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Capital Controls, Liberalizations, and Foreign Direct Investment

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ABSTRACT

This paper analyzes the effect of capital controls on foreign direct investment by American multinational firms between 1982-1997. The evidence indicates that capital account restrictions reduce the size of local multinational affiliates by roughly 20 percent, and also distort their asset allocation, financing, transfer pricing, and dividend policies. American firms operating in countries with capital controls overinvest in physical assets and underinvest – by as much as 40 percent – in financial assets. Real borrowing rates facing American firms are 2-7 percent higher in countries with capital controls than elsewhere, in response to which affiliates rely heavily on initial parent equity infusions in place of debt finance or retained earnings. American affiliates move profits out of capital control countries by manipulating the prices at which foreign affiliates trade with their US parents and by regularizing remittances to their US corporate parents, both indicative of the desire and ability to extract profits from countries imposing repatriation restrictions. These patterns imply that capital account restrictions affect foreign investors differently than they do local firms. Since foreign multinational firms can leverage internal markets to access inexpensive capital on world markets and are able to avoid some features of capital account restrictions, these firms have advantages over local firms in investing in capital-intensive activities. It follows that capital account liberalizations should be associated with greater investment, particularly in local financial assets, greater use of debt finance, and a reduced likelihood of remitting dividends, all of which characterizes the experience of American firms.

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1. Introduction

Countries that fear the economic disruptions that accompany capital outflows are often tempted to impose controls on international capital movements. These controls can take many forms, and the debate on whether they promote or deter growth has received widespread attention. The same countries are also typically concerned with attracting foreign direct investment due to the presumed benefits of such investment. Mechanisms to attract foreign direct investment and the actual benefits of foreign direct investment are likewise the subject of extensive research. The potential inconsistency of the desire to control capital movements and the desire to attract inbound foreign direct investment has, however, received limited attention, in spite of its obvious policy relevance.

This paper analyzes the effects of capital controls on the behavior of American multinational firms. Comprehensive panel data on U.S. multinational firm activity offer evidence that capital controls fundamentally affect the nature of FDI. These controls distort multinational asset allocation, financing, transfer pricing, and dividend policies. While the analysis is limited to multinational firms, the results also suggest that capital controls affect local firms and multinational firms differently. Unlike local firms, multinationals can use internal capital markets and trading relations to evade some constraints associated with capital account restrictions providing them with an advantage over local firms.

The evidence indicates that, conditional on country wealth, multinationals hold fewer assets in countries with capital controls. In levels and as a share of assets, multinational firms invest more in physical capital and less in financial assets where these controls exist. These asset allocations are also associated with different funding decisions, as multinationals employ larger amounts of initial equity capitalization and lower amounts of debt and retained earnings. Borrowing rates are significantly higher in capital control countries than they are elsewhere, thereby discouraging foreign investors from economizing on equity infusions through the extensive use of local debt finance.

Multinational firms appear to circumvent capital controls in a variety of ways. Their significant trading relations with parent companies located in the United States permit them to relocate profits out of countries with capital controls, an opportunity of which they appear to

avail themselves. American multinational firms are more likely to pay dividends from countries with capital controls than they are from other countries, and levels of dividend payments from capital control countries respond more sluggishly to income changes than do dividend payments from other countries.

Taken together, this evidence suggests that the nature of foreign direct investment is fundamentally affected by capital controls. While overall affiliate size is smaller, multinational firms invest more in physical assets and invest more initially in the form of equity capitalization in countries with capital controls. While somewhat surprising, these results are consistent with the opportunities that are uniquely available to multinational firms that thereby enjoy advantages over local firms. Since the higher cost of local debt in countries with capital controls disproportionately impacts local firms that can only tap the local capital markets, multinationals are better positioned to take advantage of investment opportunities by tapping into parent sources of financing. The paper demonstrates that the relative advantage afforded multinational firms is most pronounced in these countries, suggesting that capital account restrictions skew investment opportunities toward multinational firms and away from local firms.

Capital account liberalizations appear to be associated with the reverse of this phenomenon. For multinational firms, capital account liberalizations in a host country are associated with large increases in activity. The level of assets held in a country that has liberalized increases after the policy change, and there is a shift in asset allocation that includes a greater share of investment in financial assets. Multinational firms also respond to liberalizations by reducing the frequency of dividend payments. The cost of local debt declines substantially after liberalization, suggesting that such policy changes appear to even the playing field between local and multinational firms.

