Tax Policy Center
Urban Institute and Brookings Institution

INTERNATIONAL TAX POLICY FORUM/
THE URBAN-BROOKINGS TAX POLICY CENTER

SEMINAR

American Corporate
Tax Exceptionalism

February 20, 2009

International Tax Policy Forum

International Tax Policy Forum

INTERNATIONAL TAX POLICY FORUM /
URBAN-BROOKINGS TAX POLICY CENTER SEMINAR

American Corporate Tax Exceptionalism

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International Tax Policy Forum and
Urban-Brookings Tax Policy Center

American Corporate Tax Exceptionalism

Date: Friday, February 20, 2009, 8:30 a.m.–1:30 p.m.
Location: The Brookings Institution, Falk Auditorium,
1775 Massachusetts Ave, NW, Washington, DC 20036

> *Despite relatively low government revenues relative to national income, the combined U.S. statutory corporate tax rate is over 12 percentage points higher than the OECD average. The United States is the only OECD country that does not have a national value-added type tax; consequently, goods and services taxes account for a much smaller share of government finance. U.S. rules for taxing foreign source income also diverge from common international practice. Taking account of current budget proposals in Japan and the U.K., 23 out of 30 OECD countries now have territorial tax systems that generally exempt dividends received from foreign affiliates, unlike the U.S. worldwide tax system. This conference will assess the extent to which the U.S. tax system differs from international norms and whether these differences affect U.S. economic performance.*

8:30 am **Registration**

9:00 am **Welcome and Introduction**
William Gale (Brookings Institution and Tax Policy Center)
John Samuels (General Electric Corp.)

9:10 am **Taxation of Foreign Income by the U.S. and Other Governments**
Moderator: **Michael Graetz** (Yale Law School)
Presenter: **James Hines** (University of Michigan)

9:50 am **Corporate Tax Burdens at Home and Around the World**
Moderator: **Kevin Hassett** (American Enterprise Institute)
Presenter: **Douglas Shackelford** (University of North Carolina).
Commenter: **Martin Sullivan** (Tax Analysts)

10:40 am **Break**

11:00 am **Is U.S. Corporate Investment Abroad Bad for the U.S. Economy?**
Moderator: **Matthew Slaughter** (Dartmouth, Tuck School of Business)
Presenter: **Mihir Desai** (Harvard Business School)
Commenter: **Alan Auerbach** (University of California at Berkeley)

11:45 am **Does it matter if the United States Deviates from International Tax Norms?**
Moderator: **James Hines** (University of Michigan)
Panelists: **Rosanne Altshuler** (Tax Policy Center, Urban Institute)
Reuven Avi-Yonah (University of Michigan)
Michael Graetz (Yale Law School)

12:30 pm **Luncheon**

1:00 pm **Keynote Luncheon Address**
Ed Kleinbard (Chief of Staff, Joint Committee on Taxation)

1:30 pm **Adjourn**

Tax Policy Center
Urban Institute AND Brookings Institution

International Tax Policy Forum

ABOUT INTERNATIONAL TAX POLICY FORUM

Founded in 1992, International Tax Policy Forum is an independent group of approximately 40 major multinational companies with diverse industry representation. The Forum's mission is to promote research and education on the taxation of multinational companies. The ITPF briefs Congressional staff periodically and sponsors public seminars on major international tax policy issues. As a matter of policy, ITPF does not take positions on legislation or regulations.

On the research front, ITPF has commissioned over 20 papers on international tax policy topics such as the effects of the interest allocation rules, the compliance costs of taxing foreign source income, and the linkages between foreign direct investment and domestic economic activity (see www.ITPF.org).

Members of ITPF meet three times per year in Washington, D.C. to discuss key international tax policy issues with leading experts in government, academia, and private practice.

John Samuels, Vice President and Senior Counsel for Tax Policy and Planning with General Electric Company, chairs the Forum. ITPF's Board of Academic Advisors includes ITPF Research Director, Prof. **James Hines** (University of Michigan), Prof. **Alan Auerbach** (University of California, Berkeley), Prof. **Mihir Desai** (Harvard Business School), Prof. **Michael Graetz** (Yale Law School), and **Matthew Slaughter** (Dartmouth). PricewaterhouseCoopers LLP serves as advisor to the Forum. Potomac Communications Group provides public relations counsel

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ITPF Mission Statement

The primary purpose of the Forum is to promote research and education on U.S. taxation of cross-border investment. To this end, the Forum sponsors research and conferences on international tax issues and meets periodically with academic and government experts. The Forum does not take positions on legislative or regulatory proposals.

ABOUT THE TAX POLICY CENTER

The Tax Policy Center (TPC), a joint venture of the Urban Institute and the Brookings Institution, opened its doors in April 2002 with the goal of improving tax policy and, ultimately, Americans' quality of life and economic security. To that end, TPC provides objective, timely, and accessible information to help policymakers, journalists, interested laypeople, and academics identify and evaluate current and emerging tax policy options. Our work reflects the belief that better information, rigorous analysis, and fresh ideas injected at key points in the policy debate can forestall bad policies and reinforce good ones. The Center combines top national experts in tax, expenditure, and budget policy, and microsimulation modeling to concentrate on four overarching areas critical to future debate:

TPC QUICK FACTS

Senior staff testified before Congress 75 times

TPC cited in more than 3,000 regional and national news articles and editorials

TPC's microsimulation model generated nearly 2,000 distribution and revenue tables

TPC staff produced almost 1,000 publications

***TaxVox* became one of the most visited tax policy blogs with monthly page views exceeding 175,000**

TPC's web site averaged over 100,000 unique visits per month in 2008

Fair, simple, and efficient taxation: Virtually everyone agrees that taxes should be simple, fair, and efficient. Disagreement arises over how to define and achieve those objectives. TPC quantifies trade-offs among these goals and searches for reforms that increase simplicity, equity, and efficiency.

Social policy in the tax code: Over the past decade, much of social policy has shifted from direct expenditures to tax subsidies. A full assessment of this shift as well as tax progressivity, marriage penalties, and related issues requires consideration of both tax and spending programs. TPC is evaluating this revolution in tax and social policy.

Long-term implications of tax and budget choices: Long-term projections paint a constrained picture of the nation's fiscal prospects because of unfunded public obligations related to rising health care costs and the retirement of the baby boomer generation. TPC examines the implications of current policies and proposed tax changes for future generations.

State tax issues: State and local taxes play important roles in assisting low- and moderate-income families, attracting business development, and affecting the cyclical properties of the economy, and they serve as a laboratory for different approaches to resolving tax and fiscal issues. TPC builds on lengthy traditions at the Urban Institute and the Brookings Institution in examining state issues.

TPC disseminates its research on our popular website, www.taxpolicycenter.org, and through an electronic newsletter that provides information on our events and publications to approximately 3,600 subscribers.

In October 2007, the Center introduced a tax and budget policy blog called *TaxVox* (www.taxvox.org). The blog is a regular source of information and commentary for journalists, academics, administration officials, Hill staffers, as well as non-experts.

NBER WORKING PAPER SERIES

HOW GLOBALIZATION AFFECTS TAX DESIGN

James R. Hines, Jr.
Lawrence H. Summers

ABSTRACT

The economic changes associated with globalization tighten financial pressures on governments of high-income countries by increasing the demand for government spending while making it more costly to raise tax revenue. Greater international mobility of economic activity, and associated responsiveness of the tax base to tax rates, increases the economic distortions created by taxation. Countries with small open economies have relatively mobile tax bases; as a result, they rely much less heavily on corporate and personal income taxes than do other countries. The evidence indicates that a ten percent smaller population in 1999 is associated with a one percent smaller ratio of personal and corporate income tax collections to total tax revenues. Governments of small countries instead rely on consumption-type taxes, including taxes on sales of goods and services and import tariffs, much more heavily than do larger countries. Since the rapid pace of globalization implies that all countries are becoming small open economies, this evidence suggests that the use of expenditure taxes is likely to increase, posing challenges to governments concerned about recent changes in income distribution.

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1.   *Introduction*

There is a discomfort current in high income countries, as governments face excess demand for the services they provide together with difficulty raising revenue needed to finance greater expenditures or even to maintain services at levels to which their populations have grown accustomed. The mismatch of desires and means is an old and common story, hardly unique to governments, and not any easier for its banality. Changing world economic conditions, the globalization of production and markets, and the economic awakening of much of the world's population, have contributed to the problems confronting governments of affluent countries even as they have made possible some of the most exciting developments of modern times.

Economic theory offers insights chiefly into the dire consequences of possible methods that governments might use to address their financial difficulties. Efforts to tax mobile economic activity stimulate mobility and thereby create economic distortions as business activities, capital and labor are reallocated for tax rather than productivity reasons. Sophisticated tax avoidance through financial and other means reduces the revenue potential of high rates of income taxation and further contributes to the economic cost of taxation. Taxes on capital income distort the intertemporal allocation of consumption due to the compounding of effective tax rates over time. And redistributive taxation that subjects income to high marginal rates of effective taxation creates its own economic distortions.

The economic costs of raising tax revenue are particularly worrisome in an environment in which governments face significant demands on their resources. Despite the greater general affluence associated with globalization, some segments of industrial societies, particularly those relying on returns to less-skilled labor, may be adversely affected by resulting price changes. The accompanying social dislocations put pressures on governments to soften the impact of global economic changes,[1] and, if possible, respond in ways that help their populations thrive in more globally competitive markets. Social welfare programs have for many years served the first of these functions and education and training programs the second; all of these are

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[1] Rodrik (1998) offers evidence that open economies have larger government sectors than do closed economies, which he attributes to their greater demand for public expenditures that cushion the effects of globalization.

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expensive, so there is understandable interest in the ability of governments to maintain their funding in an era in which most large countries have open economies.

One of the potential challenges for governments that are eager to maintain and possibly strengthen their spending programs is that the same forces that are responsible for recent economic changes might also raise the cost of financing government programs with certain types of taxes. The relative ease of international trade, capital movement and communication makes it possible for production to locate in many places around the world and for tax burdens to be avoided through international transactions. Since location choices, activity levels, and taxable incomes are sensitive to local tax rates, it stands to reason that governments would feel intensifying international pressure to reduce tax burdens on business activities, investors, and possibly high net worth individuals. If tax rates fall without other compensating changes, then government tax revenues will decline, and with them government expenditures. A general reduction in government expenditures entails reduced outlays on social welfare and education programs, particularly since there are no countervailing international pressures on governments to maintain this spending.[2]

How then can governments find revenues to finance social spending and other programs without creating enormous economic distortions? Distortions are minimized by taxing bases that are least responsive to taxation. Land is the classic example of a factor inelastic in supply and therefore nondistortionary to tax, though taxing land raises other issues and in any case modern governments require far more revenue than is feasible to obtain from land taxes alone.

A good part of the problem facing governments is the mobility and potential mobility of economic activity. Some aspects of this mobility are clearly observable, taking the form of foreign direct investment by multinational firms, portfolio investment by individuals and financial institutions, international trade, immigration of individuals, international licensing of intangible property, and other forms of international factor mobility. Other features of mobility are more subtle, taking the form of businesses that thrive in locations that heretofore would not have been suitable for them, workforces that need not move because markets come to them, and ideas that are adopted everywhere. In the absence of coordinated government policies, the

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[2] See Avi-Yonah (2000) for an elaboration of this argument.

potential mobility of economic activity makes it extremely difficult for governments to exploit monopoly positions over much of their tax bases, thereby greatly contributing to the distortions created in the course of raising tax revenue.

The behavior of governments during the era of globalization offers clues to the likely course of future developments. Small countries with their relatively more open economies have always faced greater international pressures than have large countries, and their fiscal systems therefore had to adapt earlier than did large countries to the greater mobility that open markets create. Globalization means that in some sense all countries are becoming smaller. In order to explore the likely consequences for large countries of globalizing trends, it is therefore useful to consider the tax policies that small countries use, and in particular the way that their tax policies have differed from those in larger countries.

The evidence indicates that small counties rely much less than other countries do on income taxes imposed on individuals and corporations. While small and more open economies certainly use income taxes, their governments rely much less on these taxes than they do on expenditure-type taxes such as excise, sales and value-added taxes as well as tariffs on imported goods. The cross-sectional evidence for 1999 is that a ten percent smaller national population is associated with a one percent lower ratio of income taxes to total tax revenue, and panel evidence points to even stronger effects of changes in country size on the use of income taxes.

Expenditure-type taxes have risen in popularity everywhere in the world, as reflected in the fact that more than 130 countries now impose significant value-added taxes, and there is widespread reliance on excise taxes on gasoline and other commodities. The popularity of expenditure taxes is due in part to their administrative and enforcement features, and in part to their efficiency properties. In a globalizing world, expenditures have relatively clear geographic associations, reducing the potential for international tax avoidance and generally reducing the mobility of the tax base compared to alternatives such as personal income taxes or source-based business taxes including the corporate income tax. Expenditure taxes do not directly tax capital returns, but do so indirectly by taxing all returns when spent on goods and services, which has the effect of taxing pure profits on capital investments while effectively exempting normal returns to saving.

Heavy use of expenditure taxation in place of income taxation can carry serious implications for tax progressivity, since in practice many expenditure taxes have flat rates that make them much less progressive than income tax alternatives. Absence of tax progressivity is not intrinsic to taxing expenditures, since it is possible to tax lightly goods purchased disproportionately by low income families, though there are serious limits to the amount of redistribution that can be achieved that way.[3] It is possible to couple the adoption of new expenditure taxes with offsetting distributional changes in income taxation, as proposed by Graetz (2002) and others, though there are realistic questions about whether countries in practice are capable of enacting such sweeping reforms. Furthermore, there are serious proposals to institute progressive expenditure-type taxes, which could be implemented by countries such as the United States through relatively minor adjustments to existing taxes. In the absence of compensating adjustment to other taxes and expenditures, however, the most likely outcome of greater reliance on expenditure type taxation is reduced overall fiscal progressivity. Given recent changes in income distributions, governments may be dissatisfied with such an outcome, and seek creative alternatives that permit fiscal progressivity to accompany sufficient revenue generation.

2.   *Tax policy pressures on the United States*

The world economy has grown considerably more open and integrated in every decade since the Second World War. During the period from 1950 to 2004, total world exports and imports grew by an average of 5.9 percent a year.[4] While this reflects in part the growth of the world economy, it also reflects the impact of reduced transportation and communication costs, falling tariff rates, and reductions in other impediments to international business. From 1950 to 1975, world exports and imports grew by 2.2 percent a year relative to world output, and trade in manufacturing grew by 2.6 percent a year relative to output. From 1975 to 2004 the rate of growth of international trade relative to world output quickened for all goods to 2.3 percent a year, and for manufacturing to 3.0 percent a year. The openness of world economies is likewise reflected in a marked growth of foreign direct investment.

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[3] See, for example, the analysis in Sah (1983).
[4] See Hummels (2007) for detailed evidence of the growth of world trade since 1950.

Changes to the world economy have coincided with significant changes to the distribution of income in the United States and other high-income countries. Table 1 presents data compiled by the Congressional Budget Office on shares of pretax income accounted for by different income groups in the United States. The highest quintile of the income distribution received 45.5 percent of household income in 1979, a figure that rose to 55.1 percent by 2005. The top one percent of families had 9.3 percent of total income in 1979, whereas the corresponding figure for 2005 is 18.1 percent. At the other end of the income distribution, the lowest quintile in 1979 received 5.8 percent of family income, a ratio that fell to just 4.0 percent by 2005. By just about any measure income has become significantly less evenly distributed in the United States over the past three decades. There is considerable controversy over the extent to which changes to income distributions in wealthy countries can be attributed to the growth of international trade and investment, though the evidence reviewed by Feenstra and Hanson (2004) strongly suggests that globalization has contributed significantly to income inequality.

The changing income distribution creates demands for the U.S. government to improve the economic prospects of the disadvantaged with education, training, and other programs, and to modify the after-tax distribution of income through the tax and transfer system. Creating meaningful new national economic opportunities with education and training programs requires significant expenditures that entail substantial new financing sources, typically in the form of higher taxes. Redistributing income through the tax system also requires high tax rates, including not only taxes on affluent individuals and families but high implicit tax rates on means-tested transfers to low-income individuals and families.

Perhaps the most significant sectoral shift of modern times is the rising fraction of national resources devoted to health spending. The government is heavily involved in all matters concerning health, so rising health costs together with limits to the ability of private individuals and their employers to finance adequate health coverage put enormous potential burdens on governments to make up any differences. Table 2 presents recent estimates from the Centers for Medicare and Medicaid Services of historical and projected health care expenditures by private individuals and the public sector in the United States. As is evident from this table, annual federal government health spending is projected to rise from its 2006 level of $664 billion to $1.471 trillion by 2017, thereby more than doubling per capita annual federal government

spending from $2,217 in 2006 to $4,505 in 2017. Over the same period state and local governments are projected to increase their per capita annual health spending from $826 to $1,568. Even with this growing support from different levels of government, total per capita private health expenditures, including private health insurance, out-of-pocket payments, and other private expenditures, are anticipated to grow from $3,517 in 2006 to $6,203 by 2017.

Significantly increased public spending on health care requires greater resources for all levels of government. In addition, rising per capita private health care costs contribute to financial burdens on private individuals, particularly those without access to generous employer-provided health insurance. This, in turn, adds to the demand for public support of low-income individuals and families.

Changes to the distribution of income and rising health care expenditures are just two of several trends that contribute to U.S. government revenue needs in the coming years. An aging population requires greater spending on public pensions, including social security and disability insurance, and an aging public infrastructure creates significant needs for greater spending on roads and highways, sewer systems, port and airport facilities, telecommunications, and other elements of public infrastructure. At the same time that the U.S. government faces greater expenditure demands, its ability to finance expenditures is limited by greater mobility of the tax base and competition from other parts of the world for mobile economic activity.

Rising levels of worldwide foreign direct investment have the potential to trigger rounds of competitive business tax reductions, as countries seek to attract the employment opportunities, productivity spillovers, and other economic benefits commonly associated with greater investment, particularly foreign investment. Countries have incentives to reduce business tax rates if they believe that lower tax rates will be associated with greater economic activity, higher tax base, or both. While evidence of growing foreign direct investment does not by itself demonstrate that tax policies influence the magnitude and performance of international investment, there is ample separate evidence that they do.

A substantial body of research considers how taxation influences the activities of multinational firms.[5] This literature considers the effects of taxation on investment and on tax avoidance activities. With respect to investment, tax policies are obviously capable of affecting the volume and location of foreign direct investment, since all other considerations equal, higher tax rates reduce after-tax returns, thereby reducing incentives to commit investment funds. This literature identifies the effects of taxes through time-series estimation of the responsiveness of foreign direct investment to annual variation in after-tax rates of return and cross-sectional studies that exploit the large differences in corporate tax rates around the world to identify the effects of taxes on foreign direct investment. The first generation of these studies, reviewed in Hines (1997, 1999), reports tax elasticities of investment in the neighborhood of –0.6. What this means is that a ten percent tax reduction (for example, reducing the corporate tax rate from 35 percent to 31.5 percent) should be associated with six percent greater inbound foreign investment. More recent evidence suggests that foreign direct investment is even more tax sensitive than this.[6]

Contractual arrangements between related parties located in countries with different tax rates offer numerous possibilities for sophisticated tax avoidance. It is widely suspected that firms select transfer prices used for within-firm transactions with the goal of reducing their total tax obligations. Multinational firms typically can benefit by reducing prices charged by affiliates in high-tax countries for items and services provided to affiliates in low-tax countries. OECD governments require firms to use transfer prices that would be paid by unrelated parties, but enforcement is difficult, particularly when pricing issues concern differentiated or proprietary items such as patent rights. Given the looseness of the resulting legal restrictions, it is entirely possible for firms to adjust transfer prices in a tax-sensitive fashion without violating any laws. Multinational firms can structure a variety of transactions – intrafirm debt, royalty payments, dividend repatriations, and intrafirm trade – in a manner that is conducive to tax avoidance.

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[5] See Gordon and Hines (2002), Devereux (2006) and Hines (2006), from which some of this material is drawn, for recent surveys. For a fuller discussion of the tax rules facing U.S. multinational firms and the evidence on behavioral responses to international taxation of U.S. multinationals, see Hines (1997, 1999) and Desai, Foley and Hines (2003).

[6] For example, Altshuler, Grubert and Newlon (2001) compare the tax sensitivity of aggregate capital ownership in 58 countries in 1984 to that in 1992, reporting estimated tax elasticities that rise (in absolute value) from –1.5 in 1984 to –2.8 in 1992. Altshuler and Grubert (2004) offer evidence of a -3.5 tax elasticity of investment in a sample of 58 countries in 2000.

Studies of the responsiveness of firms to taxes on these margins examine reported profitabilities, tax liabilities, and specific measures of financial and merchandise trade in order to identify the effects of taxes.[7]

Taken together, this evidence implies that the volume of foreign direct investment, and accompanying economic activity and corporate tax bases, is highly responsive to local tax policies. It follows that countries contemplating lowering their corporate income tax rates can reasonably expect to receive significantly greater foreign investment as a consequence. Active tax avoidance on the part of international investors implies that taxable income conditional on investment levels also responds strongly to tax rate changes. The combination of these two effects reduces the budgetary cost to a single country that reduces its tax rate, since a lower tax rate is accompanied by a larger tax base due both to greater investment and to greater taxable income associated with local investment. The incentive to reduce corporate tax rates in order to attract foreign direct investment has increased since the early 1980s, as levels of world foreign direct investment rose sharply during that time.

3.   *Economic globalization and tax competition*

It stands to reason that countries eager to attract tax bases might compete with each other by reducing tax rates, as a result of which taxes, and therefore government expenditures, are driven to inefficiently low levels. The likelihood of such an outcome depends on the tax instruments available to governments and the nature of the competitive environment. In order to evaluate this prospect it is helpful to consider the incentives that countries face.

Our understanding of the tax rate implications of international capital mobility dates to Diamond and Mirrlees (1971), who demonstrate that efficient taxation in a small open economy entails zero taxation of income earned by foreign investors. The explanation for their result is that any positive taxation distorts the economy more than would other tax alternatives, without

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[7] For evidence on intrafirm trade, see Clausing (2001, 2003) and Swenson (2001). For evidence on intrafirm debt, see Desai, Foley and Hines (2004), Huizinga, Laeven and Nicodeme (2006), and Grubert (1998). For evidence on royalties, see Grubert (1998) and Hines (1995). For evidence on dividend repatriations, see Desai, Foley and Hines (2001) and Hines and Hubbard (1990). See Grubert and Mutti (1991) and Hines and Rice (1994) for evidence on differences in reported profitability in response to tax rates. While these studies exclusively use data on U.S. multinationals, Bartelsman and Beetsma (2003) use country level data within the OECD to identify the prevalence of profit-shifting activities more generally.

shifting any of the tax burden to foreign investors.[8] If international capital flows are increasingly sensitive to tax rate differences, then incentives to reduce tax rates are presumably rising as well. The analysis also implies that countries that nevertheless persist in taxing income earned by foreign investors will have lower incomes than those that do not.

The Diamond and Mirrlees result is commonly thought to imply that small countries have the least to gain from attempting to impose taxes on investment. Small countries are believed to face the most elastic corporate tax bases, and therefore to have the strongest incentives to offer low corporate tax rates, despite possible mitigating factors such as strategic behavior and distortions induced by other policies. While there are few tests of the proposition that the supply of capital to small countries is more elastic than the supply of capital to large countries, this is more than a matter of faith, since, in most models, it follows as an implication of their relatively small domestic business tax bases.[9] Whether countries actually design their policies based on these presumed elasticities is another matter.

Larger countries have stronger incentives to tax foreign investors, since they are able to extract some rents by virtue of the fact that prices in their economies need not respond to tax policies in a way that maintains unchanged the investors' after-tax profit margins. Possibly weighing against this is strategic competition among large countries, whose tax policies may be designed in a way that reflects their likely effects on the policies of other countries. Another consideration is that the inability to tailor tax and other policies perfectly might change efficient levels of taxation from what they would be in the absence of other distortions. For example, trade barriers may distort local prices and thereby influence the efficient taxation of foreign direct investment. If countries are unable to impose corrective taxes or subsidies on externality-producing activities of corporations, then modifications to corporate income tax rates might serve as indirect remedies. Similarly, if personal income taxation cannot be tailored to achieve efficient redistribution, then there may be circumstances in which efficient third-best tax policies might include distortionary corporate taxes. Finally, large countries might have personal income tax rates that differ from those in small countries. Efforts to align top personal and corporate tax rates in order to prevent tax arbitrage would then produce correlations between corporate tax

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[8] See Gordon (1986) for an elaboration of this argument, and Gordon and Hines (2002) for a further exposition.
[9] See, for example, Bucovetsky (1991).

rates and country sizes that stem from the determinants of personal income tax rates rather than efficient taxation of inbound foreign investment.

Several country-specific considerations therefore affect the consequences of taxing internationally mobile capital. It is noteworthy that, even in the absence of special considerations, international tax competition may produce outcomes in which capital taxes are higher than they would be in the absence of competition. This can happen when there is foreign ownership of productive factors, when competing countries differ greatly in size, or when multiple governments attempt to tax the same income sources.

The case of foreign ownership is clear: governments that care only about the welfares of domestic residents have incentives to adopt policies that enrich residents at the expense of foreigners. Foreign ownership of local firms may encourage governments to raise local capital tax rates above the levels they would impose in the absence of economic openness, since much of the tax burden is borne by owners to whom the taxing government is largely indifferent. Even foreign ownership of local land may trigger higher corporate tax rates, if the burden of corporate taxes is in part borne by landowners in the form of lower prices. Finally, governments may have incentives to overtax the foreign earnings of domestic companies, since doing so discourages foreign investment and thereby directs resources to the home economy, a valuable exchange in the presence of tax or other distortions.[10] If all governments respond to these incentives then the result is that capital can be overtaxed in equilibrium.

Competition among countries of differing sizes creates incentives for jurisdictions to choose tax policies strategically to manipulate international prices to their own advantage. As DePater and Myers (1994) note, large capital importing countries have incentives to tax capital heavily in order to reduce capital demand and therefore depress the world price of capital that domestic importers must pay. By the same reasoning, capital exporting countries have incentives to subsidize capital investment in order to raise prices, but if the exporting countries are smaller than the importers, it may not be in the interest of any individual exporter acting on

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[10] Huizinga and Nielsen (1997) analyze incentives to increase corporate tax rates when foreigners make local corporate investments, Richter and Wellisch (1996) consider the case of foreign-owned land, and Mintz and Tulkens (1996) analyze incentives to overtax foreign income.

its own to offer such subsidies. The result is that international tax competition produces higher average capital tax rates than in the absence of competition.

What is the likely impact of tax competition on tax rates and government revenues? In a simple setting of symmetric countries, no special considerations or distortions, no foreign ownership, and governments that must finance all of their expenditures with capital income taxation, Bucovetsky and Wilson (1991) confirm that international competition reduces government revenue and expenditures below efficient levels that would be chosen in the absence of competition. Oates and Schwab (1988) note that this conclusion depends critically on the assumption that governments do not have access to revenue sources other than capital income taxes, since the availability of nondistortionary alternatives eliminates any impact of capital taxes on government spending levels. Since governments rely on many revenue sources other than capital income taxes, since foreign ownership is common, countries differ in size, and tax policies are often used to correct economic distortions that cannot be more easily addressed some other way, it is possible for greater international economic mobility not to depress total government revenues.

Governments unable to raise significant amounts of revenue by taxing mobile business income may be able to use other taxes, but the revenue potentials of some alternatives to business taxes are to a lesser degree also limited by international considerations. In the case of personal income taxes, the ability to use international financial transactions may facilitate tax avoidance by high income taxpayers, and international mobility of individuals and their earnings increases the mobility of the personal income tax base.[11] Furthermore, downward pressure on business tax rates created by international competition is likely to exert downward pressure on top personal income tax rates also, due to the ability of taxpayers to select the forms of business organization. Top personal income tax rates that greatly exceed top corporate income tax rates create incentives for individuals to create corporations financed with personal investments that effectively convert personal income into corporate income, thereby undermining the revenue potential of high personal tax rates and in the process inefficiently directing their investments

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[11] See, for example, Gordon and Nielsen (1997), who note that individuals have greater international tax avoidance opportunities under income taxation than under value-added taxation, and who use Danish data to estimate the magnitude of the difference.

(Gordon and Mackie-Mason, 1995). In response to this possibility, many governments are loath to introduce significant distinctions between top personal and business tax rates.

Taxing personal income entails taxing the returns to capital, which in turn reduces incentives to save and invest. The modern theory of capital accumulation notes that the imposition of capital income taxes creates inefficiencies by introducing growing tax wedges between consumption early in life and consumption many years later.[12] The inefficiencies associated with taxing capital income are in no way mitigated, and are quite possibly increased, by the availability of international capital markets that make the supply of capital investment opportunities close to perfectly elastic.[13] Consequently greater access to world capital markets increases the efficiency costs associated with income taxation.

4. *World patterns*

The United States has a smaller government than many of its peer nations in the OECD, and the composition of U.S. tax revenues likewise differs significantly from those of other countries. Table 3 presents OECD data on government finances of OECD countries in 2004. In that year U.S. tax revenues were 25.5 percent of GDP, significantly lower than the OECD average of 35.9 percent and the European Union average of 39.7 percent. Personal income taxes accounted for 34.7 percent of U.S. tax receipts, significantly higher than the OECD average of 24.6 percent. The United States raised 8.7 percent of its total tax receipts from corporate income taxes, a shade lower than the OECD average of 9.6 percent, but raised only 18.3 percent of total tax revenue from taxes on goods and services, compared with 32.3 percent for OECD countries as a whole.

A major reason that the United States relies so much less than other countries do on taxing goods and services is that, alone among OECD nations, the United States does not have a value-added tax, which is a sophisticated form of a sales tax. For most of the world the major tax event of the late twentieth century is the widespread adoption of value-added taxes. Whereas by 1966 only two countries had introduced value-added taxes, by 1985, 35 countries had done so, and in 2004, 134 countries collected significant tax revenue with value-added taxes. Every

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[12] See, for example, Chamley (1986) and the discussion in Auerbach and Hines (2002).
[13] See the discussion in Correia (1996).

OECD country other than the United States taxes value-added, at rates that average 17.7 percent, and that range from Denmark, Hungary, and Sweden at the high end imposing 25 percent value-added tax rates, and Japan, Canada, and Switzerland at the low end all using value-added tax rates in the 5.0 – 7.5 percent range.

Table 4 presents information on top personal and corporate tax rates among OECD countries in 2004. The U.S. top personal tax rate of 41.4 percent is almost identical to the OECD average of 41.3 percent, though the U.S. corporate tax rate of 39.3 percent is the highest among OECD countries, significantly exceeding the OECD average of 29.8 percent. By the OECD's calculations, the U.S. tax burden on an average production worker reduces disposable income to 76.6 percent of take-home pay for single individuals and 95.5 percent of income for families with two children, in both cases representing smaller tax burdens than the OECD average.

4.1   Income taxes

The United States is typical among large countries in relying heavily on personal income taxes and corporate income taxes to finance government expenditures. Figure 1 presents information from the IMF Government Finance Statistics on fractions of total national tax revenue accounted for by the sum of personal income taxes and corporate income taxes. The top panel of Figure 1 presents two loci: the triangles represent averages for the quarter of the sample of countries with the largest populations, whereas the diamonds represent averages for the quarter of the sample of countries with the smallest populations. This is an unbalanced panel, since country coverage in the IMF data varies a bit from year to year; and to a lesser degree, differential population growth rates change the identities of the largest and smallest countries over time.

It is clear from the bottom panel of Figure 1 that large countries rely most heavily on income taxes. In a typical early year, such as 1972, the average large country drew 41.6 percent of its total tax revenue from personal and corporate income taxes, whereas the comparable figure for the average small country was 34.5 percent. These differences have not narrowed over time: by 2003, income taxes accounted for 43.9 percent of tax revenue in large countries, and only 27.5 percent of revenue in small countries.

One of the difficulties of interpreting the information in the top panel of Figure 1 is that the composition of large and small countries in the sample changes over time as populations change and IMF data availability fluctuates. The bottom panel of Figure 1 presents the same information for a balanced panel of countries between 1973 and 2001, a span of time over which the IMF data are most plentiful. Countries in this sample are assigned to the top size quartile and bottom size quartile based on their 1973 populations. As is evident from the figure, differences in the extent to which small and large countries rely on personal income taxes have increased over time. In 1973 the larger countries in this sample raised an average of 41.5 percent of their tax revenue from personal and corporate income taxes, whereas smaller countries raised only 31.2 percent of their tax revenue from income taxes. By 2001, larger countries relied on personal and corporate income taxes for 48.9 percent of their tax revenues, and smaller countries relied on income taxes for 29.9 percent.

The reason to distinguish countries by size is that economic openness is commonly thought to be a function of country size: there are good reasons to believe that large countries have internal markets that are larger as fractions of their total markets than is the case for smaller countries. The IMF evidence is consistent with this interpretation, as the standard measure of economic openness (the ratio of a country's exports plus imports divided by its GDP) is negatively correlated with country size. Appendix Table 1 presents annual cross-sectional correlations between country sizes (as measured by log population) and the standard measure of economic openness; between 1972 and 2006, this correlation varies between -0.32 and -0.22, and is always statistically significant.

It is possible to compare the tax policies of countries with differing degrees of openness, though one of the difficulties of such a comparison is that import and export performance is arguably affected by a country's tax policies, and therefore not entirely appropriate as an independent source of variation. It is nevertheless instructive to consider such a comparison, as presented in Figure 2. The evidence in the top panel of Figure 2 is that since the early 1980s countries with less open economies (as measured by ratios of exports plus imports to GDP) have relied more heavily on income taxes than do countries with more open economies. This difference is more pronounced in the balanced panel comparison presented in the bottom panel

of Figure 2, where if anything the difference between reliance on income taxes by countries with open and closed economies has if anything has widened over time.

The IMF data distinguish income tax revenues by personal and corporate taxes, though with spotty coverage and some uncertainty over which revenues are allocated to each category. As a result, any analysis of corporate or personal income taxes in isolation must be treated with some caution. The top panel of Figure 3 presents information on differences in the extent to which a balanced panel of large and small countries rely on corporate tax revenue over the 1973-1999 period for which data are most plentiful; this evidence illustrates the persistent pattern that smaller countries collect significantly less corporate tax revenue as fractions of total taxes. The bottom panel of Figure 3 presents similar information for open and closed economies over the 1975-1998 period, with less open economies relying to greater degrees on corporate tax sources.

Table 5 presents evidence of the impact of country size and affluence on the extent to which countries rely on personal and corporate income taxes. The table presents six cross-sectional regressions, two for 1973, two for 1985, and two for 1999; the dates were chosen with the goals of covering a wide range of years and also maintaining sizeable country coverage for the regressions. The regression in column one suggests that larger and more affluent countries may have relied more heavily than other countries on personal and corporate income taxes in 1973, though the estimated coefficients are not statistically significant. In the regression for 1985 presented in column three country sizes and levels of affluence have more statistical power in explaining the use of income taxes. The 0.019 coefficient implies that doubling a country's population is associated with a 1.9 percent higher ratio of income taxes to total tax collections, and the 0.053 coefficient implies that wealthier countries rely more heavily on income taxes.

The regressions reported in columns 5 and 6 of Table 5 indicate that the effect of country size became stronger by 1999. The 0.051 coefficient in column 5 of Table 5 is very similar to the corresponding 0.053 coefficient in column 3, but the statistically significant 0.042 coefficient in column 5 indicates that doubling a country's population is associated with a 4.2 percent higher ratio of income taxes to total taxes, corresponding to roughly a ten percent greater reliance on income taxes. The regression reported in column six reveals that the effects of country size and affluence are concentrated in their interaction: the 0.015 coefficient on the interaction term is

large and statistically significant, whereas the estimated coefficients on the uninteracted population and per capita income variables are negative.

It is possible to use the panel nature of the data to identify the impact of changes in population and income levels on the use of personal and corporate income taxes. The panel estimates include country and year fixed effects, which absorb the impact of persistent differences between countries and common effects of changes over time. In estimating these relationships in a panel framework it is necessary to normalize for the persistent increases in population and income levels that characterize the experience of most countries between 1972 and 2006. In the panel regressions that follow, the log income, log population, and interaction of log income and log population variables are normalized by dividing them by annual means of these variables, as a result of which the means of the regression variables are (by construction) one in each year (and for the sample as a whole).

Table 6 presents panel estimates of the determinants of personal and corporate income tax collections as a fraction of total taxes. These regressions include year and country fixed effects, and represent an unbalanced panel, in that not every country is included every year.[14] At a first look the evidence in the first column of Table 6 gives a rather different impression than the cross sectional regressions in Table 5. As in the cross sectional regressions, higher income levels are associated with greater use of personal income taxes, the 0.257 coefficient in column one implying that doubling a country's income level is associated with a 25.7 percent higher ratio of personal taxes to total taxes. The striking -2.985 coefficient in the same column, however, implies that high levels of national population growth are associated with reduced use of personal income taxes. Introduction of a variable capturing the interaction of country size and affluence in the regression reported in column 2 changes these results rather little.

One question raised by these regression results is the extent to which the effects of income and population may change over the 1972-2006 time period. The regression reported in column three introduces additional variables that interact starting (1972) population and income levels with time, where time is a variable taking the value one in 1972 and 35 in 2006. Introduction of these time interaction variables somewhat enhances the estimated size of income

effects, as reflected in the 0.418 coefficient in column 3. The 0.011 coefficient on the interaction of time and normalized income indicates that countries that were more affluent in 1972 tended to increase their use of income taxes over the sample period compared to other countries.

Introducing time interactions has a more striking effect on estimated population effects. The estimated coefficient on normalized population is small and insignificant in the regression reported in column three, whereas the 0.021 coefficient on the interaction of time and initial population indicates that countries with small populations in 1972 relied to declining degrees on income taxes over time. Introducing interactions between population and income in the regression reported in column four reveals that wealthy large countries made greater use of income taxes over time, as reflected in the estimated 0.052 coefficient.

4.2   Expenditure taxes

Figure 4 presents ratios of expenditure taxes – the sum of indirect taxes on goods and services and international trade taxes (chiefly tariffs) – to total tax revenue. It is evident from both the unbalanced and balanced panels displayed in Figure 4 that small countries finance much more of their governments through expenditure taxes than do large countries. The information in the lower panel of Figure 4 suggests that differences related to country sizes have not fallen over time, but instead remain quite substantial.[15]

Figure 5 compares the use of expenditure taxes by countries with more and less open economies. The evidence presented in the top panel of Figure 5 suggests that more open economies have relied relatively heavily on expenditure taxes since the early 1980s, though this was not true prior to that. Evidence from the balanced panel of countries displayed in the bottom panel of Figure 5, however, indicates that more open economies have consistently used expenditure taxes to greater degrees than less open economies.[16]

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[14] Results for a balanced panel of data covering a smaller number of countries for 1973-1999 are very similar to those reported for the larger unbalanced panel.

[15] The expenditure tax patterns displayed in Figure 4, and the subsequent regressions, are more than simply the mirror images of the income tax evidence, since countries have access to many taxes other than income and expenditure taxes, including property taxes, estate and inheritance taxes, stamp duties, payroll taxes, and others.

[16] This evidence in Figure 5 must be interpreted with caution, since expenditure taxes include trade taxes that themselves are likely to influence economic openness.

Table 7 presents evidence that country size and per capita income are consistently associated with smaller ratios of expenditure taxes to total tax revenues. The -0.041 coefficient in column 1 implies that doubling a country's population in 1973 is associated with 4.1 percent smaller ratio of expenditure taxes to total tax revenue; and the -0.048 coefficient similarly implies that doubling a country's per capita income is associated with a 4.8 percent smaller ratio of expenditure taxes to total tax revenue. These effects persist in the regressions for 1985 and 1999, presented in columns 3-6 of Table 4, indicating that expenditure taxes are most heavily used by small and poor countries.

