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## Capital flows, taxation, and institutional variation

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all, even thin people get heart attacks, just at lower rates than obese people. In economic jargon, there is a positive externality from becoming obese, because the benefit from the induced research on heart attacks and diabetes will not accrue solely to obese individuals. We estimate that this positive externality, which benefits thin people, is at least as large as the transfer induced by Medicare from thin to obese people.

The conclusions of this research agenda cast doubt on the conventional wisdom about the costs of obesity, which fails to distinguish between private and public costs. There is no doubt that becoming obese imposes substantial medical costs on the obese individual, who is more likely to develop Type II diabetes, heart disease, strokes, and a number of other unpleasant chronic dis-

eases. Furthermore, becoming obese often imposes financial costs, such as a reduction in wages in some cases. My research suggests that the vast preponderance of these costs is private and paid for by obese individuals themselves. Moreover, some of the costs that are traditionally identified as public costs may actually be benefits. Rising obesity rates, for example, may bring forth greater innovative activity and ultimately treatments that benefit thin people as well. In this setting, policies such as taxes on junk food may lower social welfare rather than raising it while placing substantial burdens on obese individuals who already pay a substantial cost for their girth.

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<sup>1</sup> J. Bhattacharya and N. Sood, "Health Insurance and the Obesity Externality,"

*NBER Working Paper No. 11529, August 2005, and Advances In Health Economics And Health Services Research, 17 (2007), pp.279–318.*

<sup>2</sup> J. Bhattacharya and M.K. Bundorf, "The Incidence of the Healthcare Costs of Obesity," *NBER Working Paper No. 11303, May 2005.*

<sup>3</sup> I. Rashad and S. Markowitz, "Incentives in Obesity and Health Insurance," *NBER Working Paper No. 13113, May 2007.*

<sup>4</sup> J. Bhattacharya and M. Packalen, "Is Medicine an Ivory Tower?" *NBER Working Paper No. 13862, March 2008.*

<sup>5</sup> J. Bhattacharya and M. Packalen, "The Other Ex-Ante Moral Hazard in Health" *NBER Working Paper No. 13863, March 2008.*

## Capital Flows, Taxation, and Institutional Variation

Mihir A. Desai\*

Tariff reductions, falling transport costs, and reduced barriers to international capital flows have created extensive opportunities for multinational firms and investors in increasingly integrated global markets. For example, the outbound foreign direct investment (FDI) position of American firms grew at an average annual rate of 11 percent to \$2.4 trillion from 1982 to 2006 while inbound FDI to the United States grew to \$1.8 trillion. Foreign portfolio investment (FPI) has grown similarly. By 2005, 16 percent of all U.S. long-term securities (equity and debt) were

held by foreigners. Foreign holdings of American stocks increased from \$400 billion to \$2.3 trillion over the last decade, while American holdings of foreign stocks increased from \$600 billion to \$3 trillion.

In the midst of this rapid integration, investors and firms still face tax systems and investor protections that differ across countries, and these differences have the potential to affect major investment and financing decisions. Governments anxious to attract FDI often consider the use of tax incentives to lure multinational firms, and governments of FDI source countries—including the United States—often wonder whether their tax treatment of foreign income is appropriate. Similarly, investor protections and the broader institutional environment remain distinctive around the world and may influence investors' port-

folio decisions and firms' operational and financing decisions.

Recent research has advanced our understanding of the role of taxation and investor protections on capital flows and patterns of FPI. We also have considered the causes and consequences of tax avoidance activity; we have established how foreign and domestic activity interact in order to inform new welfare measures; and we have elaborated on how investment and financing decisions by multinational firms reflect the effects of taxes and varying institutional regimes.

