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Globalization and Taxation

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ABSTRACT

Pre-globalization tax systems were devised in an environment where international trade was restricted by tariffs and transportation costs, and capital movements were nearly non-existent. Now that these restrictions are reduced, taxation can have spillover effects that cross national borders. This has increased the power that tax rates have over the conduct of international economic activity, which could cause some potential problems such as the loss of government tax revenue and the distortion of investment location decisions. The goal of this study is to provide an introduction to this new issue in international public finance and a summary of the debate surrounding it. This study outlines evidence that shows that multinational firms routinely use tax avoidance to reduce their global tax burdens. The study then provides an introduction to the debate on whether or not tax competition is good or bad. In conclusion the study provides an econometric analysis of the relationship between tax rates and international flows of U.S. investment, and finds that tax rates have no statistically significant impact on the location of U.S. PPE investment and a declining influence on U.S. FDI investment.

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I: AN INTRODUCTION TO GLOBALIZATION AND INTERNATIONAL CAPITAL TAXATION

The past few decades have seen rapid technological advancements in areas such as computers, communication, and transportation. These advancements have allowed an unprecedented level of high-speed global communication and transportation that have transformed the global economy. This is a transformation from a global economy divided by national borders to a new global economy, which increasingly behaves as a single world market. In this transformation national borders are slowly losing their relevance, and nations are becoming increasingly interdependent. Now government policies, which once had no effect on the global economy, can have a global impact. One such policy area is the taxation of capital income. Tax systems were previously devised in an environment where international trade was restricted by tariffs and transportation costs, and capital movements were nearly non-existent. Now that these restrictions are reduced, taxation can have spillover effects that cross national borders. This has increased the power that tax rates have over the conduct of international economic activity, which could cause some potential problems such as the loss of government tax revenue and the distortion of investment location decisions. The goal of this study is to provide an introduction to this new issue in international public finance and a summary of the debate surrounding it.

1. THE FORCES OF GLOBALIZATION

Globalization itself is not so much an inevitable economic force as it is a combination of changes in government policy and new technologies made available since the end of World War Two. Immediately following the war, an international framework

of political institutions was created that contributed to globalization by creating greater political and economic stability. The United Nations and regional organizations like the European Union, the Organization of American States, and the Organization of African Unity all helped to create greater political stability. Greater financial stability was brought to the world through the creation of the International Monetary Fund. The task of managing global economic development was given to the World Bank, and the General Agreement on Tariffs and Trade was created to reduce barriers to global trade. Also exchange rate regimes were liberalized by most governments, thus opening the way for a global capital market. The results of these government policies are that the average tariff rate has dropped from 40 percent in 1950 to 5 percent in 1980 (Tanzi, 1995), that gross volume of turnover in foreign exchange markets averages $1.5 trillion per day (Frankel, 2000), and trade volume has grown at an average annual rate of 5.1 percent while world output has only grown at an average annual rate of 2.1 percent (Tanzi, 1995). Thus in many ways globalization was and is dependent on certain political policies.

Globalization was not only the product of government policies; it was also created by technological advancements in transportation, computers, and communication. Thanks to new developments like supertankers, roll-on-roll-off cargo ships, and containerized cargo, the average ocean freight and port charges per short ton of U.S. imports and exports fell from $95 in 1930 to $29 in 1990 (in 1990 U.S. dollars). Air transportation has also become cheaper, with revenue per passenger mile falling from $0.68 in 1930 to $0.11 in 1990 (in 1990 U.S. dollars) (Frankel, 2000). Advances in communications have also had a powerful effect on the global economy by reducing the cost and increasing the efficiency of international communication. For example, between

1930 and 1990 the cost of a three minute phone call between New York and London fell from $244.65 to $3.32 (in 1990 U.S. dollars) (Frankel, 2000). The computerization of production is also a driving force behind globalization, since it has allowed the international production processes used by multinational corporations to become more efficient by integrating them through global computer networks. All of these political and technological forces have had many positive effects on everyone's daily lives. The world's resources are better allocated, thus increasing living standards. Also, people may choose from a greater variety of goods and services, and they may travel in ways that were once prohibitively expensive. Yet, not only has trade become internationalized, so have economic distortions like those caused by taxation. Thus governments must now consider the international impact of their tax systems.

2. THE ECONOMICS OF INTERNATIONAL CAPITAL INCOME TAXATION

The primary problem with the world's tax system in this climate of globalization is that both source-based and residence-based taxes are being used simultaneously. The source and residence principles are the two methods of capital income taxation. According to the source principle, income should be taxed by the nation in which the income was generated, while the residence principle holds that income should be taxed by the nation in which the income's recipient lives. If source-based taxes are used to the exclusion of residence-based taxes then capital import neutrality is achieved. Capital import neutrality means that both the foreign and domestic owned firms within a country face the same tax rates because they both pay taxes only to the country in which they are located, and thus neither group of firms can have a tax advantage against the other. However if residence-based taxes are used to the exclusion of source-based taxes then

capital export neutrality is achieved. Capital export neutrality means that investment location will not be influenced by tax rates because investors will only pay taxes to their country of residence not to the country in which they invest. Therefore tax rate differences will not influence investment because regardless of where the investment is located the resulting income will be taxed at the same rate (Ondrich and Wasylenko, 1993). Due to the fact that both principles are currently used by the nations of the world, taxes have the capacity to distort global economic behavior[1].

If the nations of the world were to decide to use only one of these tax principles, the world's tax system would have less distortionary effects on the world economy (Tanzi, 1995). Yet, it is unlikely that either form of taxation will be eliminated. One reason for this is simply that nations have more revenue options if they use both principles of taxation. The Residence principle allows nations to tax the income that their residents have earned in other counties, while the source principle allows governments to export a portion of their tax burdens to other nations by taxing the income of foreigners. The rational for taxing the income that a nation's residents have earned in other countries is that a nation's citizens have a duty to support the expenses of their government, thus even the income that they earn in other countries should be taxed. The rational for taxing the income of foreigners is that all income generated within a nation benefits from the services provided by that nation's government, such as spending on infrastructure, education, security, and research and development. Thus nations have the right to tax income, even if it is going to foreign recipients, since this income benefited from

[1] Examples of these distortions include influence over the location of international investment, the financing of multinational affiliates, the determination of transfer prices used in intra-firm trade, and the location of research and development spending.

government services. Therefore in today's world we have both forms of taxation, and we will continue to have both forms of taxation.

3. POTENTIAL CONCERNS

There are two main concerns arising from the world's use of both principles of taxation. The first of these is that differences between tax regimes will lead to a loss of tax revenue. Multinational corporations do not have to relocate production facilities to take advantage of lower taxes in another country. Instead they can use various accounting methods to shift profits from affiliates in high tax nations to affiliates in low tax nations. These methods involve using debt, instead of equity, to finance affiliates in high tax countries, the manipulation of trade between related affiliates in order to reduce the reported profits of affiliates in high tax countries while increasing the reported profits of affiliates in low tax countries, and conducting research and development in countries with high royalty withholding taxes so that these taxes do not have to be paid. All of these methods can be used to minimize a multinational corporation's global tax burden, thus posing a threat to many governments' financial stability.

The second concern is that the vast differences that exist between the world's tax regimes will distort real economic behavior. There is the fear that such differences could effect how much is invested and where that investment will be located. For the sake of efficiency, investment should be located where it can receive the highest possible returns. Thus investment should flow to firms able to produce at the minimum cost and to the locations where this production can be conducted at the minimum cost. However, once source-based taxes enter the analysis, firms focus on maximizing post-tax returns. This could lead to production being carried out in an area with higher than optimal costs but

lower taxes. For example, a firm could choose to produce in a low tax country with high production costs because the lower tax payment offsets the higher production costs. Although the firm is maximizing its post-tax returns and the country is benefiting from the investment, economic resources are being wasted on every unit of production as a direct result of the tax differences. There is one caveat to this concern, which is that nations have many non-tax characteristics that may be more important than tax considerations, such as available resources, infrastructure, the education of the workforce, and the accessibility of relevant markets (Bond, 2000).

4. THE STRUCTURE OF THIS STUDY

Thus the fact that the tax regimes of the world use both source and residence based tax systems in today's environment of globalization could cause revenue loss and economic distortions on a global scale. The next two sections of this paper will take an in-depth look at the problem of revenue loss and the debate that has arisen concerning what should be done about this loss. Section II will study various methods of tax avoidance commonly used by multinational firms, and it will cite empirical evidence, which shows that such behavior is common. If the rise of globalization and the structure of the world's tax system give multinational firms some freedom of choice about how much tax they must legally pay, would not such competition be good in that it motivates governments to provide quality services at lower costs? Section III of this paper will be a discussion of the current debate surrounding the answer to this question. As in all political debates the answers depend more on personal political philosophy than on any tangible truth, and thus this is a debate that will always exist. Section IV will look at the potential problem of economic distortions, and will consist of an empirical analysis of the

effect that tax rates have on investment location decisions. The results of this analysis contrast similar previous work by implying that taxes do not have a high level of influence on investment location decisions. Thus the world's tax system may not distort real economic activity as badly as some have feared.

II: THE PROBLEM OF REVENUE LOSS

Recent empirical findings suggest that taxes do have a powerful distortionary impact on business activities carried out by multinational firms, such as how they finance their affiliates, conduct intra-firm trade, and conduct research and development. These activities are attempts at tax avoidance, and they lead to a loss of tax revenue on a global scale.

Multinational enterprises are a product of globalization, and they are powerful members of the global market place. These firms consist of subsidiaries spread across the globe that divide between them the various phases of the parent company's production process. Each subsidiary has a specialized purpose, and they are each placed in nations that have the geographic, economic, and government environments best suited for the objectives of the subsidiary's specialty. Due to the global nature of multinational firms, they are not rigidly constrained by national borders or the legal environments within those borders. If a multinational firm has an affiliate in a high tax nation, the firm can use various methods to shift the affiliate's profits to low tax environments, thus minimizing the multinational's global tax burden. Thus multinational firms go through a great deal of effort to rearrange their financial structures around various tax systems. This is an example of the distorting influence tax systems can have on international commerce in today's globalized economy.