The panel evidence, reported in Table 8, is quite consistent with the cross sectional evidence appearing in Table 7. The -0.442 coefficient reported in column one implies that growing income levels are associated with reduced reliance on expenditure taxes, and the -1.435 coefficient indicates that population growth is likewise associated with less use of expenditure taxes. Inclusion of an interaction between population and income in the regression reported in column two changes these results very little, though the estimated income effect becomes statistically insignificant. And adding interactions between time and initial income and population levels in the regressions reported in columns 3 and 4 again does little to change the implications of the regression reported in column 1, that countries whose populations and income levels grow smaller make greater relative use of expenditure taxes.

5.   *Implications*

The international evidence indicates that governments of countries with smaller and more open economies rely less on personal and corporate income taxes, and more on expenditure and trade taxes, than do other governments. Doubtless this reflects many aspects of their economic and political situations, including that properly designed expenditure-type taxes (though typically not trade taxes) can create fewer economic distortions than many income taxes.

The United States currently taxes personal and corporate income at high rates compared to other countries, particularly given the relatively small size of the U.S. public sector. As the world economy becomes more integrated, the cost of this type of income taxation will grow relative to the cost of expenditure tax alternatives. There has been consistent U.S. resistance to the prospect of introducing extensive expenditure taxation of the type embodied in value-added

taxes or reform of the personal income tax that would give it explicit expenditure tax features. One of the political obstacles that a value-added tax or any other broad based consumption tax must overcome in the United States is the concern, in some circles, that such taxes are too efficient at raising revenue, that they too easily accommodate big government. While there is little in the way of econometric support for the notion that the adoption of a value-added tax encourages government growth (see, e.g., Metcalf, 1995), it is noteworthy that Michigan, the only state in the country to use a value-added tax instead of a corporate income tax, taxed businesses more heavily than did any other state during in the years when its value-added tax was in place (Hines, 2003). In an era in which governments face growing demands for their services, and in which other sources of tax revenue confront growing challenges and are increasingly inefficient, it may not be surprising that governments all over the world have come to rely more heavily on expenditure taxes to meet their revenue needs.

Distributional issues present some of the greatest challenges of globalization, since growing international trade and investment affect income distributions directly by changing relative prices and indirectly by affecting the range of feasible government policies. In practice many expenditure taxes are considerably less progressive than income tax alternatives, so movement away from income taxation and in the direction of greater expenditure taxation is typically associated with less equal after-tax distributions of income. Governments that are concerned about growing income inequality and that feel pressured to move their tax systems more strongly in the direction of expenditure taxation therefore can be expected to look for progressive alternatives to standard policy choices. Such alternatives may include progressive forms of expenditure taxation and expenditure policies, such as education and training programs, that support income creation by less affluent members of the population.

The fiscal challenges facing governments in the era of globalization are unlikely to be addressed with single answers such as expanded education programs, but instead strategies that include broad ranges of government policy initiatives. International agreements have the potential to play significant roles in these strategies. It is already the case that governments cooperate in international settings such as the World Trade Organization to promote international trade and investment, and bilateral and multilateral tax agreements and initiatives serve the function of facilitating tax enforcement and avoidance of double taxation of international

income. Doubtless governments will come to rely more heavily on international agreements in the years to come, but it remains to be seen whether they will accelerate or offset the recent trend in the direction of expenditure taxation.

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Figure 1: Income Taxes in Small and Large Countries

Income taxes trend, unbalanced panel (1972-2003)

Income taxes trend, balanced panel (1973-2001)
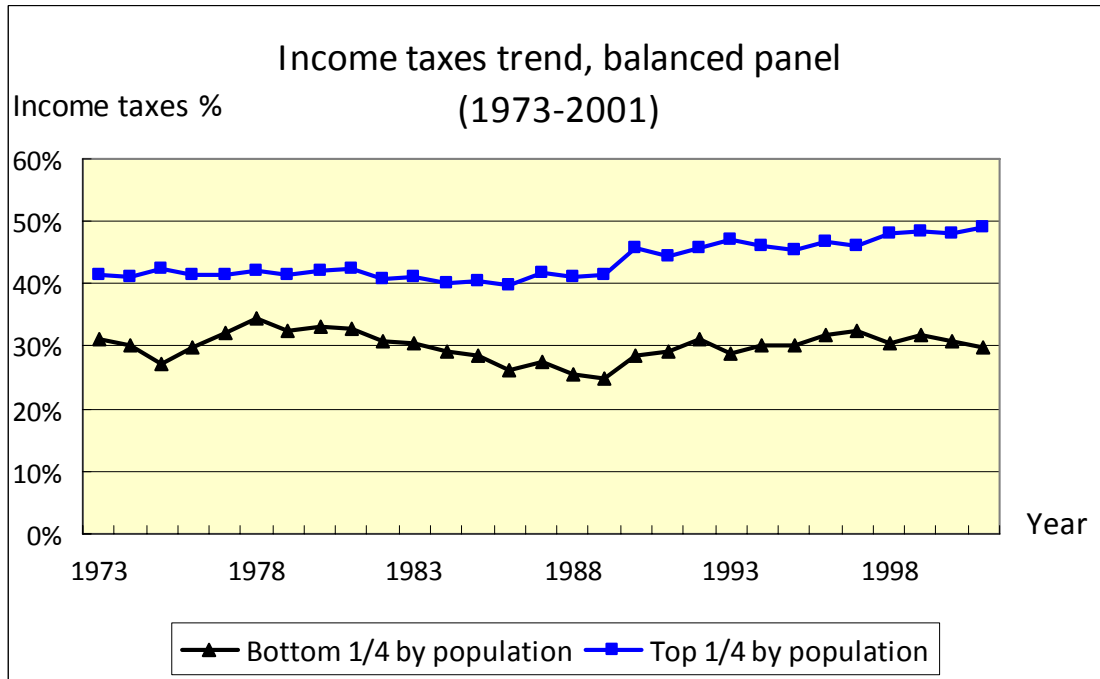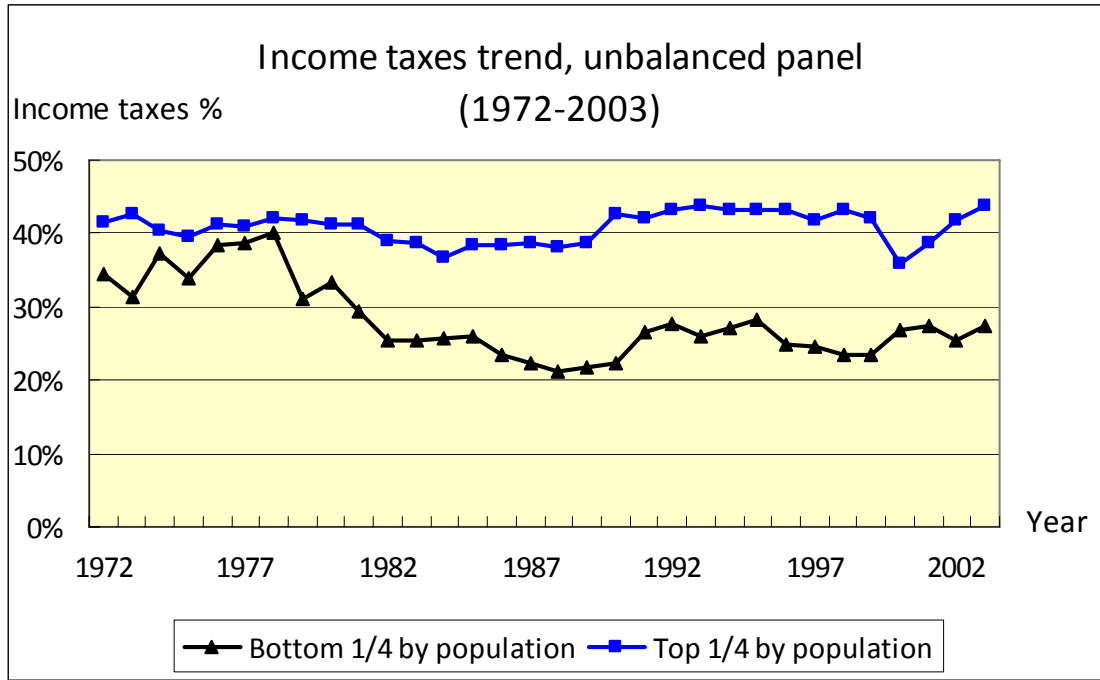
Note: the two panels of Figure 1 depict the sum of personal and corporate income taxes as fractions of total national tax revenue for samples of small and large countries.

Figure 2: Income Taxes in Countries with Open and Closed Economies

Income taxes trend, unbalanced panel (1972-2003)

Income taxes trend, balanced panel (1973-2001)

Note:

25
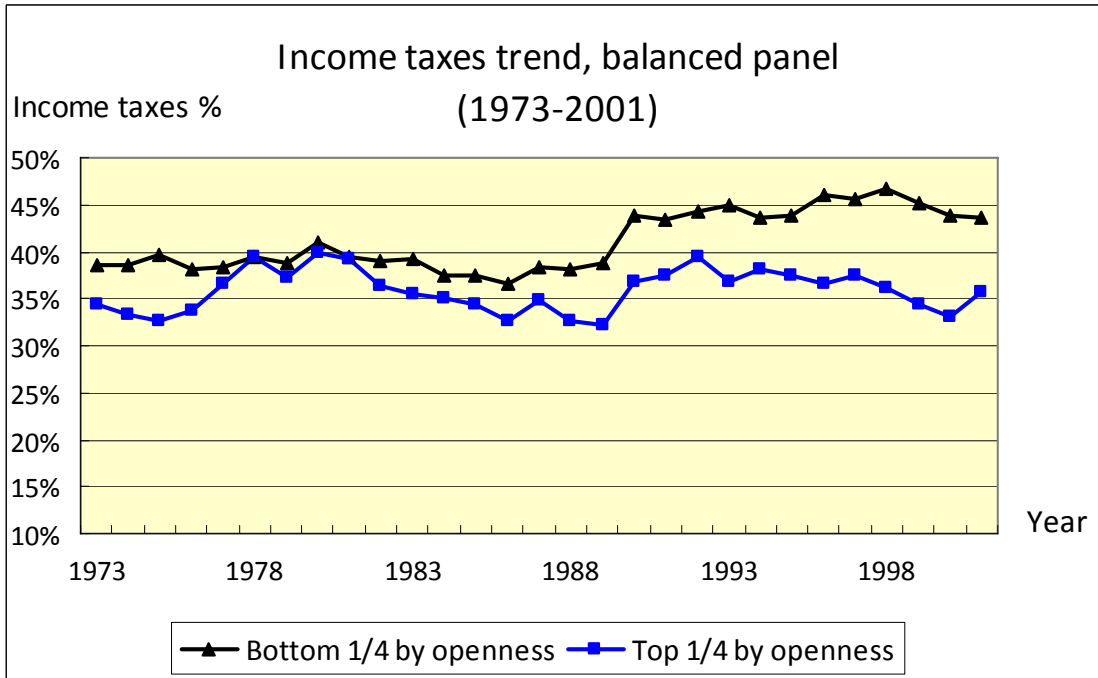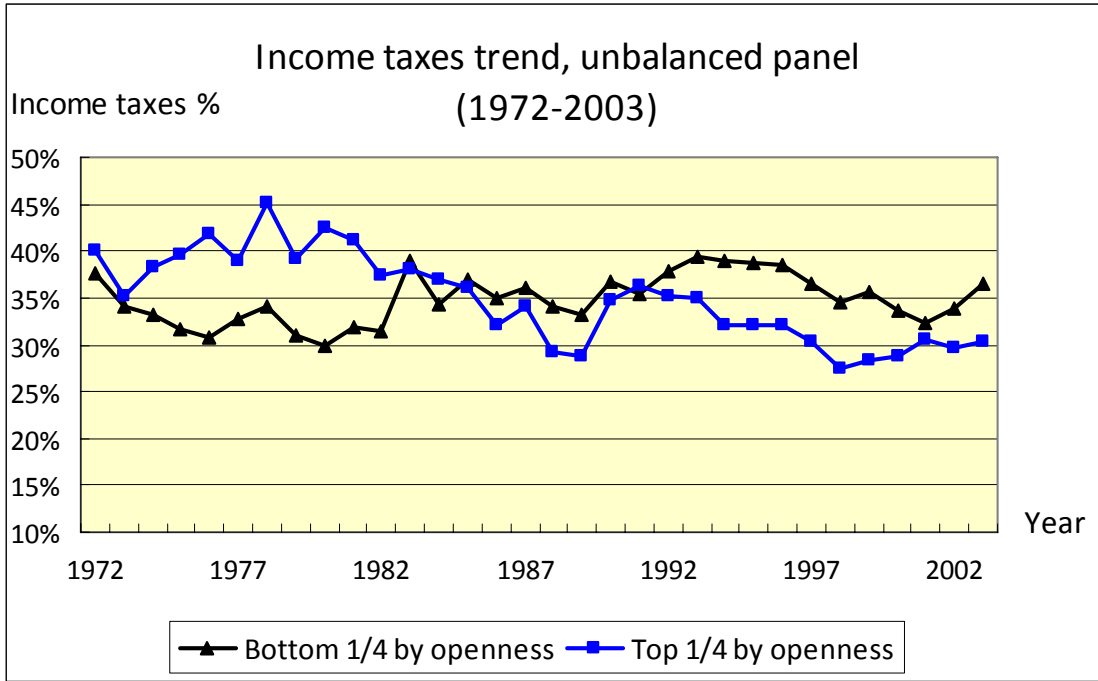
Figure 3: Corporate Income Taxes in Countries with Small and Open Economies

Corporate income tax trend, balanced panel (1973-1999)

Corporate income tax %

Legend: Bottom 1/4 by population, Top 1/4 by population

Corporate income tax trend, balanced panel (1975-1998)

Corporate income tax %

Legend: Bottom 1/4 by openness, Top 1/4 by openness

Note:

26
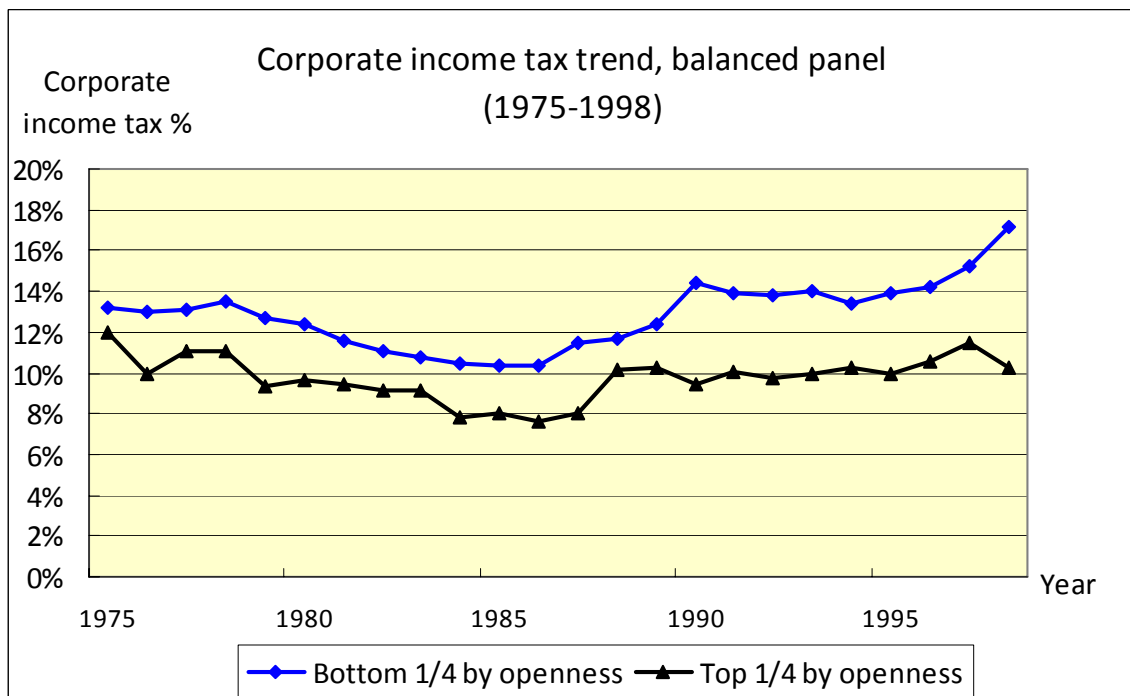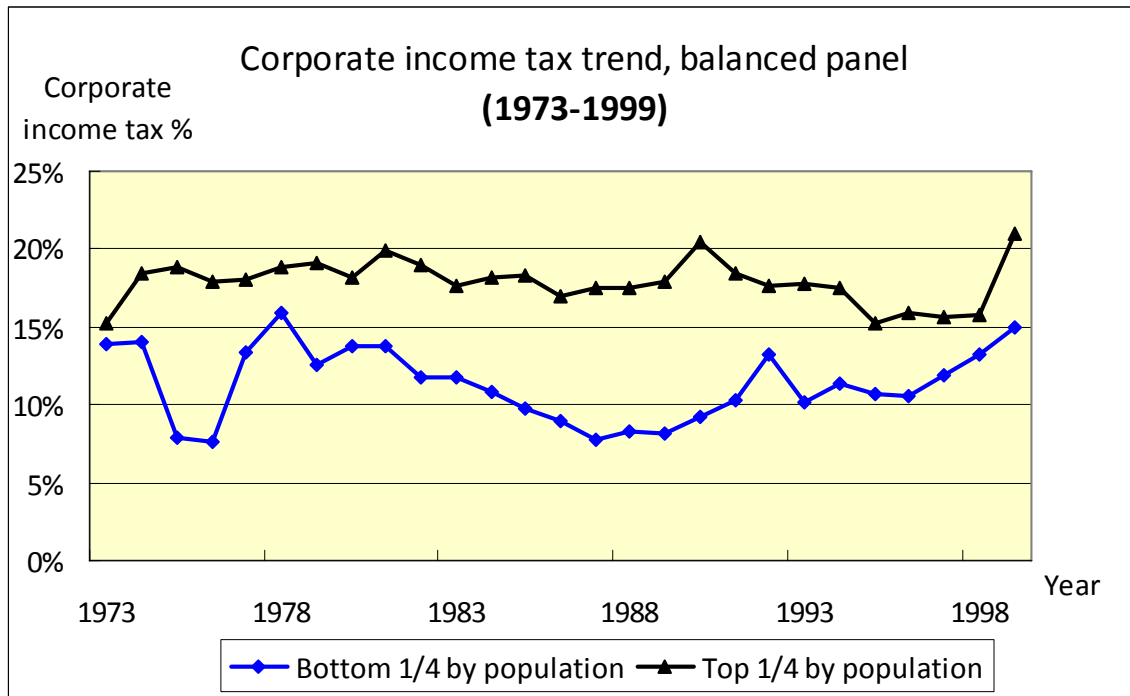
Figure 4: Expenditure taxes in Small and Large Countries

Spending taxes trend, unbalanced panel (1972-2003)

Spending taxes %

Legend: Bottom 1/4 by population — Top 1/4 by population

Spending taxes trend, balanced panel (1973-2001)

Spending taxes %

Legend: Bottom 1/4 by population — Top 1/4 by population
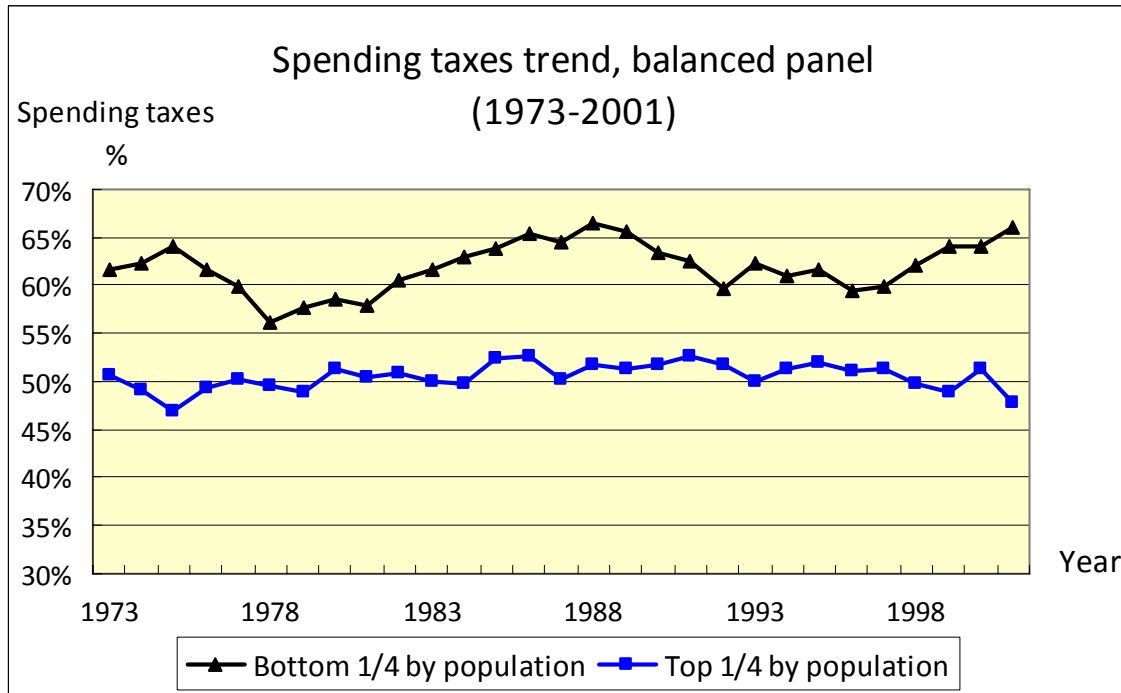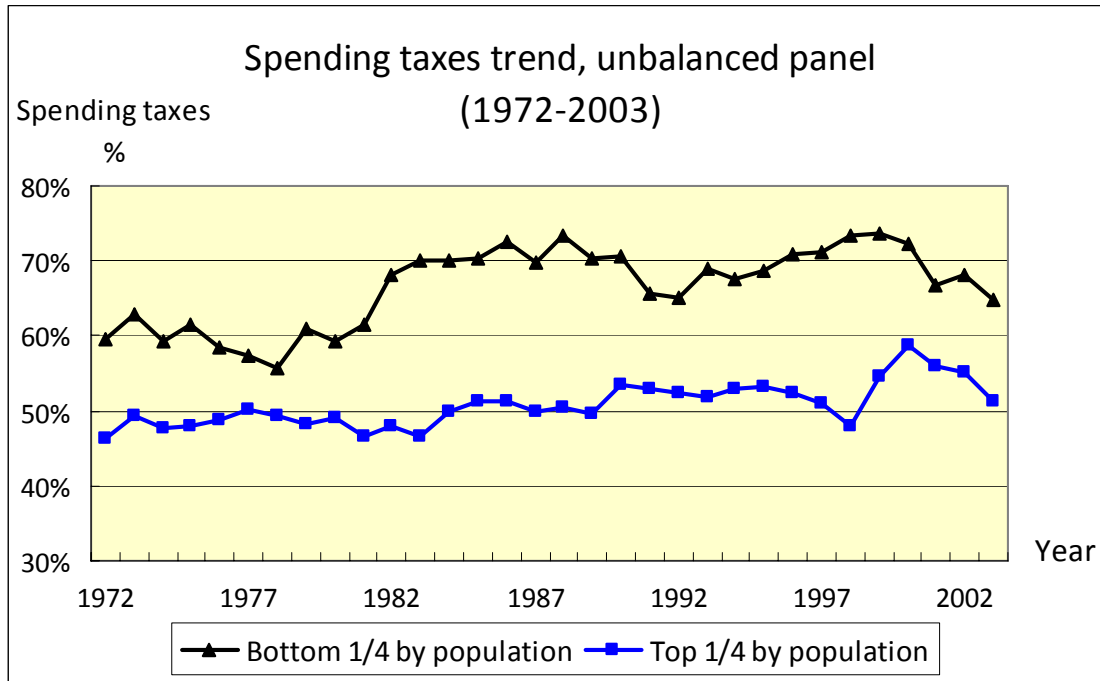
Figure 5: Expenditure taxes in Countries with Open and Closed Economies

Spending taxes trend, unbalanced panel (1972-2003)

Spending taxes trend, balanced panel (1973-2001)
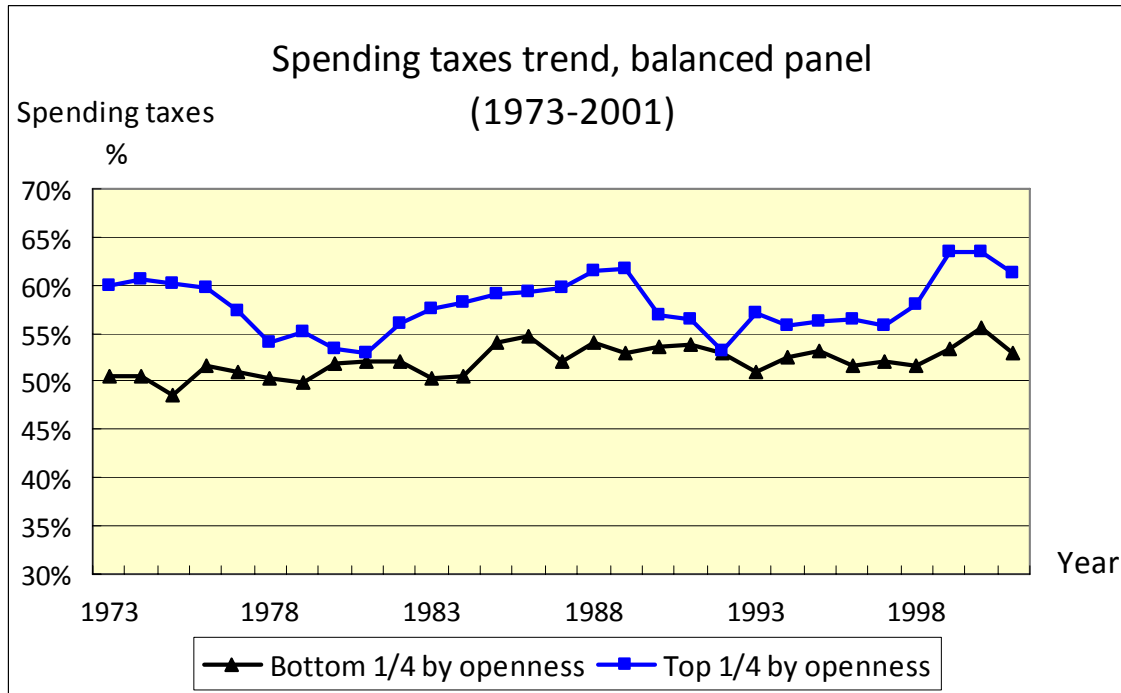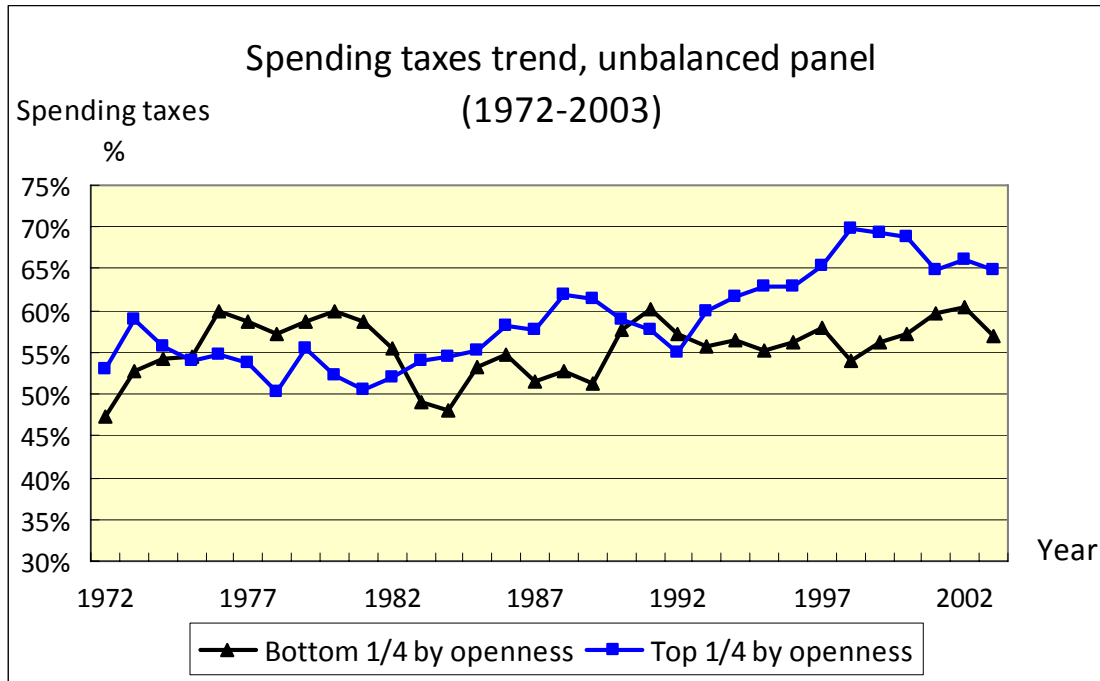
Table 1

Pre-Tax Income Shares All Households, by Household Income Category, 1979-2005

Year	Lowest Quintile	Second Quintile	Middle Quintile	Fourth Quintile	Highest Quintile	All Quintiles	Top 10%	Top 5%	Top 1%
					Share of Income (Percent) *Pretax Income*				
1979	5.8	11.1	15.8	22.0	45.5	100.0	30.5	20.7	9.3
1980	5.7	11.0	15.7	22.1	45.8	100.0	30.6	20.7	9.1
1981	5.5	10.9	15.9	22.2	46.0	100.0	30.7	20.7	9.1
1982	5.2	10.6	15.7	22.2	46.7	100.0	31.1	21.1	9.6
1983	4.9	10.3	15.5	22.2	47.7	100.0	32.2	22.2	10.3
1984	5.0	10.3	15.4	22.0	48.0	100.0	32.6	22.6	10.9
1985	4.8	10.1	15.2	21.9	48.6	100.0	33.4	23.4	11.5
1986	4.5	9.6	14.7	21.2	50.6	100.0	35.8	26.0	14.0
1987	4.4	10.0	15.3	22.1	48.9	100.0	33.5	23.4	11.2
1988	4.3	9.7	14.9	21.6	50.3	100.0	35.3	25.4	13.3
1989	4.3	9.8	15.1	21.6	49.9	100.0	34.8	24.8	12.5
1990	4.6	10.0	15.1	21.6	49.5	100.0	34.4	24.3	12.1
1991	4.7	10.0	15.4	21.8	49.0	100.0	33.7	23.6	11.2
1992	4.4	9.7	15.1	21.5	50.0	100.0	34.9	24.7	12.3
1993	4.5	9.8	15.0	21.6	49.8	100.0	34.6	24.4	11.9
1994	4.4	9.8	15.2	21.6	49.8	100.0	34.6	24.5	12.1
1995	4.6	9.7	14.9	21.3	50.2	100.0	35.2	25.1	12.5
1996	4.3	9.4	14.5	21.0	51.5	100.0	36.5	26.5	13.8
1997	4.3	9.1	14.2	20.4	52.6	100.0	37.8	27.8	14.9
1998	4.3	9.0	14.1	20.2	53.0	100.0	38.4	28.5	15.7
1999	4.2	8.9	13.8	19.9	53.8	100.0	39.4	29.6	16.7
2000	4.0	8.6	13.5	19.6	54.8	100.0	40.6	30.7	17.8
2001	4.3	9.2	14.2	20.8	52.3	100.0	37.5	27.4	14.7
2002	4.3	9.3	14.5	21.2	51.5	100.0	36.5	26.3	13.5
2003	4.2	9.1	14.3	21.0	52.1	100.0	37.2	27.0	14.3
2004	4.1	8.9	13.9	20.4	53.5	100.0	38.9	29.0	16.3
2005	4.0	8.5	13.3	19.8	55.1	100.0	40.9	31.1	18.1

Source: Congressional Budget Office.

Note: the income concept is comprehensive family income, that includes an adjustment for family size.

Table 2

National Health Expenditures; Aggregate and per Capita Amounts, Percent Distribution and Annual Percent Change by Source of Funds: Calendar Years 2002-2017[1]

Year	Total	Out-of-Pocket Payments	Third-Party Payments Total	Private Health Insurance	Other Private Funds	Public Total	Federal[2]	State and Local[2]	Medicare[3]	Medicaid[4]
Historical Estimates					Amount in Billions					
2002	$1,603.4	$211.4	$1,392.0	$552.5	$118.4	$721.1	$508.6	$212.5	$265.1	$249.0
2003	1,732.4	224.9	1,507.6	602.8	127.4	777.3	550.7	226.6	281.5	271.6
2004	1,852.3	234.9	1,617.4	645.8	134.1	837.5	597.1	240.4	309.3	292.0
2005	1,973.3	247.1	1,726.2	685.6	143.9	896.8	639.1	257.7	338.0	313.5
2006	2,105.5	256.5	1,849.0	723.4	155.3	970.3	704.9	265.4	401.3	310.6
Projected										
2007	2,245.6	269.3	1,976.3	769.4	168.1	1,038.8	753.1	285.6	427.3	338.2
2008	2,394.3	282.6	2,111.7	821.7	180.8	1,109.3	806.8	302.5	460.7	361.2
2009	2,555.1	297.6	2,257.5	878.8	192.9	1,185.8	864.3	321.5	495.0	387.9
2010	2,725.8	314.4	2,411.4	936.0	206.3	1,269.0	926.5	342.5	531.1	417.7
2011	2,905.1	332.0	2,573.1	995.4	220.3	1,357.4	992.2	365.2	568.5	450.5
2012	3,097.8	350.6	2,747.3	1,058.0	234.6	1,454.7	1,065.3	389.4	610.5	486.0
2013	3,305.0	370.3	2,934.7	1,124.3	250.1	1,560.3	1,144.7	415.6	656.4	524.6
2014	3,523.6	391.3	3,132.3	1,192.0	266.2	1,674.1	1,230.3	443.8	705.6	566.6
2015	3,757.0	413.9	3,343.2	1,263.4	282.9	1,796.9	1,322.6	474.3	758.8	612.4
2016	4,007.8	438.1	3,569.7	1,338.0	300.2	1,931.5	1,424.3	507.2	818.1	662.3
2017	4,277.1	464.3	3,812.8	1,415.3	318.3	2,079.2	1,536.2	543.0	884.0	717.3
Historical Estimates					Per Capita Amount					
2002	$5,560	$733	$4,826	$1,916	$411	$2,500	$1,763	$737	(5)	(5)
2003	5,952	773	5,179	2,071	438	2,670	1,892	779	(5)	(5)
2004	6,301	799	5,502	2,197	456	2,849	2,031	818	(5)	(5)
2005	6,649	833	5,816	2,310	485	3,022	2,153	868	(5)	(5)
2006	7,026	856	6,170	2,414	518	3,238	2,352	886	(5)	(5)
Projected										
2007	7,439	892	6,547	2,549	557	3,441	2,495	946	(5)	(5)
2008	7,868	929	6,939	2,700	594	3,645	2,651	994	(5)	(5)
2009	8,329	970	7,359	2,865	629	3,866	2,818	1,048	(5)	(5)
2010	8,816	1,017	7,799	3,027	667	4,104	2,996	1,108	(5)	(5)
2011	9,322	1,065	8,256	3,194	707	4,355	3,184	1,172	(5)	(5)
2012	9,862	1,116	8,746	3,368	747	4,631	3,391	1,240	(5)	(5)
2013	10,439	1,170	9,270	3,551	790	4,928	3,616	1,313	(5)	(5)
2014	11,043	1,226	9,817	3,736	834	5,247	3,856	1,391	(5)	(5)
2015	11,684	1,287	10,397	3,929	880	5,588	4,113	1,475	(5)	(5)
2016	12,369	1,352	11,017	4,129	926	5,961	4,396	1,565	(5)	(5)
2017	13,101	1,422	11,679	4,335	975	6,369	4,705	1,663	(5)	(5)

[1]The health spending projections were based on the 2006 version of the National Health Expenditures (NHE) released in January 2008.
[2]Includes Medicaid SCHIP Expansion and SCHIP.
[3]Subset of Federal funds.
[4]Subset of Federal and State and local funds. Includes Medicaid SCHIP Expansion.
[5]Calculation of per capita estimates is inappropriate.
NOTES: Per capita amounts based on July 1 Census resident based population estimates. Numbers and percents may not add to totals because of rounding.
SOURCE: Centers for Medicare & Medicaid Services, Office of the Actuary.

Table 3.

2004	Total tax receipts as % of GDP	% of total tax receipts from		
		Personal Income Tax	Corporate Income Tax	Taxes on Goods and Services
Australia	31.2	40.2	18.2	28.5
Austria	42.6	22.7	5.4	28.2
Belgium	45.0	30.6	8.0	25.0
Canada	33.5	35.1	10.3	25.9
Czech Republic	38.4	12.7	12.4	31.2
Denmark	48.8	50.7	6.5	32.7
Finland	44.2	30.5	8.1	31.7
France	43.4	17.0	6.3	25.6
Germany	34.7	22.8	4.5	29.2
Greece	35.0	13.8	9.4	37.1
Hungary	38.1	17.8	5.8	40.8
Iceland	38.7	36.9	3.3	41.1
Ireland	30.1	27.4	11.9	37.8
Italy	41.1	25.4	6.9	26.4
Japan	26.4	17.8	14.2	20.0
Korea	24.6	13.6	14.3	36.3
Luxembourg	37.8	17.8	15.3	30.4
Mexico	19.0	24.6	.	55.5
Netherlands	37.5	16.4	8.2	32.0
New Zealand	35.6	41.0	15.5	33.8
Norway	44.0	23.5	22.6	29.7
Poland	34.4	12.0	5.8	36.0
Portugal	34.5	15.9	8.3	38.6
Slovak Republic	30.3	9.3	8.1	39.8
Spain	34.8	17.7	9.8	28.0
Sweden	50.4	31.4	6.3	25.8
Switzerland	29.2	34.8	8.6	23.7
Turkey	31.3	14.9	7.3	47.7
United Kingdom	36.0	28.7	8.1	32.0
United States	25.5	34.7	8.7	18.3
EU Average	39.7	24.6	8.2	30.7
OECD Average	35.9	24.6	9.6	32.3

. Not available or not applicable.

Table 4.