### Portfolio Flows

Empirical efforts to isolate how taxation influences portfolio choice have produced mixed results. Investigating the

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relationship between cross-sectional differences in marginal tax rates and asset holdings is complicated by the incomplete nature of most household portfolios and the fact that income levels can influence both risk preferences and marginal tax rates. Efforts to examine how portfolios change in response to tax reforms must overcome the possibility that the observed changes reflect endogenous supply responses or other general equilibrium effects that may confound the influence of taxation on portfolio choices.

Dharmika Dharmapala and I attempt to overcome these empirical difficulties by analyzing a tax reform that differentially changed the tax treatment of otherwise similar instruments in a manner that is unlikely to have produced any endogenous supply response.<sup>1</sup> Specifically, we investigate how taxes influence portfolio choices by exploring the response to the distinctive treatment of foreign dividends in the Jobs and Growth Tax Relief Reconciliation Act (JGTRRA). JGTRRA lowered the dividend tax rate to 15 percent for American equities and extended this tax relief only to foreign corporations from a subset of countries. The division of countries into two separate groups was driven by regulatory concerns and was unrelated to future changes in investment opportunities or other regulatory efforts to change investment in these countries differentially. Given the relatively small share of their stocks held by American investors, it is unlikely that supply responses by foreign firms would be large. It is similarly unlikely that the effects of the reform on U.S. investors' portfolios would have been offset by clientele effects in asset markets. JGTRRA applied only to U.S. investor returns, leaving non-U.S. investor tax rates and asset demands unaffected.

This paper uses a difference-in-difference analysis that compares U.S. equity holdings in affected and unaffected countries. The international investment responses to JGTRRA were substantial, implying an elasticity of asset holdings with respect to taxes of -1.6. This effect cannot be explained by several potential alternative hypotheses, including dif-

ferential changes in the preferences of American investors, or investment opportunities, or time trends in investment, or any changed behavior towards tax evasion. These results show how FPI, and portfolio decisions more generally, are influenced by taxation.

Corporate taxes and investor protections also have the potential to influence FPI by changing the relative attractiveness of FPI and FDI as means of achieving international diversification. Dharmapala and I analyze whether the composition of U.S. outbound capital flows reflects efforts to bypass home country tax regimes and weak host country investor protections.<sup>2</sup> The potential effects of taxation on FPI result from the interaction between home and host country taxes. In particular, the United States taxes multinational firms legally domiciled here on their worldwide income. As a consequence of this policy, U.S. investors should prefer FPI as a means of accessing foreign diversification opportunities, particularly in low-tax countries where the residual tax imposed by the United States will be most burdensome. In effect, FPI allows investors to avoid any residual tax on investment income earned abroad arising from the worldwide tax regime. Conversely, the absence of the residual U.S. tax should make U.S. equity FPI sensitive to variations in foreign corporate tax rates, even after controlling for any effects of corporate taxes on levels of U.S. FDI. As such, the worldwide system of taxing income may vitiate the diversification benefits of multinational firms. Additionally, concerns about the rights available to minority investors might tilt them towards accessing those opportunities via investments in U.S. multinational firms that globally undertake FDI, to ensure that investor interests are better protected.

Our cross-country analysis indicates that a 10 percent decrease in a foreign country's corporate tax rate increases U.S. investors' equity FPI holdings by 21 percent, controlling for effects on FDI. This suggests that the residual tax on foreign multinational firm earnings biases capital flows to low corporate tax countries toward FPI. A single-standard-deviation

increase in a foreign country's investor protections is associated with a 24 percent increase in U.S. investors' equity FPI holdings. These results are robust to various controls, are not evident for debt capital flows, and are confirmed using an instrumental variables analysis. The use of FPI to bypass home country taxation of multinational firms is also apparent using only portfolio investment responses to within-country corporate tax rate changes in a panel from 1994 to 2005. Investors appear to alter their portfolio choices significantly to circumvent home and host country institutional regimes.

## Causes and Consequences of Tax Avoidance

Changing patterns of multinational firm activity have drawn attention to the role of tax havens and their effects on neighboring countries. More generally, accounts of rising tax avoidance by firms have generated interest in the effects of tax avoidance on economies, tax authorities, and investors. International variation in tax systems and the activities of multinational firms together have allowed insight into the causes and consequences of tax avoidance.