The financing of foreign affiliates provides a simple method to help in multinational firms' attempts to minimize tax obligations. If a parent company finances investment in its foreign affiliates through the use of equity, then its foreign profits are taxed in the affiliate's host country, and no tax is owed in the parent company's country until the profits are repatriated. If the parent company finances its investment with debt, then the affiliate pays interest which can be deducted from its taxes and the parent company receives income from the interest. Therefore multinationals tend to finance investment in a foreign affiliate with equity when the affiliate is located in a low tax environment, and with debt when the affiliate is located in a high tax environment (Hines, 1999). The empirical studies in this area are consistent with these tax incentives. Hines and Hubbard (1990) found that affiliates that were financed with loans from the parent corporation face a higher average tax rate than affiliates that were financed with equity. Also, Grubert (1998) found that high corporate tax rates in a nation where an affiliate is located are correlated with higher interest payments and lower dividend payments to the parent corporation.

Transactions between affiliates of multinationals compose a major share of all international trade. In fact, one third of today's international trade in manufactures occurs within firms (Tanzi, 1996). This is due to the growing influence of multinationals in the global economy and the fact that multinationals tend to be vertically integrated with numerous affiliates producing raw, intermediate, and final goods. For example, raw materials might be acquired by affiliate A in country B. Then they are shipped to affiliate C in country D to refine the raw materials into component parts, and finally these parts are transferred to affiliate E in country F to assemble the finished product. When

components are transferred from one affiliate to another, a transaction involving a transfer price is required by international law. Transfer prices are the prices that are charged among related companies for goods or services. The international rules governing these transfer prices require that they be based on what the good or service would be worth on the world market (Bond 2000). Yet many of the components that are transferred have no markets from which a market price can be determined. For example, the production of a modern aircraft may require millions of parts, many of which are produced specifically for that model of aircraft and are not sold in any market (Tanzi, 1996). Therefore governments cannot determine if most transfer prices are accurate. This leaves multinationals with a great deal of freedom in how they set their transfer prices and allows such price determination to become a method of tax avoidance. For example, multinationals typically reduce the prices charged by affiliates in high tax countries for components provided to affiliates in lower tax countries. This allows the multinational to reduce its global tax burden by shifting profits from high tax countries to low tax countries (Hines, 1999).

Two studies that provide evidence of tax-motivated transfer pricing are Grubert and Mutti (1991) and Hines and Rice (1994). Grubert and Mutti (1991) study the effect of tax rates on the profit/sales ratios of U.S. controlled affiliates in 29 countries. Their study implies that an affiliate in, "a country with a 40% tax rate will report profits of 5.6% of sales, compared to 12.6% in a country with a 20% tax rate." (Grubert and Mutti, 1991, pp. 287-288). Hines and Rice (1994) include 59 countries in their study and conclude that tax rates do have a significant influence on reported profitability. In fact their study implies that, "raising the tax rate from zero to 1 percent lowers [reported]

profits by 20 percent..." (Hines and Rice, 1994, p.168). The fact that these studies find a negative correlation between tax rates and before-tax reported profits, suggests that tax avoidance is a common occurrence.

Finally, the location of research and development is also influenced by tax rates. Evidence of this is provided in a study by James Hines, which finds that affiliates are indeed more research and development intensive if they are located in nations with high royalty withholding taxes (Hines, 1999). International differences in royalty withholding taxes influence R&D decisions because such withholding taxes increase the cost of importing technology, and in many cases importing technology and domestic R&D are substitutes. Therefore firms in countries with relatively high royalty withholding taxes will tend to spend more on R&D so that they can import less technology.

The extent to which methods of tax avoidance are used can be seen in the large amounts of business activity that occur in tax havens. James Hines conducted a study that identified forty-one countries as the world's tax havens. These nations account for 1.2 percent of world population and 3 percent of world GDP. Yet these havens also account for 25 percent or $359 billion of the $1.35 trillion in global corporate activity conducted by U.S. multinational enterprises, 26 percent of U.S. corporate assets, 21.4 percent of U.S. corporate equity, and 30.6 percent of U.S. corporate profits. However these tax havens only account for 4.3 percent of U.S. corporate employment and 4.2 percent of U.S. corporate plant, property, and equipment (Hines, 1994). Such disproportionately large holdings of U.S. assets and profits by tax havens shows that U.S. corporations shift some of their profits to tax havens to avoid taxation. If U.S.

multinationals shift profits to such a large degree, then most other multinationals must shift profits to the same degree in order to remain competitive.

Thus we have seen that taxes do distort economic behavior such as the financing of foreign affiliates, the conduct of intra-firm trade, and the location of research and development. Not only are these distortions anticipated by economic theory, but also they have been measured through a number of empirical studies. All of this evidence suggests that tax avoidance is a common occurrence in today's global economy. This is a cause for concern among many national governments, especially ones that provide large levels of government services, which fear a significant loss of revenue from such tax avoidance behavior. However, for those who believe that governments are inherently inefficient, the freedoms offered by tax avoidance are seen as a positive development, since the resulting tax competition will encourage governments to be more efficient. Thus a debate has arisen over the issue of whether or not the effects of tax competition should be reduced.

III: THE ARGUMENTS FOR AND AGAINST TAX COMPETITION

The forms and levels of taxation that a nation uses have always been dependent on the desired level of government spending and the redistributive aims of the country, and have always been shaped at the sub-national level by tax competition between local governments. However the reduction of trade barriers, such as tariffs and capital controls, and the resulting rapid globalization of trade and investment have dramatically increased the amount of influence that tax systems have on the international economy. Thus the high mobility of capital and the rising international influence of tax systems have put pressure on national governments to continually review their tax systems in

order to make their jurisdictions more attractive for capital investment. Some fear that such reviews only result in lower tax rates on capital income and that such tax competition could lead to a prisoner's dilemma scenario in which national governments race to the bottom and all become worse off. There are two opinions on what the effects of this international competition will be. Some believe that such tax competition will force governments to be more efficient, while others believe that such competition could destabilize the progressive tax systems upon which the modern welfare state depends.

1. ARGUMENTS FOR TAX COMPETITION

The proponents of international tax competition tend to have the view that governments are inefficient leviathans, in which elected officials and government employees are just as focused, if not more so, on maximizing their own welfare as they are on maximizing the welfare of their constituents. In such a government environment, constraints are required to limit this natural tendency to be wasteful. Thus proponents of the leviathan view of government tend to see the rise in international tax competition as an emerging potential cure for government waste. It is their hope that tax competition will bring to bear on national governments the same market forces that cause efficiency among private firms. The proponents of this view look to an article written by Charles Tiebout in 1956 titled "A Pure Theory of Local Expenditures" as the most elegant description of how competition between governments can bring about efficient levels of government spending. They apply Tiebout's theory to the case of international tax competition in order to show that international tax competition will actually increase global welfare. They believe it will do this by lowering tax rates, which will increase

economic efficiency and living standards, increasing government efficiency, and forcing taxes to be more equitable by making them commensurate with benefits.

1.1 THE LEVIATHAN VIEW OF GOVERNMENT

The traditional view of government spending is that governments are constrained by the citizens' preferences for public spending as expressed through the political process. It is believed that, when all the members of the political process act to defend their own interests, the government's policies will reflect the will of the people. This principle of self-interest is the common foundation of both democratic politics as well as capitalism. However, what is not as commonly commented on is that it is not only the voter who acts in his or her own self interest, but also those who hold positions in government. This group is composed of both politicians, who are somewhat constrained by elections and the desire to stay in office, and bureaucrats, who are under no such democratic constraints. While it may be in the voter's self interest for high quality government services to be provided at the lowest possible rate of taxation, it is in the government official's self interest to have enough surplus revenue to keep government free of the rigors of cost minimizing efficiency (Brennan and Buchanan, 1977). Due to this divergence in the self-interest of constituents and government officials, a new constraint on government spending is needed. This new constraint must not be a new political institution, since that would only repeat the same divergence. Thus proponents of the leviathan view of government see market forces as the best possible constraint on government waste.

1.2 TIEBOUT'S THEORY

Tiebout's model of government competition envisions a market for public goods composed of two types of agents: 1) voter-consumers, who each have a unique set of preferences for government service-taxation packages and are willing to move to whichever government jurisdiction best satisfies these preferences, and 2) governments, which exist in large numbers and each have unique packages of services and taxes. The major assumptions in this model are that voter-consumers are fully mobile, have full knowledge of the differences that exist between government service-tax packages, and that governments only impose benefit taxes. In this market for public services, voter-consumers communicate their preferences for government services and taxation not through participation in a political system, but by moving from one jurisdiction to another. Thus the model sees the normal political process of voting in elections as being unresponsive in matters of public spending, and thus the only option left to the voter-consumer is to move to whatever jurisdiction best satisfies its preferences. This model works well for supporters of the leviathan view of government since they see government spending as being more under the control of politicians and bureaucrats than under the control of the constituency. Once voter-consumers have located in the jurisdictions that best meet their preferences for public goods and taxes, the government is little more than a broker for public services. Since the preferences of the governments and their voter-consumer residents perfectly match up, the government demand for services accurately depicts the public's demand for public services. If a voter-consumer learns that a government jurisdiction is offering the same services at the same quality as those offered by his or her current jurisdiction, but at a lower tax rate, then the voter-consumer will

move to that jurisdiction. In order to keep their residents, each government must constantly strive to increase the quality of the government services provided while also working to produce those services at a lower average cost so that taxes can be lowered. Thus an efficient market for public goods is created (Tiebout, 1956).