2004	Highest rates of income taxes		Disposable income of average production worker (% of gross pay)	
	Personal income tax (%)	Corporate income tax (%)	Single person	Married with two children
Australia	48.5	30.0	76.3	89.9
Austria	42.9	34.0	67.0	82.1
Belgium	45.1	34.0	58.1	78.1
Canada	46.4	36.1	76.1	87.8
Czech Republic	28.0	28.0	76.2	95.9
Denmark	55.0	30.0	59.1	71.0
Finland	50.3	29.0	68.9	76.9
France	36.7	35.4	71.2	83.0
Germany	47.5	38.9	56.5	76.7
Greece	33.6	35.0	77.5	77.0
Hungary	56.0	16.0	65.6	80.3
Iceland	42.0	18.0	74.7	94.6
Ireland	42.0	12.5	83.1	102.5
Italy	41.4	33.0	72.7	85.7
Japan	47.2	39.5	81.8	84.9
Korea	36.6	29.7	90.1	91.3
Luxembourg	33.9	30.4	73.5	99.6
Mexico	26.4	33.0	94.8	94.8
Netherlands	52.0	34.5	67.5	77.7
New Zealand	39.0	33.0	80.0	82.0
Norway	47.5	28.0	69.9	79.2
Poland	26.2	19.0	68.2	70.1
Portugal	35.6	27.5	78.2	89.8
Slovak Republic	16.5	19.0	77.8	97.2
Spain	45.0	35.0	80.0	87.6
Sweden	56.5	28.0	68.5	75.9
Switzerland	37.8	24.1	78.4	90.6
Turkey	40.6	33.0	69.5	69.5
United Kingdom	40.0	30.0	73.4	80.5
United States	41.4	39.3	76.6	95.5
EU Average	43.8	31.1	70.3	82.9
OECD Average	41.3	29.8	73.7	84.9

Table 5

Dependent Variable: fraction total tax revenue from income taxes, personal and corporate	1973		1985		1999	
	(1)	(2)	(3)	(4)	(5)	(6)
ln(population)	0.025	0.049	0.019	-0.063	0.042	-0.081
	(0.015)	(0.090)	(0.010)	(0.059)	0.009	(0.053)
ln(per capita GDP)	0.016	0.069	0.053	-0.117	0.051	-0.197
	(0.016)	(0.196)	(0.015)	(0.122)	0.011	(0.106)
ln(pop)*ln(p.c. GDP)		-0.003		0.011		0.015
		(0.012)		(0.008)		(0.007)
N	64	64	77	77	71	71
R-squared	0.0531	0.0542	0.1787	0.2003	0.3492	0.3984

Table 6

	Fraction from Income Taxes			
	(1)	(2)	(3)	(4)
normalized ln (population)	-2.985	-2.789	-0.006	2.996
	(0.358)	(0.530)	(0.457)	(0.753)
normalized ln (GDP)	0.257	0.447	0.418	2.976
	(0.043)	(0.383)	(0.044)	(0.529)
Interaction of normalized population and GDP		-0.183		-2.447
		(0.366)		(0.507)
normalized ln (population)*time			0.021	-0.031
			(0.002)	(0.012)
normalized ln (GDP)*time			0.011	-0.043
			(0.001)	(0.012)
Interaction of normalized population and GDP*time				0.052
				(0.011)
N	2,353	2,353	1,891	1,891
R-squared	0.8063	0.8063	0.8201	0.8243

Note: The dependent variable is the fraction of total tax collections from income taxes. Population and income variables are normalized to have unit means in each year. The data are an unbalanced panel covering 1972-2006, and the regressions include year and country dummy variables (not reported). The time variable takes the value 1 in 1972 and 35 in 2006.

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Table 7

Dependent Variable: fraction total tax from expenditure taxes (sum of goods and trade taxes)	1973		1985		1999	
	(1)	(2)	(3)	(4)	(5)	(6)
ln(pop)	-0.041	0.012	-0.033	0.072	-0.044	0.022
	(0.013)	(0.075)	(0.010)	(0.058)	(0.010)	(0.058)
ln(p.c. GDP)	-0.048	0.069	-0.098	0.121	-0.054	0.078
	(0.014)	(0.164)	(0.015)	(0.120)	(0.012)	(0.116)
ln(pop)*ln(p.c. GDP)		-0.007		-0.014		-0.008
		(0.010)		(0.007)		(0.007)
N	64	64	77	77	70	70
R-squared	0.2627	0.2690	0.4221	0.4477	0.3500	0.3627

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Table 8

	Fraction from Expenditure Taxes			
	(1)	(2)	(3)	(4)
normalized ln (population)	-1.435	-1.584	-1.210	-2.533
	(0.382)	(0.565)	(0.509)	(0.847)
normalized ln (GDP)	-0.442	-0.587	-0.397	-1.552
	(0.046)	(0.407)	(0.049)	(0.593)
Interaction of normalized population and GDP		0.139		1.110
		(0.389)		(0.568)
normalized ln (population)*time			-0.008	-0.005
			(0.002)	(0.013)
normalized ln (GDP)*time			-0.0004	0.003
			(0.001)	0.013
Interaction of normalized population and GDP*time				-0.003
				(0.013)
N	2,345	2,345	1,883	1,883
R-squared	0.8109	0.8109	0.8045	0.8049

Note: The dependent variable is the fraction of total tax collections from expenditure taxes. Population and income variables are normalized to have unit means in each year. The data are an unbalanced panel covering 1972-2006, and the regressions include year and country dummy variables (not reported). The time variable takes the value 1 in 1972 and 35 in 2006.

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Apppendix Table 1: Annual correlations between country size and measured openness.

Year	N	Correlation (r)	p-value
1972	96	-0.3221	0.0014
1973	100	-0.3231	0.0010
1974	102	-0.3254	0.0008
1975	108	-0.3127	0.0010
1976	110	-0.3002	0.0014
1977	111	-0.3113	0.0009
1978	114	-0.3274	0.0004
1979	113	-0.3247	0.0005
1980	119	-0.3098	0.0006
1981	119	-0.3049	0.0007
1982	120	-0.2998	0.0009
1983	121	-0.2895	0.0013
1984	122	-0.2881	0.0013
1985	124	-0.3126	0.0004
1986	125	-0.3010	0.0006
1987	126	-0.2994	0.0007
1988	127	-0.2877	0.0010
1989	127	-0.2858	0.0011
1990	130	-0.2817	0.0012
1991	134	-0.2657	0.0019
1992	136	-0.2525	0.0030
1993	143	-0.2786	0.0008
1994	145	-0.2982	0.0003
1995	147	-0.2910	0.0003
1996	148	-0.2804	0.0006
1997	151	-0.2449	0.0024
1998	149	-0.2369	0.0036
1999	147	-0.2552	0.0018
2000	147	-0.2563	0.0017
2001	146	-0.2593	0.0016
2002	145	-0.2545	0.0020
2003	142	-0.2558	0.0021
2004	139	-0.2452	0.0036
2005	130	-0.2380	0.0064
2006	106	-0.2161	0.0261

Appendix Table 2

Means and Standard Deviations for Cross-Sectional Regressions in Table 5

Specification(s)	Variable	Mean	Median	Standard Deviation	N
(1), (2)	ln(pop)	15.650	15.712	1.697	64
(1), (2)	ln(p.c. GDP)	6.757	6.828	1.601	64
(2)	ln(pop)*ln(p.c. GDP)	105.67	99.67	28.20	64
(3), (4)	ln(pop)	15.573	15.807	2.078	77
(3), (4)	ln(p.c. GDP)	7.614	7.596	1.366	77
(4)	ln(pop)*ln(p.c. GDP)	118.54	117.51	26.79	77
(5), (6)	ln(pop)	16.069	15.913	1.718	71
(5), (6)	ln(p.c. GDP)	8.037	8.204	1.447	71
(6)	ln(pop)*ln(p.c. GDP)	128.82	126.17	25.78	71

Appendix Table 3

Means and Standard Deviations for Cross-Sectional Regressions in Table 6

Specification(s)	Variable	Mean	Median	Standard Deviation	N
(1), (2)	normalized ln (population)	1	1.003	0.117	2,353
(1), (2)	normalized ln (GDP)	1	1.001	0.171	2,353
(2)	Interaction of normalized population and GDP	1	0.981	0.202	2,353
(3), (4)	normalized ln (population)	1	0.999	0.109	1,891
(3), (4)	normalized ln (GDP)	1	1.002	0.172	1,891
(4)	Interaction of normalized population and GDP	1	0.974	0.197	1,891
(3), (4)	normalized ln (population)*time	15.5	14.73	9.250	1,891
(3), (4)	normalized ln (GDP)*time	15.5	14.40	9.722	1,891
(4)	Interaction of normalized population and GDP*time	15.5	14.24	9.891	1,891

Corporate Income Tax Burdens at Home and Abroad

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ABSTRACT

To our knowledge, this paper provides the most comprehensive analysis of firm-level corporate income tax burdens to date. We use publicly available financial statement information to estimate firm-level average effective tax rates (AETRs) for 10,642 corporations from 85 countries from 1988 to 2007. We find that, on average, AETRs declined by six percentage points or 18% over the period with much of the decline occurring from 1992 to 1994. German, Japanese, Australian and Canadian decreases were large. American, British, and French declines were more modest. Nonetheless, because AETRs were falling worldwide, the ordinal rank from high-tax countries to low-tax countries changed little. Japanese firms always faced the highest AETRs. The AETRs for tax havens and countries from the Middle East and Asia (ignoring Japan) were always lower than those for the U.S. and European countries. Multinationals and companies operating in only one country had similar AETRs. These findings should provide some empirical underpinning for ongoing policy debates about the taxation of multinational profits.

Corporate Income Tax Burdens at Home and Abroad

1. Introduction

This paper estimates average effective tax rates (AETRs) using financial statement information from 10,642 corporations domiciled in 85 countries and having subsidiaries in 195 countries from 1988 to 2007.[1] These AETRs enable us to compare within and across countries the tax burdens faced by domestic-only firms and multinationals and to assess the extent to which the location of foreign subsidiaries affects the worldwide tax burdens of multinationals. Tests are conducted across years and industries.

The purpose of this study is to illuminate an ongoing worldwide debate about the taxation of international commerce. At the beginning of our investigation period (1988), the taxation of multinationals was an obscure area of the law, understood by few practitioners, rarely mentioned in policy circles, and ignored by academe. Today, globalization has made the taxation of international commerce relevant to most businesses, central to policy discussions about jobs, trade, and competitiveness, and an area of interest to scholars in economics, finance, accounting, law, and related fields.

International tax policy changes are being proposed and implemented around the globe. In December, 2008, the UK and Japan decided to revamp their international tax law by shifting from a worldwide tax system to a territorial tax system. In the same month, an advisory panel formed by the Canadian Minister of Finance recommended multinational-friendly changes to its international tax law (see Advisory Panel on Canada's System of International Taxation, 2008). All three countries claimed to be attempting to enhance the competitiveness of their multinationals. Meanwhile, in the U.S., many are calling for similar reforms, questioning whether longstanding American policy toward the taxation of international business is in the best interest of the country (see Tuerff, et al. (2008), Clausing and Avi-Yonah (2007), and The President's Advisory Panel on Federal Tax Reform (2005), among many others).

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[1] Accountants define effective tax rates as income tax expense divided by net income before taxes, both figures coming from a company's income statement. In this paper, we term this ratio, "average effective tax rate," to distinguish it from "marginal effective tax rate," a term used by economists to measure investment incentives (Fullerton, 1999).

The purpose of this paper is to provide some empirical underpinning for these important policy discussions by estimating the tax expenses incurred at the parent and subsidiary level by multinationals around the globe. Although we recognize that numerous economic, social, and political forces have motivated the need for this documentation, it is beyond the scope of this paper to list the many changes in investment, technology, trade, and labor that have accelerated the development of a global economy and exacerbated the inherent difficulty that any single government faces in attempting to tax companies that service these multinational markets. Furthermore, it also is beyond the scope of this paper to detail how countries have revised their tax laws in recent years to continue to collect revenue while maintaining or increasing their share of the global economy, to list the numerous tax plans devised in response to these legislative changes, to discuss the difficulties of communicating this complex area of tax law in the political arena, or to review the literature of international tax research. Instead, we will mention a few recent events concerning the taxation of multinationals that should suffice for demonstrating the current interest in multinational taxation and the contribution that this study makes in providing some empirical facts about the extent to which the location of a company affects the taxes that it pays.[2]

To start, U.S. President Barack Obama ran on a tax plan that included "…reforming deferral to end the incentive for companies to ship jobs overseas."[3] Ignoring the merits of this proposal, such policy statements imply that U.S.-based multinationals somehow benefit unfairly from a tax system with perverse incentives. Johnston (2008), a prominent reporter, commentator, and critic of U.S. taxes, agrees, stating that "…very few grasp how corporate taxes favor multinationals over domestic firms."

In contrast, the managers of many U.S.-based multinationals often assert that the U.S. tax system places them at a competitive disadvantage compared with multinationals in other countries. They often

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[2] By "location," we mean the location of the firm for tax purposes, also known as domicile. There is no standard definition of domicile. For example, domicile is the legal residence or site of incorporation in the U.S., but the location of operational headquarters in the UK. Throughout the paper, we will refer to a company's location, home, or base to denote its tax domicile.
[3] See http://www.barackobama.com/pdf/taxes/Factsheet_Tax_Plan_FINAL.pdf

point to the relatively high U.S. statutory tax rate as evidence of the competitive disadvantage.[4] They call

for reform of the U.S. taxation of multinational profits to reflect current global business conditions,

although no consensus exists in the business community about the changes that should be made.

Consistent with claims that companies based outside the U.S. enjoy more favorable tax conditions (at

least for their American operations), the U.S. Government Accountability Office (2008) recently

concluded that U.S. companies owned by foreigners pay less U.S. tax than do U.S. companies controlled

by Americans.

Meanwhile, during much of 2008, British firms were not just complaining about the tax system,

they were abandoning it for homes with more favorable tax treatment (*The Economist*, 2008). The

Henderson Group, Charter, Shire, WPP, and the United Business Media emigrated to Ireland and the

Regus Group to Luxembourg reportedly to escape high taxes on foreign profits for multinationals based

in the UK (Werdigier, 2008 and Faith, 2008). Kingfisher, Brit Insurance, RSA Insurance, and Prudential,

among others, threatened to leave (Werdigier, 2008, Braithwaite, 2008). In fact, the *Financial Times*

(September 21, 2008) quoted an anonymous source saying, "As we understand it, half the FTSE 100 is

looking at this [redomiciling outside the UK.]." (Braithwaite, 2008).

One of those exited British firms is Invesco, which moved its home for tax purposes to Bermuda

(a tax haven) in December 2007. It was explicit about the influence of international tax considerations.

Although the S&P 500 company is headquartered in Atlanta, it moved its tax home to Bermuda, rather

than the U.S. According to Invesco's Chief Administrative Officer, Colin Meadows, "…we wanted to

make sure the transaction in moving our domicile was tax neutral for our shareholders. Moving to the

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[4] In the September 26, 2008, U.S. Presidential debate, Republican Presidential candidate Senator John McCain expressed these views about statutory tax rates, stating "Right now, American business pays the second-highest business taxes in the world, 35 percent. Ireland pays 11 percent. Now, if you're a business person, and you can locate any place in the world, then, obviously, if you go to the country where it's 11 percent tax versus 35 percent, you're going to be able to create jobs, increase your business, make more investment, et cetera. I want to cut that business tax. I want to cut it so that businesses will remain in—in the United States of America and create jobs." His opponent, Senator Barack Obama, countered, "Now, John mentioned the fact that business taxes on paper are high in this country, and he's absolutely right. Here's the problem: There are so many loopholes that have been written into the tax code, oftentimes with support of Senator McCain, that we actually see our businesses pay effectively one of the lowest tax rates in the world."

U.S. would not have been a tax neutral situation. When it came down to it, it was a very short list of places that we considered and Bermuda was at the top." (Neil, 2007).[5]

The recent British departures may be receiving undue attention in the same way that a few American inversions (reincorporations in low-tax countries with no operational impact) several years ago became highly controversial (in particular, Stanley Works' aborted move to Bermuda in 2002). The more significant losses (both in number and pounds) may be those newly formed companies that in the past would have established their headquarters in the UK but instead are domiciling outside the UK from their inception. Since these "departures" are unobservable, they mainly escape attention, though their impact may be larger and longer-lasting. Furthermore, some companies already based in (perceived to be) tax-disfavored countries, such as the UK and the U.S., claim that they wish that they had never incorporated there and would leave, except for the high tax, political and other costs of exiting.[6]

Not all developed countries host unhappy multinationals. Dutch multinationals, particularly following enactment of the 2007 Corporate Income Tax Law, reportedly are paying little, if any, tax. Of the twenty largest Dutch companies, allegedly fewer than five are paying any corporate income tax to the Netherlands (Dohmen, 2008). Consistent with favorable treatment of Dutch multinationals, one international tax expert, Timothy McDonald, Vice President of Finance and Accounting for Procter & Gamble, recently identified the Netherlands as having the model system for taxing multinationals (Tuerff, et al., 2008, p.79).

Other countries have recently followed the Dutch lead. In late 2008, both the British and Japanese governments moved to exempt dividends paid from foreign subsidiaries. The changes shift both

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[5] Interestingly, Invesco has 5,500 employees in 19 countries, but neither office nor employees in Bermuda. Desai (2008) discusses this increasingly common separation of a multinational's headquarters, tax home, and operations, which he terms the decentering of the global firm. In this paper, we may miscode a country's tax home if its tax home differs from the location provided in the company's financial records.

[6] Their ongoing dissatisfaction is reminiscent of the testimony of Bob Perlman, Vice President of Taxes for Intel Corporation, before the Senate Finance Committee in March, 1999, where he stated, "…if I had known at Intel's founding (over thirty years ago) what I know today about the international tax rules, I would have advised that the parent company be established outside the U.S. This reflects the reality that our Tax Code competitively disadvantages multinationals simply because the parent is a U.S. corporation." (Perlman, 1999). Indicative of the heated nature of this topic, the Senate Finance Committee's ranking Democrat, New York Senator Daniel Patrick Moynihan retorted, "So money matters more to you than country?" (United States Senate Committee on Finance, 1999, p.17.)

countries from a worldwide system of taxation to a territorial system, leaving the U.S. as the only major country with a worldwide system.[7]

In the UK case, the Treasury stated that "The policy objective is to enhance the competitiveness of the UK by providing the widest possible exemption." Chris Morgan of KPMG called the proposal, "…a decisive shift towards a territorial tax system where the UK only taxes profits made in the UK." However, Ian Brimicombe, head of tax at AstraZeneca, doubted that the change in the law would bring back the firms that had already exited the UK and noted that companies with intellectual property or finance subsidiaries were still disadvantaged in the UK. (Houlder, 2008). Nonetheless, UK multinationals widely welcomed the exemption of foreign dividends.

Favorable tax treatment for multinationals inevitably leads to concerns that smaller domestic firms are paying a disproportionate share of the taxes. For example, after the HM Revenue and Customs National Audit Office (2007) reported that a third of the UK's 700 largest companies paid no tax in the 2005-2006 financial year, Bill Dodwell of Deloitte stated, "That 700 of the largest companies and groups are only paying 54 per cent of corporation tax shows the giant contribution of small companies. It is probably because many are less international and so have different planning opportunities." (Houlder, 2007).

Now we have come full circle. Perceptions that multinationals are not paying their fair share of taxes because they can avail themselves of tax planning opportunities not available to smaller firms fuel calls for policy change, such as those proposed by the Obama campaign. As this smattering of recent events shows, the taxation of multinationals is controversial and politically charged with implications for a country's ability to compete for capital, investment, and labor. This paper aims to provide facts for the ongoing debate by documenting the AETRs faced by domestic-only firms, multinationals, and foreign subsidiaries around the globe and over many years.

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[7] In overly simplistic terms, countries with territorial systems only tax the domestic income of companies based in their country. In contrast, countries with worldwide systems tax all income (domestic and foreign) of their home companies and provide foreign tax credits to prevent double taxation of foreign profits.

To estimate the AETRs for multinationals around the globe, we regress firm-level AETRs on categorical variables for the home of the parent and whether the company is a multinational. The regression coefficients on the categorical variables provide estimates of country-level AETRs for both domestic firms, i.e., those operating in the home country only, and multinationals, i.e., those based in the home country but operating in at least one other country. These AETR estimates enable comparisons of domestics with multinationals within countries and across countries, industries, and years. We then conduct similar regressions adding categorical variables that denote the location of the firm's foreign subsidiaries. These tests enable us to compare the tax burdens of foreign subsidiaries.

We find that multinationals and domestic firms have similar AETRs. Japanese firms always face the highest tax rates. The AETRs for companies in tax havens and Middle Eastern and Asian (setting aside Japan) countries are always lower than those for firms based in the U.S. and Europe. We also find a worldwide decline in AETRs. From 1989 to 2006, AETRs, on average, dropped six percentage points or 18%, though much of the decline was from 1992 to 1994. German, Japanese, Australian and Canadian AETRs decreased more than American, British, and French AETRs. Nevertheless, because the AETRs were falling for all countries, the ordinal rank from high-tax countries to low-tax countries changed little. We also find some evidence that the location of a foreign subsidiary affects a multinational's worldwide tax burden.

To our knowledge, this paper provides the most comprehensive analysis of international firm-level corporate income tax burdens to date. Collins and Shackelford (1995) studied parent AETRs for four countries (Canada, Japan, the UK, and the U.S.) and ten years (1982-1991). Their subsequent study, Collins and Shackelford (2003), added Germany and investigated AETRs from 1992-1997; however, with data for only eight Japanese firm-years and 36 German firm-years, they were effectively limited to studying three countries. In both studies, they conclude that the parents of multinationals based in the U.S. and the UK faced similar AETRs, both of which exceeded the parent AETRs in Canada. In neither study did they have information about the location of the company's subsidiaries.

Recent advances in computer-readable financial statement datasets enable us to study far more companies (both at the parent and subsidiary level), countries, and years than Collins and Shackelford could study. A concurrent study with access to even more U.S. companies than our study is Dyreng and Lindsey (2009). They use text-searching software to collect subsidiary information for all U.S.-incorporated firms in the Compustat database between 1995 and 2007. Using a novel regression methodology to estimate the average worldwide, federal, and foreign tax rates on worldwide, federal, and foreign pre-tax income, they find that U.S. firms with subsidiaries in tax havens have average tax rates approximately 1.5 percentage points lower than U.S. firms with no subsidiaries in tax havens. A limitation of their study is that they do not have access to data for companies located outside the U.S. In contrast, our access to financial statement information for thousands of firms from scores of countries enables us to substantially expand our understanding of corporate tax burdens around the world. While our findings cannot identify the appropriate international tax policy, the AETR estimates in this study should prove useful quantitative information as policymakers, business, and scholars around the globe grapple with the complexities surrounding the taxation of multinational activities.

This paper is organized as follows: Section 2 develops the regression equation used to estimate the AETRs. Section 3 details the sample selection. Sections 4 and 5 present the empirical findings. Closing remarks follow.

2. Regression Equation

To compare the tax burdens of multinationals and domestic firms across countries and to determine whether multinationals and domestics in the same country face different tax burdens, we estimate a modified version of the pooled, cross-sectional regression equation developed in Collins and Shackelford (1995):[8]

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[8] Collins and Shackelford's (1995) regression model includes categorical variables indicating whether the firm's income statement is consolidated or restated in accordance with U.S. GAAP. We exclude all unconsolidated firm-years from our sample to avoid potentially including both parents and their subsidiaries as separate observations. We cannot include the restatement variable because our data do not include it.

$$AETR_{it} = \sum \beta_{0_j} COUNTRY_{it}^j + \sum \beta_{1_j} (COUNTRY_{it}^j * MN_{it})$$

$$+ \sum \beta_{2_k} INDUSTRY_{it}^k + \sum \beta_{3_m} YEAR_{it}^m + \sum \beta_{4_n} SIZE_{it}^n + \varepsilon_{it} \qquad (1)$$

where: $AETR_{it} =$ the average effective tax rate for firm i in year t.

            $COUNTRY_{it}^j =$ an indicator variable equal to 1 if firm i is based in country j in year t, equal to

            0 otherwise.

            $MN_{it} =$ an indicator variable equal to 1 if firm i has a foreign subsidiary in year t,

            equal to 0 otherwise.

            $INDUSTRY_{it}^k =$ an indicator variable equal to 1 if firm i is identified as being in industry k (by

            two-digit NAICS) in year t, equal to 0 otherwise.[9]

            $YEAR_{it}^m =$ an indicator variable equal to 1 for firm-years for which $t = m$, equal to 0

            otherwise.

            $SIZE_{it}^n =$ the percentile rank of the size of variable n for firm i in year t. $n=$\{Assets,

            Revenue, Owners' Equity\}.

We suppress the intercept so that the coefficients on the *COUNTRY* variables can be interpreted as the marginal cost of domiciling in a country, i.e., the average effective tax rate for domestic firms.[10] Throughout the paper, we refer to the coefficient on the *COUNTRY* variable as the *domestic AETR*. Suppressing the intercept also means that the coefficient on the *COUNTRY*MN* variables is the incremental tax cost for multinationals (as compared with the domestics) in that country. Throughout the

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[9] Inferences hold when we use two-digit SIC as the industry classifier.

[10] To estimate equation (1), one industry and one year have to be excluded from the regression. To determine which industry to leave out, we calculate the mean *AETR* in each industry (two-digit NAICS) in the Osiris post-2002 sample and then determine the median of those means. The industry with the median mean (code 31) is the one left out. We implement a similar procedure on the years, resulting in 2005 being the excluded year. To improve comparability across estimations, we exclude the same industry and year from each regression.

paper, we refer to the sum of the coefficients on the *COUNTRY* and the *COUNTRY * MN* variables as the *multinational AETR*.[11]

With regards to the control variables, we follow Collins and Shackelford (2003), using categorical variables to capture tax differences across industries (*INDUSTRY*) and time (*YEAR*). We also introduce three control variables (*SIZE*) to capture any systematic differences in tax rates related to firm size: the percentile ranks of Total Assets, Revenues, and Equity.[12]

The ideal dependent variable in this study would require access to the firm's actual taxes paid and the income earned in all countries and all years. Unfortunately, such information is not publicly available. Thus, to approximate the numerator for AETRs, we turn to the total worldwide income tax expense in the company's publicly available financial statements.[13] In subsequent tests, we use the current income tax expense, which is available for some firms, as the numerator. We find that inferences are unaffected.

The denominator is net income before income taxes (NIBT). Since financial reporting rules vary across countries and thus affect the computation of NIBT, we conduct sensitivity tests using total revenues and an adjusted net income as denominators.[14] Results are qualitatively the same.

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[11] Note that the magnitude of the domestic and multinational AETRs cannot be directly compared with the actual AETRs from the financial statements, which serve as the dependent variable. The domestic and multinational AETRs are the tax rates, conditional on industry, year, and size. That said, our empirical analysis will show that the estimated AETRs are very similar to the actual AETRs from the financial statements.

[12] We use percentile ranks rather than actual values or logarithms to mitigate concerns about the accuracy of the foreign exchange and unit data. We converted all dollar variables to millions of U.S. dollars using the currency and unit data in the Osiris database. However, there appear to be errors in the data for a few countries, e.g., some of the Italian data, which the database claims is expressed in Euros, appear to be expressed in Italian Lira. Also in a few cases, data appear to be expressed in thousands although Osiris asserts that they are expressed in millions. By using percentile ranks, we limit the impact of these possible errors on our size controls.

[13] The calculation of profits on a firm's income statement includes a reduction for total worldwide corporate income tax expense. Unfortunately, the total tax expense is *not* the taxes paid during the year by the firm. Rather it is the amount of taxes paid in past and current years or expected to be paid in future years attributed to activity during the current year. Nevertheless, because of its public availability, the total income tax expense has been used in many studies to approximate actual taxes paid (see discussion in Graham, Raedy and Shackelford, 2008).

[14] To test the sensitivity of our findings to the selection of NIBT as the scalar, we follow Collins and Shackelford (1995) and use two other profit measures to scale the total income tax expense: adjusted net income (NIBT plus certain key expenses); and revenues. Adjusted net income is intended to add back some key expenses whose accounting rules vary across countries, namely depreciation expense and research and development expense (they also add back pension expense, but we do not because our data source, Osiris, does not collect that item). The second scalar, revenues eliminates any cross-country variation in expenses.

Note that the AETRs in this study are not marginal tax rates, as detailed in Scholes, et al., 2009. They ignore implicit taxes, cannot assess who bears the burden of corporate income taxes, and cannot capture incentives to employ new capital (see Fullerton, 1980, and Bradford and Fullerton, 1981, for a discussion of marginal effective tax rates). Rather, the AETRs used in this study provide an estimate of the tax expense incurred on each dollar of accounting profits.

3. Sample

We use the Osiris database to collect a sample of firms for this study. To collect information about the parents for all firm-years between 1988 and 2007, we access the data through the Wharton Research Data Services (WRDS) interface. Following Collins and Shackelford (1995), we attempt to mitigate the impact of outliers and errors in the data by deleting all observations for which any one of the following are true: (a) AETR exceeds 70%, (b) AETR is negative, (c) the ratio of total income tax expense to a modification of NIBT (adding back depreciation and research and development expense) is negative or exceeds 70%.[15]

Information about the subsidiaries of these firms is accessed through an Internet interface with Bureau van Dijk. We obtain information about subsidiaries classified in levels 1 through 10.[16] Thus, if a firm has a domestic subsidiary (level 1), which has a domestic subsidiary (level 2), which has a domestic subsidiary (level 3) and so forth until the domestic subsidiary in level 9 has a foreign subsidiary (level 10), we would treat that firm as a multinational and code that country as having a foreign subsidiary.

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[15] We eliminate firm-years with (a) missing values for firm identifier (os_id_number), sales (data13002), tax expense (data13035), and NIBT (data13034), (b) nonpositive sales, and (c) negative values for depreciation, and research and development expenses. All missing values for depreciation, and research and development expense are set to zero. We delete all observations where NIBT plus depreciation and research and development expense is zero because we use this alternative AETR denominator in some robustness tests.

[16] Over two-thirds of the firms reported having zero subsidiaries. We crosschecked this information to public filings of a sample of Canadian and U.S. firms and determined that several of these firms had subsidiaries. Because accurate identification of domestic and multinational firms is central to our study, we discarded the subsidiary information of the 28,427 parent firms that reported having zero subs. We then code any firm that reports at least one foreign sub as multinational and those that report zero foreign subs as domestic.

Foreign subsidiaries buried beneath ten layers of domestic subsidiaries will be miscoded, but we doubt

that this data limitation will have a substantial impact on the paper's inferences.[17]

The Osiris subsidiary measure has a serious flaw. Osiris only reports the subsidiary information

as of the most recent updating of the information. Thus, if a company had no subsidiary in Canada before

2007 (the most recent year in the database) and then incorporated a subsidiary in Canada in 2007, we

would erroneously treat the company as having had a Canadian subsidiary for all years in our sample.

Likewise, if a company had a subsidiary in Canada for all years before 2007 and then liquidated the

Canadian subsidiary in 2006, we would erroneously treat the company as not having had a subsidiary in

Canada for every year in our sample.

We are unable to assess the extent to which this data limitation may affect the conclusions drawn

from this study. However, to mitigate the potential for miscoding the existence and location of foreign

subsidiaries, we limit the primary tests in this paper to firm-years since 2002.[18] Our logic is that the

foreign subsidiary coding is correct for 2007, has fewer errors in 2006 than in 2005, and has fewer errors

in 2005 than in 2004, and so forth. We arbitrarily select the last five years for which we have data as the

cut-off for our primary tests in the hope that the miscoding is of an acceptable level for these most recent

years. In subsequent tests, we present estimated coefficients from one regression that uses all of the firm-

years and from annual regressions for each year. Conclusions are remarkably similar regardless of the

sample period.

Our sample selection process yields a main sample of 27,136 firm-years spanning 85 countries,

ranging from only one firm-year in seven countries to 7,177 in the U.S. We combine the countries with

the fewest observations based on geography and other characteristics, leaving nine large countries:

Australia (4% of the sample), Canada (3%), China (3%), France (1%), Germany (1%), India (2%), Japan

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[17] We obtain subsidiary information up to level 10 for parents in all domiciles except Canada, New York, and North Carolina. For unresolved reasons, we were only able to obtain level 1 subsidiary information for firms domiciled in these jurisdictions.

[18] Another advantage of limiting the analysis to recent years is that it mitigates potential survivorship bias. The Osiris database is limited to companies presently in existence. Thus, our analysis is limited to firms that have survived throughout the investigation period. By restricting the sample to firm-years since 2002, we reduce the deleterious effects of survivorship bias.

(24%), UK (8%) and U.S.(26%);[19] four Asian Tigers (Hong Kong, Singapore, South Korea, and

Taiwan—12% of the sample), who share a common geography and history of economic development;

and 17 Tax Havens (3% of the sample).[20] The remaining 57 countries are organized geographically into

five groups: Africa (1% of the sample), Asia (2%), Europe (6%), the Middle East (2%) and Latin America

(2%).[21] All of the tests are conducted and results are reported using these 16 countries and groups.

For the 16 countries and groups, Table 1 reports the firm-year means of Sales, Assets, Equity,

Total Income Tax Expense, and NIBT, dichotomized into 12,778 domestic-only firms and 14,358

multinationals.[22] Not surprisingly, multinational firms average more sales, assets, equity, total tax

expense and NIBT than domestics do. Table 1 also presents the means of the total income tax expense

divided by net income before taxes. These are the actual AETRs from the firms' financial statements, not

AETRs estimated from regression analysis. The domestics have slightly higher AETRs of 30% compared

with 28% for the multinationals. The penultimate column in the table shows the average number of

subsidiaries (domestic and foreign) and the last column shows the average number of subsidiaries located

in foreign countries.

4. Results from Comparing Domestic-only Firms with Multinationals

4.1. Actual vs. Estimated AETRs

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[19] The large countries were selected based on the size of their economy and the number of their firm-years. These nine countries were the only ones with gross domestic product in excess of one trillion dollars in 2008 (per the *CIA World Factbook*) and at least 200 firm-years in the sample.

[20] To identify tax havens, we use the list produced by the Global Policy Forum (see http://www.globalpolicy.org/nations/launder/haven/2008/0304listhavens.htm). Note that though they classify Hong Kong and Singapore as tax havens, we do not include them in the tax haven group but rather as members of the Asian Tiger group. However, inferences are unaltered if we include Hong Kong and Singapore in the Tax Havens group and leave South Korea and Taiwan as the countries in the Asian Tiger group.

[21] We should emphasize that no countries are included twice in the groupings. For example, the Asia group only includes Asian countries not included in other places. Thus, it does not include Japan because it is reported separately.

[22] Osiris asserts that its data are recorded in local currency and provides a variable indicating an appropriate exchange rate for conversion to U.S. dollars and a variable indicating the units in which the data are expressed. However, some unusually large numbers for a few countries, particularly Italy and Mexico, suggest that at least some of the figures are stated in a currency different from the one indicated or in units different from the ones indicated. Since our regression measures are scaled, we doubt that any variation in currency should affect our conclusions. Consistent with that expectation, inferences are unaltered when all Italian and Mexican observations are deleted from the study.

Table 2, Panel A presents the domestic-only AETRs, which are the *COUNTRY* coefficients from estimating equation (1). Panel B presents the multinational AETRs, which are the sum of the *COUNTRY* and the *COUNTRY*MN* coefficients. All AETRs are expressed in percentages.

The first column in Table 2 reports the actual AETRs from the financial statements. The second column reports the AETRs from estimating equation (1).[23] There is remarkably little difference between the two columns.[24] We infer from the similarity between the actual and estimated AETRs that the control variables (for industry, year and size) have little impact on the coefficients of interest. This pattern holds throughout the paper, suggesting that the inferences drawn in this study would be the same whether we used the actual AETRs from the financial statements or the AETRs estimated in the regression. For brevity, we will focus exclusively on the estimated AETRs in the remainder of the paper.

4.2. *Comparing the tax burdens of domestic-only firms across countries*

The AETRs in Table 2, Panel A enable us to compare the tax burdens of domestic-only firms across countries. The estimated regression coefficients for the domestic-only AETRs (in the second column) range from 10% (Middle East) to 39% (Japan) with mean (median) [standard deviation] of 24% (24%) [6%]. The Tax Havens (17%) are the only other group with a domestic AETR under 20%. Japan (39%) is the only country with a domestic AETR above 27%. Throughout the study this pattern will reappear—the Middle East and usually the Tax Havens will have the lowest AETRs, and Japan's AETR will far exceed any other country's AETR.

The domestic AETR for the U.S. is 26%, slightly above the worldwide average and nearly identical to the AETRs of UK, France, Germany and the remaining European countries, which are

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[23] To illustrate, for Canadian companies, Panel A shows that the mean actual AETR from the financial statements for domestic-only firms is 22%, while the estimated AETR for domestics is 23%. Panel B shows that the multinational actual AETR from the financial statement is 26% and the estimated multinational AETR is 24%.

[24] The actual domestic AETRs in Panel A average only 0.4 percentage points more than the domestic estimated AETRs. The largest spread in absolute value is 3.1 percentage points for Japan. More importantly, for purposes of comparing countries, the rank order of the two AETRs columns is nearly identical with a Pearson coefficient of 99%. With the multinationals in Panel B, the actual AETRs average 2.1 percentage points more than the estimated multinational AETRs. The largest spread in absolute value is 3.9 percentage points for Africa. The Pearson correlation coefficient is 99%.

grouped together. This order will hold throughout the study, i.e., the U.S. domestic AETR will be above average and quite similar to those in Europe. Furthermore, ignoring Japan's high rates, the Asian AETRs will be less than the American and European AETRs. In fact, all of the domestic AETRs for France, Germany, UK, U.S., and Europe exceed those for China, India, the Tigers, and Asia and will for most of the tests in the paper.

4.3. *Comparing the tax burdens of multinationals across countries*

The AETRs in Table 2, Panel B enable us to compare the tax burdens of multinationals across countries. The mean and median [standard deviation] of the multinational AETRs in the second column are 22% [6%]. As with the domestic AETRs, the Middle East (11%) and Japan (36%) have the extreme AETRs. The Tax Havens (15%), China (17%), Tigers (17%), and India (18%) also are under 20%. Germany (30%) has the second highest multinational AETR. The U.S. multinational AETR follows at 27%. Once again, the U.S. finds itself with an above-average AETR and bracketed by its European trading partners with the next highest AETRs coming from the UK (26%), France (25%) and Europe (24%). The Asian countries, other than Japan, generally have lower AETRs than the Americans and Europeans do. In fact, as with the domestic AETRs, all of the multinational AETRs for France, Germany, UK, U.S., and Europe exceed those for China, India, the Tigers, and Asia. We infer that the general rankings from high-tax countries to low-tax countries are qualitatively the same for domestics and multinationals.

The difference between the percentages in Panel B and those in Panel A (which is the coefficient on *COUNTRY*MN*) is the amount by which the multinational AETRs exceed the domestic AETRs. The mean (median) [standard deviation] for the difference is -1% (-2%) [2%]. This indicates that the multinationals in most countries face slightly lower AETRs than their domestic-only counterparts face.

Interestingly, the four groups whose domestics face the highest AETRs compared with their multinational counterparts are Asian (India (-5%), China (-4%), Tigers (-3%) and Japan (-3%)). We detect no other patterns. Germany has the largest positive incremental multinational AETR (3%), but the

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other European groups are scattered throughout the ranks. The incremental multinational AETR for the U.S. is 1%, consistent with American domestics facing slightly lower AETRs than American multinationals.

4.4. Comparisons using Firms with Negative NIBT and Zero Actual AETRs

The sample used in the estimations discussed in the previous sections excluded all firm-years with losses (i.e., negative NIBT). In this sensitivity test, we add back the 3,297 firm-years with losses and actual AETRs (from the financial statements) that equal zero and estimate equation (1). By definition, adding these loss firm-years lowers the estimated AETRs.

Nonetheless, the third column in Table 2 shows that the inclusion of loss firm-years has inconsequential impact on the relative high-tax to low-tax rank across the countries: Japanese domestic (multinational) AETRs remain the highest by far at 31% (26%), ten (five) percentage points above the German AETRs. The domestic (multinational) Middle Eastern AETRs are the lowest at 5% (4%), five (three) percentage points below the Tax Havens. All of the multinational AETRs for France, Germany, UK, U.S., and Europe exceed those for China, India, and the Tigers. Thus, we infer that the inclusion of firms with losses and zero actual AETRs has little impact on the inferences about the relative order of high-tax to low-tax countries.

Conversely, the domestic AETRs for the U.S (13%) and UK (15%) are below the domestic mean and median of 16%. This is the only specification (domestic or multinational) in this paper where the American and British AETRs are below the mean and median AETRs. This changes the order of domestic AETRs, leaving American and European AETRs roughly the same as their Asian counterparts.

This reordering of the domestic AETRs is consistent with a disproportionate number of domestic firm-years with losses in Western countries. Indeed, we find that 57% of the domestic additions to the sample as a result of allowing negative NIBT firm-years are American. China, the Tigers, and Asia combined account for only 4% of the sample increase. No Japanese domestics or multinationals and no

Indian domestics are added to the sample. We have no explanation for the absence of Japanese firms or Indian domestics with negative NIBT and zero AETRs.