Typical accounts of corporate tax avoidance characterize such activities as transfers from the state to investors. This view has been questioned by a line of inquiry that emphasizes the nature of the agency problem in firms. Such a perspective is recommended by the fact that the state can be characterized as the largest minority shareholder in most firms given their claim on pretax cash flows via the corporate tax system. Alexander Dyck, Luigi Zingales, and I analyze the interaction between corporate taxes and corporate governance.<sup>3</sup> We show that the characteristics of a taxation system affect the extraction of private benefits by company insiders. A higher tax rate increases the amount of income that insiders divert and thus worsens governance outcomes. In contrast, stronger tax enforcement reduces diversion and, in so doing, can raise the stock market value of a company in spite of the increase in the tax burden,

as evidenced by patterns from the Russian stock market. We also show that the corporate governance system affects the level of tax revenues and the sensitivity of tax revenues to tax changes. When the corporate governance system is ineffective (that is, when it is easy to divert income), an increase in the tax rate can reduce tax revenues. We test this prediction in a panel of countries. Consistent with the model, we find that corporate tax rate increases have smaller (in fact, negative) effects on revenues when corporate governance is weaker.

Dharmapala and I examine whether these interactions are relevant for American firms, particularly those that undertake activity in tax havens.<sup>4</sup> We test alternative theories of corporate tax avoidance that yield distinct predictions on the valuation of corporate tax avoidance. We then use unexplained differences between income reported to capital markets and to tax authorities to proxy for tax avoidance activity. These “book-tax” gaps are larger when firms are alleged to be involved in tax shelters. OLS estimates indicate that the average effect of tax avoidance on firm value is not significantly different from zero, but is positive for well-governed firms as predicted by an agency perspective on corporate tax avoidance.

We use an exogenous change in tax regulations that affected the ability of some firms to avoid taxes abroad—the onset of so-called “check the box” regulations—to construct instruments for tax avoidance activity. The IV estimates yield larger overall effects and reinforce the basic result that higher quality firm governance leads to a larger effect of tax avoidance on firm value. The results are robust to a wide variety of tests for alternative explanations. Taken together, the results suggest that the simple view of corporate tax avoidance as a transfer of resources from the state to shareholders is incomplete given the agency problems characterizing shareholder-manager relations. This paper builds on previous work<sup>5</sup> that develops this measure of corporate tax avoidance and examines why managers undertake tax shelters. We discuss the broader importance of the book-

tax gap in a related paper.<sup>6</sup>

Aside from these interactions with the agency problem, tax havens are also of interest because they may have effects on tax revenues and real activity. C. Fritz Foley, James R. Hines, and I examine what types of firms establish tax haven operations and what purposes these operations serve.<sup>7</sup> Analysis of affiliate-level data for American firms indicates that larger, more international firms, and those with extensive intra-firm trade and high R and D intensities, are the most likely to use tax havens. Tax haven operations facilitate tax avoidance both by permitting firms to allocate taxable income away from high-tax jurisdictions and by reducing the burden of home country taxation of foreign income. The evidence suggests that the primary use of affiliates in larger tax haven countries is to reallocate taxable income, whereas the primary use of affiliates in smaller tax haven countries is to facilitate deferral of U.S. taxation of foreign income.