1.3 APPLYING TIEBOUT'S THEORY TO THE GLOBAL TAX SYSTEM

For proponents of the leviathan view of government, this would be the ideal environment for the governments of the world to operate in. However this environment can only exist if tax competition is allowed to exist, mobility is free of costs, and taxes are made to function as benefit taxes whenever possible. One of the greatest concerns of those who oppose tax competition is that it could make funding the social programs of the welfare state more difficult. However, the supporters of tax competition believe that tax rates should reflect the benefits derived from those taxes. Thus welfare states should not tax mobile international capital and multinational enterprises too heavily in order to fund social programs because international capital and multinationals derive few benefits from such programs. For example, international capital and multinational corporations derive benefits from government spending in national defense, crime reduction, education, and research, but they do not derive much benefit from government spending on subsidies for the poor, aid for the disabled, environmental protection, and so on. Thus tax competition proponents argue that welfare states are having financial problems in today's highly globalized economy not because of tax competition, but because of improperly structured tax systems that force mobile corporations and international capital to pay for government programs that they do not need (McLure, 1986). Supporters of tax competition tend to believe that if welfare states used more benefit taxes, so that the taxes

imposed on an individual or corporation reflect the benefits derived from such taxation, tax competition would not be much of a problem.

The opponents of tax competition might argue that the programs of the welfare state could not survive in such a Tieboutian system of benefit taxation, but this might not necessarily be the case. The poor are not the only ones who benefit from social programs; even the wealthy derive some benefits from them. For example, the social programs of the welfare state provide the wealthy with a type of insurance that the private market cannot provide. This would be insurance against exploitation by a poverty stricken majority and against an increasing crime rate. There is even evidence of a welfare state that has survived in a Tieboutian system of taxation thanks to a recent empirical study. This welfare state is Switzerland and its canton system of government. In Switzerland each canton has the freedom to design its own tax system, and the people have total freedom to live in any canton they want. In such a small country one would think that the wealthy would move to the cantons with the lowest transfer payments while the poor would move to the cantons with the highest transfer payments, thus causing the collapse of the welfare state in Switzerland. On the contrary, the welfare state in Switzerland has survived even though it is conducted at the canton level with little assistance from the federal government (Feld, 2000). Although the assumptions of the Tiebout model can never be fully realized at the international level, proponents look to this study as evidence that the Tiebout model can work.

1.4 REFORMS TO IMPROVE TAX COMPETITION

The kinds of reforms that supporters of tax competition would implement would seek to make the assumptions of the Tiebout model as much of a reality as possible.

Thus one of the reforms that proponents of tax competition would support is the simplification of tax codes so that taxpayers find them easier to understand. Making reporting requirements less complex could do this, and it would also lower the costs of compliance. Simplifying the tax system could also include eliminating exemptions, which would eliminate more complex tax regulations and increase efficiency by broadening the tax base.

Increasing the global use of benefit taxes would be another reform that proponents of tax competition would like to see carried out. Such benefit taxes would work by earmarking the revenues of certain taxes so that they would be used to fund certain government programs. Thus all taxes would be proportional to the benefits that they helped to fund. For example, taxes on gasoline and vehicles would go to support highway funding, since those who buy gasoline and vehicles are the ones who most directly benefit from highway spending. Another example would be that taxes on the incomes of individuals could help support their nation's programs for the poor, since these people have to live with the social consequences of poverty. According to proponents of the Leviathan view, not only does this make taxation more fair by making people pay only for the government services that they gain utility from, but it also makes the size of the government's spending for a certain program rise and fall according to the demand for that program's services. For example, the less people spend on gasoline and vehicles the less there is for the government to spend on highways, but the lower demand for gasoline and vehicles implies a lower demand for highways so less money will be needed for their maintenance (Brennan and Buchanan, 1978). The way this tax structure restricts the size of government is one of its most positive characteristics, from the

viewpoint of those who support tax competition since they tend to support the leviathan view of government.

Another reform that supporters of tax competition would support would be efforts to increase the international mobility of labor, since a mobile labor force is one of the assumptions of the Tiebout model. The forces of globalization would increase the mobility of the world's labor force if it were not for a few government barriers that have basically trapped these people within their nation's borders. In fact before the Great Depression there was far more labor mobility than there is today even though transportation is now much cheaper. The problem is that the backlash against globalization that occurred during the great depression forced governments to enact a number of immigration restrictions that still exist today. Thus today there are limits to the number of immigrants that any one nation will accept in a single year, and even those who are accepted face challenging obstacles. Also, individuals are required to have a visa before they are allowed to even visit a foreign land, and in order to work there they must acquire hard to get work permits. Even the accreditation of diplomas and degrees is a barrier to labor mobility, since these obstacles make it harder for one's skills to be recognized by foreign employers or educational institutions (Tanzi, 1995). It should be noted that there will always be barriers to labor mobility such as linguistic and cultural barriers, but if these government barriers could be eased than labor would have greater mobility. This would increase the allocation of the world's labor supply, give individuals some of the freedoms of choice which exist in the Tiebout model, and it would offer some protection from the inequitable tax burdens that the opponents of tax competition anticipate.

Thus proponents of tax competition and the leviathan view of government believe that governments are inherently wasteful, and that tax competition could create an efficient market for public goods by forcing governments to be more efficient. As mentioned above, there is evidence that such a market for public services could be created through the use of a tax system like that outlined in the Tiebout model and used in the Swiss cantons. All that would be necessary to make the world's tax system more like that of the Tiebout model would be to decrease the costs of compliance, increase the use of benefit taxes, and increase the mobility of the world's labor force. These reforms would allow both increased economic efficiency and increased government efficiency, while at the same time allowing tax competition to continue with few negative effects.

2. THE ARGUMENTS AGAINST TAX COMPETITION

Those who oppose tax competition share a belief that income from capital will increasingly face a lighter tax burden due to the downward pressure that tax competition exerts on tax rates. It is believed that such large differentials between tax rates and such large reductions in the tax burden faced by capital income will result in negative equity consequences on a global scale. The equity consequences are that the ever dwindling tax revenues acquired through the taxation of capital income will force governments to make up for the revenue loss by increasing the rates of more regressive taxes such as consumption taxes and payroll taxes. The increasing reliance on such regressive taxes will reduce the redistributive, and revenue-earning capacity of tax systems in developed welfare states. A prospect that is increasingly disturbing when one looks at current demographic trends. In the not too distant future welfare states will have to care for populations in which the number of retired people is larger than the number of people

who are of working age. If welfare states do not have the revenues necessary to fund such massive social spending programs, the only recourse will be for such social benefits to be reduced. Unfortunately they would be reduced at a time when they are most needed due to the destabilizing effects of globalization. The greatest fear of opponents of tax competition is that such reductions in social spending could cause a backlash against globalization, which overall is having a positive effect on the world economy. Therefore, the arguments of those in opposition to tax competition consist of a series of predictions that start with decreased capital income taxation and end with the possible break down of the welfare state and globalization, and thus they see the end of such harmful tax competition as being centrally important if the benefits of globalization are to be realized. This discussion of the arguments against tax competition will consist of summaries of the three main arguments used by opponents of tax competition. These arguments are that tax competition leads to the under taxation of capital income, a loss of equity in the global tax system, and the undermining of funding for the social programs of the welfare state.

2.1 THE CAUSES OF UNDER-TAXATION IN TAX JURISDICTIONS

There are three jurisdictions that have the right to tax income made from international commerce, and opponents of tax competition believe that these jurisdictions will place an increasingly lighter tax burden on such income. These jurisdictions are the demand jurisdiction, in which a firm sells its products, the supply jurisdiction, in which a firm produces its products, and the residence jurisdiction, in which a firm is incorporated or administered. According to the opponents of tax competition, the incentives and tax collecting abilities of these three jurisdictions do not match up in a way that leads to the

needed taxation of international corporate income. Currently the residence and supply jurisdictions have the greatest ability to collect taxes on international earnings, since firms must have a physical presence in these jurisdictions. However they lack the incentive to aggressively tax such income due to the highly competitive nature of such taxation. Taxation among supply and residence jurisdictions is competitive due to the emergence of "production and administration tax havens". These are countries with preferential tax regimes that provide foreign firms with reduced tax rates to the point that these firms are receiving government services at the expense of domestic firms and individuals. Opponents of tax competition believe that the emergence of this new kind of tax haven, all nations have had to reduce their tax rates out of fear that international firms will locate elsewhere. Such preferential regimes have spread to the point that there are now 103 countries offering special tax concessions to foreign firms that agree to set up production or administration facilities in their country (Avi-Yonah, 2000). It is expected by opponents of tax competition that such tax havens will become increasingly attractive to international firms due to the rise of electronic commerce, which will make it easier for firms to locate operations in these tax havens. This will be especially true of firms that are involved with the growing trade in digitizable goods and services. Of these two jurisdictions, the residence jurisdictions will have the hardest time collecting revenues since they already offer their multinational firms exemptions from the taxation of foreign source income or deferral of such taxation until the profits are repatriated. This allows multinational firms to avoid paying taxes on foreign source income indefinitely.

Demand jurisdictions have the greatest desire to tax such income since the income is being earned there in the first place. But the demand jurisdiction will find it

increasingly difficult to find firms with a permanent establishment or nexus in its jurisdiction. The reason for this is that tariffs are continually decreasing. Tariffs once forced foreign firms that wanted a large market share in a demand jurisdiction to set up a permanent establishment in order to avoid paying tariffs. Now that tariffs are decreasing, the need to set up such permanent establishments is also decreasing. Also the emergence of electronic commerce will make it easier for firms to sell their products without a physical presence in the demand jurisdiction. Thus all three tax jurisdictions will find it increasingly more difficult to tax international commerce due to the emergence of production and administration tax havens, electronic commerce, and greater investment mobility. In a global tax system like this, in which every tax jurisdiction will have difficulty taxing capital income, there is bound to be revenue loss. Opponents of tax competition believe that this revenue loss will have negative global consequences on the equity of taxation.