4.5. Comparisons excluding firms with non-positive AETRs

The original sample included firm-years with zero AETRs as long as their NIBT was positive. In this robustness check, we drop those 1,058 firm-years with non-positive AETRs as reported in the financial statements. By definition, eliminating these zero AETR firms increases the estimated AETRs. However, the fourth column in Table 2 shows that this change in the sample does not qualitatively affect the relative high-tax to low-tax rank across the countries: Japanese domestic (multinational) AETRs are 40% (36%), nine (six) percentage points above those for the U.S. (Germany), the country with next highest AETR. The domestic (multinational) Middle Eastern AETRs are the lowest at 12% (13%), eight (four) percentage points ahead of the Tax Havens. Once again, the U.S. and European countries generally have higher AETRs than Asian countries. All of the domestic and multinational AETRs for France, Germany, UK, U.S., and Europe exceed those for China, India, the Tigers, and Asia. We conclude that the exclusion of zero AETRs does not affect the relative order of country AETRs.

4.6. Comparisons using Manufacturers Only

Manufacturers (two-digit NAICS codes 31, 32, and 33) compose 49% of the sample. To assess whether the AETRs in the manufacturing sector are similar to those in other industries, we estimate equation (1) using only manufacturers. The fifth column in Table 2 shows the resulting AETRs. The rank order of the countries is unchanged: Japanese AETRs remain substantially higher than any of the other countries' AETRs. The U.S. and European countries have higher AETRs than Asian AETRs (once again, ignoring Japan). The Middle Eastern AETRs are lowest. Furthermore, the Pearson correlation coefficient for the domestic (multinational) AETRs when all firm-years are included in the sample and when only manufacturers are included is 86% (98%). In short, when the sample is restricted to the

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manufacturing sector, results are qualitatively the same as when the full sample is tested. We infer that

the AETRs are not substantially different between manufacturers and other companies.

4.7. Comparisons using the Current Income Tax Expense

The numerator in our computation of AETR, the total income tax expense, is the tax expense on

current profits, regardless of whether those taxes were paid in the past, are paid in the current year, or will

be paid in the future. The current income tax expense includes only that portion of the total income tax

expense related to taxes that will be paid in the current year. Thus, current income tax expense should be

a better numerator than total income tax expense for our measure of AETRs.[25]

Unfortunately, Osiris does not collect the current income tax expense. However, Compustat

Global does collect it.[26] Thus, to test the sensitivity of our inferences to the use of the total income tax

expense, we merge the Osiris and Compustat Global databases to create a matched sample of 9,185 firm-

years from 2003-2007 for whom data are available in both databases.[27] We then estimate equation (1)

using the matched sample and the current income tax expense. The regression coefficient estimates for

COUNTRY and *COUNTRY*MN* will enable us to compare domestic and multinational AETRs across

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[25] See Hanlon (2003) for a detailed discussion of both the total and current income tax expenses and problems associated with using either of them to approximate actual taxes paid.

[26] Unfortunately, Compustat Global has its own problems; in particular, it has no foreign subsidiary information. The only item in the Compustat Global database that indicates any foreign activity is foreign tax expense. Unfortunately, accounting rules vary across countries in the reporting of foreign income tax expense, rendering cross-country comparisons based on foreign tax expense problematic. In addition, no foreign income tax expense will be reported by companies that owe no foreign tax, even if they have extensive foreign activities. Thus, the Compustat Global database is inadequate for this study. To illustrate this point, 678 (30%) of the 2,276 firm-years in our matched sample in 2006 (the year in which we have the most confidence in our procedure for identifying multinationals using Osiris data) are classified differently (and we believe erroneously) when we rely on the presence of foreign income tax expense in Compustat Global to identify multinationals.

[27] The matched sample is smaller for several reasons. First, Compustat Global may track different companies from those tracked by Osiris. Second, the only firm identifier common to the two databases is the firm name. Slight variations in the name (e.g., Inc. versus Incorporated) may result in matches being overlooked. Last, an inordinate number of European firms erroneously show zero current tax expense in 2005 and 2006 . Compustat Global has acknowledged this error but has not yet corrected it. We drop all firm-years from the problematic countries from our sample.

countries and within countries and thus assess whether the inferences, reached using the total income tax expense, hold when we use the current income tax expense.[28]

The sixth column in Table 2 shows the estimated AETRs using the current income tax expense and the matched sample. A limitation of the smaller, matched sample is that we have fewer observations for some countries, e.g., we have only one domestic African firm-year that reports a current income tax expense. Thus, we do not report an estimated domestic AETR for Africa or any other domestic or multinational cell with fewer than 20 observations. This eliminates domestic and multinational estimated AETRs for Canada and domestic estimated AETRs for France, India, the Tax Havens, Africa and the Middle East, leaving nine (15) domestic (multinational) AETRs.

We find that domestic (multinational) AETRs are 1.2 (0.5) percentage points smaller using current income tax expense than using total income tax expense, which is consistent with deferred tax liabilities exceeding deferred tax assets. We also find that our high-tax to low-tax rankings are largely indifferent to whether the AETR numerator is total or current income tax expense. Japan's current domestic (multinational) AETR remains substantially higher than any other country's AETR at 38% (35%). The next highest AETR is in Europe (Germany) at 32% (30%). With no estimate for the Middle East, the Tigers, and Latin American share the lowest domestic AETR at 17%. The Middle East and China tie for the lowest multinational AETR (14%). Ignoring Japan, all of the Asian AETRs are less than the American and European AETRs.

In summary, the AETRs and the relative rank of the countries are largely unaffected by whether the numerator in the AETR calculation is total income tax expense or current income tax expense. Thus, for the remainder of this paper, we will use the sample with total income tax expense as the numerator because it is triple the size of the sample that uses the current income tax expense.

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[28] To establish comparability between the two samples, we first estimate equation (1) with the smaller, matched sample, but continuing to use the total income tax expense in the numerator of the AETR measure. We find that the AETRs from this regression are similar to the ones estimated using the full sample and total income tax expense. This provides confidence that any difference between the findings using total income tax expense in the numerator and those using current income tax expense in the numerator is not attributed to sample differences.

4.8. Comparisons using all Firm-Years from 1988-2007

As discussed above, we exclude pre-2003 firm-years because the Osiris foreign subsidiary information, which we use to identify multinationals, is only coded for the most recent Osiris update. Since we do not know when a firm formed its first foreign subsidiary and certainly many companies became multinationals since our data begin in 1988, using all firm-years undoubtedly results in miscoding some domestic-only firm-years as multinational firm-years.

To find out if this miscoding for some unknown number of firm-years before 2003 affects the high-tax to low-tax ranking among the countries in our study, we estimate equation (1) including all firm-years for which we have data. This adds 41,737 firm-years to our sample. The last column in Table 2 shows the resulting estimated AETRs.

Despite this 150% increase in observations and the inevitable miscoding of multinationals introduced by adding the earlier firm-years and the potential survivorship bias noted above, the inferences are remarkably unaltered. As evidence, the Pearson correlation coefficient for the domestic-only (multinational) AETRs from the original, post-2002 sample and this larger sample with all firm-years is 92% (96%).

The rank order of the countries remains qualitatively unaltered: the Japanese domestic (multinational) AETR is 38% (36%), nine (five) percentage points greater than those for France (Germany), the country with next highest AETR. The domestic (multinational) Middle Eastern AETR is the lowest at 11% (12%), seven (two) percentage points below those of China and Latin America (Tax Havens). Once again, the U.S. and European countries generally have higher AETRs than Asian countries. All of the domestic and multinational AETRs for France, Germany, UK, U.S., and Europe exceed those for China, India, the Tigers, and Asia. In short, the high-tax to low-tax rankings are substantially the same from 1988 to 2007 as they are for the years 2003-2007.

4.9. Year-by-year comparisons from 1988 to 2007

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The previous section establishes that the estimates of equation (1) are substantially the same whether the sample is drawn from recent years (2003-2007) or from the entire investigation period (1988-2007). In this section we report annual estimated AETRs, using the complete sample of firm-years to estimate equation (1). These estimated regression coefficients enable us to analyze the changes in AETRs over time for each country.

Table 3 reports the annual estimated domestic and multinational AETRs. Percentages are only presented if there are at least 20 observations, but all available firm-years were included in the regressions.

We find that the high-tax to low-tax rank across countries has changed little over the two decades. The order in 1988 (the first year) was similar to the rank in 2006 (the final year with data for all groups). In 1988, the Japanese multinational AETR was the highest at 49% (15 percentage points ahead of any other country); in 2006, they were the highest at 36% (nine percentage points higher than those from any other country). In fact, although their rates declined significantly over time, in every year Japanese domestic and multinational AETRs were higher than those in any country (note that we have no Japanese domestic AETR information before 1993). Further work is needed to understand Japan's ability to sustain substantially higher tax rates than its trading partners throughout the two decades.

In 1988, the Tax Havens enjoyed the lowest multinational AETR. Since then, they have averaged just three percentage points above the minimum AETR for all groups. The Middle East has had the lowest domestic (multinational) AETRs since 2000 (2002). From 1997 to 2000, no multinationals had lower AETRs than India.

The U.S. and European countries always had higher AETRs than the Asian countries, with the notable exception of Japan. In 1998 (the first year with data for all Asian countries), the AETRs of France, Germany, UK, U.S., and Europe averaged 29%. The AETRs of China, India, Tigers, and Asia averaged 15%. In 2006, those same Western countries bested their same Eastern counterparts 25% to 18%.

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Moreover, the American and European countries have consistently bunched together with two notable differences. One, the European multinational AETR was 22% in 1989, even lower than the Tax Haven's multinational AETR. European AETRs remained steady over time and were slightly above average by 1999. Every other group had lower AETRs in 2006 than they did in 1988.

Second, German multinational AETRs approached Japanese levels in 1989 at 47%. Over the next two decades, German multinational AETRs fall more than any other country's, ending 2006 at 27%, although still five percentage points above average. Two other countries with large declines were Japanese multinationals from 49% in 1988 to 36% in 2006 and Australian multinationals from 34% in 1988 to 22% in 2006. U.S. AETR declines were more modest: multinational and domestic AETRs both dropped by only two percentage points. For the ten groups for which we have data from 1989 to 2006 (British and American domestics and multinationals and Australian, French, German, Japanese, Tax Haven and European multinationals), the average decline over the period was 6 percentage points or 18% of their 1989 AETRs.

The AETR declines had one precipitous drop. Nearly half of the decline in percentage points occurred between 1992 and 1994. During those two years, German multinational AETRs fell 14 percentage points. Australian multinational AETRs tumbled 8 percentage points. Japanese and Tax Haven multinational AETRs dropped 6 percentage points. The decrease was permanent. AETRs for those four groups never rebounded.

Two other countries are worth mentioning. From 2002 to 2003, the AETRs for Canadian domestics dropped from 31% to 22% and multinationals from 27% to 21%. Neither group has seen its AETR jump back to its earlier level. Finally, the only country that showed a substantial increase in AETRs is India, where multinational AETRs jumped from 8% in 2000 to 20% in 2002 and have remained at roughly that level.

5. Results from Comparing Foreign Subsidiaries

5.1. Cross-country comparisons

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In the previous section, we used the presence of a foreign subsidiary to distinguish multinationals from domestic-only firms. In this section, we include categorical variables for the locations of the foreign subsidiaries in the regression model. The coefficients on the foreign subsidiary variables enable us to assess the extent to which (a) the tax burdens of subsidiaries vary across countries, (b) the location of a parent affects the tax burdens of its foreign subsidiaries, and (c) the location of a foreign subsidiary affects the tax burdens of its parent. The regression equation is:

$$AETR_{it} = \sum \beta_{0_j} COUNTRY_{it}^j + \sum \beta_{1_k} SUB_{it}^k$$

$$+ \sum \beta_{2_m} INDUSTRY_{it}^m + \sum \beta_{3_n} YEAR_{it}^n + \sum \beta_{4_p} SIZE_{it}^p + \varepsilon_{it} \qquad (2)$$

where: $SUB_{it}^k = $ an indicator variable equal to 1 if firm i reports a subsidiary in country k, equal to 0 otherwise.

All other variables are defined the same as in equation (1). The estimated regression coefficient on SUB is the estimated AETR for a foreign subsidiary's home country.

We continue to use the same 16 groups as in the previous section. Each group serves as a *COUNTRY* variable and a *SUB* variable. Each firm-year has one country in which its *COUNTRY* variable is coded one. However, it has *n* *SUB*s coded one, where *n* is the number of different countries in which the parent has at least one subsidiary.[29]

We begin with the original sample of 27,136 firm-years since 2002 with total income tax expense as the numerator for the AETR. We lose 167 firm-years whose companies indicated that they had a foreign subsidiary, which was adequate for coding it as a multinational in estimating equation (1), but did not specify the location of the foreign subsidiary, rendering it unusable for estimating equation (2). The remaining 26,969 firm-years have *SUB* coded as one 57,887 times. All 16 subsidiary locations have at least 1,500 firm-years. Europe is the most popular location for foreign subsidiaries with 6,653 firm-years.

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[29] For example, if a U.S. parent had subsidiaries in Canada, Germany, and Bermuda, $COUNTRY^{US}$, SUB^{CANADA}, $SUB^{GERMANY}$, and $SUB^{BERMUDA}$ would each be coded one and all other $COUNTRY$ and SUB variables would be coded zero.

Table 4 shows the regression coefficient estimates for *COUNTRY* in Panel A and *SUB* in Panel B. The *COUNTRY* coefficients from equation (2) should be the same as the *COUNTRY* coefficients from equation (1), except to the extent that identifying the location of a firm's foreign subsidiaries, as opposed to just identifying the existence of a foreign subsidiary, provides information. It seems plausible that knowing the subsidiary's home country would affect inferences because foreign subsidiaries are not randomly distributed across parents (e.g., Canadian companies are more likely to have a subsidiary in the U.S. than are Indian companies). In addition, multinationals from some countries might be more likely to have profitable foreign investments or operate in high-tax countries. That said, we find little evidence that the location of the foreign subsidiary matters. Only two *COUNTRY* coefficients are more than one percentage point different from the corresponding *COUNTRY* coefficients in Table 2. The domestic German AETR increases from 27% to 30%, while the domestic Indian AETR drops from 23% to 20%.

We now turn our attention to Panel B and the *SUB* coefficients. We expect cross-country variation in the *SUB* coefficients to the extent that locating a foreign subsidiary in a country affects the multinational's worldwide tax expense. For example, if a firm can report more of its profits in a tax haven than in a high-tax country, then its total tax burden should be lower. We find no evidence of substantial cross-country variation in *SUB* coefficients. The *SUB* coefficients range from a 1.3 percentage points decrease in AETRs (Asia) to a 1.1 percentage points increase in AETRs (Australia). The Tax Haven *SUB* coefficient implies that a firm with at least one subsidiary in a haven country enjoys a 0.6 percentage point lower AETR, negative but hardly a substantial amount. Similarly, the Tiger countries, which include two countries that are commonly considered tax havens (Hong Kong and Singapore), has a *SUB* coefficient of -0.5, which is negative but also largely inconsequential.

In untabulated tests, we repeat the analysis using current income tax expense and the sample described in Section 4.7. Inferences are unaltered. We infer from these tests that any cross-country variation in tax expenses experienced by foreign subsidiaries has little impact on the consolidated parent's income tax expense. This is consistent with our earlier results which showed that domestics and multinationals within a country face roughly the same tax rates. This conclusion holds even after we

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replace a crude measure, the mere presence of a foreign subsidiary, with a finer measure, the location of the subsidiary.

That said, our tests may suffer from inadequate power arising from data limitations. Recall that Osiris only provides foreign subsidiary information for the most recent year. Thus, there is no intertemporal variation in the subsidiary mixes of the firms in our sample. Furthermore, clustering among subsidiaries may undermine our ability to interpret the coefficients. For example, if firms that operate in high-tax countries always have subsidiaries in tax havens, then our estimated regression coefficients for high-tax countries may be capturing the lower taxes provided by tax havens and vice versa. That said, we find evidence in the next section that is consistent with parent and subsidiary locations affecting AETRs. Therefore, any possible data and design weaknesses perceived in these tests do not seem to be overwhelming.

5.2. Parent-subsidiary interactions

The lack of results in the previous section may stem from the fact that foreign subsidiaries affect the AETRs of their parents differently depending on the location of the parent. For example, German subsidiaries may lower the high-tax AETRs of Japan parents but increase the low-tax AETRs of Tax Havens parents. In the prior tests, the two effects of German subsidiaries may have offset each other, giving the appearance that German subsidiaries have little impact on their parents' AETRs.

In this section, we alter the research design in an attempt to detect any possible parent-subsidiary interactive effects. Specifically, we modify equation (2) by adding interactions between the *COUNTRY* and *SUB* variables. We then compare the coefficients on the interactions to assess the extent to which subsidiaries affect parents differently, depending on whether the parent is in a high-tax or low-tax country.

Table 5 presents the interaction coefficients (recall that no coefficients are shown unless there are at least 20 observations in a cell).[30] Consistent with foreign subsidiaries in tax havens reducing multinationals' overall tax burdens, we find that all, but one group (Asia), reduce their AETRs when they have a subsidiary in the Tax Haven countries. The largest tax savings are enjoyed by Latin American parents, who reduce their AETR by 6.9 percentage points, and Tiger parents, who reduce their AETRs by 5 percentage points. However, we find that Asian and Middle Eastern subsidiaries provide even greater savings to their parents. Every parent country reduces its AETR when it has a subsidiary in those two locations.

On the other hand, subsidiaries in the U.S. increase their parents' AETRs. All parents, except France, show an increase in their worldwide tax expense, led by Latin American parents (9.5%) and African parents (8.2%). Foreign subsidiaries in Japan (Tigers) [Africa] also increase all parents' worldwide tax expenses with the largest increase incurred by German (Australian) [Japanese] parents.

Note that there are at least two reasons why foreign subsidiaries in these countries (U.S., Japan, Tigers and Africa) would increase the tax expenses of their multinational parents. First, they may tax foreign subsidiaries more heavily than other countries tax the rest of their worldwide enterprise. Second, those foreign subsidiaries may be more profitable than the rest of the worldwide enterprise. Unfortunately, our tests are unable to adjudicate between these two possibilities.

This interactive specification also allows us to determine whether parents in a country face different tax burdens depending on the location of their foreign subsidiaries. For example, we can compare the coefficient on the interaction of U.S. parents with Japanese subsidiaries with the coefficient on the interaction of U.S. parents with Tax Haven subsidiaries to measure the benefits to U.S. parents of having a subsidiary in a tax haven as opposed to having one in Japan.

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[30] Since we have groups of countries, the group can have its foreign subsidiaries in its group. For example, an Italian company may have a subsidiary in Spain. Since both countries are in the European group, the observation will appear in the cell that shows Europe as both parent and subsidiary.

In contrast to the clear patterns that we find among the subsidiaries (i.e., some are always tax increasing and others always tax decreasing), we find few patterns among parents. No parent countries always face tax increases (or decreases) regardless of the subsidiary location.

As would be expected, we find evidence that Tax Haven parents increase their worldwide AETRs when they invest in other countries. Substantial tax increases occur with subsidiaries in Australia (6.6 percentage points), the U.S. (5.7 percentage points), Japan (4.9 percentage points) and Germany (4.6 percentage points). The only substantial tax savings occur with foreign subsidiaries in places with low taxes, namely the Middle East (4.8 percentage points) and other Tax Haven countries (3.1 percentage points).

U.S. parents face the highest AETR increase from their foreign subsidiaries in Tiger (5.4 percentage points) and African (4.1 percentage points) countries. They enjoy the greatest tax reductions in the Middle East (5.1 percentage points) and Asia (4.3 percentage points).

We also find that Tax Haven subsidiaries lower U.S. AETRs by 1.6 percentage points. This estimate is remarkably similar to the finding in Dyreng and Lindsey (2009) that U.S. firms with at least one subsidiary in a tax haven have a tax burden on worldwide income that is 1.5 percentage points lower than that of U.S. firms with no subsidiaries in tax haven countries.

To summarize, our interactive tests detect some patterns among parent-subsidiary AETRs. We find that foreign subsidiaries in Tax Havens, Asia and the Middle East result in AETR reductions for multinationals. Conversely, we find that foreign subsidiaries in the U.S., Japan, Tiger countries and Africa uniformly increase the tax expense of their multinational parents. We also find that the AETRs of Tax Haven parents rise unless they establish foreign subsidiaries in equally low-tax countries.

6. Closing Remarks

To our knowledge, this paper provides the most comprehensive analysis of international firm-level corporate income tax burdens to date. Its findings should aid the development of tax policy by quantifying the average effective tax rates faced by multinational corporations around the globe. The

AETRs provide an empirical foundation for the heated debates about the taxes paid by multinationals and domestics around the world and should help to balance rhetoric with documented empirical facts.

Examining firm-level financial statement information for 10,642 corporations domiciled in 85 different countries with subsidiaries in 195 different countries, we compute country-level AETRs for 68,873 firm-years from 1988 to 2007. We estimate country-level AETRs by regressing firm-level AETRs on categorical variables for the firm's home country, the presence (and, in some tests the location) of a foreign subsidiary, and variables intended to control for systematic effects over time, across industries, and related to firm size. The regression coefficients for the categorical variables provide estimates of country-level tax burdens.

We find that:

- Multinationals and domestic-only firms face similar AETRs;

- Japan consistently has much higher AETRs than any other country;

- The U.S. and European countries have above-average AETRs;

- Tax havens, and Middle Eastern, and Asian countries (excepting Japan) have below-average AETRs.

- AETRs fell worldwide over the last two decades;

- The decline in AETRs was about six percentage points or 18%, primarily from 1992 to 1994.

- German, Japanese, Australian and Canadian AETRs fell more than American, British, and French AETRs.

- The ordinal rank from high-tax countries to low-tax countries remained remarkably constant because all countries reduced their tax burdens.

On this last point, further work is warranted to understand how the tax order of countries has remained so steady over two decades of radical worldwide changes in business, law, politics and technology, to name a few. Although tax rates have fallen dramatically over the last 20 years, high-tax

countries remain high-tax and low-tax countries remain low-tax. Perhaps globalization permits countries to change their tax systems but forces a herding effect because tax changes in one country reverberate around the globe. If this is the case, then fundamental tax changes, e.g., adopting a formula apportionment system or conforming book and tax accounting, may be impossible without worldwide coordination.

We should note that while high AETRs may indicate that a country taxes its corporations heavily, it is possible that the countries have high AETRs because they are more prosperous, attract better managers and/or create better business opportunities. Our tests are unable to distinguish between these two competing explanations, but we would welcome research that could differentiate between them.

Finally, we close by reminding the reader of an important caveat discussed above, namely that the AETRs computed in this study do not use actual tax return data. Instead, we resort to the only publicly available firm-level tax information: income tax expense and profit measures disclosed in companies' financial statements. To the extent our measures suffer from differences in the role of accounting information and the rules governing financial reporting, our tests may be flawed. However, based on prior work that documents a close link between the tax information in the financial statements and tax information in the tax return, we trust that our estimates are not so imprecise as to lead to erroneous inferences.

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Table 1
Sample

		n	Sales	Assets	Equity	Total tax	NIBT	ATR (%)	# Subs	# Foreign subs
Full sample	Domestic	12,778	612	847	305	17	56	30	13	
	Multinational	14,358	3,513	4,290	1,563	115	371	28	68	30
AUSTRALIA	Domestic	474	133	316	133	8	28	24	13	
	Multinational	664	1,055	1,298	600	36	158	24	53	22
CANADA	Domestic	376	423	547	274	11	52	22	7	
	Multinational	426	1,340	2,616	963	67	218	26	31	11
CHINA	Domestic	534	176	289	112	3	14	21	11	
	Multinational	184	762	1,132	392	17	96	18	20	6
FRANCE	Domestic	44	62	290	157	3	32	25	14	
	Multinational	333	8,340	10,275	3,204	276	815	28	241	119
GERMANY	Domestic	74	79	199	72	3	11	26	71	
	Multinational	293	8,757	12,990	3,270	200	628	33	151	71
INDIA	Domestic	80	193	243	80	4	15	24	2	
	Multinational	375	508	637	303	15	78	20	6	5
JAPAN	Domestic	3,929	642	715	262	14	35	42	7	
	Multinational	2,497	3,875	4,534	1,642	96	252	39	42	13
UNITED KINGDOM	Domestic	749	419	730	279	16	61	26	41	
	Multinational	1,314	3,340	3,580	1,295	135	426	28	99	25
UNITED STATES	Domestic	2,836	1,166	1,799	582	36	111	28	25	
	Multinational	4,341	4,965	6,136	2,333	185	597	30	81	38
TIGERS	Domestic	2,241	330	414	177	7	33	20	4	
	Multinational	972	2,236	2,411	918	34	190	18	19	7
TAX HAVENS	Domestic	48	134	316	151	3	18	17	9	
	Multinational	819	1,765	1,979	881	42	197	17	69	58
AFRICA	Domestic	128	665	753	379	40	128	27	5	
	Multinational	184	1,750	1,405	541	56	200	26	42	19
ASIA	Domestic	452	145	254	119	6	24	22	2	
	Multinational	172	357	666	220	12	45	23	19	6
EUROPE	Domestic	318	265	548	195	14	49	27	19	
	Multinational	1,340	2,577	3,233	1,108	94	297	26	84	44
LATIN AMERICA	Domestic	326	1,020	1,284	509	45	160	26	7	
	Multinational	175	1,840	2,388	936	57	248	25	18	4
MIDDLE EAST	Domestic	169	163	335	168	3	34	8	4	
	Multinational	269	345	717	325	8	56	11	18	12

This table presents the means of variables in the Osiris dataset for years 2003-2007. All dollar figures are in millions of U.S. dollars.

Table 2
Summary of results

	(1) 2003-2007 Positive NIBT Nonnegative AETR	(2) 2003-2007 Positive NIBT Nonnegative AETR	(3) 2003-2007 Nonzero NIBT Nonnegative AETR	(4) 2003-2007 Positive NIBT Positive AETR	(5) 2003-2007 Manufacturing firms Positive NIBT Nonnegative AETR	(6) 2003-2007 Positive NIBT Nonnegative AETR AETR= Current tax/NIBT	(7) 1988 - 2007 Positive NIBT Nonnegative AETR
AdjR2		0.86	0.82	0.88	0.87	0.88	0.87
N		27,136	30,433	26,078	13,034	9,185	68,873
	Mean	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate
Panel A **- Domestic**							
AUSTRALIA	24	24	11	28	27	21	24
CANADA	22	23	13	26	27		25
CHINA	21	21	15	23	21	20	18
FRANCE	25	26	21	27			29
GERMANY	26	27	21	28		25	27
INDIA	24	23	18	24	21		21
JAPAN	42	39	31	40	38	38	38
UNITED KINGDOM	26	26	15	27	27	24	23
UNITED STATES	28	26	13	31	30	28	24
TIGERS	20	20	13	21	20	17	19
TAX HAVENS	17	17	10	20			19
AFRICA	27	25	18	26	30		21
ASIA	22	22	17	23	20	22	22
EUROPE	27	26	18	28	28	32	25
LATIN AMERICA	26	24	16	25	26	17	18
MIDDLE EAST	8	10	5	12	12		11
Panel B **- Multinational**							
AUSTRALIA	24	22	10	25	25	22	23
CANADA	26	24	13	26	26		25
CHINA	18	17	10	19	15	14	15
FRANCE	28	25	16	26	26	23	23
GERMANY	33	30	21	32	32	30	32
INDIA	20	18	13	19	22	19	15
JAPAN	39	36	26	38	36	35	37
UNITED KINGDOM	28	26	17	27	27	25	24
UNITED STATES	30	27	15	29	28	27	26
TIGERS	18	17	9	18	17	15	15
TAX HAVENS	17	15	7	17	17	15	14
AFRICA	26	23	14	24	24	23	19
ASIA	23	22	15	22	22	19	20
EUROPE	26	24	15	26	25	24	22
LATIN AMERICA	25	22	13	24	24	23	18
MIDDLE EAST	11	11	4	13	13	14	12

Column (1) reports the mean AETR for each country/group in the Osiris 2003-2007 sample, as shown in Table 1.

Columns (2) – (7) present the results of estimating $AETR_{it} = \sum \beta_{0_j} COUNTRY_{it}^j + \sum \beta_{1_j} (COUNTRY_{it}^j * MN_{it}) + CONTROLS$ on samples described in the column headings. Panel A reports the estimate of β_0 for each country/group. Panel B reports the estimate of $(\beta_0 + \beta_1)$ for each country/group. All available observations were included in the estimation, but estimates are only reported for countries/groups having 20 or more observations.

Table 3
Yearly estimates

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
AdjR2	0.90	0.90	0.90	0.89	0.89	0.88	0.89	0.89	0.88	0.88	0.88	0.87	0.87	0.87	0.86	0.86	0.85	0.86	0.85	0.86
N	1,175	1,288	1,409	1,493	1,694	1,918	2,359	2,679	2,993	3,255	3,463	4,101	4,536	4,394	4,980	5,734	6,567	6,991	7,085	759
Panel A - Domestic																				
AUSTRALIA																				
CANADA											33	32	30	29	31	22	22	20	19	
CHINA											20	17	16	18	21	20	20	21	21	
FRANCE																				
GERMANY																		25	23	
INDIA																	19			
JAPAN					48	43	42	42	42	44	44	40	42	40	41	38	36	38	39	39
UNITED KINGDOM	30	32	30	28	29	26	26	25	24	24	23	24	24	25	26	25	23	25	26	21
UNITED STATES	28	28	27	26	27	25	25	25	25	26	27	26	26	25	26	24	24	25	26	24
TIGERS						32	26	26	26	24	21	22	21	21	21	20	18	19	18	
TAX HAVENS																				
AFRICA							30		28	30	25	13	23	26	24	24	23	25	24	
ASIA							30	30	28	30	25	23	23	25	25	21	22	20	22	
EUROPE									28	29	30	28	25	25	29	25	25	25	25	
LATIN AMERICA					16	17	14	13	9	13	15	15	13	23	23	25	22	23	24	
MIDDLE EAST						32	26	26	24	21	22	21	21	8	8	11	7	9	11	
Panel B - Multinational																				
AUSTRALIA	34	33	32	27	34	26	26	25	25	24	27	25	24	25	22	20	21	22	22	20
CANADA					28	31	24	26	29	31	31	32	29	29	27	21	22	22	24	
CHINA										11	11	15	14	13	18	16	16	17	17	
FRANCE	27	29	26	25	26	22	22	23	23	28	29	28	26	27	26	24	23	23	25	
GERMANY		47	46	42	44	36	30	33	33	34	38	37	34	31	32	32	27	27	29	27
INDIA										9	8	10	8	16	20	18	17	17	18	
JAPAN	49	50	47	46	49	45	43	41	41	42	44	39	37	38	38	34	33	33	36	39
UNITED KINGDOM	28	29	28	27	28	24	25	24	25	25	25	24	27	29	25	26	24	25	25	23
UNITED STATES	29	30	30	28	29	27	27	27	28	29	29	29	30	28	27	24	25	25	27	24
TIGERS						22	17	19	17	16	19	17	15	16	14	13	14	15	17	
TAX HAVENS	21	24	20	19	20	14	14	14	15	16	16	17	15	16	14	14	13	15	15	
AFRICA												18	18	24	24	23	23	20	21	23
ASIA							24	22	22	22	21	23	23	26	25	21	22	20	22	
EUROPE	23	22	25	21	23	19	21	21	23	24	24	24	26	25	25	23	23	20	22	23
LATIN AMERICA					18	18	19	14	14	12	13	16	18	18	22	22	19	20	23	
MIDDLE EAST												17	15	15	14	11	9	9	11	

Results of estimating $AETR_{it} = \sum \beta_{0_j} COUNTRY_{it}^j + \sum \beta_{1_j} (COUNTRY_{it}^j * MN_{it}) + CONTROLS$ for each year in the sample described in Column (7) of Table 2. Panel A reports the estimate of β_0 for each country/group. Panel B reports the estimate of $(\beta_0 + \beta_1)$ for each country/group. Estimates are reported for country-years with 20 or more observations.

Table 4
Results of Parent/Subsidiary Specification

AdjR2	0.86
N	26,969
Panel A **- Parents**	
AUSTRALIA	24
CANADA	24
CHINA	20
FRANCE	26
GERMANY	30
INDIA	20
JAPAN	38
UNITED KINGDOM	26
UNITED STATES	27
TIGERS	19
TAX HAVENS	17
AFRICA	24
ASIA	22
EUROPE	25
LATIN AMERICA	24
MIDDLE EAST	11
Panel B **- Subsidiaries**	
AUSTRALIA	1.1
CANADA	0.6
CHINA	(0.7)
FRANCE	0.8
GERMANY	(0.6)
INDIA	0.4
JAPAN	(0.5)
UNITED KINGDOM	0.0
UNITED STATES	(1.1)
TIGERS	(0.5)
TAX HAVENS	(0.6)
AFRICA	0.9
ASIA	(1.3)
EUROPE	0.4
LATIN AMERICA	(0.4)
MIDDLE EAST	(0.3)

This table presents the results of estimating $AETR_{it} = \sum \beta_{0_j} COUNTRY_{it}^j + \sum \beta_{1_k} SUB_{it}^k + CONTROLS$ on a subsample of the sample described in Table 1 for which we have necessary subsidiary information. Panel A reports the estimate of β_0 for each country/group. Panel B reports the estimate of β_1 for each country/group.

Table 5
Estimates of Parent/Subsidiary Interactions

Parents	Subsidiaries															
	AUSTRALIA	CANADA	CHINA	FRANCE	GERMANY	INDIA	JAPAN	UNITED KINGDOM	UNITED STATES	TIGERS	TAX HAVENS	AFRICA	ASIA	EUROPE	LATIN AMERICA	MIDDLE EAST
AUSTRALIA		(1.1)	(1.6)	(1.6)	(0.3)	3.2	4.9	1.3	3.1	7.0	1.8	(3.6)	(4.9)	(0.3)	(0.5)	(1.4)
CANADA			2.9	2.2												
CHINA																
FRANCE	9.1	0.3	2.6		2.4	2.1		2.5	3.3	5.6	2.5	4.0	(10.5)	3.8	2.6	(1.3)
GERMANY	4.0	(6.4)	2.1	3.4		0.6	7.6	3.3	5.6	4.0	3.3	5.6	(9.3)	3.2	3.4	(3.4)
INDIA					(1.4)		(0.1)	0.9	0.1				1.8			
JAPAN	1.9	(3.5)	0.0	3.4	(1.2)	(0.8)		0.9	4.8	2.8	(0.0)	7.8	(4.1)	(0.7)	(2.4)	(2.5)
UNITED KINGDOM	6.2	(4.2)	2.4	2.4	1.8	2.5	4.1		1.7	3.8	2.8	3.7	(0.5)	(2.3)	(1.9)	(1.9)
UNITED STATES	4.6	(1.6)		1.3	0.9	1.7	1.7	8.2		5.4	4.1	4.1	(1.9)	0.9	0.1	(5.1)
TIGERS	8.2	(0.4)	(1.5)	1.3	0.5	2.3	3.1	1.7	7.3		1.2	4.3	(5.0)	2.0	1.7	(4.1)
TAX HAVENS	1.0	(4.7)	5.3	4.6	4.6	4.9	4.9	0.3	5.7	3.2		4.3	2.0	0.9	(0.9)	(4.8)
AFRICA	(0.2)							2.9	8.2	5.7	2.9		(2.2)	(0.5)	1.1	(3.6)
ASIA			(0.1)							5.0	1.6			(6.4)		
EUROPE	5.5	(3.6)	(0.3)	(0.2)	2.1	3.1	5.3	1.6	7.5	3.1	1.6	1.3	(2.3)		(1.9)	(2.3)
LATIN AMERICA									9.5							(2.5)
MIDDLE EAST	3.0		2.1		0.6			2.1	7.2	3.1	1.3	2.9	1.1	2.3	5.4	(9.9)

This table presents the results of estimating $AETR_{it} = \sum \beta_{0_j} COUNTRY_{it}^j + \sum \beta_{1_k} SUB_{it}^k + \sum \beta_{2_n} COUNTRY_{it}^j * SUB_{it}^k + CONTROLS$ on a subsample of the sample described in Table 1 for which we have necessary subsidiary information. Each cell reports the estimate of β_2 for the interaction of the given parent and subsidiary variables. For example, the estimate of β_2 for the interaction term $COUNTRY_{it}^{AUSTRALIA} * SUB_{it}^{CANADA}$ is (1.1). All interaction terms were included in the estimation, but estimates are only reported for cells with 20 or more observations.

Domestic Effects of the Foreign Activities of U.S. Multinationals

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ABSTRACT

Do firms investing abroad simultaneously reduce their domestic activity? This paper analyzes the relationship between the domestic and foreign operations of American manufacturing firms between 1982 and 2004 by instrumenting for changes in foreign operations with GDP growth rates of the foreign countries in which they invest. Estimates produced using this instrument indicate that 10% greater foreign investment is associated with 2.6% greater domestic investment, and 10% greater foreign employee compensation is associated with 3.7% greater domestic employee compensation. These results do not support the popular notion that expansions abroad reduce a firm's domestic activity, instead suggesting the opposite.

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1. Introduction

There is considerable debate over the likely domestic effects of the rapidly increasing foreign activity by U.S. multinational firms. In particular, flows of foreign direct investment (FDI) to rapidly growing foreign markets generate fears that such investment displaces domestic employment, capital investment, and tax revenue. An alternative perspective suggests that growing foreign investment may instead increase levels of domestic activity by improving the profitability and competitiveness of domestic operations as firms expand globally. Very little empirical evidence is currently available with which to distinguish these views.

The effect of increased foreign activity by U.S. multinational firms on their own domestic operations turns on production and cost considerations that might take any of a number of forms.[1] One possibility is that a multinational firm's total worldwide production level is approximately fixed, being determined by resource limits, capacity constraints, or market competition. Given that foreign and domestic factors of production are conditional substitutes, any additional foreign production then necessarily reduces domestic production, hence foreign and domestic investment levels will be negatively correlated. Alternatively, the level of total production might not be fixed, but it instead may be responsive to profit opportunities that are influenced by economic growth rates. In such a framework it is possible that increases in FDI raise the return to domestic production, stimulating domestic factor demand and domestic output. Firms might, for example, find that foreign operations provide valuable intermediate inputs at low cost, or that foreign affiliates serve as ready buyers of tangible and intangible property produced in the United States.

This paper evaluates the extent to which increased foreign activity by U.S. manufacturing firms influenced their domestic activities between 1982 and 2004. This exercise employs confidential affiliate-level information on the activities of U.S. manufacturing firms collected by the Bureau of Economic Analysis (BEA). These data permit individual foreign operations to be matched to the domestic activities of the same firms; as a result, it is possible to measure the extent to which expansions in foreign business activity coincide with changes in domestic

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[1] The text uses "domestic" to refer to the U.S. activities of U.S. multinational firms, and "foreign" to refer to the non-U.S. activities of the same companies.

1

activity. The evidence indicates that there is a strong positive correlation between the domestic and foreign activity levels of multinational firms.

The fact that foreign and domestic operations are jointly determined makes this evidence difficult to interpret. Investment and desired output are functions of many variables that influence firm profitability, some of which are inevitably omitted from any empirical analysis, and these omissions may themselves induce positive or negative correlations between foreign and domestic activities. For example, the discovery of a new drug by a pharmaceutical company may be manifest in coincident positive growth of activity both abroad and at home. Alternatively, real exchange rate movements may make it more profitable for an American firm to produce in foreign locations and less profitable to produce in the United States, thereby encouraging the firm to expand its foreign activities and reduce its domestic activities more or less simultaneously, even though the foreign activities and domestic activities are unrelated.