U.S. multinational firms are also more likely to establish new tax haven operations if their non-haven investments are growing rapidly, which generally confirms the notion that greater foreign investment increases the potential return to using tax havens. The analysis shows that 1 percent greater sales and investment growth in nearby non-haven countries is associated with a 1.5 to 2 percent greater likelihood of establishing a tax haven operation. This evidence also suggests that tax havens may serve to increase economic activity in nearby high-tax countries. Tax havens serve this function by indirectly reducing tax burdens on income earned in high-tax countries, and by attracting investment that may enhance the profitability of operations in those countries. Proximity allows firms to split up production processes and increases the extent to which firms can avoid taxes through transfer pricing. Evidence that firms with extensive nearby investments find it profitable to establish tax haven operations likewise implies that the availability of tax haven opportunities increases the attractiveness of investments in high-tax locations. While it is common to worry about

the role of nearby tax havens in diverting economic activity, these results indicate that the opposite may well be the case, as the ability to reduce tax obligations through judicious use of tax haven operations may stimulate greater investment in their high-tax neighbors.

## Domestic and Foreign Investment Interactions

There is considerable debate over the likely domestic effects of the rapidly increasing foreign activity by U.S. multinational firms. In particular, FDI flows to rapidly growing foreign markets generate fears that such investment displaces domestic employment, capital investment, and tax revenue. An alternative perspective suggests that growing foreign investment may instead increase levels of domestic activity by improving the profitability and competitiveness of domestic operations as firms expand globally. Very little empirical evidence is currently available with which to distinguish these views. The absence of evidence in this domain is particularly troubling because a central motivation for tax policy of foreign income has been “capital export neutrality,” a notion in part predicated on the idea that outbound FDI represents lost investment.

Foley, Hines, and I report time-series evidence that aggregate foreign and domestic investment are positively correlated for the United States.<sup>8</sup> Such aggregate evidence is open to many alternative explanations. In one paper<sup>9</sup> we expand on this line of inquiry by using firm-level evidence and an instrumental variables strategy to overcome identification difficulties in this setting.

Firms whose foreign operations grow rapidly exhibit coincident rapid growth of domestic operations, but this pattern alone is similarly problematic, as foreign and domestic business activities are jointly determined. We use foreign GDP growth rates, interacted with lagged firm-specific geographic distributions of foreign investment, to predict changes in foreign investment by a large panel of U.S. manufacturing firms. Estimates produced using this

instrument for changes in foreign activity indicate that 10 percent greater foreign capital investment is associated with 2.2 percent greater domestic investment, and that 10 percent greater foreign employee compensation is associated with 4 percent greater domestic employee compensation. Changes in foreign and domestic sales, assets, and numbers of employees are likewise positively associated. Foreign investment also has positive estimated effects on domestic exports and R and D spending, suggesting that growth-driven foreign expansions stimulate demand for tangible and intangible domestic output. These results do not support the popular notion that greater foreign activity crowds out domestic activity by the same firms, instead suggesting that the reverse is true of foreign activity.

These findings further lend support to an alternative welfare metric for assessing the appropriate tax policy for foreign profits. The traditional welfare metric of capital export neutrality is predicated on the substitutability of foreign and domestic activity and recommends the taxation of worldwide income with credits for foreign taxes paid. An alternative welfare benchmark, capital ownership neutrality, has been developed recently, emphasizing distortions to ownership decisions and lost productivity in a setting where substitutability may not be complete, as suggested by these findings. The capital ownership neutrality benchmark recommends exemption of foreign income for national and global welfare maximization.

## The Nature of Multinational Firm Activity

Analysis of microdata on American multinational firms collected by the Bureau of Economic Analysis has allowed for new insights into how patterns of FDI are shaped by variations in investor protections, political risk, capital controls, and currency crises. These studies also shed light on how these varying institutions influence local firms and how taxes shape multinational firm decisionmaking.

Pol Antràs, Foley, and I examine how costly financial contracting and weak

investor protections influence the cross-border operational, financing, and investment decisions of firms.<sup>10</sup> We develop a model in which product developers have a comparative advantage in monitoring the deployment of their technology abroad. We demonstrate that when firms want to exploit technologies abroad, multinational firm activity and FDI flows arise endogenously when monitoring is not verifiable and financial frictions exist. The mechanism generating MNC activity is not the risk of technological expropriation by local partners but rather the demands of external funders who require MNC participation to ensure value maximization by local entrepreneurs. The model demonstrates that weak investor protections limit the scale of multinational firm activity, increase the reliance on FDI flows, and alter the decision to deploy technology through FDI as opposed to arm's length licensing. Using firm-level data, we test and confirm several distinctive predictions for the impact of weak investor protection on MNC activity and FDI flows.