2.2 EFFECTS OF TAX COMPETITION ON EQUITY

For opponents of tax competition, the most disturbing consequence of tax competition is that income derived from capital is being taxed at ever decreasing effective rates. Since the wealthier segments of society save a larger proportion of their wealth and derive a larger proportion of their income from non-wage sources than do those in the lower economic segments of society, these lower effective tax rates on capital have serious implications for the equity of the global tax system. In order for a tax system to be considered equitable, individuals in the wealthier segments of society should face an average tax rate that is at least equal to that faced by individuals in lower economic classes. However it is the argument of the opponents of tax competition that

competition has caused tax rates on capital income to reach effective rates that are extremely low or nearly zero. Therefore it is possible for the wealthy to face lower average tax rates than those faced by less wealthy individuals. The reason for this is that if less wealthy individuals receive most of their income from earned income while wealthy individuals receive most of their income from capital investments that are taxed at a near zero effective rate, then it is possible for the average rate of taxation faced by the wealthy to be less than that faced by less wealthy individuals. A situation like this is a serious threat to the progressive tax rates and redistributive goals of national governments.

These low effective rates of taxation on capital also threaten to make national tax systems more regressive due to the revenue loss that it forces governments to experience. This is due to the fact that governments must raise revenue, and if international capital cannot be taxed as heavily as it once was then the loss must be recovered by raising other tax rates. Unfortunately the taxes that are left to governments to increase for added revenue tend to be regressive. For example, between 1965 and 1995 government revenues as a percentage of GDP among OECD countries saw a significant increase. However during this same period among OECD countries, income taxes as a percentage of government revenues have remained relatively unchanged while payroll taxes as a percentage of government revenues have increased on average from 18 percent to 25 percent and consumption taxes have increased from 12 percent to 18 percent (Avi-Yonah, 2000). Trends like these suggest that national governments have compensated for tax competition related revenue losses by increasing the tax burden imposed on less wealthy citizens who tend to have wealth that is less mobile. Thus the opponents of tax

competition believe that tax competition will possibly result in a regressive world tax system.

2.3 TAX COMPETITION AND THE FUTURE OF THE WELFARE STATE

Progressive taxation is one of the principles upon which the welfare state was founded. The benefits of the welfare state tend to go to members of the lower and middle classes, and are theoretically paid for by imposing on the upper classes a higher average tax rate. Thus the tax systems and social benefits of the welfare state act as a redistribution of wealth from the upper classes to the middle and lower classes. However it is the argument of tax competition opponents that tax competition will allow capital income to be taxed at ever-lower effective rates thus making the tax systems that support the welfare state regressive in nature. This has the effect of putting the burden of paying for the social benefits that go to the lower and middle classes on the lower and middle classes themselves. When this occurs the redistributive goals of the welfare state collapse. Under normal conditions this in and of itself would be a great threat to the welfare state, but current demographic trends in the number of future retired persons will put even greater stress on the welfare state.

The fact that in the future retired persons will out number working age people is a great danger to the future stability of the welfare state. In 1990 18 percent of the OECD countries' population was over the age of sixty. By 2030 the World Bank expects this number to rise to an average of 30 percent. Percentages like these will be true for most countries, but other countries like Japan will have a far more difficult time. In 2040, Japan is expected to have a population in which 52 percent are over the age of 65 while only 20 percent will be of working age. The reason for this is that in most countries birth

rates have dropped because parents have decided that having large families is too expensive. At the same time the quality of health care has greatly improved, thus allowing people to live longer lives (Beck, 1995). The problem with these trends is that the baby boom generation is living longer, but failed to produce birth rates high enough to easily fund their government pensions. In times like these welfare states will need every penny they can find. Thus in this kind of environment the revenue losses created by tax competition become all the more grave.

Some may ask if the welfare state is simply no longer economically useful, but opponents of tax competition answer that globalization and its resulting economic flux requires a social safety net. The more open a country is to international trade, the more economic risk it places on its citizens. It is the opinion of opponents of tax competition that the government has a responsibility to reduce the risk that globalization places on its citizens. This risk is reduced by the social safety net, especially unemployment and worker retraining benefits. Such benefits not only prevent the population from becoming desperately frustrated with international economic forces out of their control, but it also allows a nation's work force to adapt to the demands of the global market more quickly by retraining them for new roles. Without the welfare state, nations would be sluggish in their response to global economic change, thus causing painful consequences for ordinary citizens displaced by the forces of globalization. If significant segments of society came to have an overly negative view of globalization, then globalization itself could end along with its positive side effects. It should be noted that globalization is not some unstoppable economic force; instead it relies on political support. Globalization is the product of liberalized capital movements, reduced tariffs, and floating exchange rates.

These are all political policies that could be reversed if citizens without a proper social safety net allowed their fears to get the best of them. This is exactly what happened at the beginning of the Great Depression, when the incredible forces of globalization present throughout the nineteenth century were brought to a halt in 1914 due to political barriers like isolationism, increased tariffs, and immigration restrictions (Frankel, 2000). If such a backlash against globalization were to occur, all of the many benefits of globalization would be eliminated.

2.4 REFORMS TO REDUCE TAX COMPETITION

With all of these negative consequences of tax competition, the opponents of tax competition believe it is vital that reforms of the global tax system are made that reduce this competition. Since some variation in tax rates is inevitable, the opponents of tax competition do not believe that nations should have equal tax rates. Instead they call for the elimination of harmful tax competition and the creation of a tax floor that would set a global minimum for the world's tax rates. Two international organizations that are committed to the reduction of harmful tax competition are the Organization for Economic Cooperation and Development and the European Union. However, before discussing their reform initiatives it will be useful to explore how they define harmful tax competition.

A report, commissioned in 1998 by the Organization for Economic Cooperation and Development, addresses this issue and outlines various criteria that can be used to identify tax systems that are behaving in a harmfully competitive manner. The criteria listed in the OECD report are in agreement with similar criteria listed in European Union publications (Commission of the European Communities, 1997), and therefore they can

safely be considered an internationally recognized standard for determining if a tax regime is harmfully competitive. The first characteristic of a competitive tax regime is that there is a low or zero effective tax rate on the relevant income. This simply means that the tax rate is unusually low when compared to similar taxes imposed by other countries. The second characteristic is that the regime is "ring fenced", which means that the low tax rates offered to foreign companies by the nation's tax system are not offered to companies which are owned domestically. This is an attempt by the taxing nation to protect its own revenue base from the unusually low tax rates that it is offering to foreign companies. The third characteristic of a competitive tax regime is that there exists a lack of transparency in the administration of the regime. This usually implies that the tax rates offered by a regime to foreign companies are the product of secret negotiations, thus making it harder for the foreign company's home country to take defensive measures. The last key characteristic is that there is a lack of effective exchange of information between the nation in question and other governments. The use of such secrecy by a tax regime usually implies that the country is helping foreign companies to hide information regarding revenue and profits from the companies' home countries (OECD, 1998). Any national tax system that has a combination of two or more of these characteristics fits the generally recognized international definition of a harmfully competitive tax system.

A report released by the OECD in April of 1998, titled "Harmful Tax Competition, An Emerging Global Issue", outlines a number of reforms that will be needed if harmful tax competition is to be reduced. The reforms fall into three categories: 1) domestic legislation, 2) tax treaties, and 3) international cooperation. The recommendations for domestic legislation include actions that nations can take

unilaterally to reduce the benefits of tax competition. The overall effect of these reforms would be to reduce the tax advantages available to foreign-source income that has already benefited from preferential tax regimes. By doing this it is hoped that the incentives for taking advantage of tax competition will be reduced. The recommendations concerning tax treaties aim at strengthening the bilateral relationships that already exist between nations. The goal of these treaty recommendations is to ensure that tax treaties are not used to facilitate tax competition. One of the most important tax treaty recommendations is to increase the exchange of information between tax administrations, since bank secrecy laws are what allow income to be hidden in tax havens. The report also encourages both OECD members and nonmembers to cooperate to prevent the further spread of harmful tax competition. It is recommended that nations work together to encourage each other to refrain from adopting new preferential tax measures, review their existing tax regimes in order to find any harmful competitive practices, and remove any preferential tax regimes that are found. None of these reforms will be successful without the cooperation of a large number of nations, but if this cooperation can be achieved harmful tax competition would be greatly reduced and so will the revenue problems faced by many governments (OECD, 1998).

Some argue that the cooperation needed to reduce the problem of harmful tax competition can only be achieved through the creation of a world tax organization. The creation of international organizations has been popular since the end of World War Two. For example, the World Trade Organization deals with trade matters and the International Monetary Fund deals with issues surrounding macroeconomic stability and balance of payment equilibrium, but there is no institution for international tax issues. However

nations no longer compete with tariffs or exchange rates; today they use tax incentives. Thus they argue that it is time for the creation of an international organization that would deal with global tax issues. Such an organization could generate relevant tax statistics for the world, provide technical assistance to nations with tax administration problems, and provide a global forum for the resolution of tax disputes (Tanzi, 1998). Like the WTO's work to harmonize tariff rates, this tax organization could work towards the creation of a minimum tax level, which would reduce international spillover effects.

3. CONCLUSION

As in most policy debates, neither side has a monopoly on the truth, and thus which side one takes largely depends on one's beliefs regarding the proper role of government. Although international tax competition is relatively new, tax competition at the sub-national level has been in existence ever since local governments have been given the power to impose taxes. Therefore there is a large collection of literature on the subject of tax competition among local governments. A literature review by Timothy Goodspeed has looked at the literature on sub-national tax competition to see what it has to say about the international tax debate. According to Goodspeed, the literature implies that tax competition leads to an efficient allocation of resources only if benefit taxes are used, otherwise externalities are created which will lead to inefficient location decisions (Goodspeed, 1998). Thus the literature on sub-national tax competition implies that there are only two choices, either increase the world's use of benefit taxes or reduce the amount of international tax competition. Thus whether or not tax competition can be allowed to continue depends on how realistic it is to increase the global use of benefit taxes. One's opinion of benefit taxes depends to a large degree on one's view of the

government. Those who view the government as an uncontrollable leviathan will support benefit taxes and tax competition at all levels of government, and those who have a benevolent view of government will tend to reject benefit taxes as being inequitable and seek the reduction of tax competition. Thus the debate surrounding international tax competition is only a part of a much larger and older debate about the nature of government and its role in society.