Since the locations of foreign investments differ significantly between firms, it is possible to construct firm-specific weighted averages of foreign GDP growth. These firm-specific foreign economic growth rates can be used to generate predicted growth rates of foreign activity that are then employed to explain changes in domestic activity. This empirical procedure effectively compares two U.S. firms, one whose foreign investments in 1982 were, for example, concentrated in Britain, and another whose foreign investments were concentrated in France. As the British economy subsequently grew more rapidly than the French economy, the firm with British operations should exhibit more rapid growth of foreign investment than would the firm with French operations. If the domestic activities of the firm with British operations grow at different rates than the domestic activities of the firm with French operations, it may then be appropriate to interpret the difference as reflecting the impact of changes in foreign operations.

Weighted foreign economic growth rates are strong predictors of subsequent foreign investment by U.S. firms. Foreign growth rates predict increases in foreign investment by firms with foreign operations that are focused on serving host country markets and also by firms with foreign operations that are export oriented. This second pattern suggests that foreign economic growth rates do not merely capture changes in host country demand but also reflect changing economic opportunities from movements in real input costs due to productivity gains or other

changes. As such, the instrumental variables analysis is relevant not only for studying foreign investment directed at serving host country markets but also for studying foreign investment that produces output for other markets.

Second stage equations based on predictions that use foreign economic growth rates to instrument for changes in foreign activity imply that 10 percent greater foreign capital investment triggers 2.6 percent of additional domestic capital investment, and that 10 percent greater foreign employee compensation is associated with 3.7 percent greater domestic employee compensation. There are similar positive relationships between foreign and domestic changes in assets, and numbers of employees.[2]

There are several channels through which foreign activities can influence the scope of domestic operations, including cases in which foreign production requires inputs of tangible or intellectual property produced in the home country. The same instrumental variables method used to identify the effect of foreign investment on domestic investment can also be used to identify the effect of foreign investment on other types of domestic activity. The estimates indicate that greater foreign activity is associated with higher exports from U.S. parent companies to their foreign affiliates and is also associated with greater domestic R&D spending.

The positive association between changes in foreign and domestic activities persists in supplemental specifications designed to address alternative interpretations of the main results. The use of weighted foreign economic growth rates as instruments for changes in foreign investment has the potential to produce misleading results if the foreign investments of firms planning rapid expansion of domestic investment are disproportionately attracted to economies expected to grow rapidly. To address this possibility, the residuals from regressing foreign GDP growth against lagged GDP growth can be used instead of actual GDP growth in explaining foreign investment; this substitution produces very similar results.

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[2] The example of one large American multinational firm illustrates the relationships manifest in the large-sample evidence. Between 2000 and 2006, Caterpillar increased it foreign employment by 49%, to the point that foreign employment constituted half of its total global employment. Over this period, Caterpillar's U.S. exports, a fraction of which were sent to its foreign affiliates, grew by 104%, and its U.S. employment grew by 29%. While it is difficult to draw causal inferences from the experiences of individual companies, this example illustrates that foreign operations need not divert domestic activity.

In order to avoid the possibility that industry-specific shocks might produce a correlation of foreign and domestic investment growth rates, the regressions reported in the paper include fixed effects for each two-digit parent industry in each year. BEA industry classifications are similar in scope to SIC industry classifications. Furthermore, the use of a larger set of year-specific three-digit industry fixed effects does not change the results. Alternatively, if firms export to unaffiliated customers, and invest in, the same countries, foreign economic growth rates might directly stimulate export-oriented domestic activity. This can be controlled for by including an additional variable equal to export-weighted foreign economic growth, which again does not alter the results. Finally, there are circumstances in which real exchange rate movements that are correlated with economic growth rates might independently influence both foreign and domestic activity, but replicating the analysis with controls for firm-specific changes in foreign exchange rates yields similar answers.

These results carry implications for U.S. policies that influence the attractiveness of foreign investment to U.S. firms. A number of policies are based on the premise that greater foreign business activity, whatever its source, comes at the cost of reduced domestic activity. For example, recent proposals requiring U.S. firms to abide by U.S. labor and regulatory standards when operating abroad would increase costs of certain foreign activities in the hopes of making domestic operations more competitive. Those who advocate greater U.S. taxation of active foreign business income often do so in the belief that subjecting foreign business income to high rates of tax will stimulate demand for domestic factors of production. While plausible, and perhaps intuitive, the premise motivating these policies appears to be inconsistent with the evidence presented in this paper. This, in turn, suggests that the conceptual framework used to evaluate policies might be due for revision, as discussed by Desai and Hines (2003) in the context of tax policy.

Previous studies report mixed results in analyzing the impact of foreign operations on domestic economic activity. Lipsey (1995) analyzes a cross-section of U.S. multinational firms, reporting a mild positive correlation between foreign production and domestic employment levels. Stevens and Lipsey (1992) analyze the investment behavior of seven multinational firms, concluding that investments in different locations substitute for each other due to costly external financing. The absence of compelling instruments that satisfy the necessary exclusion

restrictions complicate the interpretation of this evidence, a problem that likewise appears in studies of aggregate FDI and domestic investment. Feldstein (1995) analyzes decade-long averages of aggregate FDI and domestic investment in OECD economies, reporting evidence that direct investment abroad reduces domestic investment levels. Devereux and Freeman (1995) come to a different conclusion in their study of bilateral flows of aggregate investment funds between seven OECD countries, finding no evidence of tax-induced substitution between domestic and foreign investment, and Desai, Foley and Hines (2005a) report time series evidence that foreign and domestic investment are positively correlated for U.S. firms. Blonigen (2001) investigates the related question of whether foreign production by multinationals is a substitute or complement for exports, finding evidence for both effects. The effect of foreign operations on the domestic activities of multinational firms therefore remains an open question.[3]

Much of the recent theoretical and empirical work on multinational firms emphasizes alternative motivations for foreign direct investment[4] or the reasons why alternative productive arrangements[5] are employed. Specifically, Hummels, Ishii and Yi (2001), Yi (2003) and Hanson, Mataloni and Slaughter (2005) emphasize the importance of vertical specialization to international trade patterns and the expansion strategies of multinational firms. The findings of this research – that multinational firms exhibit high degrees of integrated production – are consistent with sizeable effects of foreign operations on domestic activity.

Section 2 of the paper sketches a simple framework for the analysis of growth-driven FDI on the domestic operations of multinational firms. Section 3 describes the available data on U.S. direct investment abroad. Section 4 presents empirical evidence of the determinants of foreign investment levels by U.S. firms, and the impact of foreign investment on economic activity in the United States. Section 5 is the conclusion.

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[3] Several studies, including Brainard and Riker (1997), Riker and Brainard (1997), Slaughter (2000), Feenstra and Hanson (1996, 1999) and Harrison and McMillan (2004) have emphasized the link between foreign activities and domestic wages and employment. Additionally, Blonigen and Wilson (1999) investigate the role of demand by multinational firms in determining variations in the measured substitutability of foreign and domestic goods.
[4] Investments are often characterized as being vertical or horizontal. The horizontal FDI view represents FDI as the replication of capacity in multiple locations in response to factors such as trade costs, as in Markusen (1984, 2002). The vertical FDI view represents FDI as the geographic distribution of production globally in response to the opportunities afforded by different markets, as in Helpman (1984).
[5] Antràs (2003), Antràs and Helpman (2004), Desai, Foley and Hines (2004), Helpman, Melitz and Yeaple (2004) and Feenstra and Hanson (2005) analyze the determinants of alternative foreign production arrangements.

2.   *Foreign Economic Growth and the Operations of Multinationals Firms*

The first stages of the regressions that follow use the fact that firms differ in their initial distributions of foreign economic activity to predict different growth rates of subsequent activity, based on differences in the average GDP growth rates of the countries in which their activities were initially concentrated. These predicted growth rates then become the independent variables in second stage equations used to explain changes in domestic business operations. This empirical strategy takes a firm's initial distribution of activity among foreign countries to be exogenous from the standpoint of subsequent changes in domestic business activity. In order to consider the merits of this strategy, it is useful to formalize the way in which foreign economic growth influences domestic and foreign investment through production considerations and demand conditions.

Consider a multinational firm that produces output with a production function $Q(k, k^*)$, in which k represents inputs of domestic factors and k^* represents inputs of foreign factors; output is taken to be a concave function of each of these inputs. The firm faces costs of c per unit of k and c^* per unit of k^*. Revenue is given by $R(Q, y^*)$ (the usual demand properties imply that

$\dfrac{\partial R}{\partial Q} > 0$ and $\dfrac{\partial^2 R}{\partial Q^2} \leq 0$) and y^* denotes foreign economic conditions. R is a function of y^* only

insofar as foreign economic conditions affect sales revenue for a given output level, presumably through affecting the prices that output can command in local foreign markets.

The firm maximizes $R(Q, y^*) - (ck + c^* k^*)$, and the first order conditions for profit maximization are:

(1)
$$\frac{\partial R}{\partial Q} \frac{\partial Q}{\partial k} = c$$

(2)
$$\frac{\partial R}{\partial Q} \frac{\partial Q}{\partial k^*} = c^*.$$

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In this setting a change in foreign costs ($c*$) affects domestic economic activity by influencing $k*$, which in turn affects $\frac{\partial Q}{\partial k}$. This can be seen by totally differentiating (1), denoting the induced change in foreign inputs by $dk*$, and the resulting change in domestic inputs by dk:

$$(3) \qquad \frac{\partial Q}{\partial k} \frac{\partial^2 R}{\partial Q^2} \left[\frac{\partial Q}{\partial k} dk + \frac{\partial Q}{\partial k *} dk * \right] + \frac{\partial R}{\partial Q} \left[\frac{\partial^2 Q}{\partial k^2} dk + \frac{\partial^2 Q}{\partial k \partial k *} dk * \right] + \frac{\partial Q}{\partial k} \frac{\partial^2 R}{\partial Q \partial y *} dy* = dc.$$

Since $dc = 0$, equation (3) implies that:

$$(4) \qquad dk = \frac{\left[\frac{\partial Q}{\partial k} \frac{\partial Q}{\partial k *} \frac{\partial^2 R}{\partial Q^2} + \frac{\partial R}{\partial Q} \frac{\partial^2 Q}{\partial k \partial k *} \right] dk * + \frac{\partial Q}{\partial k} \frac{\partial^2 R}{\partial Q \partial y *} dy *}{-\left[\left(\frac{\partial Q}{\partial k} \right)^2 \frac{\partial^2 R}{\partial Q^2} + \frac{\partial R}{\partial Q} \frac{\partial^2 Q}{\partial k^2} \right]}.$$

Since $\frac{\partial^2 R}{\partial Q^2} \leq 0$ and $\frac{\partial^2 Q}{\partial k^2} < 0$, it follows that the denominator of the right side of equation (4) is positive.

The first term in the numerator of equation (4) is positive only if $\frac{\partial^2 Q}{\partial k \partial k *} > 0$ and is of sufficient magnitude to offset the negative sign of the term that includes $\frac{\partial^2 R}{\partial Q^2}$. This will be the case if foreign and domestic inputs exhibit significant complementarity in production. The second term in the numerator of equation (4) is a demand effect: if $\frac{\partial R}{\partial Q}$ increases with $y*$, then higher values of $y*$ will be associated with increased demand for k. This reflects the possibility that the change in foreign economic conditions also directly affects $\frac{\partial R}{\partial Q}$ by influencing final output demand, as captured by $\frac{\partial^2 R}{\partial Q \partial y *}$. If foreign affiliates or parent companies sell significant portions of their output in markets where affiliates are located, and local demand influences the prices that output commands, then if $y*$ is per capita income in countries where affiliates are

located it may be the case that $\dfrac{\partial^2 R}{\partial Q \partial y*} > 0$. As such, the two terms in the numerator of equation (4) reveal that foreign economic growth can influence domestic factor demand through production and demand considerations.

Equation (4) suggests that it is possible to estimate the impact of foreign input changes on domestic factor demands by using changes to foreign economic conditions as instruments. From equation (2) it is clear that reduced values of $c*$ are associated with higher levels of $k*$. Real values of $c*$ are difficult to observe, but to the extent that national economic growth is associated with productivity gains that correspond to declining real input costs, then changes in foreign income levels can serve as $y*$, and therefore proxies for changes in $c*$. For example, a shock to foreign technology might reduce real foreign factor costs and simultaneously promote foreign GDP growth. In such a case, the change in foreign GDP can be used to predict changes in foreign factor demand by U.S. firms.

The second term in the numerator of equation (4) is a reminder that changes in foreign income have the potential to affect the demand for domestic factors via output demand effects. In particular, it is possible that $\dfrac{\partial R}{\partial Q}$ is itself a function of $y*$, since firms with foreign operations concentrated in rapidly growing countries may find that foreign demand for their output grows faster than do firms without strong presences in hot foreign markets. If $\dfrac{\partial R}{\partial Q}$ is an increasing function of $y*$, then a change in $y*$ will be positively correlated with changes in domestic factor demands even if there is no production spillover, that is, even if $\dfrac{\partial^2 Q}{\partial k \partial k*} = 0$. Since some of the policy questions raised by these demand effects differ from those triggered by production effects, it is useful to consider the importance of the demand channel.

How might one distinguish production effects from demand effects in estimating the impact of foreign GDP growth on domestic factor demands? One method of doing so is to distinguish firms based on the extent to which their sales are likely to be influenced by conditions in foreign markets. Firms whose foreign affiliates sell relatively little in their host markets may be affected by local income growth, but these effects are likely to reflect changes in

real factor costs rather than new selling opportunities. If the second term in the numerator of equation (4) is plausibly zero for such firms, then one is left with production effects being responsible for the impact of foreign income growth on domestic factor demands. The evidence analyzed below is indeed consistent with this interpretation.

The possibility that foreign GDP growth influences foreign factor use because it is correlated with sales by foreign affiliates is an issue for the interpretation of the instrument, not its validity. In order to serve as a valid instrument it is necessary that the average GDP growth rate of foreign countries in which a firm invests is conditionally uncorrelated with the residual in the second stage equation explaining the firm's domestic economic activity. This condition requires that foreign economic growth affects its domestic operations only by influencing the level and character of its foreign operations. This restriction cannot be directly tested, but reasonable specifications of production processes within multinational firms imply that by far the most likely channel by which foreign economic prosperity affects firms with local operations is by affecting local operations.

While the preceding establishes how foreign economic growth can give rise to production and demand effects, it also offers guidance on the validity of the instrument. There are three important scenarios in which the instrument would be invalid, and each is considered in the empirical tests below. First, specific industrial activity might be concentrated in certain countries, and domestic and foreign operations might experience common shocks. For example, if most of the foreign operations of electronic component manufacturing parents were located in Taiwan, a productivity shock to the industry could be associated with high growth in Taiwan while the productivity shock also has a direct effect on the growth of parent firms in the industry. The resulting possible misattribution of cause and effect can be largely prevented by including fixed effects that are specific to individual industries and time periods. Second, firms might export to unaffiliated customers in the same foreign countries in which they invest, in which case foreign economic growth might stimulate exports and thereby domestic operations directly. This consideration suggests that it is useful to control for export-driven changes in domestic activity by including an independent variable equal to export-weighted foreign economic growth. Third, parent firms that are trying to grow quickly may invest in countries whose economies are

expected to grow rapidly in the future. This scenario implies that only the unanticipated component of foreign economic growth would be a valid instrument.

Finally, it is also possible that foreign investment by U.S. firms affects local GDP growth rates, making foreign GDP growth rates inadmissible as instruments in explaining foreign investment. This effect is, however, likely to be very small in magnitude except for a certain number of small countries, principally tax havens, that draw disproportionate volumes of U.S. investment.[6] Since the empirical work presented in the paper uses average foreign GDP growth rates weighted by investment levels, this consideration is very unlikely to contaminate the estimated results.

3.   *Data and descriptive statistics*

The empirical work presented in section 4 is based on the most comprehensive and reliable available data on the activities of U.S. multinational firms. The BEA Benchmark Surveys of U.S. Direct Investment Abroad in 1982, 1989, 1994, 1999, and 2004 provide a panel of data on the financial and operating characteristics of U.S. multinational firms.[7] In order to limit the heterogeneity of the sample, observations are restricted to U.S. firms with parent companies in manufacturing industries (as defined in the BEA survey using a classification that corresponds almost exactly to SIC codes 20-39).[8] In each of the four benchmark years, all affiliates with sales, assets, or net income in excess of certain size cutoffs of no more than $10 million in absolute value, and their parents, were required to file reports. Measures of aggregate foreign activity of individual firms are obtained by summing measures of activity across the firm's foreign affiliates. The surveys collect sufficient information to quantify domestic and foreign sales, assets, net property, plant and equipment, employment compensation, and employment, as well as R&D spending by parents and exports from parents to affiliates.[9]

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[6] For an analysis of the effect of foreign direct investment on GDP growth rates of small tax havens, see Hines (2005).

[7] The International Investment and Trade in Services Survey Act governs the collection of the data and the Act ensures that "use of an individual company's data for tax, investigative, or regulatory purposes is prohibited." Willful noncompliance with the Act can result in penalties of up to $10,000 or a prison term of one year. As a result of these assurances and penalties, BEA believes that coverage is close to complete and levels of accuracy are high.

[8] Manufacturing firms have 56% of the employee compensation and 56% of the property plant and equipment of all U.S. multinational firms in the BEA data for these years.

[9] Only a limited number of firms reported U.S. exports from parents to affiliates in 2004 due to a change in reporting requirements. Therefore, the sample used to analyze intercompany exports does not include observations for 2004.

The BEA collects identifiers linking parents and affiliates through time, thereby permitting the calculation of changes in domestic and foreign input use. Growth rates are computed as ratios of changes in activity between benchmark years to averages of beginning and ending period levels of activity. [10] Since the data include five benchmark survey years – 1982, 1989, 1994, 1999, and 2004 – it is possible to calculate changes in this normalized measure for at most four periods. As the analysis considers changes only, observations of firms that initiate or terminate global activities between benchmark years are not part of the analysis for that period.[11]

Table 1 presents means, medians, and standard deviations of variables used in the regressions that follow. The instrumental variables procedure uses foreign GDP growth rates, which are calculated by dividing changes (between benchmark years) in the gross domestic product per capita of affiliate host countries by the average of beginning and ending period values.[12] These country growth rates are aggregated using weights equal to a firm's beginning of period affiliate net property, plant and equipment in each country. To control for the possibility that GDP growth rates affect domestic levels of activity by influencing parent exports to final consumers abroad, some regressions include as an independent variable GDP growth rates weighted by a parent company's beginning of period exports to unrelated parties. Some regressions also include changes in real exchange rates, which are computed using nominal exchange rates taken from Heston, Summers, and Aten (2006) and measures of inflation from the IMF's International Financial Statistics database; the real exchange rate movement is defined to equal the ratio of the change in the dollar-equivalent real exchange rate to the average of this rate at the beginning and end of period. Firm-specific exchange rate changes equal the product of these real exchange rate changes and weights equal to beginning of period affiliate net property plant and equipment in each country.

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[10] Construction of growth rates around averages of start and end of period values has become standard procedure in the analysis of firm-level job flows, as in Davis, Faberman, and Haltiwanger (2006). Tornqvist, Vartia, and Vartia (1985), and the appendix to Davis, Haltiwanger and Schuh (1996), compare the properties of this growth rate measure to alternatives including log changes and growth rates calculated relative to initial values.

[11] The change in foreign activity attributable to the growth of surviving parents is considerably larger than is the change due to net entry and exit of parents in each of the four periods covered by the data. Appendix Table 1 of Desai, Foley, and Hines (2005) provides a description of changes in net foreign property, plant and equipment investment of U.S. multinationals, decomposing these changes into the growth of surviving firms, entry by new firms, and capital reductions due to exit by firms that were previously part of the sample.

[12] Per capita gross domestic product is the CGDP variable reported by Heston, Summers and Aten (2006), representing incomes adjusted for purchasing power and reported in current dollars.

4.   The Relationship Between Foreign and Domestic Activity

The simple correlation of changes in foreign and domestic activity is evident from Figure 1, which presents a scatter plot of foreign and domestic sales growth rates for multinational firms in the sample.[13] As in the regression analysis, foreign growth rates are defined as the ratio of the change in a measure of foreign activity between benchmark years to the average of its values in these years; and domestic growth rates are similarly defined.   The upward sloping relationship between foreign and domestic sales growth in Figure 1 suggests a positive correlation between growth rates of foreign and domestic economic activity that is investigated further below.

4.1.   OLS Specifications

Table 2 presents estimated coefficients from OLS specifications explaining changes in the domestic activities of parent companies as functions of changes in their foreign activities. All specifications include fixed effects for two-digit parent industries in each period, and the standard errors correct for clustering at the parent company level.[14] The 0.2018 coefficient reported in column one of Table 2 indicates that 10 percent higher foreign net property, plant and equipment growth is associated with 2.0 percent higher domestic net property, plant and equipment growth by parent companies.   Asset accumulation displays a similar pattern, the 0.3241 coefficient reported in column two implying that 10 percent foreign asset growth is associated with 3.2 percent domestic asset growth. The regressions reported in columns three and four consider changes in labor demand. The 0.2454 coefficient reported in column three indicates that 10 percent higher foreign employment compensation is associated with a 2.5 percent greater domestic employment compensation. And the 0.2263 coefficient reported in column four similarly implies that 10 percent higher numbers of foreign employees is associated with 2.3 percent higher numbers of domestic employees. Across all of these measures of multinational firm activity, the OLS analysis suggests that increased foreign activity is associated with greater domestic activity.

4.2.   Instrumental Variables Specifications

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[13] Foreign sales refers to the sales of a firm's foreign affiliates, regardless of the destination of those sales, and domestic sales refers to the sales of a firm's domestic operations, regardless of the destination of those sales.

[14] Information is missing for some firms in certain years, which is why sample sizes vary between specifications in Table 2.

The instrumental variables approach outlined above relies on the ability of foreign economic growth rates to explain changes in foreign activity levels of U.S. multinational firms. Table 3 presents the results of regressions of growth rates of foreign activity on firm-specific weighted averages of foreign economic growth rates, the weights corresponding to beginning of period distributions of foreign property, plant, and equipment. Growth rates are defined as in Table 2, all specifications include period-industry fixed effects, and the standard errors correct for clustering at the parent level.

The results indicate that the economic performance of foreign economies significantly influences the foreign activity of U.S. multinational firms. The 1.4755 coefficient reported in column one indicates that 2 percent faster annual average GDP growth in countries in which a firm invests is associated with 3.0 percent faster growth of affiliate net property, plant and equipment. Similar results appear in the regressions reported in columns two through four, whose coefficients imply that 2 percent faster annual GDP growth is associated with 2.3 percent greater foreign asset accumulation, 2.3 percent greater foreign employee compensation growth, and 1.3 percent greater foreign employment growth.

As discussed above, foreign economic growth is associated with greater levels of foreign activity by U.S. firms either because economic growth increases the value of the foreign output of U.S. firms or because foreign economic growth coincides with reduced real input costs due to productivity gains or other changes. In order to consider these distinct channels, it is useful to identify the impact of foreign GDP growth on export sales by foreign affiliates, as such sales presumably are little, if at all, affected by output demand in the affiliates' host countries. Such an exploration addresses concerns that the instrumental variables analysis is only relevant for certain types of foreign investments – for example, those that serve local markets.

Table 4 builds on the regressions reported in Table 3 by adding a variable equal to the average fraction of affiliate sales directed outside their own home markets; this variable is measured as of the beginning of the period. The interaction of this variable and weighted GDP growth indicates whether parent companies whose affiliates sell their output outside their host markets are more or less sensitive than others to changes in foreign economic growth rates. There are two notable features of the results presented in this table. First, and perhaps

unsurprisingly, the coefficient on the uninteracted GDP growth variable is positive and significant in all of the specifications other than that explaining foreign employment growth. This implies that capital investment and labor demand by firms whose affiliates do not export respond positively to foreign GDP growth, which is consistent either with cost or demand effects of foreign economic conditions. Second, and more tellingly, the estimated coefficients on the interaction term are positive in all four equations, albeit not statistically significant, suggesting that there is no indication that the foreign operations of firms whose affiliates sell predominantly to host country markets are the most sensitive to foreign economic conditions; if anything, the reverse may be true. As such, it appears that cost considerations are important mechanisms by which foreign economic growth influences foreign factor demand.

Table 5 presents estimated coefficients from instrumental variables regressions in which predicted values of changes in foreign activity (based on coefficients drawn from the regressions presented in Table 3) are used to explain changes in domestic capital and labor demand. All specifications include complete sets of period-industry fixed effects for two-digit parent industries in each period, and the standard errors allow for clustering at the parent level. The 0.2578 coefficient in column one of Table 5 indicates that 10 percent greater accumulation of foreign property plant and equipment, as predicted by host country GDP growth, is associated with 2.6 percent growth of domestic net property plant and equipment. This estimated effect is quite similar to that implied by the OLS regression reported in column 1 of Table 2. The 0.2387 coefficient in column two indicates that 10 percent greater foreign asset accumulation is associated with 2.4 percent growth of domestic assets, though this effect is of marginal statistical significance. There is no indication that firms accumulating capital assets in their foreign affiliates do so at the expense of domestic capital accumulation; instead, greater use of foreign capital appears to stimulate greater use of domestic capital.

The dependent variable in the regression reported in the third column of Table 5 is the growth rate of domestic employee compensation; the 0.3692 coefficient indicates that greater total foreign labor compensation is associated with greater demand for domestic labor. This estimated effect is somewhat larger than that implied by the 0.2454 OLS coefficient presented in column three of Table 2, though the two are statistically indistinguishable. Similarly, the 0.6550 coefficient in the fourth column of Table 5 implies that greater foreign employment is associated

with greater domestic employment.[15] Further regressions (not reported) indicate that growth-induced changes in foreign employment compensation per employee are unrelated to changes in domestic employment compensation per employee. This evidence is consistent with a model of complementarity in which foreign employment compensation affects domestic employment compensation through changes in employment levels and not through changes in compensation per employee.

4.3.   *Sources of Domestic Growth*

There are several channels through which foreign activities can influence the scope of domestic operations, including cases in which foreign production requires inputs of tangible or intellectual property produced in the home country. The regressions presented in Table 6 consider the effects of greater foreign sales on domestic research and development (R&D) and domestic exports to affiliates located abroad. Columns one and two report estimated coefficients from regressions in which the dependent variable is the change in domestic R&D.[16] The 0.3225 estimated coefficient in the OLS regression reported in column one indicates that 10 percent faster foreign sales growth is associated with 3.2 percent more rapid growth of domestic R&D spending. In order to avoid bias that might arise due to the joint determination of domestic R&D growth and foreign affiliate sales growth, the specification in column two instruments for foreign sales growth using foreign GDP growth rates.[17] The 0.4991 estimated coefficient in this specification implies a slightly larger effect, 10 percent faster foreign sales growth being associated with 5.0 percent greater domestic R&D spending. Since foreign operations stand to benefit from intangible assets developed by R&D spending, it is not surprising that greater foreign investment might stimulate additional spending on R&D in the United States.

Columns three and four report estimated coefficients from regressions in which the dependent variable is the growth in a parent company's exports to its affiliates. The estimated

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[15] Reliable inference from instrumental variables estimation requires strong first stage instruments. The Cragg-Donald (1993) statistics for the instruments used in columns 1-4 are, respectively, 37.27, 37.61, 28.58, and 9.58. Critical values computed in Stock and Yogo (2005) imply that conventional 5% level Wald tests based on IV statistics have actual sizes that exceed thresholds of 10% for the first three specifications and 15% for the fourth. Consequently, there is no evidence of critical weakness in the first stage instruments.

[16] Growth rates that serve as dependent variables in Table 6 are computed in the same way as other growth rates: they are ratios of changes between benchmark years to averages of beginning and end of period values.

0.6642 coefficient reported in column three indicates that 10 percent higher growth of foreign sales is associated with 6.6 percent greater exports from U.S. parent companies to their foreign affiliates. The corresponding instrumental variables coefficient of 0.6473, reported in column four, indicates that firms whose initial investments were concentrated in economies that subsequently grew rapidly tend to expand their exports from the United States to affiliates abroad. These results are consistent with those presented in Table 5, in which domestic investment and employment growth respond positively to changes in their foreign counterparts.

4.4.   Robustness Checks

As noted earlier, there exist scenarios that raise potential questions about the validity of the instrument. For example, firms with considerable foreign direct investment in a country might also export significant amounts of its final product from the U.S. to unaffiliated customers in the same country. If this were the case, local GDP growth would be an invalid instrument, since high foreign economic growth would directly stimulate domestic investment to meet U.S. export demand. The first two regressions presented in Table 7 address this possibility by including as an independent variable a measure of foreign GDP growth weighted by beginning of period firm exports to unrelated parties, constructed from BEA data that identify the destination of each firm's U.S. exports to unrelated parties.[18] It is also possible that real exchange rate movements that are associated with differences in GDP growth rates might influence relative prices in a way that directly affects factor demands by multinational firms. The first two regressions of Table 7 also address this concern by including measures of real exchange rate changes weighted by a firm's distribution of property, plant and equipment at the beginning of each period.

Since not all parents are exporters, the use of trade share data reduces sample sizes somewhat, but, as the regressions reported in columns one and two of Table 7 illustrate, the inclusion of trade-weighted GDP growth rates and exchange rates has very little impact on the estimated effects of foreign capital accumulation and employment compensation growth. Ten percent faster foreign capital accumulation is associated with 2.7 percent faster domestic capital

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[17] The first stage results of this IV specification and the one presented in column 4 indicate that Parent Weighted GDP Growth Rates are significant in predicting foreign sales growth rates.

accumulation in the regression reported in column one, and 10 percent faster foreign employment compensation growth is associated with 3.3 percent faster domestic employment compensation growth in the regression reported in column two. The estimated direct effects of trade-weighted foreign GDP growth and exchange rate movements are negligible in both regressions.

If firms with rapidly growing domestic activities choose to locate their foreign operations in relatively high growth economies, the results in Table 5 may not accurately reflect the influence of higher foreign growth rates on domestic factor demands. In order to evaluate this possibility, the regressions presented in the third and fourth columns of Table 7 use measures of unexpected host country growth as instruments. Specifically, these instruments are computed by taking residuals from a regression of GDP growth on its own lag, then weighting these residuals using firm specific weights that correspond to beginning of period levels of net property, plant and equipment. The regressions reported in columns three and four of Table 7 are run on the same sample as that used in the regressions reported in columns one and three of Table 5, and the estimated coefficients are quite similar (0.2503 and 0.2578 in the case of property, plant and equipment; 0.3888 and 0.3692 in the case of employment compensation), suggesting that it is the unpredictable component of GDP growth that is responsible for the results appearing in Table 5. An additional predictor of GDP growth is available for 1999, when the IMF published two-year growth predictions for a large number of countries. Computing instruments by first regressing GDP growth on its own lag and, when available, IMF growth projections and then weighting residuals by beginning of period net PPE in each country changes the estimates very little.

The merger and acquisition activities of multinational firms raise the possibility that the estimated impact of foreign investment on domestic investment might reflect what happens when one U.S. multinational firm buys another, thereby simultaneously acquiring the target's domestic and foreign assets. If this acquisition activity is most prevalent among firms with foreign affiliates located in high growth countries, then it could be responsible for the pattern that is apparent in the data. In such cases the estimated effect of foreign investment on domestic investment may offer a misleading picture of changes in factor demands, since acquisitions may

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[18] In each of the first stages of the specifications presented in Table 7, Parent Weighted GDP Growth Rates are significant in explaining growth in foreign activity.

entail purchasing bundles of foreign and domestic assets that are not what the acquirer would otherwise desire. The regressions presented in the first four columns of Table 8 address this potential problem by removing from the sample observations of parent companies that acquire other U.S. parent companies or divisions of other parents.[19]

Columns one and two of Table 8 present OLS specifications of regressions run on the restricted sample of firms. Estimated coefficients on foreign net PPE growth and foreign employment compensation growth are similar to those obtained from regressions using the whole sample and presented in columns one and three of Table 2. Estimated effects of foreign changes on domestic activity in the instrumental variable regressions presented in columns three and four of Table 8 are likewise similar to those presented in columns one and three of Table 5. Although the 0.1419 coefficient in column three is insignificant, it implies that 10 percent foreign investment is associated with 1.4 percent greater domestic investment. The 0.3023 coefficient in column four implies that 10 percent foreign wage growth is associated with 3.0 percent greater domestic employment compensation growth.

In a related vein, reported estimates do not capture the effect of a domestic firm's initial expansion in markets abroad. Since the IV estimation method requires the use of beginning of period values of foreign activity, it is not possible to construct an instrument for new foreign investment by firms without prior foreign exposure. Firms initiating activity abroad are responsible for only a small fraction of aggregate foreign investment, so their effect is unlikely to dominate the total responsiveness of domestic investment to foreign activities.[20] It is also possible to analyze a subset of observations representing the first period following a firm's foreign entry. The regressions presented in columns five through eight of Table 7 are run on this subsample of observations. Sample sizes are necessarily very small (between 569 and 611); nonetheless, the OLS results in columns five and six are similar to those reported in columns one

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[19] The BEA data identify purchases of one U.S. multinational firm by another and purchases of foreign affiliates previously owned by another firm in the BEA data.

[20] See Appendix Table 1 in Desai, Foley and Hines (2005b) for data on the magnitude of entry relative to the magnitude of growth of existing firms in the BEA data. The BEA data also allow one to consider the effects of introducing an affiliate on exports from the parent. It is possible to measure average changes in parent exports to unaffiliated foreign persons in a particular country during the period that a new affiliate appears in that country. During such periods, parent exports appear to increase. The average change in unaffiliated parent trade, measured as the change in unaffiliated parent trade scaled by the average of beginning and end of period unaffiliated trade, is 12.3%.

and two of the same table for the considerably larger sample of firms that do not merge. Point estimates of the effects of foreign investment and foreign employment compensation growth are larger in the IV specifications reported in columns seven and eight, and only the effects of foreign employment compensation growth are significant, owing to the small sample sizes.[21] Thus, there is no indication that foreign expansion is associated with domestic contraction soon after firms initiate foreign activity.[22]

Although the main specifications presented include fixed effects for each two-digit industry in each year, there is potential value in using more detailed industry classifications. Some countries may be dominated by small numbers of industries, in which firms experience common shocks that affect their foreign and domestic activities; in such cases, the foreign and domestic investments of the firms, and the GDPs of the countries in which they invest, would all be positively correlated. Alternatively, large movements in certain commodity prices could affect domestic and foreign activity in particular industries and be correlated with the growth of economies that are host countries of U.S. affiliates in these industries. In order to assess the possibility that these phenomena are important enough to drive the results, additional tests (not reported) include fixed effects specific to each three-digit parent industry for each time period in the data.[23] The estimated coefficients are again very similar to those reported in Table 5. To ensure that outliers or large firms do not drive the main results, the specifications presented in Table 5 have been run as quantile regressions, and they have been run using a sample that excludes the largest 5 percent of the firms in the sample, as measured by total start of period foreign property, plant and equipment. The results are likewise very similar to those reported in Table 5.

4.5.   *General Equilibrium Considerations*

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[21] The first stages of the specifications presented in columns 3, 4, and 8 of Table 8 indicate that Parent Weighted GDP Growth Rates are significant in explaining measures of foreign activity growth. The instrument is positive, but not significant in the first stage of the specification in column 7, perhaps as a consequence of the small sample size.
[22] Selection issues could also obscure the results if firms expand domestically when they cease to operate abroad. Because the data do not include detailed information about why firms leave the sample and do not track firms when they terminate their foreign activity, this concern cannot be easily addressed. As it happens, not many firms exit the sample, and those that do tend to be small, so they are unlikely to have major effects on the estimated coefficients.
[23] There are 101 two-digit industry/year fixed effects but 302 three-digit industry/year fixed effects.

These estimated effects of foreign operations on domestic sales and factor demands are identified by differences between firms in the growth rates of the foreign economies in which they invest, which in turn affect the rates at which firms expand their foreign investments. As a result, the estimates are cross-sectional in nature: they reflect comparisons of the subsequent domestic activities of firms that invested in certain foreign countries with firms that invested in others. The total domestic effects of policies affecting foreign investment include price changes that affect all firms and are not reflected in cross-sectional comparisons of some firms with others. These general equilibrium considerations include changes in output prices of industries with significant foreign exposure, any endogenous effects on interest rates, exchange rates, wages, prices of investment goods, and others. These endogenous price changes are likely to attenuate, but not reverse in sign, the estimated firm-level effects of foreign operations on domestic capital accumulation, employment, R&D spending, and exports. In the absence of a complete general equilibrium analysis it is difficult to estimate the aggregate magnitudes of these effects on the U.S. economy, but there is nonetheless a presumption that the signs of aggregate effects resemble those estimated on the basis of firm-level evidence.

5.   *Conclusion*

Manufacturing firms that expanded their foreign operations between 1982 and 2004 simultaneously expanded their domestic operations, and this relationship persists when actual foreign expansions are replaced by predicted values based on weighted growth rates of foreign economies. Foreign investment that is triggered by foreign economic growth is associated with growing domestic capital accumulation, employment compensation, R&D, and exports to related parties. These results run counter to the simple intuition that foreign direct investment represents a diversion of domestic economic activity by firms undertaking the foreign investment. This intuition is based on the notion that each firm has a fixed amount of global production, so any additional foreign production comes at the cost of reduced domestic production. Neither firms nor economies operate on such a zero-sum basis, so there is ample reason to think that greater foreign production associated with foreign economic growth might stimulate greater demand for productive factors in the United States. While there may be considerable individual variation, the average experience of all U.S. manufacturing firms over the last two decades is inconsistent with the simple story that all foreign expansions come at the cost of reduced domestic activity.

These results carry implications for U.S. policies that influence levels of foreign investment by U.S. companies. The United States taxes the foreign incomes of U.S. firms, permitting taxpayers to claim tax credits for foreign income tax payments and to defer U.S. taxation of certain unrepatriated profits of foreign subsidiaries. A system of taxing foreign income while providing foreign tax credits is commonly justified by appeal to the principle of capital export neutrality, itself predicated on the intuition that foreign investment reduces domestic investment on a one-for-one basis.[24] The evidence that domestic manufacturing activity does not appear to fall in response to increased foreign investment spurred by foreign economic growth suggests that these principles, and the policies they support, are ripe for reconsideration. If foreign and domestic investment are not substitutes, then it becomes more attractive to exempt active foreign business income from domestic taxation, particularly given the benefits of improving asset ownership allocation by having a tax system that satisfies capital ownership neutrality (Desai and Hines, 2003).

Public fears over the possible outsourcing of economic activity have added force to policy proposals that, if enacted, would limit the foreign activities of American firms. Recent proposals include those providing specific incentives for firms that increase domestic employment relative to foreign employment, and others applying U.S. labor and environmental regulations to activities in foreign countries. Whatever their merits, adoption of these reforms would very likely constrain foreign activity by American firms. The evidence provided in this paper suggests that these initiatives may also have the unintended effect of reducing domestic activity by the same firms.

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[24] The standard international tax theory is developed in Musgrave (1969) and Horst (1980), and reviewed by Gordon and Hines (2002).