Foley, Hines, and I examine the role of capital controls in influencing local borrowing rates and patterns of investment, financing, and transfer pricing.<sup>11</sup> Borrowing rates are 5.25 percentage points higher in countries imposing capital controls than they are elsewhere for affiliates of the *same* multinational parents. Multinational firms distort their reported profitability and their dividend repatriations in order to mitigate the impact of capital controls. Affiliates have 5.2 percent lower reported profit rates than comparable affiliates in countries without capital controls, reflecting, in part, trade and financing practices that reallocate income within a firm. The distortions to reported profitability are comparable to those that stem from a 27 percent difference in corporate tax rates. Dividend repatriations are also regularized to facilitate the extraction of profits from countries imposing capital controls. If capital controls impose costs through higher interest rates and the distortions associated with avoidance, then liberalizations of capital controls should have significant effects. In

fact, affiliates experience 6.9 percent faster annual growth of property, plant, and equipment investment subsequent to the liberalization of controls, indicating that capital controls impose significant burdens on foreign investors.

International variations in political risk also can influence financing decisions of multinational firms. Foley, Hines, and I demonstrate that American multinational firms respond to politically risky environments by adjusting their capital structures abroad and at home.<sup>12</sup> Foreign subsidiaries located in politically risky countries have significantly more debt than do other foreign affiliates of the same parent companies. American firms further limit their equity exposures in politically risky countries by sharing ownership with local partners and by serving foreign markets with exports rather than local production. The residual political risk borne by parent companies leads them to use less domestic leverage, resulting in lower firm-wide leverage. Multinational firms with above-average exposures to politically risky countries have 8.4 percent less domestic leverage than do other firms. These findings illustrate the broader impact of risk exposures on capital structure.

Foley, Kristin J. Forbes, and I study the effects of financial constraints on firm growth by investigating whether large depreciations differentially affect multinational affiliates and local firms in emerging markets.<sup>13</sup> U.S. multinational affiliates increase sales, assets, and investment significantly more than local firms both during and after currency crises. The enhanced relative performance of multinationals is traced to their ability to use internal capital markets to capitalize on the competitiveness benefits of large depreciations. Investment specifications indicate that increases in leverage resulting from sharp depreciations constrain local firms from capitalizing on these investment opportunities, but do not constrain multinational affiliates. Multinational parents also infuse new capital in their affiliates after currency crises. These results indicate another role for foreign direct investment in emerging markets as multinational affiliates expand

economic activity during currency crises when local firms are most constrained.

The role of taxes in shaping financial and operating decisions has also been a prominent feature of these studies. The behavior of U.S. multinational firms consistently demonstrates that taxes play critical roles in shaping the volume and location of foreign investment, the financing of foreign investment, and the organizational structures of multinational firms. The papers also capitalize on the international variation faced by multinational firms to provide estimates of how taxes influence financial and investment decisions more generally.

For example, Foley, Hines, and I show that capital structure and internal capital allocations decisions respond significantly to tax differentials.<sup>14</sup> While other studies have not found significant effects, the setting of a multinational firm facing multiple tax regimes provides a cleaner setting for considering this question. Similarly, we have explored the role of tax and non-tax factors in dividend policy by looking at multinational firm repatriations.<sup>15</sup> We have also studied the sensitivity of investment to income and indirect tax differentials.<sup>16</sup> We have examined ownership and organizational form decisions.<sup>17</sup> Finally, the incidence of export subsidies was the motivation behind our investigation of the effects of WTO complaints against income tax incentives for exports.<sup>18</sup>

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