IV: AN EMPIRICAL STUDY ON THE EFFECT OF TAX RATES ON INVESTMENT LOCATION DECISIONS

In today's economy there is a global market for capital, and this market faces numerous nationally based systems of taxing the income earned by capital. One potential problem with this high degree of differentiation among the world's tax regimes is that it might influence where investment is located. The problem with tax rates influencing investment location decisions is that this represents a distortion of real economic behavior, thus causing an inefficient allocation of the world's resources. Investment should be located where production can be conducted at the lowest possible cost, and this will happen if firms maximize their returns to investment. Yet, under real world conditions tax rates distort how a firm maximizes its returns. For example, if differences in tax rates change a firm's decision about where to locate, its production could occur in a nation with higher costs but lower taxes. The firm may be maximizing its after-tax returns, but it is not maximizing its pre-tax returns. Thus its higher production costs create a global dead weight loss.

This statistical study attempts to answer two related questions. First, this study attempts to determine how sensitive the investment location decisions of U.S. firms are to

tax rate variation across countries. Second, this study attempts to determine if this sensitivity has changed over time. If the widely held notions of globalization are true and the world is indeed becoming an integrated market place where nations are becoming more alike, then one would think that tax rate differences between countries would be influential in U.S. firms' investment decisions. This is because tax rate differences would be one of the few remaining differences found between nations. But these widely held notions might not be accurate. If the forces of globalization increase international trade, then economic theory would imply that such trade would lead nations to specialize in the economic activities in which they have a comparative advantage. The implication of this line of argument is that rather than being a force of conformity, globalization could be a force of specialization. In a world where nations are specializing in certain types of economic activity, a nation's economic specialty would exert far more influence on U.S. investment decisions than would tax rate differences.

In order to address these questions, this paper uses data published in the U.S. Commerce Department's Direct Investment Abroad Benchmark Surveys for the years 1977, 1982, 1989, and 1994. These surveys contain financial data regarding the foreign affiliates of U.S. parent companies. From these data, measurements were acquired for U.S. investment abroad and for foreign effective tax rates that have all been aggregated to the country level. This study then combines these data with data from other sources in order to control for the non-tax features of the various countries, such as GNP per capita, population, and economic openness. After the data has been collected, there are between 39 and 48 countries for each of the four years studied.

This study then regresses a measure of U.S. multinational investment in each country on tax rate variables and measures of non-tax characteristics of the countries. Two measures of U.S. investment are used. The first is Plant, Product, and Equipment (PPE), which measures the book value of real productive assets held by American owned foreign affiliates. The second is Foreign Direct Investment (FDI), which measures the book value of the equity that American parent corporations hold in their foreign affiliates. Regressions are run using each type of investment in order to see what the effects of tax rate differentials might be on the two different types of investment.

1. REVIEW OF RECENT LITERATURE

This section will review four recent studies that are related to the one presented in this paper: Grubert and Mutti (1991), Hines and Rice (1994), Altshuler, Grubert, and Newlon (1998), and Grubert and Mutti (2000). Just as in this paper, these four studies all use cross-sectional data, and they all attempt to measure the effect that tax rates have on the location of U.S. investment abroad. Two of these studies, Grubert and Mutti (1991) and Hines and Rice (1994), use data from the 1982 benchmark survey on U.S. direct investment published by the U.S. Department of Commerce, while the other two used data from the U.S. Treasury corporate tax files compiled by the Internal Revenue Service.

Both Grubert and Mutti (1991) and Hines and Rice (1994) share one potential problem; their results may not be very useful if one is studying the effect of tax rates on the global location of U.S. productive capital investment. This is because both studies give tax havens a disproportionate amount of influence in their models. Grubert and Mutti (1991) do this in the way they structure their tax variable, and Hines and Rice (1994) do this by having a data set in which over half of the observations are tax havens.

The potential problem with giving tax havens such disproportionate influence is that there are many cases in which the PPE owned by an affiliate in a tax haven is actually used in a branch in some other nation (Grubert and Mutti, 2000). In such cases the real capital attributed to a tax haven is not being used in that nation for any productive economic purpose. It is only being funneled through the tax haven, before it reaches its final location, in order to lower the parent corporation's global tax burden. Thus if a study is attempting to measure what influence tax rates have on the final location of productive investment, it should not give tax havens a disproportionate influence because tax havens are rarely the final location of such investment.

Grubert and Mutti (1991) regress the log of net PPE on two different forms of the effective tax rate and on a number of non-tax characteristics in order to analyze the distribution of U.S. PPE among manufacturing affiliates in 33 countries. The first form of the tax variable that they use is the log of one minus the effective tax rate, calculated as total taxes paid divided by net pre-tax income. Using this form of the tax variable Grubert and Mutti are able to measure the sensitivity of investment demanded to changes in post-tax returns to investment, and they calculate an elasticity of 1.96. However this result was not statistically significant. The second form of the tax variable that they use is the inverse of the effective tax rate. According to Grubert and Mutti this form of the tax variable indicates that, "... tax incentives have a disproportionate effect at low rates." (Grubert and Mutti, 1991, p. 288). Thus the formation of the variable is based on the assumption that the elasticity becomes larger at lower tax rates. However the potential problem with this tax variable is that nations with such low tax rates tend to be tax havens. Thus this variable gives tax havens a disproportionate amount of influence in

Grubert and Mutti's model. As previously mentioned, this could have reduced the accuracy of this study's measurements of PPE location. Using this form of the tax variable Grubert and Mutti calculate a positive and highly significant tax coefficient of 0.11. Grubert and Mutti put this into perspective by stating, "... based on the inverse formulation, a reduction in the host country tax rate from 20% to 10% is projected to increase U.S. affiliates' net plant and equipment in the country by 65%." (Grubert and Mutti, 1991, p. 290). Yet, this tax coefficient of 0.11 calculated by Grubert and Mutti using their inverse formulation may have been made less accurate by its reliance on tax havens and the tax avoidance activities that occur in them.

Hines and Rice (1994) also regress the log of net PPE on host country effective tax rates in order to consider the distribution of U.S. PPE among 73 countries. In their regression they calculate a tax coefficient equal to –3.3 that is statistically significant. However this large tax coefficient only translates into a –1 elasticity of PPE ownership with respect to tax rates (Hines, 1999). Hines and Rice are focusing on the activities of U.S. corporations within tax havens, thus half of their sample consists of tax haven countries. Also their sample is not restricted only to the activities of manufacturing firms, but also includes financial firms as well. By including so many tax havens, which generally are used only as an intermediate location of capital in order to lower tax burdens, and including the activities of financial firms, which specialize in such tax avoidance behavior, Hines and Rice may have encountered the same problem faced by Grubert and Mutti (1991). Thus their tax elasticity may also be an inaccurate measure of the influence of taxes on the global allocation of capital.

The other two studies covered in this review, Altshuler, Grubert, and Newlon (1998) and Grubert and Mutti (2000), use data from the U.S. Treasury corporate tax files compiled by Internal Revenue Service. Altshuler, Grubert, and Newlon (1998) use data from 1984 and 1992 in order to determine the sensitivity of investment location decisions to tax rate differences across 58 countries for each of these two years and to determine if this sensitivity has increased over time. They regress the log of PPE on the log of one minus the effective tax rate, calculated by dividing total taxes paid by pre-tax net income, and non-tax characteristics of the countries for both years. As in the Grubert and Mutti (1991) study, this form of the tax variable measures the sensitivity of real capital investment to after tax returns. The tax coefficient calculated by the 1984 regression is 1.32, but is not statistically significant. The tax coefficient calculated by the 1992 regression is 2.68 and is statistically significant at the five percent level. The results of this study imply that the sensitivity of investment to tax rate differences has increased over time, since the elasticity has risen from insignificance, in 1984, to 2.68, in 1992.

The most recent study on the influence of tax rates on investment location decisions is Grubert and Mutti (2000). They use cross-sectional data on the manufacturing affiliates of U.S. manufacturing parents to analyze the distribution of real capital across 60 countries. Their data comes from the 1992 Treasury tax file, and just as in their previous study they use log (1-t) as their tax variable, where t is the effective tax rate calculated by dividing total taxes paid by pre-tax net income. A regression of the log of PPE on this tax variable and other variables, which represent non-tax country characteristics, produced a tax elasticity of 3.23, which is statistically significant. This

indicates that a one percent change in after tax returns will lead to just over a three percent change in investment.

To summarize, the previous work on this topic indicates that taxes do have a statistically significant effect on the location of U.S. real capital investment. Although Grubert and Mutti (1991) and Hines and Rice (1994) may have been influenced by the disproportionate influence of tax havens in their data, Altshuler, Grubert, and Newlon (1998) and Grubert and Mutti (2000) do not appear to have given tax havens any disproportional influence. Both of these later studies calculated statistically significant tax elasticities of about three. However they also used the same data source for their regressions and nearly identical models, so it is not surprising that they achieved nearly the same results.

This study is different from the previous literature it that it is the only study to include four years of data, while the most included by any previous study was two. Also, this is the only study to use not only PPE to measure investment, but FDI as well. Finally, this study is the only study, among those that use the U.S. Commerce Department's Benchmark Survey, to include geography dummy variables in its specification. All of these facts could be seen as improvements over the previous studies.