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Figure 1: Domestic and Foreign Sales Growth of Multinational Firms, 1982-2004
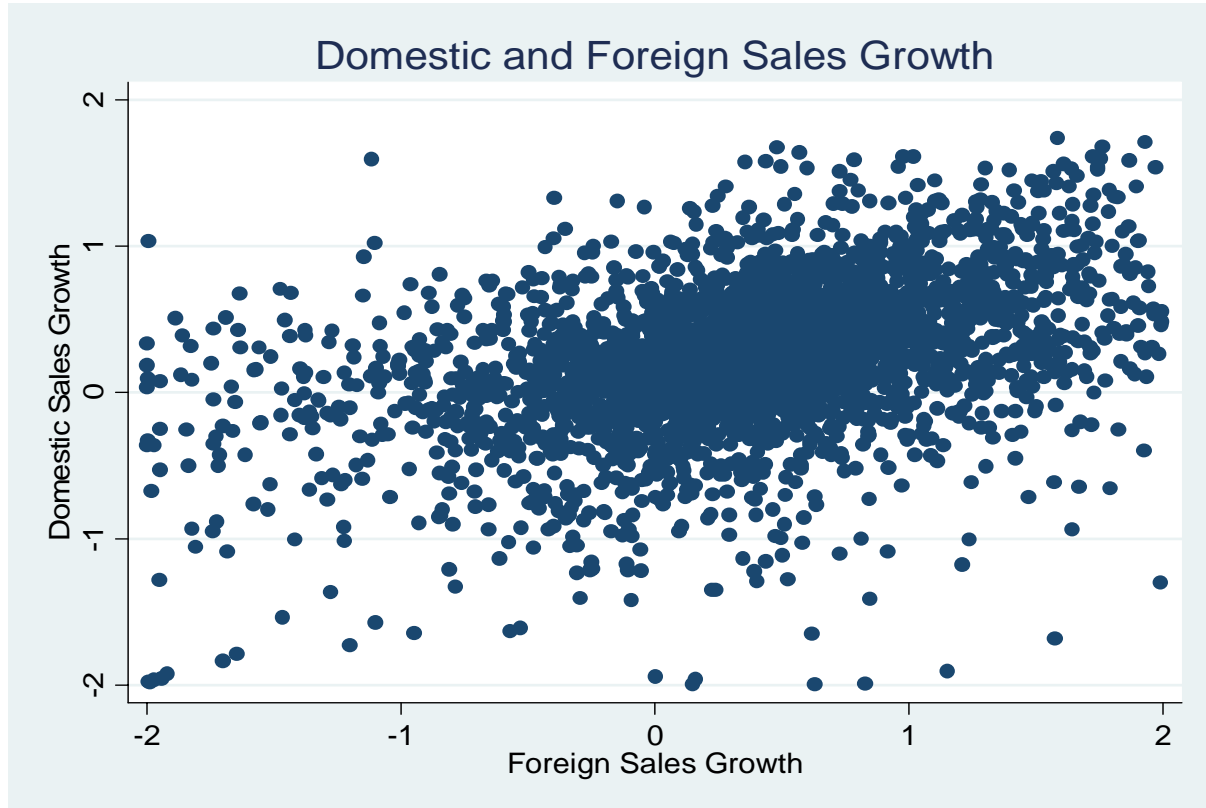
Note: The vertical and horizontal axes of the figure measure growth rates of domestic sales and foreign sales. Growth rates are defined as ratios of changes in sales to the average of beginning and ending period values. Each observation is a single multinational firm between two benchmark years, the benchmark years consisting of 1982, 1989, 1994, 1999, and 2004).

Table 1
Descriptive Statistics

	Mean	Median	Standard Deviation
Foreign Affiliate Net PPE Growth	0.3127	0.3313	0.8245
Foreign Affiliate Asset Growth	0.4071	0.4275	0.7073
Foreign Affiliate Employment Compensation Growth	0.3191	0.3467	0.7336
Foreign Affiliate Employment Growth	0.1141	0.1088	0.7366
Parent Weighted GDP Growth Rate	0.2368	0.2091	0.1036
Share of Sales Abroad	0.3237	0.2579	0.2998
Domestic Net PPE Growth	0.1295	0.0952	0.8995
Domestic Asset Growth	0.3121	0.3078	0.5330
Domestic Employment Compensation Growth	0.2164	0.2377	0.5066
Domestic Employment Growth	-0.0030	0.0005	0.4837
Parent R&D Growth	0.1922	0.2945	0.9320
Growth of Parent Exports to Affiliates	0.2664	0.4013	1.0464
GDP Growth Weighted by Parent Trade	0.2329	0.2093	0.0962
Change in Real Exchange Rate	-0.1229	-0.0807	0.2565

Notes: Growth rates of net property, plant and equipment (PPE), assets, employment compensation, and employment are computed as the ratio of the change in activity between benchmark years to the average of beginning and ending year levels of activity. Parent Weighted GDP growth rate is the weighted change, over benchmark periods, in the gross domestic product per capita of affiliate host countries, divided by the average of beginning and ending period values. Values of real gross domestic product per capita in current prices are taken from Heston, Summers, and Aten (2006). Country weights used for each parent equal beginning of period net PPE levels in each country. Share of sales abroad is measured as of the beginning of each period, and it is computed by aggregating sales by each affiliate to persons outside of the affiliate's host country and dividing by total affiliate sales. Growth rates of parent research and development, and parent exports to affiliates, are ratios of changes between benchmark years to average values of these measures at the beginning and end of the period. GDP Growth Weighted by Parent Trade is calculated using weights equal to beginning of period parent host country U.S. dollar exchange rate to the average of this rate at the beginning and end of the period, using weights equal to start of period PPE. Real exchange rates are calculated using nominal exchange rates reported in Heston, Summers, and Aten (2006) and measures of inflation from the IMF International Financial Statistics database.

Table 2

Changes in Foreign and Domestic Inputs: OLS Specifications

Dependent Variable:	Domestic Net PPE Growth	Domestic Asset Growth	Domestic Employment Compensation Growth	Domestic Employment Growth
	(1)	(2)	(3)	(4)
Constant	-0.3257	-0.1270	-0.3041	0.0565
	(0.5472)	(0.1254)	(0.4059)	(0.1099)
Foreign Net PPE Growth	0.2018			
	(0.0151)			
Foreign Asset Growth		0.3241		
		(0.0153)		
Foreign Employment Compensation Growth			0.2454	
			(0.0150)	
Foreign Employment Growth				0.2263
				(0.0145)
Period/Industry Fixed Effects?	Y	Y	Y	Y
No. of Obs.	2,968	3,316	2,978	2,968
R-Squared	0.6893	0.3001	0.1904	0.1882

Note: The dependent variables are domestic growth rates of net property, plant and equipment (PPE) (column 1), assets (column 2), employment compensation (column 3), employment (column 4). Domestic and foreign growth rates are ratios of changes in activity between benchmark years to averages of the beginning and end of period values. All regressions are OLS specifications that include period/industry fixed effects. Heteroskedasticity-consistent standard errors that correct for clustering at the parent level appear in parentheses.

Table 3

Foreign GDP Growth and Changes in Foreign Input Use

Dependent Variable:	Foreign Net PPE Growth	Foreign Asset Growth	Foreign Employment Compensation Growth	Foreign Employment Growth
	(1)	(2)	(3)	(4)
Constant	-0.4615	-0.2567	-0.5229	0.0224
	(0.1203)	(0.0986)	(0.0577)	(0.5342)
Parent Weighted GDP Growth Rate	1.4755	1.1723	1.1402	0.6746
	(0.2888)	(0.2368)	(0.2711)	(0.2536)
Period/Industry Fixed Effects?	Y	Y	Y	Y
No. of Obs.	2,844	3,137	2,842	2,834
R-Squared	0.0720	0.0897	0.0715	0.0478

Note: The dependent variables are foreign growth rates of net property, plant and equipment (PPE) (column 1), assets (column 2), employment compensation (column 3), and employment (column 4). Foreign growth rates are ratios of changes in activity between benchmark years to averages of the beginning and end of period values. Parent Weighted GDP growth rates are the weighted changes, between benchmark periods, in gross domestic product per capita of affiliate host countries, divided by averages of beginning and end of period values. Values of real gross domestic product per capita in current prices are taken from Heston, Summers, and Aten (2006). Country weights used for each parent equal beginning of period net PPE levels in each country. All regressions are OLS specifications that include period/industry fixed effects. Heteroskedasticity-consistent standard errors that correct for clustering at the parent level appear in parentheses.

Table 4

Foreign GDP Growth and Changes in Foreign Input Use: Further Evidence

Dependent Variable:	Foreign Net PPE Growth	Foreign Asset Growth	Foreign Employment Compensation Growth	Foreign Employment Growth
	(1)	(2)	(3)	(4)
Constant	-0.3462	0.1192	0.1257	0.0700
	(0.1492)	(0.1149)	(0.1419)	(0.5540)
Parent Weighted GDP Growth Rate	1.1986	0.9130	0.9274	0.5280
	(0.3583)	(0.2973)	(0.3407)	(0.3347)
Share of sales abroad	-0.2006	-0.1306	-0.2152	-0.2153
	(0.1394)	(0.1110)	(0.1266)	(0.1291)
Parent Weighted GDP Growth Rate * Share of Sales Abroad	0.6569	0.5606	0.8638	0.6961
	(0.5300)	(0.4230)	(0.4798)	(0.4859)
Period/Industry Fixed Effects?	Y	Y	Y	Y
No. of Obs.	2,774	3,049	2,777	2,769
R-Squared	0.0726	0.0917	0.0754	0.0509

Note: The dependent variables are foreign growth rates of net property, plant and equipment (PPE) (column 1), assets (column 2), employment compensation (column 3), and employment (column 4). Foreign growth rates are ratios of changes in activity between benchmark years to averages of the beginning and end of period values. Parent Weighted GDP growth rates are the weighted changes, between benchmark periods, in gross domestic product per capita of affiliate host countries, divided by averages of beginning and end of period values. Values of real gross domestic product per capita in current prices are taken from Heston, Summers, and Aten (2006). Country weights used for each parent equal beginning of period net PPE levels in each country. Share of sales abroad is measured as of the beginning of each period, and it is computed by aggregating sales by each affiliate to persons outside of the affiliate's host country and dividing by total affiliate sales. All regressions are OLS specifications that include period/industry fixed effects. Heteroskedasticity-consistent standard errors that correct for clustering at the parent level appear in parentheses.

Table 5

Effects of Foreign Factors on Domestic Factor Demand: IV Specifications

Dependent Variable:	Domestic Net PPE Growth	Domestic Asset Growth	Domestic Employment Compensation Growth	Domestic Employment Growth
	(1)	(2)	(3)	(4)
Constant	1.0018	0.5452	0.1754	-0.0131
	(0.0181)	(0.0292)	(0.0746)	(0.0052)
Foreign Net PPE Growth	0.2578			
	(0.1184)			
Foreign Asset Growth		0.2387		
		(0.1260)		
Foreign Employment Compensation Growth			0.3692	
			(0.1456)	
Foreign Employment Growth				0.6550
				(0.2771)
IV w/ Parent Weighted GDP Growth?	Y	Y	Y	Y
Period/Industry Fixed Effects?	Y	Y	Y	Y
No. of Obs.	2,844	3,137	2,842	2,834

Note: The dependent variables are domestic growth rates of net property, plant and equipment (PPE) (column 1), assets (column 2), employment compensation (column 3), and employment (column 4). Independent variables are corresponding foreign growth rates. Domestic and foreign growth rates are defined as ratios of changes in activity between benchmark years to averages of the beginning and end of period values. All regressions are IV specifications in which parent weighed GDP growth rates are used as instruments for foreign growth rates. These instruments are calculated by first computing GDP growth rates measured as the change in host country GDP per capita in between benchmark years scaled by average GDP per capita at the beginning and end of the period. Values of real gross domestic product per capita in current prices are taken from Heston, Summers, and Aten (2006). These GDP growth rates are then weighted using weights equal to the beginning of period net PPE in each country. All specifications include period/industry fixed effects. Heteroskedasticity-consistent standard errors that correct for clustering at the parent level appear in parentheses.

Table 6

Foreign Growth, Domestic R&D, and Domestic Exports

Dependent Variable:	Parent R&D Growth		Growth of Parent Exports to Affiliates	
	(1)	(2)	(3)	(4)
Constant	1.1877	1.0017	-0.1009	1.7494
	(0.0335)	(0.2439)	(0.2328)	(0.0911)
Foreign Sales Growth	0.3225	0.4991	0.6642	0.6473
	(0.0318)	(0.2316)	(0.0373)	(0.2525)
IV w/ Parent Weighted GDP Growth?	N	Y	N	Y
Period/Industry Fixed Effects?	Y	Y	Y	Y
No. of Obs.	2,616	2,616	2,140	2,140
R-Squared	0.1145		0.2184	

Note: The dependent variables are the growth rate of parent R&D expenditures (columns 1 and 2) and parent exports to affiliates (columns 3 and 4). Growth rates are computed by taking ratios of changes in measures in between benchmark years to average values of measures at the beginning and end of the period. The regressions in columns 1 and 3 are OLS specifications, and the regressions in columns 2 and 4 are IV specifications. Weighed measures of host country GDP growth are used as instruments for foreign affiliate sales growth in columns 2 and 4. Instruments are calculated by first computing GDP growth rates measured as changes in host country GDP per capita between benchmark years scaled by average GDP per capita at the beginning and end of the period. Values of real gross domestic product per capita in current prices are taken from Heston, Summers, and Aten (2002). These GDP growth rates are then weighted using weights equal to the beginning of period net PPE in each country. All specifications include period/industry fixed effects. Heteroskedasticity-consistent standard errors that correct for clustering at the parent level appear in parentheses.

Table 7

Introducing Controls for Trade Patterns and Exchange Rates, and an Alternative Instrument

Dependent Variable:	Domestic Net PPE Growth	Domestic Employment Compensation Growth	Domestic Net PPE Growth	Domestic Employment Compensation Growth
	(1)	(2)	(3)	(4)
Constant	0.3898 (0.1649)	0.3085 (0.0459)	1.0029 (0.0181)	0.1654 (0.0702)
Foreign Net PPE Growth	0.2656 (0.1368)		0.2503 (0.1184)	
Foreign Employment Compensation Growth		0.3343 (0.1577)		0.3888 (0.1372)
GDP Growth Weighted by Parent Trade	-0.1212 (0.1381)	-0.1474 (0.1391)		
Change in Real Exchange Rate	0.0289 (0.0512)	0.0340 (0.0469)		
IV w/ Parent Weighted GDP Growth?	Y	Y	N	N
IV w/ Parent Weighted GDP Growth Residuals?	N	N	Y	Y
Period/Industry Fixed Effects?	Y	Y	Y	Y
No. of Obs.	2,309	2,306	2,844	2,842

Note: The dependent variable in columns 1 and 3 is growth of domestic property, plant and equipment (PPE), and the dependent variable in columns 2 and 4 is growth of domestic employment compensation. Domestic and foreign growth rates are defined as ratios of changes in activity between benchmark years to averages of the beginning and end of period values. Changes in the real exchange rate equal ratios of changes in the beginning and end of period real host country U.S. dollar exchange rates to average values at the beginning and end of the period, weighted by beginning of period affiliate PPE. Real host country U.S. dollar exchange rates are computed using nominal exchange rates taken from Heston, Summers, and Aten (2006), and inflation is drawn from the IMF International Financial Statistics database. GDP Growth Weighted by Parent Trade is the weighted average of GDP growth rates, computed using weights equal to beginning of period parent exports to unrelated parties in a country. Values of per capita gross domestic product are taken from Heston, Summers, and Aten (2006). All regressions are IV specifications. Instrumental variables are calculated by first computing GDP growth rates measured as the change in host country GDP per capita between benchmark years scaled by average GDP per capita at the beginning and end of the period. Instruments in columns 1 and 2 weight host country GDP by beginning of period net PPE in each country. Instruments in the columns 3 and 4 equal residuals from regressions of GDP growth rates on its own lag, with these residuals then weighted by beginning of period PPE in each country. All specifications include period/industry fixed effects. Heteroskedasticity-consistent standard errors that correct for clustering at the parent level appear in parentheses.

Table 8

Controlling for Mergers and New Entrants

Dependent Variable:	(1) Domestic Net PPE Growth	(2) Domestic Employment Compensation Growth	(3) Domestic Net PPE Growth	(4) Domestic Employment Compensation Growth	(5) Domestic Net PPE Growth	(6) Domestic Employment Compensation Growth	(7) Domestic Net PPE Growth	(8) Domestic Employment Compensation Growth
Constant	0.2828 (0.0240)	0.0320 (0.0220)	0.2967 (0.0408)	0.0075 (0.0375)	-0.0715 (0.0551)	0.2964 (0.0471)	-0.1337 (0.0759)	-0.0435 (0.0940)
Foreign Net PPE Growth	0.1944 (0.0164)		0.1419 (0.1118)		0.1679 (0.0318)		0.5164 (0.4770)	
Foreign Employment Compensation Growth		0.2318 (0.0164)		0.3023 (0.1286)		0.1911 (0.0286)		0.6393 (0.2984)
IV w/ Parent Weighted GDP Growth?	N	N	Y	Y	N	N	Y	Y
Period Fixed Effects?	Y	Y	Y	Y	Y	Y	Y	Y
Drop Acquirers?	Y	Y	Y	Y	N	N	N	N
Focus on New Entrants?	N	N	N	N	Y	Y	Y	Y
No. of Obs.	2,469	2,480	2,368	2,367	605	611	570	569
R-Squared	0.6798	0.1307			0.3983	0.1043		

Note: The dependent variables are domestic growth rates of net property, plant and equipment (PPE) (columns 1, 3, 5 and 7) and growth of domestic employment compensation (columns 2, 4, 6, and 8). Domestic and foreign growth rates are ratios of changes in activity between benchmark years to averages of beginning and end of period values. The regressions in columns 1, 2, 5 and 6 are OLS specifications and the regressions in columns 3, 4, 7 and 8 are IV specifications. Parent weighed GDP growth rates are used as instruments for foreign growth rates. Instrumental variables are calculated by first computing GDP growth rates measured as the change in host country GDP per capita between benchmark years scaled by average GDP per capita at the beginning and end of the period. Values of real gross domestic product per capita in current prices are taken from Heston, Summers, and Aten (2006). These GDP growth rates are then weighted using weights equal to the beginning of period net PPE in each country. The sample is restricted to non-acquirers in columns 1-4 and to new entrants in columns 5-8. All specifications include period fixed effects. Heteroskedasticity-consistent standard errors that correct for clustering at the parent level appear in parentheses.

Articles

A Multilateral Solution for the Income Tax Treatment of Interest Expenses

The question of the proper treatment of interest expenses has generally been looked at from the perspective of either inbound or outbound investment and with the view that nations are either debtors or creditors, not both. As a result, the issues of residence countries' limitations on interest deductions on borrowing to finance tax-favoured foreign-source income, on the one hand, and of source countries' restrictions on interest deductions intended to limit companies' ability to strip income from a higher-tax to a lower-tax country, on the other, have generally been treated as separate issues, with no real effort to show how they relate. This article demonstrates their linkage and proposes a multilateral solution that would address both of these problems.

1. Introduction

Although there has been some discussion in recent years of the treatment of borrowing and its attendant interest expenses, the tax treatment of this expense has generally received less analysis than that of business income. Some recent developments, however – including greater taxpayer sophistication in structuring and locating international financing arrangements, increased government concerns with the role of debt in sophisticated tax avoidance techniques, and disruption by decisions of the European Court of Justice (ECJ) of a host of Member States' regimes for limiting interest deductions – have stimulated new laws and policy controversies concerning the international tax treatment of interest expenses. Recent developments make clear the complexity, the incoherence and the futility of countries acting independently to limit interest deductions.[1] They also raise fundamental questions about the proper treatment of interest expenses and whether other expenses, such as for headquarters costs or research and development (R&D), should raise similar concerns.

National rules are in flux regarding the financing of both inbound and outbound transactions. When outbound investments are financed by debt, the question arises whether the fact that the foreign-source income will be deferred or taxed at lower rates justifies the home country limiting the deductibility of interest expenses. In the United States and the United Kingdom, for example, attention has recently focused on whether to allocate and disallow interest deductions connected to foreign-source income under a dividend exemption system.[2] Also in the U.S., House Ways and Means Committee Chairman Charles Rangel (Democrat, New York) has introduced

legislation under the U.S. foreign tax credit system that would allocate and postpone interest deductions on outbound investments until dividends are repatriated.[3]

The EU Member States have recently been revising their treatment of interest deductions with special concern for the taxation of inbound investments. As in the outbound context, the critical questions stem from government concerns about the potential for a disappearing corporate tax base. In Europe, the greatest attention has focused on the treatment of "fat" or "thin" capitalization rules (known in the U.S. as "earnings stripping rules"). Reconsideration of Member States' limitations on interest deductions in this context was required by the ECJ in its 2002 decision in the *Lankhorst-Hohorst* case (and subsequent decisions), which struck down Germany's thin capitalization rules as applied to interest paid to companies from other Member States as a violation of the freedom of establishment guarantee of the EC Treaty.[4] These ECJ decisions require equal treatment of

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1.   For a useful summary of recent developments, see the excellent General Report authored by Pascal Hinny and the 34 Branch Reports on Subject 2: New tendencies in tax treatment of cross-border interest of corporations, in *Cahiers de droit fiscal international*, Vol. 93b (2008) (62nd Congress of the International Fiscal Association, Brussels, 2008). See also Arnold, Brian, General Report on Subject I: Deductibility of interest and other financing charges in computing income, in *Cahiers de droit fiscal international*, Vol. 79a (1994), at 491 (48th Congress of the International Fiscal Association, Toronto, 1994); and Shaviro, Daniel N., "Does More Sophisticated Mean Better? A Critique of Alternative Approaches to Sourcing the Interest Expense of American Multinationals", 54 *Tax Law Review* 353 (2001).

2.   The proposals by the U.S. Joint Committee on Taxation and the President's Advisory Panel on Federal Tax Reform for a dividend exemption system would require the allocation and disallowance of interest expenses incurred to earn foreign-source income. See U.S. Joint Committee on Taxation, *Options to Improve Tax Compliance and Reform Tax Expenditures*, JCS-02-05 (27 January 2005); and President's Advisory Panel on Federal Tax Reform, *Simple, Fair, and Pro-Growth: Proposal to Fix America's Tax System* (Washington, D.C.: U.S. Government Printing Office, 2005). In contrast, the U.S. Department of the Treasury recently issued a report on the competitiveness of U.S. businesses that suggests a dividend exemption system with no allocation of interest. U.S. Department of the Treasury, *Approaches to Improve the Competitiveness of the U.S. Business Tax System for the 21st Century* (20 December 2007). See also HM Treasury and HM Revenue & Customs, *Taxation of the Foreign Profits of Companies: A Discussion Document* (June 2007).

3.   Tax Reduction and Reform Act of 2007, H.R. 3970, 110th Congress, §§ 975-977 (2007). This is one of several proposals designed to help finance a lower corporate income tax rate in the United States. In addition, Congress passed legislation in 2004, effective in 2009, that would shift from water's edge interest allocation to worldwide allocation for purposes of determining the foreign tax credit limitation, but that change has now been postponed until 2011. Housing and Economic Recovery Act of 2008, Public Law 110-289, 122 Stat. 3039. See discussion at notes 19-21, infra.

4.   *Lankhorst-Hohorst GmbH v. Finanzamt Steinfurt*, Case C-324/00, 2002 ECR I-11,779. In *Lankhorst-Hohorst*, the ECJ considered a law under which German subsidiaries of non-German parent companies were denied deductions for interest paid to the foreign parent company when the subsidiary had a high debt-to-equity ratio, although such deductions were allowed for

borrowing by domestic and non-domestic companies that are from the EU Member States. In response, Germany now limits interest deductibility to a specified percentage (30%) of "earnings before interest, tax, depreciation and amortization" (EBITDA) without regard to whether the borrowing is from a foreign lender or a related company. Similar rules are being enacted or considered by certain other EU Member States.

In November 2007, the U.S. Treasury issued a report on earnings stripping in response to a congressional mandate requiring such a study as part of legislation dealing with corporate inversions from U.S.-headquartered to foreign-headquartered companies.[5] In Canada, questions about limitations on interest deductions have arisen in the context of a broad review of international tax policy.[6] And in Belgium, for example, a notional interest deduction based on a company's net assets was enacted in 2006 in an effort to reduce the advantages for debt over equity financing.[7] In addition to the foregoing specific rules, interest deductions may also be disallowed under general anti-abuse rules or transfer pricing regimes.

Some countries levy withholding taxes on cross-border payments of interest, although most do not. Where applicable, the withholding tax rates vary from about 12.5% (Italy) to nearly 42% (Mexico), but are often reduced or eliminated by bilateral tax treaties. (The OECD Model Tax Convention sets a maximum rate of 10%.) These treaty reductions are, in turn, restricted to residents of the treaty country by limitation on benefits clauses in the treaties. Obviously, a sufficiently high withholding tax on payments of interest can substitute for disallowing interest deductions.

As this very brief overview implies, the treatment of cross-border interest payments is now one of the most complex aspects of income tax law. Rules differ among countries and contexts. As a result of the decisions of the ECJ, some uncertainty remains in Europe about what rules are permissible. The subject is further complicated by different countries' varying approaches to distinguishing interest payments from dividends. Moreover, because money is fungible, it is difficult in both theory and practice to know the "purpose" of specific borrowing. Nevertheless, many countries attempt to "trace" borrowed funds to their use, creating opportunities for creative tax planning and inducing inevitable disputes between taxpayers and tax collectors.

These disparities in law and practice create opportunities for either double or zero taxation. Since taxpayers generally have great control over the location of their borrowing, there is considerably greater risk of the latter.

Heretofore, in both the literature and policymaking, the question of the proper treatment of interest expenses has generally been looked at from the perspective of either inbound or outbound investment and with the view that nations are either debtors or creditors, not both. As a result, the issues of residence countries' limitations on interest deductions on borrowing to finance

low-taxed, exempt or deferred foreign-source income, on the one hand, and of source countries' restrictions on interest deductions intended to limit companies' ability to strip income from a higher-tax to a lower-tax country, on the other, have generally been treated as separate issues. Each of these issues has been discussed in the literature, but there has been no real effort to show how they relate. A fundamental contribution of this article is to demonstrate their linkage and to call for a multilateral solution that would address both of these problems.

I shall use the following simple and stylized example to illustrate the fundamental issues and to show how they are connected. At the outset, the example assumes that the purpose of the taxpayer's borrowing is known; I shall deal subsequently with this oversimplification.

2. A Simple Example to Illustrate the Issues

Assume three countries: H – with a corporate income tax rate of 35%, M – with a 25% rate, and L – with a 15% rate. H is a high corporate tax rate country, such as the U.S. or Japan; M, like most of western Europe, has a corporate tax rate a bit below the OECD average; and L, like China and Ireland for example, has a low corporate tax rate. For simplicity of exposition, H is assumed to want to tax only the domestic-source income of both its residents and non-residents, and it therefore exempts foreign-source dividends.[8] The policy choice for H is (1) allowing interest deductions in full whenever borrowing occurs in H without regard to where the investment it finances occurs, or (2) disallowing interest deductions when borrowing is determined to be used for investing abroad. Thus, to the policymakers of H, the question is whether to disallow interest deductions when interest is incurred to finance exempt (or low-taxed) income. For reasons that will be made clear subsequently, an interest disallowance regime should disallow interest deductions only when the company's borrowing is disproportionately greater in H than elsewhere based on an allocation of interest expenses that compares the ratio of the company's H borrowing to H assets with the ratio of its worldwide borrowing to worldwide assets.

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payments by German subsidiaries to German parent companies. See also *Bosal Holding*, Case C-168/01 (13 October 2003); and *Test Claimants in the Thin Cap Group Litigation*, Case C-524/04 (13 March 2007).

5.   U.S. Department of the Treasury, *Report to the Congress on Earnings Stripping, Transfer Pricing and U.S. Income Tax Treaties* (November 2007).

6.   The 19 March 2007 Canadian federal budget included a proposal to eliminate the deductibility of interest on debt incurred by Canadian corporations to finance foreign affiliates. In the face of significant criticism, on 14 May 2007 Minister of Finance Jim Flaherty announced significant changes to the interest deductibility proposals. The 14 May 2007 news release is available on the Department of Finance web site at www.fin.gc.ca/news07/07-041e.html. The 2007 Canadian federal budget is available at www.budget.gc.ca/2007/index_e.html.

7.   See Martin, Stéphane and Patrick Smet, Branch Report for Belgium on Subject 2: New tendencies in tax treatment of cross-border interest of corporations, in *Cahiers de droit fiscal international*, Vol. 93b, supra note 1, at 127, 139.

8.   I use an exemption system for illustrative purposes here both for clarity in the exposition of the issues and because it is the dominant method of relieving double taxation of income on outbound investment within the OECD. Only the Czech Republic, Ireland, Japan, Korea, Mexico, New Zealand, Poland, the United Kingdom and the United States use foreign tax credits. U.S. Department of the Treasury, supra note 2, at 19, Table 1.5.

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Take a simple case where an *H* resident company borrows 100 in *H* to finance an investment of 100 in *L*. Assume that the interest expense is 10 and the income from the *L* investment is 15. If the interest expense were deducted against the *L* income, the net income from the *L* investment would be 5, which at the 15% *L* rate would yield an *L* income tax of 0.75 and after-tax income of 4.25 to the *H* company. There would be no domestic income or deduction in *H* and no *H* tax.

If borrowing could be traced to its use, this seems a plausible answer. But, because money is fungible, such tracing is not feasible in practice (despite the commonplace efforts to do so). So it seems reasonable to conclude that the company borrowed in order to keep all of its worldwide assets (rather than selling one or more assets to make the investment in *L*) and to avoid issuing new equity. This explains why *H* should treat borrowing as occurring proportionately to the *H* company's worldwide assets.[9]

If, however, *H* has no interest disallowance rule and allows the 10 of interest to be deducted in full against other income that would otherwise be taxed by *H* at its 35% rate, this would save the company 3.50 in *H* income taxes. The 15 of income in *L* would result in an *L* income tax of 2.25. The *H* company would have earned 6.25 after tax on an investment yielding just 5 before tax – implying not just zero taxation of the *L* income, but in fact a negative rate of taxation, a subsidy for this investment. From the point of view of *H*, this investment would have cost it 3.50 in foregone revenue, 1.25 of which would go to the *H* company and 2.25 of which would go to the treasury of *L*.[10] Perhaps some argument (presumably on competitiveness grounds) can be made for *H* subsidizing this investment by the *H* company, but what argument is there in a case such as this for transferring revenues from *H's* treasury to the treasury of *L* simply because the company chose to locate its borrowing for this investment in *H*? If *H* is revenue constrained, the 3.50 of revenue lost on this investment must be made up from somewhere else, and important economic and distributional consequences will turn on who and what is taxed.

Moreover, at its 15% tax rate, the government of *L* should get only 0.75 in income taxes on an investment yielding a pre-tax profit of 5, rather than the 2.25 it did receive – an amount equivalent to levying a 45% tax on the company's before-tax profits. Under current arrangements, however, *L* will allow no deduction for interest expenses when the borrowing takes place in *H*, so the government of *L* might get 2.25 in taxes whether *H* allows the interest deduction or not. But the consequences will be very different depending on whether that money comes from the *H* company or from other *H* taxpayers. If *H* disallows the entire interest deduction in this case and *L* does not allow any deduction because the borrowing occurred in *H*, *H* will collect its 35% tax on the company's domestic income and, as indicated above, *L's* income tax of 2.25 would produce a tax rate of 45% on this investment – a rate higher than that in either of these countries. In other words, there would be a significant element of double taxation.

The *H* company, of course, could avoid this double tax by, for example, locating the borrowing in *L* rather than *H*. And if each country is to tax the net domestic income earned there, the interest deduction should be allowed by *L*, not *H*.

Internation equity also supports this result. In this example, the source country is given not only the first bite at taxing the active business income earned there, but the sole claim on taxing such income. Given the priority of source countries on the asset side, why should the residence country also be required to lose revenue on the liability side? The source country, by not allowing deduction of the interest, is the cause of the double tax. Why should it be the residence country's responsibility to undo that result – especially when the residence country is not even making a residual claim to tax the foreign income?

For an important variation on this basic example, assume now that *M*, with its income tax rate of 25%, has no interest disallowance rule. If the *H* company also has income and assets located in *M*, it might choose to borrow in *M* instead of *H* or *L* and deduct the 10 of interest against income that *M* would otherwise tax. In that case, the *H* company would save 2.50 of tax in *M* and pay income tax to *L* of 2.25 for an after-tax return of 5.25 on an investment yielding 5 before tax – again earning a return that is higher after tax than before tax. In this case, however, the 0.25 subsidy to the *H* company and the 2.25 transfer to the treasury of *L* would come from the taxpayers of *M* rather than *H*.

The policymakers of the *M* government would view this transaction as a problem of earnings stripping (or thin capitalization) by the *H* company. Thus, economically similar transactions will fit into different traditional analytic boxes depending on which country is examining the transaction and where the borrowing takes place.

Here again, if the borrowing company were resident in *M*, it is perhaps conceivable that some argument or empirical claim could be advanced for this treatment (as before, no doubt grounded in the competitive advantages to *M's* residents of a resident company making this investment[11]), but it seems impossible to fashion an

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9. I ignore here the theoretical difficulty and practical necessity of using the book value rather than the fair market value of assets. Relying on basis, rather than value, does have the advantage of resolving the difficult issue of intangible assets since the costs of self-created intangibles are typically deducted rather than capitalized.
10. In theory, the revenue lost to *H* through the interest deduction might be made up if *H* were to tax the lender on the interest income. While the precise dimensions of this possibility are difficult to get a handle on, as a practical matter, given the large holdings of U.S. corporate debt in tax-exempt retirement accounts, university endowments and other tax-exempt entities and by foreigners, this is quite unlikely – at least in the U.S.
11. See Samuels, John, Vice President & Senior Counsel of Tax Policy and Planning, General Electric, "True North: Charting a Course for U.S. International Tax Policy in the Global Economy", the David R. Tillinghast Lecture on International Taxation, 25 September 2007 (forthcoming in *Tax Law Review*); see also the discussion at notes 35-37, infra.

argument that this transfer from the treasury of *M* to both the *H* company and *L's* treasury makes any sense at all as a deliberate policy choice of *M*. Of course, if *M* is an EU Member State, the decisions of the ECJ in *Lankhorst-Hohorst* and subsequent cases might not allow it to treat an *H* company any differently than an *M* company.[12] And it is also possible that the non-discrimination clause of *M's* bilateral tax treaties might foreclose it from making such a distinction.[13]

To complete the analysis, it is worth noting that an *M* company contemplating a debt-financed investment in *L* would have an incentive to do its borrowing in *H* (if it had assets and income there) so that its interest deduction would offset income that would otherwise be taxed at *H's* higher 35% rate. Thus, *H* will also have earnings stripping (or thin capitalization) problems to deal with.

3. How Interest Expenses Should Be Allocated

3.1. A word about source

It is fundamental that, except in the context of a system of current taxation of worldwide income with an unlimited foreign tax credit – a system that no country now has, ever has had, or is likely ever to have – it is essential for each nation to distinguish between domestic-source income and foreign-source income. The consequences of this distinction vary depending on a country's tax rate and its system for avoiding double taxation. In the U.S. foreign tax credit system, for example, the distinction between foreign-source and domestic-source income is important principally for determining the limitation on foreign tax credits; in an exemption system, it is important for measuring taxable versus exempt income.

But, as is well known, the "source" of income is not well grounded economically, nor is it conceptually straightforward.[14] In many instances (not discussed here), archaic rules and distinctions prevail.[15] Moreover, the current rules often stem from political decisions and compromises made scores of years ago when capital was far less mobile. The sourcing of interest, for example, was a contentious decision made in the 1920s during the initial formulation of international agreements for relieving double taxation.[16] Since both net foreign-source and domestic-source income must be measured, however, it is necessary to source both income and deductions, even if the current sourcing rules seem arbitrary and archaic.

3.2. The effect of different rules in different countries

As the foregoing example illustrates and the empirical economics literature amply demonstrates, different tax rates in different countries create incentives for companies both in choosing where to locate real investments and in shifting income and deductions around the world.[17] And, as the example above illustrates, when countries differ in their rules for determining the source of a particular kind of income, both double taxation and zero (or even negative) taxation can occur. U.S. multinationals frequently complain, for example, about the double taxation that occurs because the U.S. allocates and

disallows interest (for foreign tax credit limitation purposes) while other countries do not allow deduction of the interest disallowed by the U.S. They stifle such complaints, however, when in other contexts the lack of harmonization allows them to avoid taxation in any country.[18] In the absence of multilateral agreement, these difficulties, opportunities and issues will persist.

As a result, it is treacherous to evaluate companies' claims of competitive disadvantage based on pairwise distinctions of specific rules. To know whether a company headquartered in one country is advantaged or disadvantaged compared to another company headquartered elsewhere, one would have to compare the totality of consequences of similar investments. In the literature, this typically occurs only through efforts to measure the overall effective tax rates. These exercises typically simply assume a certain proportion of debt and equity finance, and therefore do not address the issues I am addressing here, in particular, the location of borrowing. In any event, piecemeal policy-by-policy comparisons should be taken with a grain of salt; a disadvantage in one aspect of tax policy may be compensated for by an advantage elsewhere. Taxpayers obviously have incentives to highlight their disadvantages rather than their advantages.

3.3. The particular difficulty of tracing interest deductions to the income the borrowing finances

Given the fungibility of money, knowing the purpose of borrowing is an impossible quest. Nevertheless, even for purely domestic investments, the U.S. tax law, for example, distinguishes among categories of personal interest, investment interest and a wide variety of business interest costs. The U.S. has essentially been undaunted by the folly of attempting to trace borrowed money to its use. So have many other countries. This is one reason why the tax provisions governing interest deductions, which frequently condition the deductibility of interest on the

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12. *Lankhorst-Hohorst*, supra note 4, and the cases cited there.
13. Such claims were made – but ignored by the United States – in connection with the enactment of the U.S. earnings stripping rules. Graetz, Michael J. and Alvin C. Warren, Jr., "Income Tax Discrimination and the Political and Economic Integration of Europe", 115 *Yale Law Journal* 1186 (2006); Warren, Jr., Alvin C., "Income Tax Discrimination Against International Commerce", 54 *Tax Law Review* 131 (2001).
14. Ault, Hugh J. and David Bradford, "Taxing International Income: An Analysis of the U.S. System and Its Economic Premises", in Razin, Assaf and Joel Slemrod (eds.), *Taxation in the Global Economy* (1990), at 11.
15. See e.g. Colón, Jeffery M., "Financial Products and Source Basis Taxation: U.S. International Tax Policy at the Crossroads", 1999 *University of Illinois Law Review* 775.
16. See Graetz, Michael J. and Michael O'Hear, "The 'Original Intent' of International Taxation", 46 *Duke Law Journal* 1021 (1997).
17. Gordon, Roger H. and James R. Hines, *International Taxation*, National Bureau of Economics Research Working Paper No. 8854-4 (2002); European Commission, Commission Staff Working Paper, *Company Taxation in the International Market*, COM(2001) 582 (2001).
18. Kane, Mitchell, "Strategy and Cooperation in National Responses to International Tax Arbitrage", 53 *Emory Law Journal* 89 (2004); Ring, Diane, "One Nation Among Many: Policy Implications of Cross-Border Tax Arbitrage, 44 *Boston College Law Review* 79 (2002); Rosenbloom, H. David, "International Tax Arbitrage and the 'International Tax System'", 53 *Tax Law Review* 137 (2000).

purpose of the indebtedness, are now among the most complex in the income tax. These complexities, and the controversies about them, often occur, as in the instant context, because of the tax-favoured treatment of assets financed with borrowed funds.