2. DATA SOURCES AND MEASUREMENT ISSUES

The principle data source for this study is the U.S. Direct Investment Abroad Benchmark Survey, which is conducted by the U.S. Department of Commerce. These surveys have been published only for the years 1977, 1982, 1989, and 1994, and they contain various types of data regarding the activities of foreign affiliates of U.S. parent

corporations. By using the Benchmark survey this study has limited itself to analyzing U.S. investment patterns instead of global investment patterns because the goal of this paper is to study the effect of differences in host country tax rates on investment choices across foreign locations, not on the choice between investing domestically and investing in a foreign market. This study also restricts its analysis to the investment activities of majority owned manufacturing affiliates of manufacturing U.S. parents. This is done to increase the accuracy of the study's measurements of PPE allocation because the PPE assets reported by a financial affiliate may be located in a country other than the one in which the affiliate is incorporated. By excluding the activities of financial firms from this study, the accuracy of PPE allocation measurements are maximized. From these surveys information regarding the investment patterns of U.S. parent companies and the tax burdens faced by their affiliates in various countries were collected and aggregated at the country level so that each observation consists of the information for an entire country, not just a single affiliate.

The Benchmark data are then augmented with country specific non-tax data acquired from other sources in order to control for other country characteristics that might influence location decisions. Data regarding population, GNP per capita, and average inflation rates were obtained from the World Bank Development Reports. Population and GNP per capita both measure the size of an economy, while inflation measures an economy's price stability. Nations with high population and GNP per capita levels represent larger markets, which are more attractive to investors, while high inflation rates would tend to discourage investment since they are advantageous for debtors not creditors. Greater GNP per capita may also indicate a more productive

workforce, and thus would encourage investment. Since the gains from low tax rates might be less in nations with restrictive trade regimes, a measurement of each nation's economic openness was acquired from the Penn World Tables. This measurement is calculated by adding the value of a nation's imports and exports and dividing this total by the value of the nation's GDP. It thus represents the volume of international trade conducted by each nation as a percentage of its GDP. The final non-tax variables in this data set are five geographic dummy variables, with the five geographic categories being: Europe, South America, Africa and the Middle East, Asia, and Australia/New Zealand. Since this is a study of U.S. investment patterns, this set of variables attempts to control for the cost of doing business with nations that do not border the United States. These dummy variables also capture any of these region's characteristics such as capital concentration and workforce productivity.

2.1 Measuring Assets

The benchmark surveys provide two means for measuring U.S. investment in its affiliate corporations. The first is net Plant, Product, and Equipment (PPE), which measures the book value of real productive assets held by U.S. owned firms. The second is U.S. Foreign Direct Investment (FDI), which measures the book value of the ownership claims in foreign affiliates held by controlling U.S. parent corporations. For example, assume there are two U.S. controlled foreign affiliates each with $100 million in assets entirely invested in PPE. One affiliate is 100 percent owned by its controlling U.S. parent, while the other is 60 percent owned by its controlling U.S. parent and 40 percent owned by investors in the affiliate's host country. Both affiliates account for $100 million in PPE investment. However, establishing the first firm accounts for $100

in FDI, while the other firm only accounts for $60 million in FDI. Although PPE is the measurement used by the previous literature, both PPE and FDI have their strengths and weaknesses, and thus both have been used by this study.

One potential problem with the PPE measure that is evident in the above example is that it can overstate the amount of a parent corporation's investment. As seen above, if an affiliate is responsible for $100 million in PPE investment, but it is only 60 percent owned by its parent corporation, then the parent corporation is still credited with $100 million in PPE investment even though only 60 percent of the financing for that investment came from the parent corporation. However the rationale for giving the parent corporation credit for the $100 million in PPE investment is that since the parent corporation is the majority owner it is responsible for deciding the way in which the affiliate's assets are invested, even though it is not responsible for all of the financing.

Another problem with the PPE measure is that the PPE assets reported by an affiliate may be located in a country other than the one in which the affiliate is incorporated. This problem usually occurs in tax havens, which often host large numbers of financial affiliates and holding companies. Restricting this study exclusively to the activities of majority owned manufacturing affiliates of manufacturing U.S. parents is an attempt to minimize this problem. Also, there are few countries in this study that could be considered tax havens.

FDI also has it weaknesses. One of these is that it is a measure of equity investment, not necessarily investment in productive capital such as factories and machinery. For example, if an affiliate were sold from one parent firm to a new parent firm for $100 million, this $100 million would be registered as FDI investment into the

country in which the affiliate is located. Yet none of this money has been used to purchase improvements that might make the affiliate more productive, it is simply a transfer of equity from one parent to another. Thus neither PPE nor FDI is a perfect measure of investment. PPE is the superior measure for investments that go directly to increasing productivity, instead of equity financing or repatriation, while FDI is the superior measure for determining exactly how much investment financing came from each country.

2.2 Measuring Effective Tax Rates

Effective tax rates for the manufacturing affiliates of manufacturing U.S. parents in each country were calculated by dividing total taxes paid by total pretax net income. Both of these variables were acquired from the Commerce Department Benchmark Surveys. The primary problem with this tax variable is that it is endogenous to investment location decisions. If a nation has a sudden increase in investment that qualifies for certain incentive packages, like accelerated depreciation, then that nation's effective tax rate would be understated for that year. The only way to avoid this problem is to use an exogenous tax variable like the statutory corporate income tax rate. However although they are exogenous, statutory rates are less accurate than effective tax rates. This is due to the fact that the statutory tax rates do not capture the ad hoc investment incentives that governments may use to attract companies, while effective tax rates do. This is because effective rates are calculated using the total taxes paid by the affiliates in that country, while statutory rates only represent tax legislation. Thus they do not represent what is actually happening in the economy. Therefore this study, just as all the

studies mentioned in the literature review, uses the effective tax rate to construct the primary tax variables.

Ideally a study would use the statutory rates as a robustness check, but unfortunately these statutory rates were not available for all the years of this study. Thus government revenue as a percentage of GDP was used instead. However it should be noted that this measure is not necessarily correlated with the tax rates faced by capital. It is possible that a nation could have revenues that are a higher percentage of GDP due to a high personal income tax rate or perhaps the nation receives large revenues from non-tax sources. This variable also acts as a measure of government spending for services that would attract investment. Yet despite these facts, this variable is a rough approximation of each nation's tax environment, since governments that tend to have higher levels of taxation would also have revenues that are a higher percentage of GDP. Due to this variable's ability to roughly describe each nation's tax environment and to the fact that it is likely to be exogenous to investment location decisions, it can be used to check the robustness of this study's results. Unfortunately, the data sets using government revenue as a percentage of GDP have fewer observations due to the fact that the information was not available for all the nations covered by the study.

3. DESCRIPTIVE STATISTICS

Once all these investment, tax, and country characteristic variables were collected, four data sets were constructed using effective tax rates as the tax variable and four smaller data sets were constructed using government revenue as a percentage of GDP as the tax variable. The effective tax rate data sets have between 37 and 48 observations, where each observation represents a country. The smaller data sets have

between 32 and 42 observations. The descriptive statistics for these data sets are provided in tables one through eight. There are some notable outliers in each of the four years. In the 1977 data set there is a maximum effective tax rate value of 92.81%, and in the 1982 data set there is a maximum effective tax rate value of 98.88%, while the means were 41.07% and 46.08% respectively. Although these values are highly unlikely, they are true observations and removing them from the data sets had no effect on the quality of the regressions. There are also some notable inflation outliers. The inflation outliers for all four years are the inflation rates of South American countries, which seem to have a tendency toward hyperinflation. The most notable of these is Brazil with an inflation rate of 227.8% in 1989 and 900.3% in 1994. One more notable outlier is the maximum value of the openness variable, which for all four years has a value between 306.21% and 386.23%. All of these extreme openness values are the responsibility of Singapore, an extremely small nation that conducts an immense amount of international trade. There is also an interesting trend that is immediately noticeable in the descriptive statistics and this is the fact that the mean effective tax rate has decreased from 41.07% in 1977 to 28.14% in 1994. This has occurred while the mean level of government revenue as a percentage of GDP has remained relatively stable during the same period. This trend is shown in table nine. Downward pressure on tax rates of this sort may have been caused by the various tax reform efforts that were carried out across the globe during the 1980s in response to the pressures of international tax competition. The fact that government revenue as a percentage of GDP has remained stable while the average effective tax rate has decreased implies that revenues lost due to lower tax rates have been recovered by broadening the tax base or increasing other tax rates.

4. ESTIMATION RESULTS

The model used in this study assumes that the supply of U.S. investment is a function of effective tax rates and country characteristics, such as population, GNP per capita, inflation, openness to international trade, and geographic location relative to the United States. This specification is very similar to the ones used in the previous studies, except that the earlier studies tended to use the log of one minus the effective tax rate as their tax variable, while this study simply uses the log of the effective tax rate[2]. The effective tax rate used by this study and the previous studies were all calculated in the same way, by dividing total foreign taxes paid by total pre-tax net income. As mentioned previously four regressions were run for each year with each regression using a different combination of investment and tax variables. Out of the four regressions done for each year the primary regression was one that used net PPE as the investment variable and effective tax rates as the tax variable. This is considered, by the previous literature, to be the most accurate model for measuring the sensitivity of real capital investment to tax rates. A second regression was then run using FDI as the investment variable instead of PPE. FDI measures more financial investment than does PPE and therefore can be used to determine whether or not financial investment is more sensitive to tax rates than is real capital investment. The third and fourth regressions run for each year use PPE and FDI respectively as the investment variable, but replace effective tax rates with government revenue as percentage of GDP. This is done as a sensitivity check in order to see how the use of an exogenous tax variable might affect the regression results. However, it should be noted that government revenue as a percentage of GDP also acts as a measurement of

[2] Log (t) was used instead of log (1-t) because there is no fundamental difference between the two, except that the signs of the tax coefficients are opposite.

government services which could potentially attract investment. Unfortunately, due to a lack of available information the data sets using government revenue as a percentage of GDP are smaller than the data sets using effective tax rates. Thus their results cannot be directly compared. The results of all of these regressions are given in tables 10 through 13.

The results of the first regression, where PPE is used as the investment variable and effective tax rates are used as the tax variable, for the four years of this study imply that tax rates have no significant influence on the allocation of American real productive capital investment. However population, GNP per capita, and openness to international trade all had a positive statistically significant impact on investment location decisions, and a country's location in Europe, Africa, the Middle East, or Asia had a negative and statistically significant impact on investment location for all four years of the study.

The fact that this study finds that effective tax rates have no statistically significant relationship with U.S. PPE location contrasts previous studies. Grubert and Mutti (1991) and Hines and Rice (1994), using the U.S. Commerce Department's benchmark survey, calculated statistically significant tax coefficients of 0.11 and –3.33 respectively for 1982. However it should be noted that, while they did use the same data source as this study, the structures of their studies tended to give activities within tax havens a large degree of influence. Their measures for PPE may have been influenced by the fact that PPE owned by affiliates in tax havens tends to be used by branches in other nations. Thus their regressions may have measured financial investment to a larger degree than this study has. This might explain why they found significance while this study did not, since financial investment is more mobile and more sensitive to tax rates

than is real productive investment. Altshuler, Grubert and Newlon (1998) and Grubert and Mutti (2000), using the U.S. Treasury corporate tax files, found statistically significant tax coefficients of 2.7 and 3.23 respectively for 1992. The difference between their results and the results of this study may be explained by the fact that the information available in the U.S. Treasury corporate tax files allowed these two studies to use a larger number of observations.

The results of the second regression, where FDI is used as the investment variable and effective tax rates are used as the tax variable, imply that tax rates do have a significant influence on U.S. FDI, but that this influence is on the decline. The FDI regression for the four years of this study produced the following tax elasticities: -1.021 for 1977, -0.420 for 1982, -0.652 for 1989, and -0.436 for 1994. The tax elasticity for 1982 is not statistically significant, but the tax elasticities for the other three years are statistically significant at the five percent level. One should note that FDI cannot be used as an accurate measure of real productive capital investment. This is due to the fact that FDI is only a measure of the value of the equity that U.S. parent corporations have in their foreign affiliates, not a measure of the value of the productive capital used by those affiliates. Yet these regressions are still interesting because they show that a nation's tax rates do have an impact on the amount of financial investment a nation will receive from U.S. firms, but this is not a very powerful impact since these elasticities are inelastic in every year of statistical significance except 1977. They are also interesting because a comparison of these elasticities implies that financial investment's sensitivity to tax rates has declined from an elasticity of -1.021 in 1977 to -0.436 in 1994. This decrease in the tax elasticities has most likely been caused by a convergence in effective tax rates among

member countries of the OECD. The majority of FDI flows occur among OECD members, and according to the International Monetary Fund the dispersion of these nation's effective tax rates around the average effective rate, as measured by the standard deviation, has declined from eight percent to five percent (Gropp and Kostial, 2001). This convergence of effective tax rates among OECD members and the previously mentioned steady decline in the world's effective tax rates suggest that tax competition is an important issue and that governments may have redesigned their tax systems in order to prevent revenue loss from tax avoidance.

The results of the third regression, where government revenue as a percentage of GDP is used as the tax variable and PPE is used as the investment variable, produced a statistically significant coefficient only for 1982. This coefficient was 1.588 and was significant at the five percent level. It should be noted that this coefficient is positive. Thus government revenue as a percentage of GDP is probably a better measure of a nation's government services than it is of the tax burden faced by an affiliate in that nation. This would explain the positive coefficient, since government services like investments in infrastructure, education, and security would attract investment. However since the other years failed to reach statistical significance, this set of regressions suggests that in general the amount of revenue raised by a government as a percentage of its GDP has no significant impact on U.S. PPE investment.

The final set of regressions, where government revenue as a percentage of GDP is used as the tax variable and FDI is used as the investment variable, produced results that were similar to those just mentioned in the PPE regressions. However the one year that achieved statistical significance was 1989 rather than 1982. The 1989 tax coefficient is

0.654, which is significant at the 10 percent level. This result implies that U.S. FDI investment had an inelastic sensitivity to the level of revenues raised by a government in 1989 as a percentage of its GDP. Also, the coefficient is positive just as it was in the PPE regression. This is more evidence of the attractive power that government services have over investment. Over all this set of regressions along with the previous PPE regressions suggest that generally government revenue as a percentage of GDP has no real impact on the level of U.S. PPE or FDI investment, thus effective tax rates are more relevant in capital location decisions.

5. CONCLUSION

Tax rate variation has the potential of distorting real economic activity and causing an inefficient allocation of the world's resources. Thus measuring the degree to which national tax regimes influence the allocation of U.S. real productive investment has been an active area of research in international taxation. The most recent studies all indicate that effective tax rates do play a significant role in influencing location decisions. However, this study is different from the previous literature it that it is the only study to include four years of data, while the most included by any previous study was two. Also, this is the only study to use not only PPE to measure investment, but FDI as well. Finally, this study is the only study, among those that use the U.S. Commerce Department's Benchmark Survey, to include geography dummy variables in its specification. All of these facts could be seen as improvements over the previous studies.

The results of this study offer evidence that contrasts the findings of the previous literature, since this study's results suggest that a nation's effective tax rates have no

statistically significant influence on U.S. real productive investment as measured by PPE. These results also suggest that a nation's tax environment does have a statistically significant influence on U.S. financial investment as measured by FDI, but this influence has been declining from an elasticity of -1.021 in 1977 to -0.436 in 1994 due to a possible convergence of international tax rates. When these same regressions were run using government revenue as a percentage of GDP instead of effective tax rates, the PPE regressions had a significant coefficient of 1.588 in 1982 and the FDI regressions had a significant coefficient of 0.654 in 1989, but no other years had significant coefficients. Thus this measure of a nation's tax environment seems to have no real impact on PPE or FDI investment for most years of the study. The general conclusion of this study is that a nation's tax regime has little or no influence on the location of U.S. productive investment, but it does have a significant although declining influence over the location of U.S. financial investment. The importance of these finding is that they suggest tax rate variation may cause little distortion in the location of productive assets, and a declining distortion in the location of financial assets. Thus the major problem with the world's tax system may not be the distortion of investment location, but the revenue loss that results from multinational firms using tax regime differences to avoid taxes.

SECTION V: CONCLUSION

Globalization has radically increased the potential influence that tax policy has on international economic activity. Before today's forces of globalization were realized, the nations of the world could impose taxes using both the source and residence principles of taxation without there being any large effects on international economic behavior. Yet in today's world this practice of using both forms of taxation can lead to the potential

problem of distorting investment location decisions, and the lack of harmonization can lead to losses of tax revenue. The goal of this study was to provide an introduction to this new issue in international public finance and a summary of the debate surrounding it.

In section two it was shown that through tax avoidance multinational firms have the capacity to greatly reduce their tax burdens. The primary forms of this tax avoidance involve the financing of foreign affiliates, the setting of prices used in intra-firm commerce, and the location of research and development. According to empirical studies cited in this section, all of these forms of tax avoidance are commonly used by multinational firms.

Such tax avoidance creates an element of competition between the world's tax regimes. According to one's views regarding the role of government, one could either see this competition as a positive force for creating government efficiency or as a destructive force threatening to eliminate the welfare state and all hope for greater global equity. The primary difficulty with all of the various reforms proposed by both sides of this debate is that trying to reform taxes on a global scale would be a massive challenge because there will always be incentives for a small group of nations to cheat on any international agreement. The only thing that both sides of the debate agree on is that the world's tax system is in need of some kind of reform.

The fourth section of this study conducted an empirical analysis in order to determine the influence that tax rates have on U.S. investment location decisions. Its results were that tax rates have little or no influence on the location of PPE investment and an inelastic and declining influence on FDI investment. These results are a contrast to the results of previous studies which all indicated that tax rates do have a significant

influence on investment location decisions. Further research will be needed before the ways in which tax rate differences might influence investment location decisions are fully understood.

Table 1: 1977 Effective Tax Rate Data Set

Variable	Number of Observations	Mean	Std Dev	Minimum	Maximum
FDI	37	3105.27	5982.37	39	33128
PPE	37	2326.19	4847.95	74	25990
Tax Rate	37	41.07%	17.58	6.91%	92.81%
GNP/Capita	37	4132.73	3038.96	420	9970
Population	37	25.201	29.001	0.358	116.1
Inflation	37	22.04%	44.70	4.5%	267.8%
Openness	37	70.30%	56.95	15.17%	332.5%

Table 2: 1977 Gov. Rev. % of GDP Data Set

Variable	Number of Observations	Mean	Std Dev	Minimum	Maximum
FDI	32	3491.88	6355.16	58	33128
PPE	32	2621.19	5158.29	74	25990
Gov. Rev. % of GDP	32	33.43%	11.51	13.45%	55.18%
GNP/Capita	32	4435.34	3018.67	420	9970
Population	32	26.961	30.182	0.358	116.1
Inflation	32	23.13%	48.02	4.5%	267.8%
Openness	32	67.34%	58.04	15.17%	332.5%

Table 3: 1982 Effective Tax Rate Data Set

Variable	Number of Observations	Mean	Std Dev	Minimum	Maximum
FDI	41	4219.61	7685.66	34	41890
PPE	41	3464.17	6808.08	55	32924
Tax Rate	41	46.08%	22.46	3.65%	98.88%
GNP/Capita	41	6032.68	5089.6	260	17010
Population	41	47.183	113.19	0.220	717
Inflation	41	16.45%	20.82	4.8%	136%
Openness	41	75.22%	63.36	14.89%	386.23%