In the context of cross-border investments, beginning with the regulations issued in 1977, the U.S. generally accepted the fact that money is fungible and apportioned the interest expense of U.S. corporate entities for foreign tax credit purposes according either to the (book) value of assets or to gross income.[19] The assets approach was most widely used; thus, interest deductions (for foreign tax credit limitation purposes only) were generally computed using the following (simplified) formula: allowable U.S. interest expense equals worldwide interest expense times the ratio of U.S. assets to worldwide assets. The Tax Reform Act of 1986 refined this concept by looking at interest expenses on a consolidated basis for affiliated corporations rather than on an entity-by-entity basis. The 1986 law, however, unfortunately and erroneously ignored foreign subsidiaries in this calculation,[20] which is why it became known as "water's edge allocation". But that defect was remedied by legislation in 2004, which will treat all members of a worldwide group as a single corporation.[21] (The 2004 corrective legislation, however, was not scheduled to take effect until 2009 and, in 2008, the legislation was delayed until 2011.[22])

A worldwide allocation system, based on the ratio of debt to assets, is the most appropriate method for measuring domestic-source and foreign-source income if interest expense is to be allocated.[23] *Importantly, worldwide allocation based on assets implies that interest deductions will not be treated as allocable to foreign-source income and disallowed except when borrowing in one country is disproportionate to borrowing elsewhere.*

4. What is at Stake in the Treatment of Interest Expenses?

4.1. Location of investment

Some argue that the failure to allocate interest deductions on a worldwide basis will create an inappropriate incentive for companies to invest abroad rather than at home. The example above demonstrates why this might be true. It is important to recognize, however, that the fundamental income tax incentive for a company to invest in a low-tax country, such as L, rather than in higher-tax countries, such as H (or M), is due to the lower tax rate in L. Extensive econometric evidence shows that, although business, not tax, considerations often dominate, the location of investments is significantly influenced by tax rate differences, and an important study by the European Commission has concluded that differences in tax rates are the principal income tax factor affecting decisions about the location of investments.[24] The essential point is this: the incentive to invest in L rather than in H exists even if the investments are financed solely by equity and no interest deductions are at issue. An investment in H yielding 5 before tax will

produce only 3.25 after tax, compared to the 4.25 available after tax for an investment in L. Only by eliminating the tax rate differential – through harmonization of tax rates or a capital-export neutrality policy of current taxation by H of the income earned in L with a foreign tax credit for M's taxes, a policy no country has adopted – will that incentive be eliminated.

Careful analyses of situations where assets eligible for favourable tax treatment are acquired with debt, such as where borrowing occurs to finance domestic tax-exempt income or other tax-favoured domestic investments, for example in plant and equipment, have also concluded that it is the tax preference, not the borrowing, that is the fundamental stimulant to the investment.[25] In such instances, it may even be the case that disallowing interest deductions will inhibit the effectiveness of the underlying tax preference.[26] But these analyses focus on cases where both the income taxation on the asset side and the tax treatment of the interest expense are controlled by the same domestic policymaking process. Importantly, with the issue here, the tax preference on the asset side – the low tax rate in L – is outside the control of the H or M government. And, as the example demonstrates, allowing full deduction of the interest on the borrowing in H (or M) will tend to exacerbate the preference for investments in low-tax countries by producing an overall *negative* rate of income tax on the foreign investment.

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19. For a history of interest allocation, see Hufbauer, Gary Clyde and Airel Assa, *U.S. Taxation of Foreign Income* (2007), at 236-240. For an analysis suggesting that worldwide allocation of interest is "more consistent [than water's edge allocation] with the basic objective of the foreign tax credit limit" and details about the formulas that have been used in the United States, see Gravelle, Jane G. and Donald J. Marples, "The Foreign Tax Credit's Allocation Rules", Congressional Research Service (16 May 2008).

20. To my knowledge, no respectable policy argument has been made in support of the U.S. system of water's edge allocation. It is an unprincipled revenue grab enacted in 1986 that has remained in the law far too long, but the U.S. Congress, seeking revenues to finance other tax reductions, seems determined to keep it in place at least for a while longer.

21. American Jobs Creation Act of 2004, Public Law 108-357, 118 Stat. 1418, § 401.

22. See note 3, supra.

23. The comparison, for example, is U.S. debt to U.S. assets versus worldwide debt to worldwide assets, with allocation to a foreign source required only when the former ratio is greater than the latter (or, alternatively, the ratio of U.S. borrowing to worldwide borrowing must be the same or less than the ratio of U.S. assets to worldwide assets). There may, however, be an argument for looking at interest on a net basis, i.e. looking only at the excess of interest expense over interest income, but I will put that issue aside here. It is probably most important for financial institutions.

24. European Commission, supra note 17. See Hines, Jr., James R., *Tax Policy and the Activities of Multinational Corporations*, National Bureau of Economics Research Working Paper No. W5589 (1996).

25. See e.g. Warren, Jr., Alvin C. and Alan J. Auerbach, "Transferability of Tax Incentives and the Fiction of Safe Harbor Leasing", 95 *Harvard Law Review* 1752 (1982); see also Pearlman, Ronald A., "A Tax Reform Caveat: In the Real World, There is no Perfect Tax System", in Auerbach, Alan J. and Kevin A. Hassett (eds.), *Toward Fundamental Tax Reform* (2005).

26. There is controversy, for example, in the U.S. policy literature over the merits of § 265(a)(2) of the Internal Revenue Code, which disallows interest deductions on indebtedness used to purchase or carry state and local bonds the interest on which is exempt from income tax. 26 U.S.C. § 265(a)(2); see Chirelstein, Marvin A., *Federal Income Taxation: A Law Student's Guide to the Leading Cases and Concepts* (10th ed., 2005), § 6.06(a).

4.2. Creating incentives for bad investments

As the example above illustrates, allowing a deduction in a higher-tax country for borrowing to invest in lower-tax countries can produce after-tax returns greater than the investment's pre-tax returns. This means that investments that would not be undertaken by anyone in a world without any corporate income taxes may become attractive in a world with varying tax rates and no interest allocation. Such investments will clearly decrease worldwide welfare and will, almost certainly, decrease welfare in the countries where the interest deductions are allowed.[27] Empirical evidence about the benefits that might justify such a policy does not exist, nor does it seem likely that any evidence will be forthcoming that would justify such negative taxes as standard policy. A far better policy, as discussed below, would be for all countries to allow interest deductions on borrowing in proportion to the assets in that country regardless of where the borrowing takes place.

4.3. Choice of debt over equity finance

Allowing an interest deduction without allocation increases the advantage of debt over equity as a source of corporate finance. However, as with the decision about where to invest, the crux of this problem lies not with the failure to allocate interest, but more fundamentally with the general corporate income tax disparity between the treatment of debt and equity. Much has been written on behalf of a variety of corporate tax integration proposals to eliminate or reduce this disparity.[28] But no country has achieved parity between debt and equity finance by disallowing deductions for interest, nor does that seem likely to occur. Interest deductions will continue to be generally allowed, but whenever debt finance is permitted to produce interest deductions that will offset income otherwise taxed at a higher rate than that on the income resulting from the borrowing, this will exacerbate the advantage of debt finance. Such a regime also affects companies' decisions about the location of debt and equity finance so as to maximize the tax savings from the disparities in their treatment.

4.4. Location of borrowing

Allowing an interest deduction in *H*, even if the borrowing is disproportionately located in *H*, will encourage companies to locate their borrowing in *H* whenever the tax rate in *H* is higher than elsewhere. For example, both companies headquartered in the U.S. and companies headquartered elsewhere will prefer to deduct their interest expense against U.S. income (if they have any) that would be taxed at 35%, rather than to use the interest deduction in a country where it would offset income that would be taxed at a lower rate.[29] Indeed, given the mobile nature of corporations' ability to borrow, borrowing may disproportionately be located in *H* almost as easily for a foreign multinational as for a domestic-headquartered company.[30] *There seems to be no good policy reason for the U.S. to want to encourage borrowing that finances foreign investments to be located in the U.S.*

Interest is not the only expense that companies incur which produces foreign-source income taxed at a low rate. For example, expenditures for R&D may, over time, yield royalty income both domestically and abroad. Under the U.S. foreign tax credit system, the foreign-source royalties may bear little or no corporate income tax anywhere.[31] Likewise, headquarters expenses, often described as general and administrative or stewardship costs, tend to be concentrated in the country where a company locates its headquarters, even though these expenses support the company's production of income throughout the world. In both of these cases, some commentators have argued for a full deduction of these costs in the country where they occur without regard to where the income is earned or whether it is taxed anywhere.[32] These arguments, however, are grounded in the special benefits of these expenditures to the country where they occur – due, for example, to positive externalities from R&D and the high-quality jobs at stake in both R&D and headquarters activities. No similar arguments are available for the location of borrowing transactions.

4.5. Internation equity between source and residence countries

Under current international income tax arrangements, the source country is generally given not only the first bite at taxing the active business income earned there, but in many cases, through the domestic exemption of foreign-source dividends, the sole claim on taxing such income.[33] This source-country priority has been established either unilaterally, such as by the United States when it first enacted a foreign tax credit, or bilaterally through income tax treaties. Today, this priority is a fundamental element of more than 2,000 bilateral income tax treaties.[34] But these treaties do not require countries to allow interest deductions wherever the borrowing occurs.[35] Since source countries have the first claim to

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27. The argument for repealing § 265 of the U.S. Internal Revenue Code is not applicable here; there is a great difference between transferring U.S. federal revenues to U.S. state and local governments to help them save interest costs and transferring such revenues to low-tax foreign countries. Moreover, although the advantages of repealing § 265 have long been known, this denial of interest deductions remains untouched.
28. See e.g. Graetz, Michael J. and Alvin C. Warren, Jr. (eds.), *Integration of the U.S. Corporate and Individual Income Taxes: The Treasury Department and American Law Institute Reports* (1998).
29. While corporations may have considerable control over where they locate their borrowing, that control may not be absolute: *L*, for example, may not have well-developed capital markets for corporate borrowing. And there may be economies of scale from concentrating borrowing in one or a few places. Moreover, a corporation will have to have assets in *L* to deduct interest there given *L*'s likely earnings stripping rules. But the *government* of *H* should prefer *L* as the place for corporate borrowing to finance investments in *L*.
30. The foreign company would need to have adequate assets or income in *H* in order not to run afoul of *H*'s earnings stripping rules.
31. This is because royalties are permitted to be deducted abroad, may bear little or no withholding tax, and can be sheltered from U.S. tax through cross-crediting.
32. See e.g. Hufbauer and Assa, supra note 19, at 133-143.
33. Graetz and O'Hear, supra note 16; Avi-Yonah, Reuven S., "The Structure of International Taxation: A Proposal for Simplification", 74 *Texas Law Review* 1301 (1996).
34. OECD Model Tax Convention on Income and on Capital, 15 July 2005, Arts. 23 A and 23 B.
35. They do, however, require countries not to discriminate against foreigners.

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the tax revenues from income on business assets, it seems incongruous that the residence country should also be required to forego additional revenue due to the location of liabilities there. This is not required by tax treaties. Source countries contribute to causing the double tax by not allowing the deduction of interest expenses. Why should residence countries be responsible for eliminating that double tax by allowing interest deductions for borrowing used to finance assets abroad – especially when most residence countries do not even make a residual claim to tax the foreign-source income?

4.6. The potential for competitive disadvantage

The recent debate in the United States over the treatment of interest expenses has focused on outbound investments and the proper scope for the allocation (and disallowance) of interest expenses. In a turn away from its previous view, the U.S. Treasury Department, in its December 2007 report, *Approaches to Improve the Competitiveness of the U.S. Business Tax System for the 21st Century*, called for the U.S. to allow interest deductions in full without regard to the location of the investments attributable to the borrowing.[36] The University of Michigan economist James Hines in a recent article[37] and General Electric's top tax officer John Samuels in his New York University Law School Tillinghast Lecture[38] have also recently advocated this policy. The Treasury report emphasizes the complexity of interest allocation. Prof. Hines focuses on its potential to result in advantages for foreign over domestic ownership of businesses. And Mr Samuels claims that the U.S. disallowance of interest expense will put U.S.-based multinationals at a competitive disadvantage compared to companies headquartered in nations that allow interest deductions without any such limitations.

I cannot address these views in any detail in this article. Nor is such discussion necessary here since my main purpose here is to point the way to a *multilateral* solution to this issue. But the breadth of the claims that the benefits to the U.S. from having U.S. multinationals make foreign investments justify full U.S. deduction of interest under all circumstances is troubling. There is an extraordinary "race to the bottom" quality to these arguments. In essence, they claim that the U.S. makes a mistake by disadvantaging U.S.-based companies in *any* aspect of the tax law where the consensus treatment among the U.S.'s trading partners reaches a more advantageous result. Such claims are particularly hard to credit in a context where U.S. multinationals have ready access to worldwide capital markets. They are likely to respond to a U.S. rule disallowing interest deductions when borrowing is disproportionately located in the U.S. simply by relocating their borrowing to a more favourable jurisdiction.

Moreover, such claims do not respond to any of the concerns expressed above. Nor have they been supported by any compelling empirical evidence that either worldwide economic efficiency would be improved by such a policy or, more narrowly, that the benefits to U.S. workers and investors from such a policy would exceed their

costs. (Indeed, if the U.S. is worried about the international competitiveness of its workers and businesses, a far stronger argument exists for lowering the U.S. corporate tax rates, but that issue is well beyond the scope of this endeavour.) To be revenue neutral, allowing interest deductions without any limit or allocation requires higher tax rates than would a U.S. policy which requires worldwide allocation of interest expenses. And, for the reasons discussed above, it is difficult to see why allowing interest deductions without allocation should be a policy priority.

5. A Multilateral Solution

5.1. Worldwide allocation

The problems I have described here – the mismeasurement of income, potential distortions in the location of investment, an increased incentive for debt over equity finance, distortions in the location of borrowing, and unjustified revenue transfers among countries – would all disappear if all countries allocated interest deductions to assets on a uniform worldwide basis and allowed a proportionate amount of interest expense to be deducted against income earned domestically *without regard to where the borrowing occurs.*[39] Such a system would deny interest deductions only when borrowing in one country is disproportionately higher than in the rest of the world.

For outbound investment, the advantages of such a regime should by now be apparent. Incentives to locate borrowing in high-tax countries would disappear, as would incentives to make debt-financed investments because their after-tax returns exceed their pre-tax returns. Debt would be located wherever it is most economical. The revenue transfer from countries where borrowing is located to those where investments are made would stop. And the advantages of debt over equity finance would be reduced somewhat.

In the case of inbound investment, where the problem is typically described as earnings stripping or thin capitalization, there is also much to commend worldwide allocation as a mechanism for determining allowable interest. No country would have to fear that it was bearing a disproportionate portion of a company's interest expense. Indeed, some EU Member States now allow worldwide allocation as a safe-harbour method to protect companies against interest expense disallowance.

The practical difficulty with such an allocation rule for inbound investments is that, without international

36. U.S. Department of the Treasury, supra note 2, at 60.
37. Hines, James R., "Reconsidering the Taxation of Foreign Income", paper delivered at New York University Law School on 14 November 2007 (forthcoming in *Tax Law Review*), available at taxprof.typepad.com/taxprof_blog/files/hines_reconsidering_nov_07.pdf.
38. Samuels, supra note 11.
39. Another possibility would be to allocate interest expense proportionately to income rather than assets. This would also be a major improvement over current laws and practices, but an allocation based on assets seems conceptually more sound and is probably easier to implement.

cooperation, the information about a company's total amount of borrowing and assets necessary to calculate a worldwide allocation may not be readily available to the source country. This explains why source countries have separately devised thin capitalization rules, often relying on fixed allowable debt-to-equity ratios or fixed limits on interest expense deductions as a percentage of income (EBITDA) to limit interest deductions. However, as with interest allocation for outbound investments, disallowing interest deductions through earnings stripping or thin capitalization rules – when, as is generally the case, the interest disallowed by the source country will not be allowed by the residence country – may lead to double taxation of the inbound income. On the other hand, allowing the interest deductions in full may produce negative tax rates and threatens the domestic tax base. Thus, worldwide allocation is desirable for both source and residence countries.

5.2. The benefits of a multilateral response

Rarely does a difficult international income tax issue produce such a clear solution. Worldwide allocation of interest expense by both source and resident countries would eliminate a host of problems now bedevilling nations throughout the world – problems that have produced varying, complex and inconsistent responses among different countries, responses that frequently may result in zero or double taxation. Given the flexibility of multinational corporations to choose where to locate their borrowing and the difficulties nations have in maintaining their domestic income tax bases in the face of such flexibility, achieving a multilateral agreement for the treatment of interest expense based on a worldwide allocation should become a priority project for both source and residence countries. The OECD and the European Commission might lead the way. The European Commission should begin by incorporating such a rule into its common consolidated corporate tax base project.[40] For the OECD, making worldwide allocation a commonplace feature of bilateral income tax treaties throughout the world, along with attendant requirements for information sharing adequate for source countries to be confident about their ability to enforce such a rule, would be fair to all nations and substantially improve economic efficiency and internation equity throughout the world. As has so often been the case, a common multilateral solution may be accomplished piecemeal through bilateral income tax treaties.[41]

Solving the problem of interest expense deductions on a multilateral basis would offer great benefits to virtually all nations. Unlike some other areas of international income tax law where a nation may see substantial advantages from pursuing a beggar-thy-neighbour tax policy, there is no important national competitive advantage available in departing from the solution I have offered here. That alone does not make achieving a multinational solution easy, but it might make it possible.

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40.   For an overview, see Weiner, Joann M., "Approaching an EU Common Consolidated Tax Base", 46 *Tax Notes International* 647 (14 May 2007).
41.   One cannot help but note the irony that the most promising path to a multilateral solution to an income tax issue is through revisions of bilateral treaties.

Corporate Income Tax Burdens at Home and Abroad

Kevin Markle and Douglas A. Shackelford
University of North Carolina

American Corporate Tax
Exceptionalism
February 20, 2009

U.S. Presidential debate, September 26, 2008

McCAIN:

"Right now, **American business pays the second-highest business taxes in the world, 35 percent. Ireland pays 11 percent.**

"Now, if you're a business person, and you can locate any place in the world, then, obviously, if you go to the country where it's 11 percent tax versus 35 percent, you're going to be able to create jobs, increase your business, make more investment, et cetera.

"I want to cut that business tax. I want to cut it so that businesses will remain in the United States of America and create jobs."

▷ 2

U.S. Presidential debate, September 26, 2008

OBAMA:

"Now, John mentioned the fact that business taxes on paper are high in this country, and he's absolutely right. Here's the problem: There are so many loopholes that have been written into the tax code, oftentimes with support of Senator McCain, that we actually see **our businesses pay effectively one of the lowest tax rates in the world**."

▷ 3

What Do We Do?

▸ Estimate average effective tax rates (AETRs) using financial statement information

▸ Compare AETRs for domestics and multinationals

▸ Compare AETRs across countries

▸ Compare AETRs across years

▸ Measure the impact of foreign subsidiaries on AETRs

▷ 4

What Do We Find?

‣ Multinationals and domestic firms face similar AETRs.

‣ Average AETR decline from 1988-2007 was 6 percentage points (18%), much of which occurred from 1992-1994.

‣ Country AETR order remains constant over time.

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‣ U.S. and European countries have above-average AETRs.

‣ Middle East, Tax Havens and Asian (ignoring Japan) countries have below-average AETRs.

▷ 5

Regression Equations

Three specifications:

$$AETR_{it} = \sum \beta_{0_j} COUNTRY_{it}^j + \sum \beta_{1_j} (COUNTRY_{it}^j * MN_{it})$$

$$+ \sum \beta_{2_k} INDUSTRY_{it}^k + \sum \beta_{3_m} YEAR_{it}^m + \sum \beta_{4_n} SIZE_{it}^n + \varepsilon_{it} \qquad (1)$$

$$AETR_{it} = \sum \beta_{0_j} COUNTRY_{it}^j + \sum \beta_{1_k} SUB_{it}^k$$

$$+ \sum \beta_{2_m} INDUSTRY_{it}^m + \sum \beta_{3_n} YEAR_{it}^n + \sum \beta_{4_p} SIZE_{it}^p + \varepsilon_{it} \qquad (2)$$

$$AETR_{it} = \sum \beta_{0_j} COUNTRY_{it}^j + \sum \beta_{1_k} SUB_{it}^k + \sum \beta_{2_i} COUNTRY_{it}^j * SUB_{it}^k$$

$$+ \sum \beta_{3_m} INDUSTRY_{it}^m + \sum \beta_{4_n} YEAR_{it}^n + \sum \beta_{5_p} SIZE_{it}^p + \varepsilon_{it}$$

▷ 6

Variables

- Coefficients of Interest $AETR_{it} = \sum \beta_{0_j} COUNTRY_{it}^j + \sum \beta_{1_j} (COUNTRY_{it}^j * MN_{it})$
  - β_0 = domestic AETR
  - $(\beta_0 + \beta_1)$ = multinational AETR

- AETR = book ETR (from the financial statements)
  - Numerator is total tax expense (≥ 0)
    - Same conclusions using current income tax expense
  - Denominator is NIBT (>0), robust to other income measures

- Controls
  - Industry (two-digit NAICS)
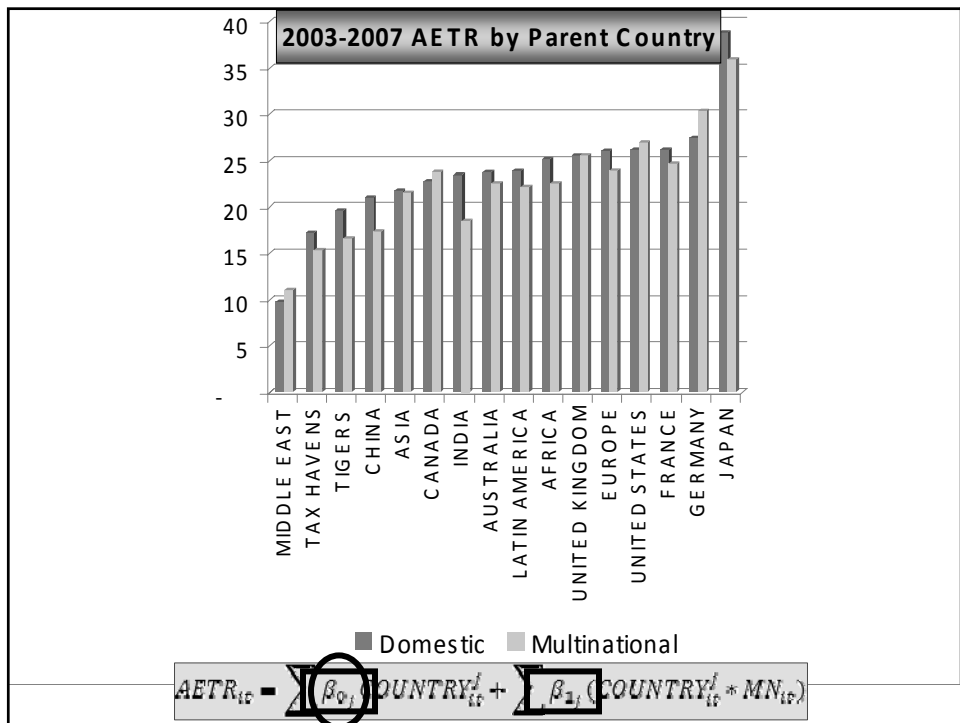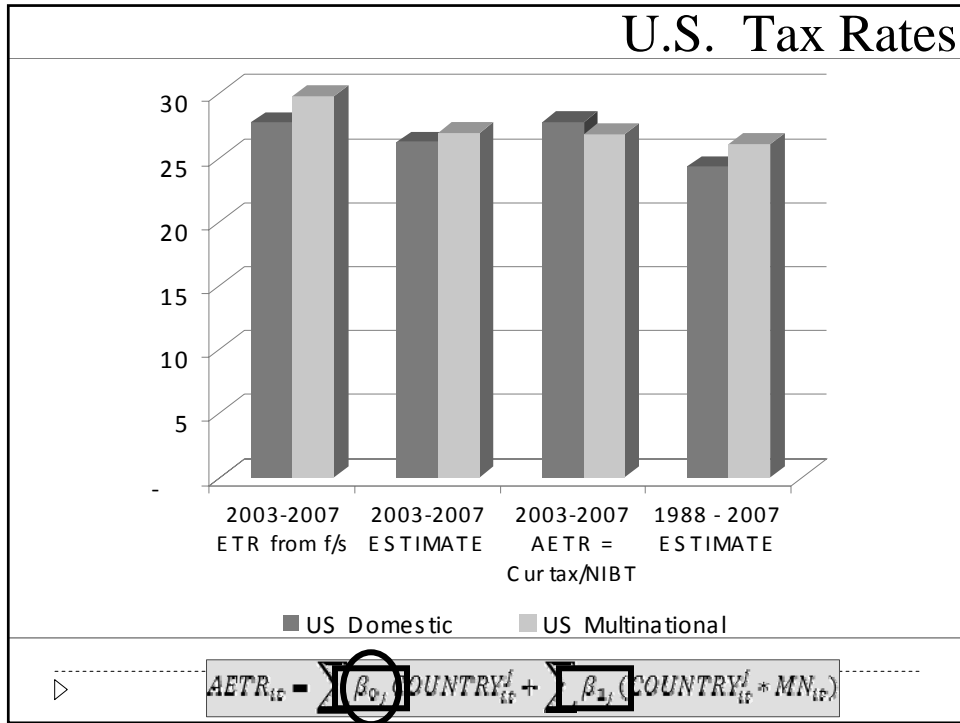 - Year
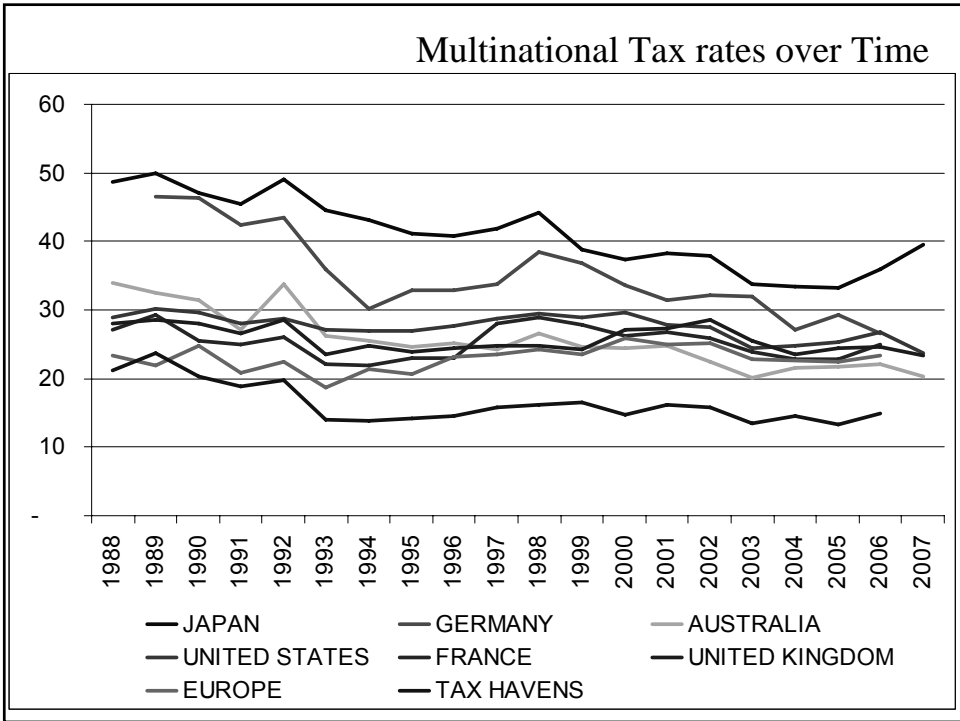 - Size – percentile rank of sales, assets, equity

▷ 7
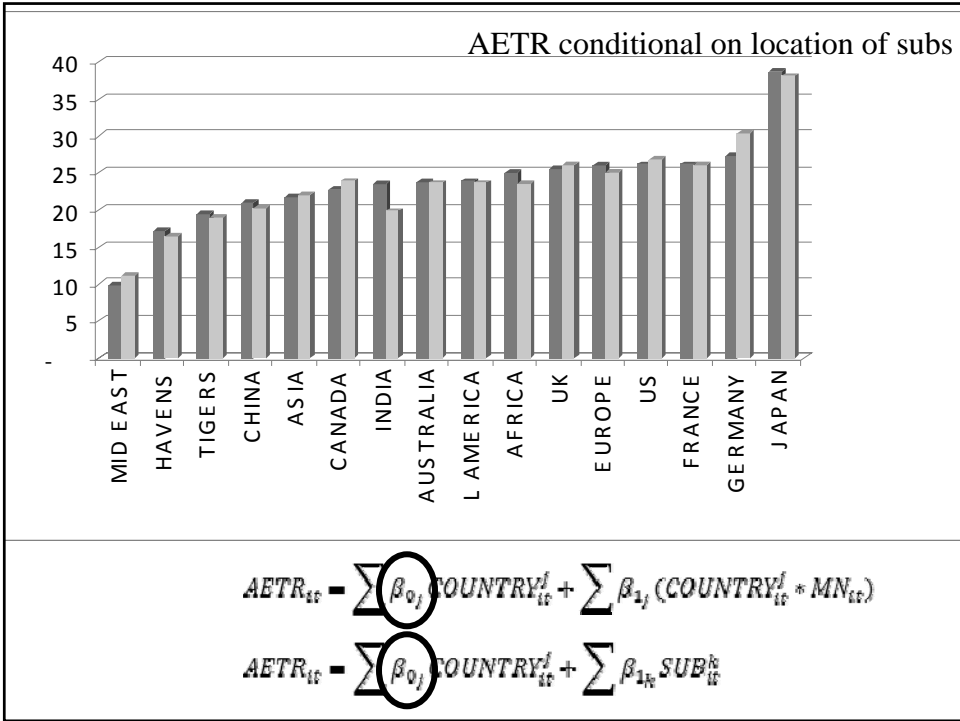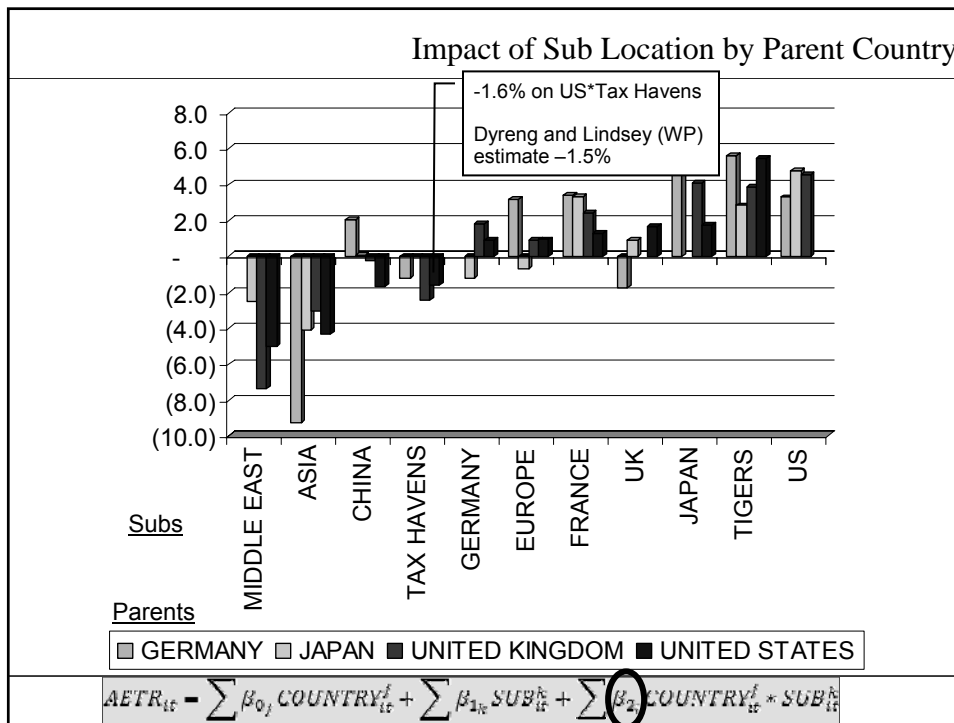
Countries
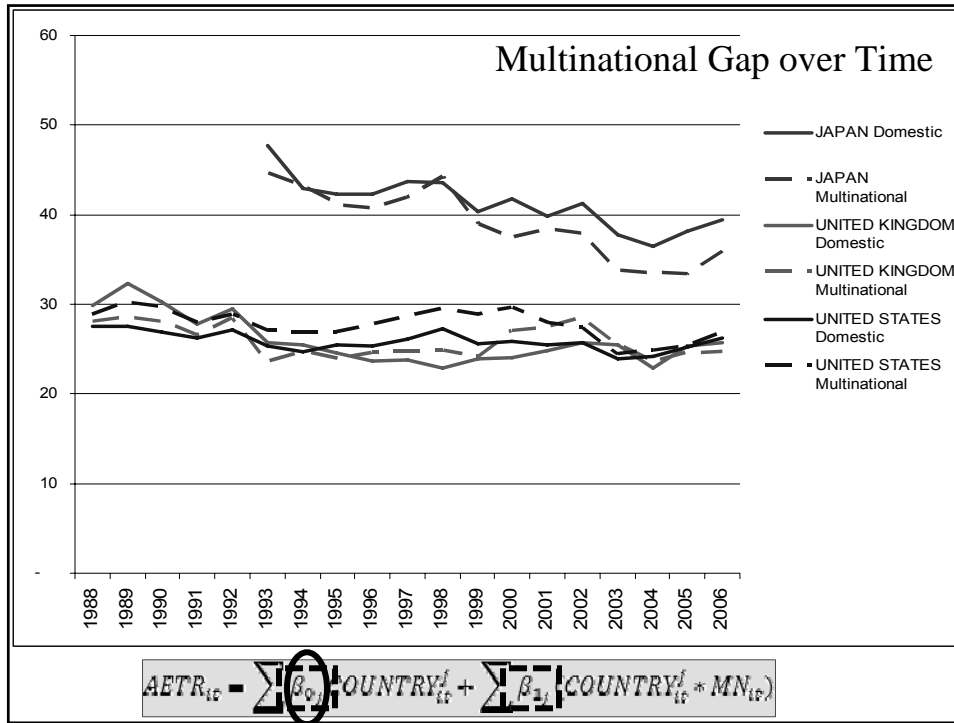
Sample: parents in 85 countries
         subs in 195 countries
         BUT only know sub locations in 2008

Countries	Groups
• Australia • Canada • China • France • Germany • India • UK • US	• Asian Tigers • Tax Havens • Africa • Asia • Europe • Latin America • Middle East

▷ 8

U.S. Tax Rates

2003-2007 AETR by Parent Country

AETR conditional on location of subs

$$AETR_{it} = \sum \beta_{0_j} COUNTRY_{it}^j + \sum \beta_{1_j} (COUNTRY_{it}^j * MN_{it})$$

$$AETR_{it} = \sum \beta_{0_j} COUNTRY_{it}^j + \sum \beta_{1_k} SUB_{it}^k$$

Multinational Tax rates over Time

Multinational Gap over Time

JAPAN Domestic

JAPAN Multinational

UNITED KINGDOM Domestic

UNITED KINGDOM Multinational

UNITED STATES Domestic

UNITED STATES Multinational

$$AETR_{it} = \sum \beta_{0j} COUNTRY_{it}^j + \sum \beta_{1j} COUNTRY_{it}^j * MN_{it})$$

Impact of Sub Location by Parent Country

-1.6% on US*Tax Havens

Dyreng and Lindsey (WP) estimate –1.5%

Subs: MIDDLE EAST, ASIA, CHINA, TAX HAVENS, GERMANY, EUROPE, FRANCE, UK, JAPAN, TIGERS, US

Parents

GERMANY   JAPAN   UNITED KINGDOM   UNITED STATES

$$AETR_{it} = \sum \beta_{0j} COUNTRY_{it}^j + \sum \beta_{1k} SUB_{it}^k + \sum \beta_{2} COUNTRY_{it}^j * SUB_{it}^k$$

What Do We Find?

▸ Multinationals and domestic firms face similar AETRs.

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▷ 15

Future Work--Clusters

▸ Companies appear to cluster among countries
  ▸ e.g., If anywhere in Europe, then in Ireland, the Netherlands, and Switzerland?

▸ Future work:
  How does this clustering affect our understanding of the taxes on multinationals?

▷ 16

Comments on
"Corporate Income Tax Burdens
at Home and Abroad"
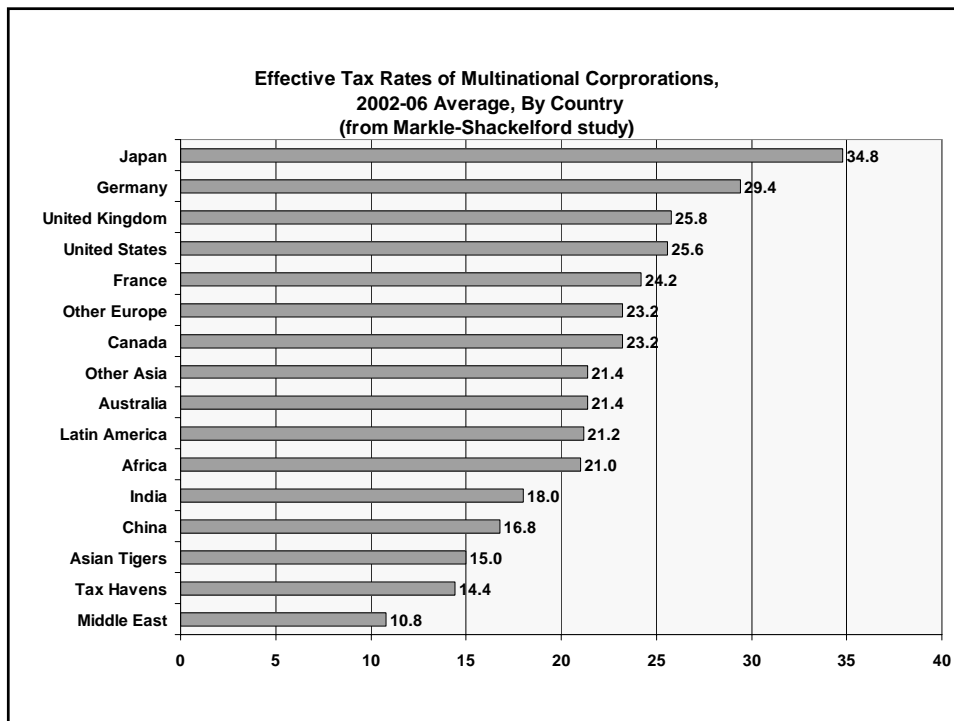
by Kevin Markle and

Douglas A. Shackelford

Martin A. Sullivan
Tax Analysts
For
ITPF/Urban-Brookings Tax Policy Center Conference
February 20, 2009
Washington D.C.