Table 4: 1982 Gov. Rev. % of GDP Data Set

Variable	Number of Observations	Mean	Std Dev	Minimum	Maximum
FDI	37	4579.43	8012.74	34	41890
PPE	37	3746.7	7115.69	55	32924
Gov. Rev. % of GDP	37	32.7%	12.97	11.89%	61.21%
GNP/Capita	37	6048.92	4965.03	260	17010
Population	37	49.365	118.463	0.220	717
Inflation	37	16.732%	21.9	4.8%	136%
Openness	37	72.435%	64.187	14.89%	386.23%

Table 5: 1989 Effective Tax Rate Data Set

Variable	Number of Observations	Mean	Std Dev	Minimum	Maximum
FDI	46	6642.37	13061.163	84	61926
PPE	46	5052.26	11350.52	34	63636
Tax Rate	46	36.84%	22.98	1.85%	94.71%
GNP/Capita	46	9429.13	8445.38	250	29880
Population	46	49.964	124.82	0.260	832.500
Inflation	46	18.11%	37.30	1.1%	227.8%
Openness	46	78.75%	62.79	13.24%	368.65%

Table 6: 1989 Gov. Rev. % of GDP Data Set

Variable	Number of Observations	Mean	Std Dev	Minimum	Maximum
FDI	42	71.54.67	13559.29	84	61926
PPE	42	5429.62	11814.44	34	63636
Gov. Rev. % of GDP	42	28.20%	10.96	1.34%	47.99%
GNP/Capita	42	10023.33	8511.38	340	29880
Population	42	51.701	129.792	0.260	832.500
Inflation	42	18.776%	38.974	1.1%	227.8%
Openness	42	74.53%	58.82	13.24%	368.65%

Table 7: 1994 Effective Tax Rate Data Set

Variable	Number of Observations	Mean	Std Dev	Minimum	Maximum
FDI	48	9950.77	17188.63	186	90251
PPE	48	6808.83	12603.17	182	61008
Tax Rate	48	28.14%	15.59	1.43%	64.29%
GNP/Capita	48	11778.75	10597.76	280	37930
Population	48	76.944	211.634	0.404	1190.900
Inflation	48	46.16%	150.36	1.3%	900.3%
Openness	48	62.35%	56.01	13.47%	306.21%

Table 8: 1994 Gov. Rev. % of GDP Data Set

Variable	Number of Observations	Mean	Std Dev	Minimum	Maximum
FDI	34	12100.97	19853.07	198	90251
PPE	34	8440.35	14591.77	182	61008
Gov Rev % of GDP	34	31.46%	10.65	7.65%	48.1%
GNP/Capita	34	14528.53	10515.18	1200	37930
Population	34	27.465	29.20	0.404	125
Inflation	34	24.74%	83.42	1.3%	492.2%
Openness	34	57.82%	37.43	15.53%	181.26%

Table 9: Tax Trends

Tax Variable	1977	1982	1989	1994
Effective Tax Rate	41.07%	46.08%	36.84%	28.14%
Gov. Rev. % of GDP	33.43%	32.70%	28.20%	31.46%

Table 10: Regressions using Log of PPE and Log of Effective Tax Rate

Variables	1977	1982	1989	1994
Constant	-5.786** (-2.05)	-3.433 (-0.89)	-9.669** (-2.76)	-10.526** (-3.79)
Log Effective Tax Rate	-0.028 (-0.10)	-0.014 (-0.04)	-0.184 (-0.97)	0.309 (1.63)
Log Population	1.212** (6.06)	1.039** (3.88)	1.373** (7.25)	1.181** (7.08)
Log GNP/Capita	0.748** (3.85)	0.582** (2.83)	1.005** (5.85)	0.947** (6.64)
Log Inflation	-0.265 (-1.13)	-0.236 (-0.63)	-1.156 (-0.96)	-0.103 (-0.77)
Log Openness	1.405** (3.06)	1.46** (2.35)	1.727** (3.90)	1.672** (4.91)
Europe	-1.672** (-2.73)	-2.639** (-2.30)	-2.025** (-2.86)	-1.04* (-1.65)
South America	-0.616 (-0.90)	-0.86 (-0.67)	-0.372 (-0.44)	0.659 (0.84)
Africa and Middle East	-1.383* (-1.80)	-3.169** (-2.44)	-1.829** (-2.24)	-1.308* (-1.81)
Asia	-2.972** (-4.04)	-3.476** (-2.69)	-2.747** (-3.41)	-1.889** (-2.90)
Australia and Pacific	-0.564 (-0.69)	-1.525 (-1.09)	-0.065 (-0.07)	0.543 (0.63)
Adjusted R Squared	0.7214	0.4689	0.6825	0.6991
Number of Observations	37	41	46	48

Notes: 1) t values are given in parentheses, 2) **indicates significance at the 5% level, and 3) *indicates significance at the 10% level.

Table 11: Regressions using Log of FDI and Log of Effective Tax Rate

Variables	1977	1982	1989	1994
Constant	1.268 (0.43)	-0.012 (-0.00)	-4.864 (-1.31)	-6.294** (-2.10)
Log Effective Tax Rate	-1.021** (-3.41)	-0.420 (-1.39)	-0.652** (-3.25)	-0.436** (-2.12)
Log Population	1.215** (5.83)	0.95** (3.93)	1.175** (5.87)	1.114** (6.18)
Log GNP/Capita	0.708** (3.50)	0.665** (3.59)	1.087** (5.99)	1.044** (6.77)
Log Inflation	-0.75** (-3.07)	-0.574* (-1.70)	-0.256 (-1.48)	-0.208 (-1.44)
Log Openness	0.995** (2.08)	1.12** (2.00)	1.022** (2.18)	1.228** (3.34)
Europe	-1.64** (-2.57)	-2.43** (-2.35)	-2.032** (-2.72)	-1.298* (-1.91)
South America	-0.18 (-0.25)	-0.539 (-0.47)	-0.474 (-0.54)	0.397 (0.47)
Africa and Middle East	-1.486* (-1.86)	-3.577** (-3.05)	-1.706** (-1.97)	-1.504* (-1.93)
Asia	-3.053** (-3.98)	-3.391** (-2.91)	-2.573** (-3.02)	-2.042** (-2.90)
Australia and Pacific	-0.3 (-0.35)	-1.412 (-1.12)	-0.49 (-0.48)	-0.031 (-0.03)
Adjusted R Squared	0.7287	0.5814	0.6690	0.6760
Number of Observations	37	41	46	48

Notes: 1) t values are given in parentheses, 2) **indicates significance at the 5% level, and 3) *indicates significance at the 10% level.

Table 12: Regressions using Log of PPE and Log of Gov. Rev. % of GDP

Variables	1977	1982	1989	1994
Constant	-8.2** (-2.72)	-8.293** (-2.06)	-10.705** (-2.67)	-12.042** (-2.55)
Log Gov. Rev. % of GDP	0.471 (0.51)	1.588** (2.11)	0.209 (0.61)	0.083 (0.10)
Log Population	1.238** (6.33)	0.897** (3.59)	1.334** (6.32)	1.338** (7.32)
Log GNP/Capita	0.839** (2.24)	0.676** (3.13)	1.002** (4.67)	1.139** (2.94)
Log Inflation	-0.195 (-0.75)	-0.026 (-0.07)	-0.187 (-0.89)	-0.177 (-0.85)
Log Openness	1.346** (2.77)	0.951 (1.40)	1.734** (3.28)	1.706** (3.31)
Europe	-1.85** (-2.91)	-2.555** (-2.36)	-2.181** (-2.77)	-1.189* (-1.95)
South America	-0.696 (-0.99)	-0.142 (-0.12)	-0.321 (-0.35)	0.876 (1.13)
Africa and Middle East	-1.807** -2.09	-1.614 (-1.13)	-1.94** (-2.18)	-1.417* (-1.78)
Asia	-2.977** (-3.87)	-1.93 (-1.36)	-2.788** (-3.10)	-1.844** (-2.79)
Australia and Pacific	-0.716 (-0.88)	-1.592 (-1.21)	-0.283 (-0.26)	0.644 (0.79)
Adjusted R Squared	0.7438	0.5641	0.6482	0.7814
Number of Observations	32	37	42	34

Notes: 1) t values are given in parentheses, 2) **indicates significance at the 5% level, and 3) *indicates significance at the 10% level.

Table 13: Regressions using Log of FDI and Log of Gov. Rev. % of GDP

Variables	1977	1982	1989	1994
Constant	-4.909 (-1.49)	-4.208 (-1.08)	-7.396 (-1.62)	-15.388** (-3.08)
Log Gov. Rev. % of GDP	-0.272 (-0.27)	1.02 (1.41)	0.654* (1.68)	-0.673 (-0.80)
Log Population	1.02** (4.76)	0.768** (3.18)	1.074** (4.46)	1.25** (6.47)
Log GNP/Capita	1.091** (2.65)	0.688** (3.30)	0.952** (3.89)	1.69** (4.13)
Log Inflation	-0.627** (-2.21)	-0.489 (-1.37)	-0.426* (-1.77)	-0.156 (-0.70)
Log Openness	1.158** (2.18)	0.846 (1.29)	1.109* (1.84)	2.069** (3.79)
Europe	-1.932** (-2.78)	-2.381** (-2.28)	-2.483** (-2.77)	-1.255* (-1.95)
South America	0.13 (0.17)	0.234 (0.20)	-0.345 (-0.33)	1.088 (1.33)
Africa and Middle East	-1.649* (-1.74)	-2.421* (-1.75)	-1.866* (-1.84)	-1.208 (-1.43)
Asia	-3.281** (-3.89)	-2.395* (-1.75)	-3.019** (-2.94)	-2.161** (-3.09)
Australia and Pacific	-1.067 (-1.20)	-1.544 (-1.22)	-1.098 (-0.90)	0.167 (0.19)
Adjusted R Squared	0.6976	0.5872	0.5582	0.7722
Number of Observations	32	37	42	34

Notes: 1) t values are given in parentheses, 2) **indicates significance at the 5% level, and 3) *indicates significance at the 10% level.

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