Distinguishing Feature of Paper

- **Comprehensive data set provides worldwide perspective, G-8 as well as developing economies**
- **Information on subsidiaries of multinationals, including domicile of subsidiaries**
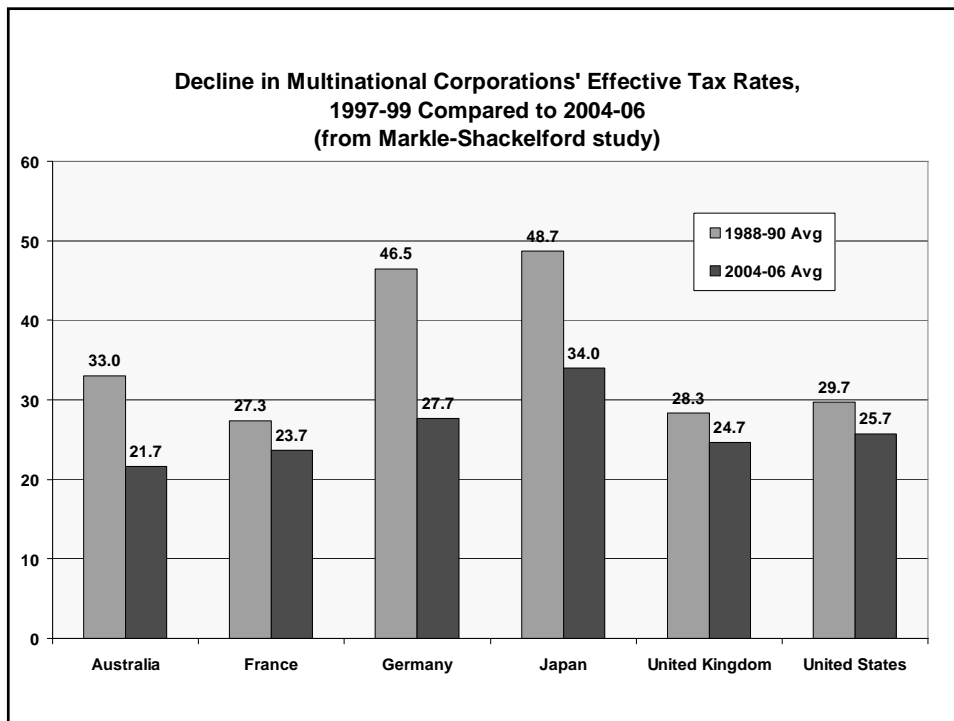
1

Four Key Findings

#1 Ranking of Countries by Tax Rates Fairly Constant over Time and over Different Subsets of Data

**Effective Tax Rates of Multinational Corprorations,
2002-06 Average, By Country
(from Markle-Shackelford study)**

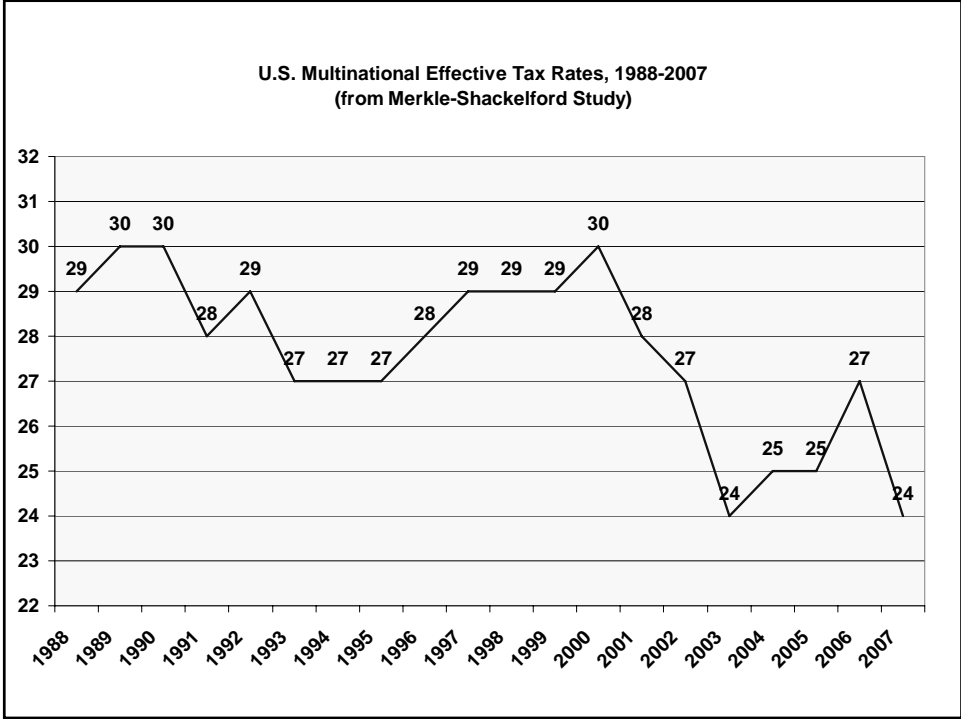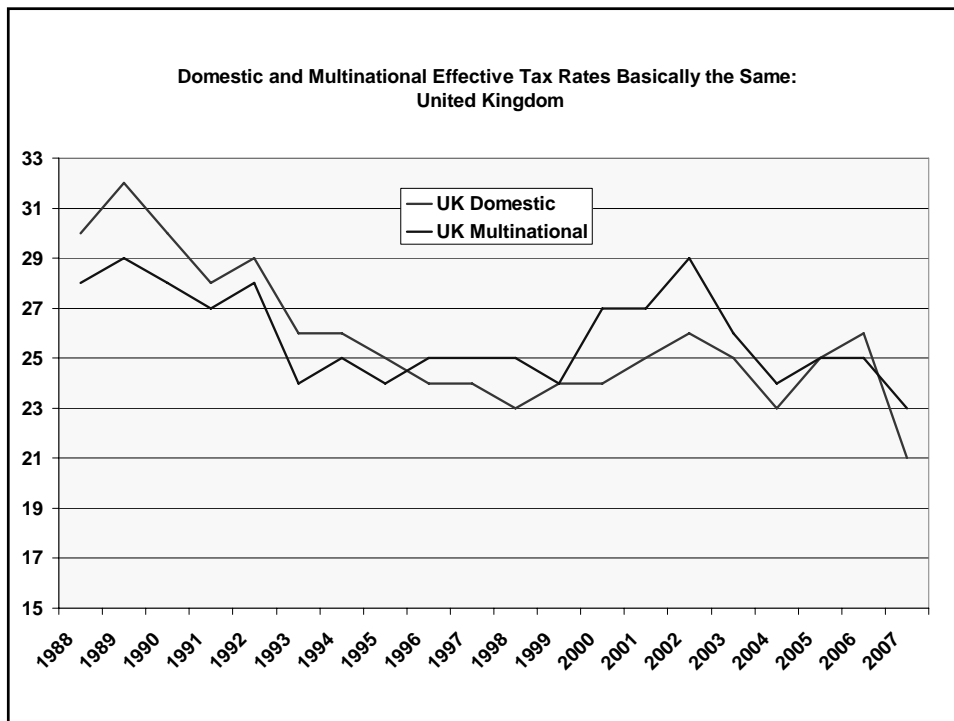| Country	Rate
Japan	34.8
Germany	29.4
United Kingdom	25.8
United States	25.6
France	24.2
Other Europe	23.2
Canada	23.2
Other Asia	21.4
Australia	21.4
Latin America	21.2
Africa	21.0
India	18.0
China	16.8
Asian Tigers	15.0
Tax Havens	14.4
Middle East	10.8

2

Four Key Findings

#1 Ranking of Countries by Tax Rates Fairly Constant over Time and over Different Subsets of Data

#2 Effective Tax Rates Declining Over Time

Decline in Multinational Corporations' Effective Tax Rates, 1997-99 Compared to 2004-06 (from Markle-Shackelford study)

Legend: ☐ 1988-90 Avg ■ 2004-06 Avg

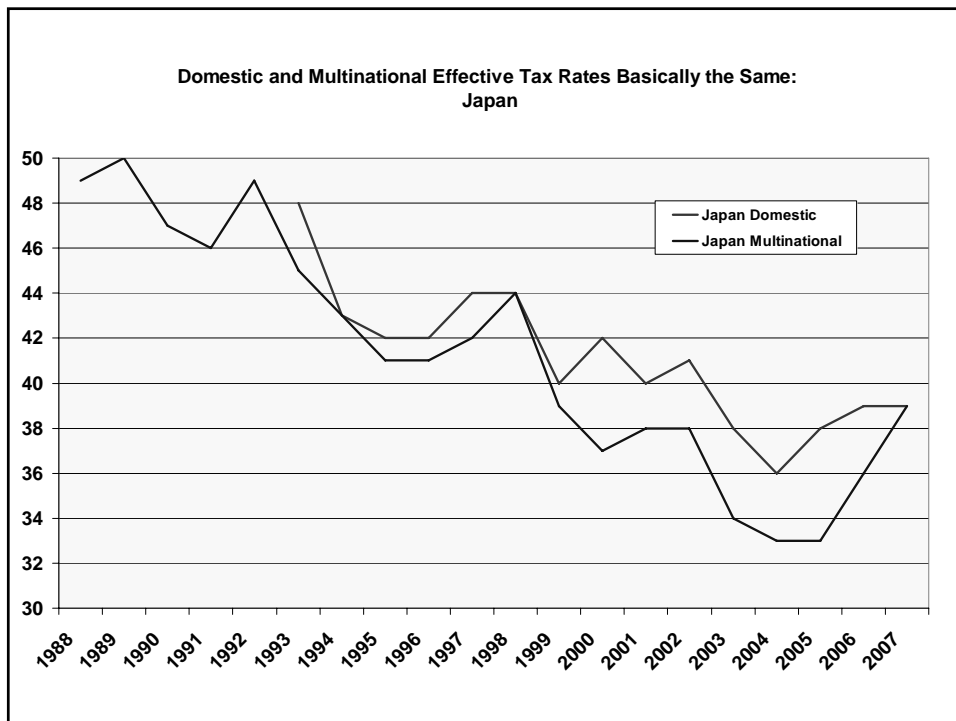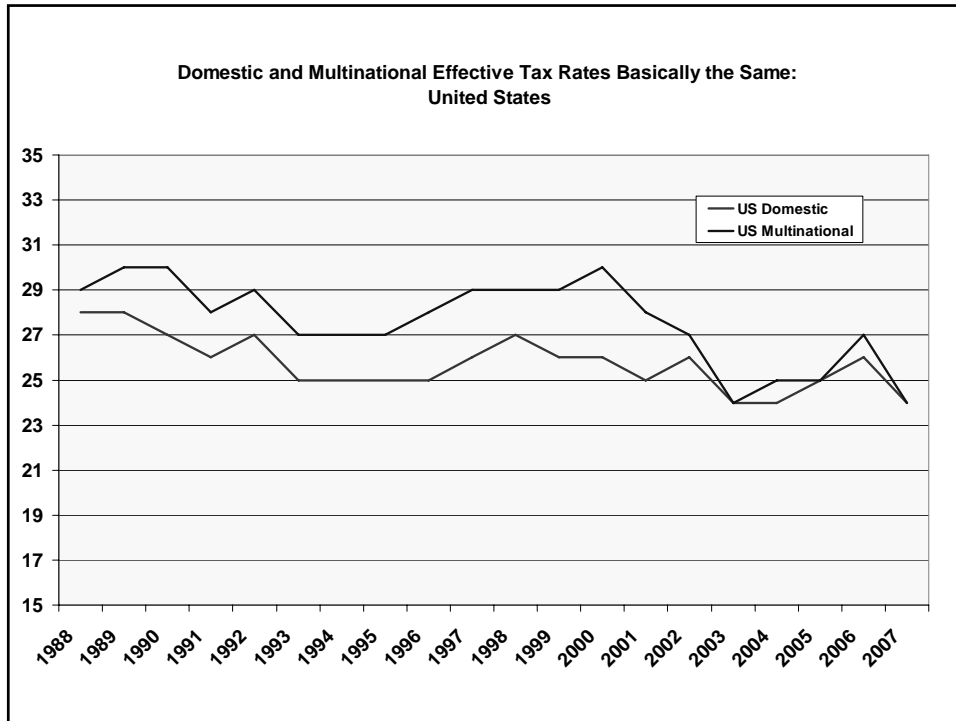| Country	1988-90 Avg	2004-06 Avg
Australia	33.0	21.7
France	27.3	23.7
Germany	46.5	27.7
Japan	48.7	34.0
United Kingdom	28.3	24.7
United States	29.7	25.7

Four Key Findings

#1 Ranking of Countries by Tax Rates Fairly Constant over Time and over Different Subsets of Data

#2 Effective Tax Rates Declining Over Time

#3 Effective Tax Rates of Multinational and Domestic Corporations About the Same

U.S. Multinational Effective Tax Rates, 1988-2007
(from Merkle-Shackelford Study)

Four Key Findings

#1 Ranking of Countries by Tax Rates Fairly Constant over Time and over Different Subsets of Data

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#3 Effective Tax Rates of Multinational and Domestic Corporations About the Same

**Domestic and Multinational Effective Tax Rates Basically the Same:
United Kingdom**

5

Domestic and Multinational Effective Tax Rates Basically the Same: United States

Domestic and Multinational Effective Tax Rates Basically the Same: Japan

Four Key Findings

#1 Ranking of Countries by Tax Rates Fairly Constant over Time and over Different Subsets of Data

#2 Effective Tax Rates Declining Over Time

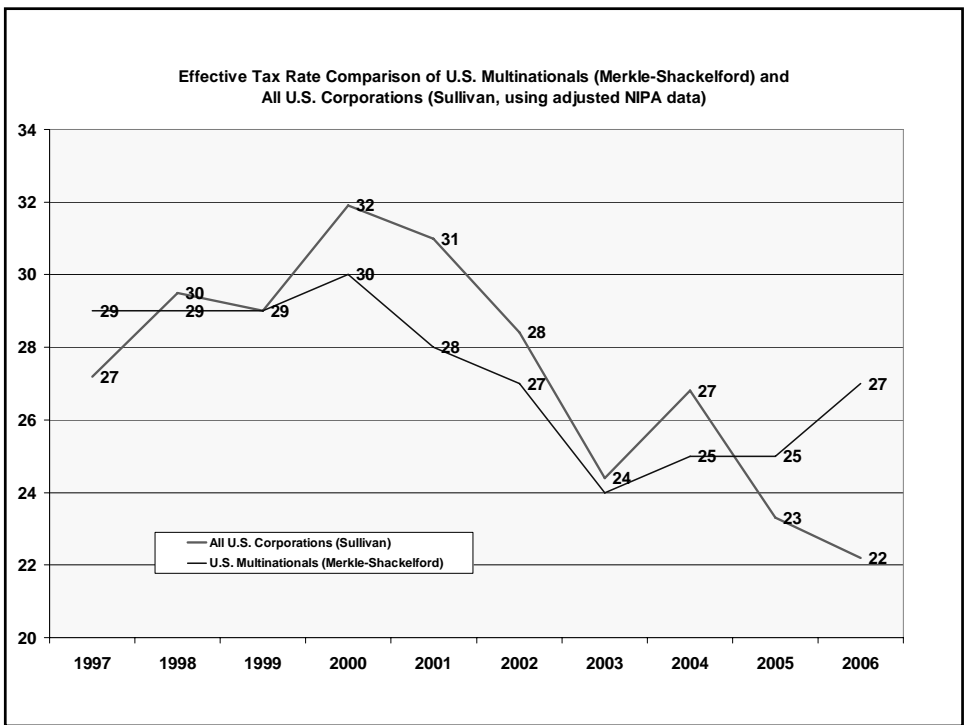#3 Effective Tax Rates of Multinational and Domestic Corporations About the Same

#4 Effective Tax Rates of Multinationals with Subsidiaries in Tax Havens are Lower
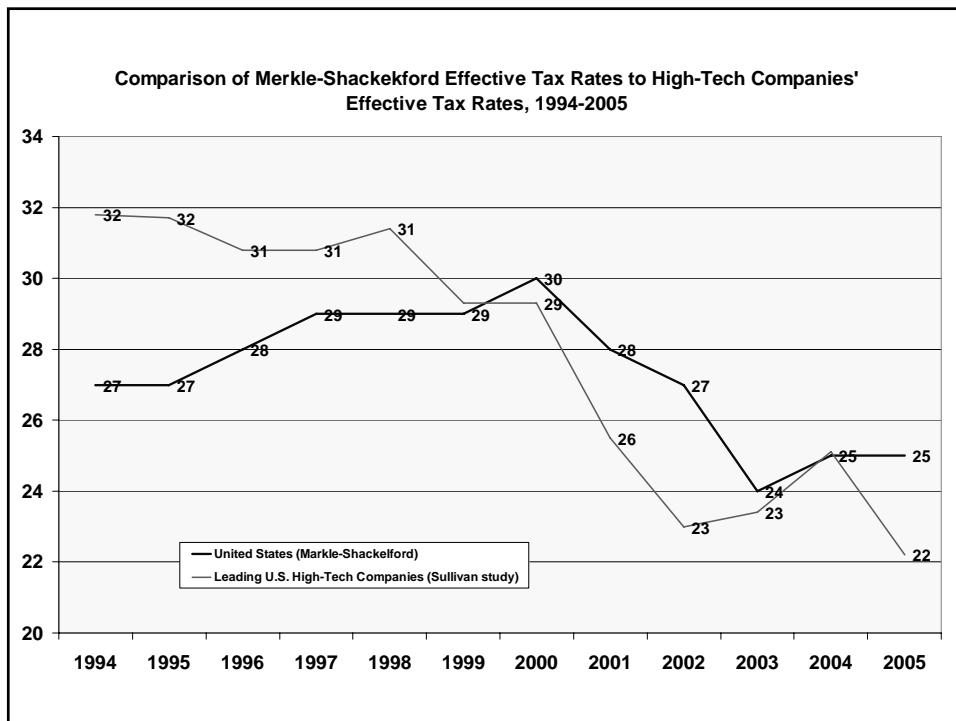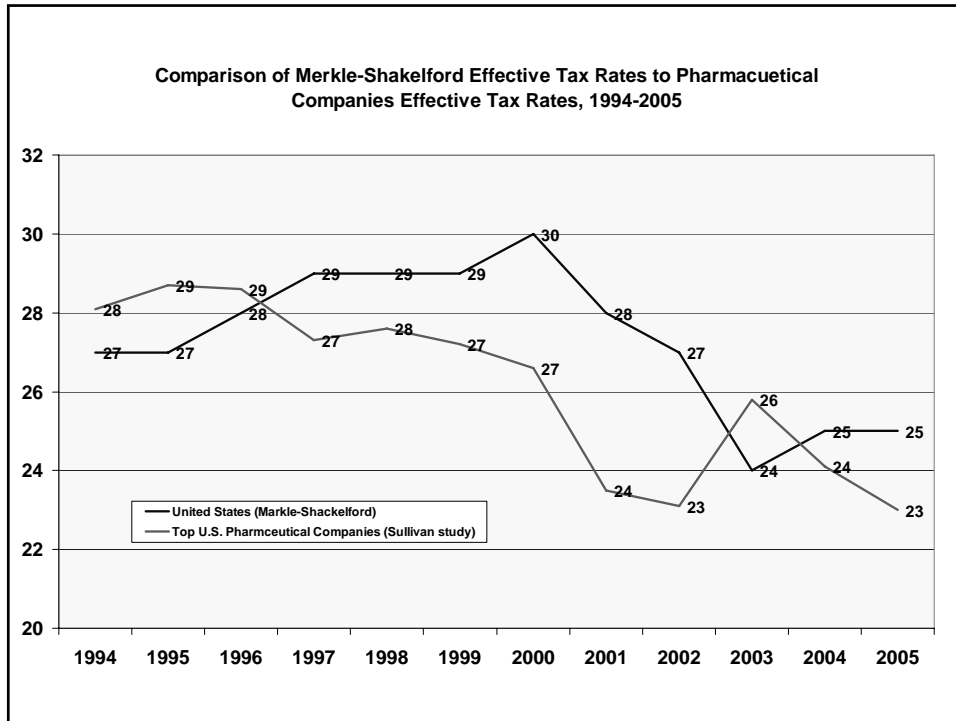

**Simplified Version of Table 5 of
Markle-Shackelford Paper**
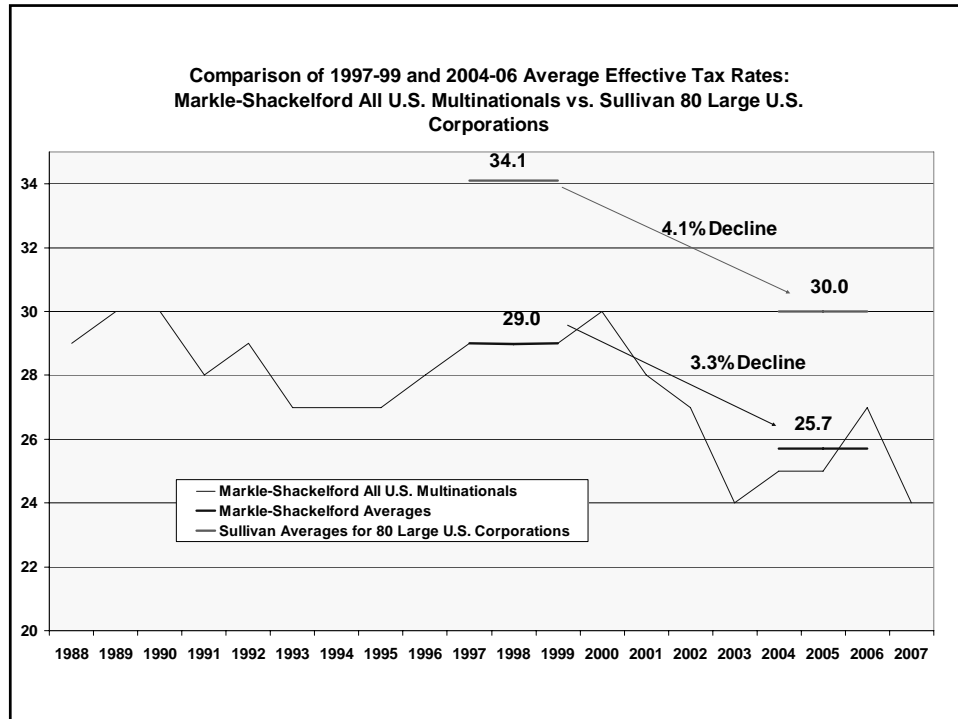*Effect of Foreign Subsidiaries on Parents'
Effective Tax Rate*

Parent	Japan sub	U.S. sub	Tax Haven sub	Other Asia sub
France	2.1	-0.9	-3.8	-10.5
Germany	7.6	3.3	-1.2	-9.3
Japan		4.8	0	-4.1
United Kingdom	4.1	4.5	-2.5	-3
United States	1.7		-1.6	-4.3

Comment #1

- Marlke-Shackelford study supports prior research showing significant decline in effective tax rates of U.S. multinational corporations over the last decade

Effective Tax Rate Comparison of U.S. Multinationals (Merkle-Shackelford) and All U.S. Corporations (Sullivan, using adjusted NIPA data)

Comparison of Merkle-Shakelford Effective Tax Rates to Pharmacuetical Companies Effective Tax Rates, 1994-2005

Comparison of Merkle-Shackekford Effective Tax Rates to High-Tech Companies' Effective Tax Rates, 1994-2005

9

**Comparison of 1997-99 and 2004-06 Average Effective Tax Rates:
Markle-Shackelford All U.S. Multinationals vs. Sullivan 80 Large U.S.
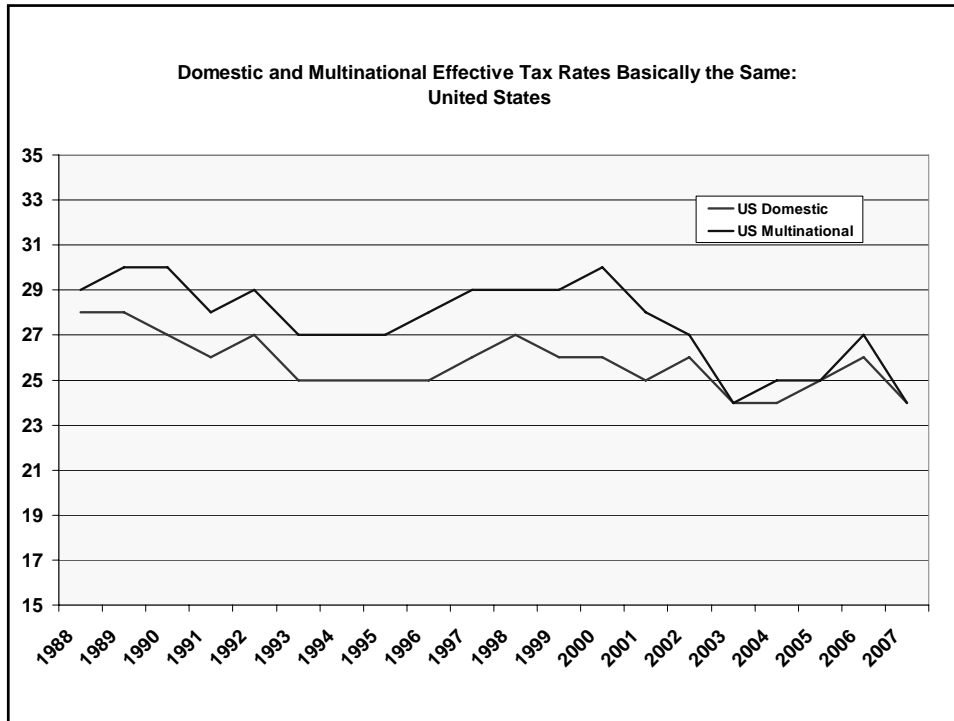Corporations**

Comment #2

- Markle-Shackelford study provides some clues to what is behind lower tax rates

- Simply being a multinational is not enough

- But WHERE subsidiaries are located does matter

**Domestic and Multinational Effective Tax Rates Basically the Same:
United States**

Legend: US Domestic, US Multinational (chart with years 1988–2007 on x-axis, values 15–35 on y-axis)

Simplified Version of Table 5 of
Markle-Shackelford Paper
Effect of Foreign Subsidiaries on Parents'
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Parent	Japan sub	U.S. sub	Tax Haven sub	Other Asia sub
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Japan		4.8	0	-4.1
United Kingdom	4.1	4.5	-2.5	-3
United States	1.7		-1.6	-4.3

Comment #3

Other research shows that the decline in ETRs is attributable to foreign operations, which in turn is due to:

1. Foreign countries lowering tax rates

2. More "real" foreign business activity

3. More income shifting abroad; and more shifting from high-tax to low-tax countries

Comment #4

To help reduce shifting of real business activity and paper profits to foreign locations, United Stataes needs to reduce it statutory corporate tax rate.

Democrats cannot ignore this trend with claims about U.S. AVERAGE corporate tax rates being relatively low.

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Martin A. Sullivan, "Why Reported Effective Corporate Tax Rates Are Falling," *Tax Notes*, Mar. 3, 2008, p. 977.

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Rosanne Altshuler

Rosanne Altshuler, Senior Fellow, Urban Institute. Altshuler is currently codirector of the Urban-Brookings Tax Policy Center. She is on leave from Rutgers University where she is a professor of economics. She served as Senior Economist to the President's Advisory Panel of Federal Tax Reform in 2005 and has been a Special Advisor to the Joint Committee on Taxation as well as a consultant to the U.S. Treasury Department and Canadian Department of Finance. Altshuler has published numerous articles on the economics of taxation and edited the National Tax Journal from 2001 through 2006.

Alan J. Auerbach

Alan J. Auerbach is the Robert D. Burch Professor of Economics and Law, Director of the Burch Center for Tax Policy and Public Finance, and former Chair of the Economics Department at the University of California, Berkeley. He is also a Research Associate of the National Bureau of Economic Research and previously taught at Harvard and the University of Pennsylvania, where he also served as Economics Department Chair. Professor Auerbach was Deputy Chief of Staff of the U.S. Joint Committee on Taxation in 1992 and has been a consultant to several government agencies and institutions in the United States and abroad. A former Vice President of the American Economic Association, he was Editor of that association's *Journal of Economic Perspectives* and is now Editor of its new *American Economic Journal: Economic Policy*. Professor Auerbach is a Fellow of the American Academy of Arts and Sciences and of the Econometric Society.

Reuven S. Avi-Yonah

Reuven S. Avi-Yonah is the Irwin I. Cohn Professor of Law and Director of the International Tax LLM Program at the University of Michigan Law School. He teaches the basic course on taxation and courses on international taxation, corporate taxation, tax treaties and transnational law. He has published numerous articles on domestic and international tax issues, and is the author of <u>International Tax as International Law: U.S. Tax Law and the International Tax Regime</u> (Cambridge Univ. Press, 2007) and <u>U.S. International Taxation: Cases and Materials</u> (Foundation Press, 2nd ed. 2005, with Brauner & Ring), and co-editor of <u>Comparative Fiscal Federalism: Comparing the U.S. Supreme Court and European Court of Justice Tax Jurisprudence</u> (Kluwer, 2007). Prof. Avi-Yonah graduated <u>summa cum laude</u> from the Hebrew University in 1983, received a PhD in History from Harvard University in 1986, and received a JD <u>magna cum laude</u> from Harvard Law School in 1989. From 1989 to 1993, Prof. Avi-Yonah practiced tax law in Boston and New York, specializing in the international tax aspects of mergers and acquisitions. From 1994 to 2000 he was Assistant Professor of Law at Harvard Law School. He has served as consultant to the U.S. Treasury and the OECD on tax competition issues, and has been a member of the executive committee of the New York State Bar Association Tax Section and of the Advisory Board of Tax Management, Inc. He is currently a member of the Steering Group of the OECD International Network for Tax Research and Chair of the ABA Tax Section VAT Committee, and an International Research Fellow of the Oxford University Centre for Business Taxation.

Mihir A. Desai

Mihir A. Desai is an Assistant Professor of Business Administration in the Finance and Entrepreneurial Management areas of Harvard Business School. Professor Desai's research focuses on international corporate and public finance. Within international corporate finance, he has investigated the determinants of ownership shares and capital structure choice for multinational affiliates, the advantages afforded by the internal capital markets of multinationals, the determinants of dividend remittance policy for multinationals, and the interaction between domestic and international investment decisions by firms. Within international public finance, his research has emphasized the effects of taxation on the export, financing, organizational form, and investment decisions of firms facing multiple tax regimes. Additionally, his work has also addressed the dynamics of international tax competition, the interactions of inflation and taxation in an open economy and the policy choices available to developing countries facing the loss of talent. He is a Faculty Research Fellow in the National Bureau of Economic Research's Public Economics Program, and his research has been cited in *The Economist*, *BusinessWeek*, and *The New York Times*.

Currently, Professor Desai teaches First-Year Finance and has participated in several executive education programs at HBS. Additionally, he co-teaches Public Economics (EC 1410) at Harvard College. He received the Student Association Award for teaching excellence from the HBS Class of 2001. He received his Ph.D. in political economy with a concentration in corporate finance and public finance from Harvard University; his MBA as a Baker Scholar from Harvard Business School; and a bachelors degree in history and economics with honors and distinction from Brown University. In 1994, he was a Fulbright Scholar to India. His professional experiences include working at CS First Boston, McKinsey & Co., and advising a number of startup firms.

BROOKINGS

William G. Gale

William Gale is vice president and director of the Economic Studies Program at the Brookings Institution and the Arjay and Frances Miller Chair in Federal Economic Policy. He conducts research on a variety of economic issues, focusing particularly on tax policy, fiscal policy, pensions and saving behavior. He is co-director of the Tax Policy Center, a joint venture of the Brookings Institution and the Urban Institute. He is also director of the Retirement Security Project, an initiative supported by the Pew Charitable Trusts, in partnership with Georgetown University's Public Policy Institute and Brookings

Prior to joining Brookings in 1992, he was an assistant professor in the Department of Economics at the University of California, Los Angeles, and a senior staff economist for the Council of Economic Advisers under President George H.W. Bush.

He is the co-author or co-editor of several books, including *Aging Gracefully: Ideas to Improve Retirement Security in America* (Century Foundation, 2006); *The Evolving Pension System: Trends, Effects, and Proposals for Reform* (Brookings, 2005); *Private Pensions and Public Policy* (Brookings, 2004); *Rethinking Estate and Gift Taxation* (Brookings, 2001), *and Economic Effects of Fundamental Tax Reform* (Brookings, 1996).

He has also written numerous scholarly research articles, including publications in the *American Economic Review, Journal of Political Economy,* and *Quarterly Journal of Economics,* and has served as editor and editorial board member of several academic journals. He has also written extensively in policy-related publications and newspapers.

Gale has served on advisory boards for the Government Accountability Office, the Internal Revenue Service, the Joint Committee on Taxation and the Board of the Center on Federal Financial Institutions.

Gale attended Duke University and the London School of Economics and received his Ph.D. from Stanford University in 1987. He lives in Fairfax, VA, with his wife Julie, who is a psychologist, two children Danny, 19, and Becca, 16, and two golden retrievers.

[December 2008]

Michael J. Graetz

Michael J. Graetz is the Justus S. Hotchkiss Professor of Law at Yale University. Before becoming a professor at Yale in 1983, he was a professor of law at the University of Virginia and the University of Southern California law schools and Professor of Law and Social Sciences at the California Institute of Technology. His publications on the subject of Federal taxation include a leading law school text and more than 60 articles on a wide range of tax, international taxation, health policy, and social insurance issues in books and scholarly journals. His most recent book is *100 Million Unnecessary Returns: A Simple Fair and Competitive Tax Plan for the United States,* published in January 2008 by Yale University Press. His previous books include *Death by a Thousand Cuts: The Fight over Taxing Inherited Wealth* published by Princeton University Press; *True Security: Rethinking Social Insurance* (Yale University Press, 1999); and *The U.S. Income Tax: What It Is, How It Got That Way and Where We Go From Here*, (W. W. Norton & Co, 1999) (a paperback edition of the book originally published as *The Decline (and Fall?) of the Income Tax)* and *Foundations of International Income Taxation* (Foundation Press, 2003);*).* He is also the author of a leading law school coursebook, *Federal Income Taxation: Principles and Policies.*   His most recent articles are "Income Tax Discrimination and the Political and Economic Integration of Europe" (115 Yale Law Journal 1186, 2006) and Dividend Taxation in Europe: When the ECJ makes Tax Policy, (44 Common Market Law Review, 1577, 2007).

During January-June 1992, Michael Graetz served as Assistant to the Secretary and Special Counsel at the Treasury Department. In 1990 and 1991, he served as Treasury Deputy Assistant Secretary for Tax Policy. Professor Graetz has been a John Simon Guggenheim Memorial Fellow and he received an award from Esquire Magazine for courses and work in connection with provision of shelter for the homeless. He served on the Commissioner's Advisory Group of the Internal Revenue Service. He served in the Treasury Department in the Office of Tax Legislative Counsel during 1969-1972. He is a fellow of the American Academy of Arts and Sciences.

Michael Graetz is a graduate of Emory University (B.B.A. 1966) and the University of Virginia Law School (J.D. 1969). A native of Atlanta, Georgia, He is married to Brett Dignam and has five children.

Kevin A. Hassett

Kevin A. Hassett is the director of economic policy studies and a resident scholar at AEI. He is also a weekly columnist for Bloomberg. Before joining AEI, Mr. Hassett was a senior economist at the Board of Governors of the Federal Reserve System and an associate professor of economics and finance at the Graduate School of Business of Columbia University. He was an economic adviser to the George W. Bush campaign in the 2004 presidential election, and was the chief economic adviser to Senator John McCain (R-Ariz.) during the 2000 primaries. He has also served as a policy consultant to the U.S. Department of the Treasury during both the former Bush and Clinton administrations. Mr. Hassett is a member of the Joint Committee on Taxation's Dynamic Scoring Advisory Panel. He is the author, coauthor or editor of six books on economics and economic policy, including the AEI book on tax reform, *Toward Fundamental Tax Reform*. He has published scholarly articles in the *American Economic Review*, the *Economic Journal*, the *Quarterly Journal of Economics*, the *Review of Economics and Statistics*, the *Journal of Public Economics*, and many other professional journals. His popular writings have been published in the *Wall Street Journal*, the *Atlantic Monthly*, *USA Today*, the *Washington Post*, and numerous other outlets. His economic commentaries are regularly aired on radio and television, including recent appearances on the *Today Show*, CBS's *Morning Show*, *Newshour with Jim Lehrer*, *Hardball, Moneyline*, and *Power Lunch*.

James R. Hines Jr.

James Hines teaches at the University of Michigan, where he is the Richard A. Musgrave Collegiate Professor of Economics in the department of economics, Professor of Law in the law school, and Research Director of the business school's Office of Tax Policy Research. His research concerns various aspects of taxation. He holds a B.A. and M.A. from Yale University and a Ph.D. from Harvard, all in economics. He was on the faculties of Princeton and Harvard prior to moving to Michigan, and has held visiting appointments at Columbia University, the London School of Economics, the University of California-Berkeley, and Harvard Law School. He is a research associate of the National Bureau of Economic Research, research director of the International Tax Policy Forum, co-editor of the American Economic Association's *Journal of Economic Perspectives*, and once, long ago, was an economist in the United States Department of Commerce.

Edward D. Kleinbard

Edward D. Kleinbard is currently Chief of Staff of the Joint Committee on Taxation where he began work on September 17, 2007. The Joint Committee is one of four Congressional joint committees; its staff functions as a nonpartisan office to assist Congress in every aspect of the tax legislative process, from the development and analysis of tax proposals for Members of Congress to the drafting of tax bills, estimations of all revenue legislation considered by the Congress, and investigations of various aspects of the Federal tax system.

Prior to his appointment to the Joint Committee, Mr. Kleinbard worked as a partner based in the New York office of Cleary Gottlieb Steen & Hamilton LLP. He retired from Cleary Gottlieb on September 15, 2007.

Mr. Kleinbard's expertise focuses on federal income tax matters, including taxation of new financial products, financial institutions and international mergers and acquisitions.

Mr. Kleinbard is widely recognized as one of the elite tax lawyers in the United States. He is consistently listed in *The International Who's Who of Corporate Tax Lawyers*, which most recently (fourth edition, 2004) named him one of the top 15 tax lawyers worldwide, calling him an "outstanding" practitioner and "one of the very best in the USA." He is distinguished in *The International Who's Who of Business Lawyers* (2007) as a leading tax lawyer. Mr. Kleinbard is similarly included in the *PLC Which Lawyer? Yearbook* (2007) and the *PLC Handbook: Tax on Corporate Transactions* (2007-2008) as a "leader" in tax law. Mr. Kleinbard was recognized in *International Tax Review's "World Tax 2006"* rankings for his outstanding work in capital markets. He was also listed as one of the top 25 lawyers worldwide in his practice area in Legal Media Group's *Expert Guides* (2004) and was recognized by the same publisher as one of the "Best of the Best 2006." The BTI Consulting Group selected Mr. Kleinbard as one of 14 exceptional lawyers nationwide, and also identified him as a *BTI Client Service All-Star*, as nominated by the world's largest financial services firms for delivering superior client service. *Best Lawyers* chose to include Mr. Kleinbard in its next edition of *The Best Lawyers in America* (2008), making him one of a distinguished group to receive this honor for at least 10 consecutive years. Mr. Kleinbard consistently receives top rankings in both *Chambers Global The World's Leading Lawyers* and *Chambers USA America's Leading Lawyers for Business. Chambers USA* (2007) hails Mr. Kleinbard as "one of the biggest names of the New York State Bar" and "a prolific writer on tax issues."

Mr. Kleinbard has published extensively on tax matters, including "Rehabilitating the Business Income Tax," for The Hamilton Project at the Brookings Institution, "Designing an Income Tax on Capital," a chapter in the book *Taxing Capital Income*, "Throw Territorial Taxation From the Train," in *Tax Notes*, "A Holistic

Approach to Business Tax Reform," in *Tax Notes*, "Is It Time to Liquidate LIFO?" in *Tax Notes*, "Seventh Circuit Decides Appeal of Bank One Mark-to-Market Swap Valuation Tax Case," in *Derivatives Financial Products Report*, "IRS Should Release Schedules M-3, Not Entire Corporate Tax Returns," in *Tax Notes*, "Proposed Treasury Regulations Offer Dealers and Traders Safe Harbor for Section 475 Mark-to-Market Valuations," in the *Journal of Taxation and Regulation of Financial Institutions*, "The Business Enterprise Income Tax: A Prospectus," in *Tax Notes*, "Competitive Convergence in the Financial Services Markets," in *Taxes*, "The U.S. Taxation of Equity Derivative Instruments," Chapter 24 of *The Handbook of Equity Derivatives*, "Everything I Know About New Financial Products I Learned from DECS," in a Practicing Law Institute, Tax Law and Practice Course Handbook, "Corporate Tax Shelters and Corporate Tax Management," in *The Tax Executive*, "The Role of Mark-to-Market Accounting in a Realization-Based Tax System," in *Taxes*, "Short Sales and Short Sale Principles in Contemporary Applications," in *N.Y.U. Tax Institute*, "Equity Derivative Products: Financial Innovation's Newest Challenge to the Tax System" in *Texas Law Review*, "Risky and Riskless Positions in Securities" in *Taxes*, and "Income Deposit Securities: Old Debt/Equity Principles Applied to a New Financial Product" in *Derivatives Financial Products Report*. He received a 2006 Burton Award for Legal Writing for his article on the Business Enterprise Income Tax.

John M. Samuels

John Samuels is GE's Vice President and Senior Counsel for Tax Policy and Planning. He is responsible for GE's worldwide Tax Organization and for the Company's global tax planning and tax compliance operations. He is a member of GE's Corporate Executive Council, the GE Capital Corporation Board of Directors and the GE Pension Board.

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