Consideration of the ways in which multinational firms respond to capital controls affords the opportunity to reconcile the disparate available evidence of the impact of capital controls on economic growth and aggregate investment. In particular, evidence of whether capital account liberalizations have any significant effect on economic growth has been fragile and fleeting. At the same time, evidence of increased local firm investment in response to stock market liberalizations has been robust. This paper provides evidence that capital account

liberalizations are likely to carry different implications for local and foreign investors as well as for different kinds of investment. While the evidence provided in this paper is uniquely associated with multinational firms, capital account liberalizations appear to provide an evening of the playing field between local and multinational firms suggesting that the effect of liberalizations is likely to be important for both the composition and level of investment.

Section 2 of the paper reviews the empirical literature on the impact of capital account restrictions. Section 3 presents a model that outlines the ways in which capital account restrictions alter multinational decision making, thereby serving as the basis of the empirical work to follow. Section 4 provides an overview of the data employed in the analysis and describes aggregate patterns of multinational activity and capital account rules. Section 5 presents empirical evidence of the effects of capital account restrictions on the sizes of multinational affiliates, their asset allocation, funding sources, transfer pricing, and dividend policies. Section 6 is the conclusion.

2. Capital Controls, Liberalizations and Economic Growth

There is a sizable literature that considers the effect of capital account restrictions on aggregate investment and economic growth. This work draws few definitive conclusions, though two distinctive views have emerged.

The skeptical view of capital account liberalization is most often associated with Rodrik (1998) and related work. Using the IMF classification of what constitutes countries with capital controls, Rodrik finds no significant statistical association between capital account openness and growth. This evidence is used to bolster a more general skepticism regarding the virtues of financial openness in the world of the second-best, as in Bhagwati (1998). The more optimistic view of capital account liberalization is advanced by Fischer (1998), and supported by evidence provided in Quinn (1997). Using an index subsequently adopted by many authors, Quinn reports a significant positive correlation between changes in his measure of capital account openness and subsequent economic growth.

The salience of these issues for policy makers has motivated work attempting to disentangle the reasons for these contradictory findings. In particular, researchers have focused

on the distinctive nature of these measures (as in Edwards (2001)), the possibility that capital liberalization operates differently for countries of different income levels (as in Alesina, Grilli and Milesi-Ferretti (1994), which can be compared to Grilli and Milesi-Ferreti (1995)), the role of preexisting policies and the role of sequencing in determining the effects of capital control liberalizations (as in Arteta, Eichengreen and Wyplosz (2001) and Chinn and Ito (2002)), and the role of political institutions in dictating outcomes associated with capital account liberalizations (as in Quinn, Inclan and Toyoda (2001)). The effect of capital account liberalizations in stimulating economic growth and investment remains an open question. Eichengreen (2002) provides an excellent overview of this large literature and concludes that capital account liberalization "remains one of the most controversial and least understood policies of our day."

Finance scholars have considered the effects of stock market liberalizations on investment using firm-level data. Following the intuition of Stulz (1995, 1999), Henry (2000), Bekeart and Harvey (2000), and Bekaert, Harvey and Lundblad (2002) find that stock market liberalizations in a narrow set of emerging market countries are followed by investment booms by local firms listed on equity markets. Chari and Henry (2002) confirm the existence of investment booms, but find no evidence that the distribution of investment subsequent to a liberalization follows the predictions associated with the repricing of systematic risk. As such, investment booms may be more associated with reductions in the risk-free interest rate than with repricing of equity risk.[1] Johnson and Mitton (2001) consider the distributional implications that arise from the interactions of capital controls and political favoritism. Employing evidence from share price reactions to capital control policies in Malaysia, Johnson and Mitton find that politically connected firms have sharper price responses to capital control policies and these effects are muted by access to world capital markets. Desai, Foley and Hines (2002a) analyze the relaxation of restrictions on 100 percent foreign ownership of local enterprises, finding that multinational firms respond with greater 100 percent ownership of foreign affiliates, and also with more active trading relationships with local affiliates. In combination with work on the overall importance of foreign direct investment on economic growth, as in Aitken and Harrison (1999), these results suggest that ownership restrictions can influence overall economic growth in emerging markets.

3. A Model of Multinational Activity Under Capital Controls

This section analyzes the behavior of profit-maximizing multinational firms investing in countries with binding capital controls. The purpose of this analysis is to identify the effects of capital controls on levels of investment and other measurable aspects of multinational activity.

Consider the incentives of a firm whose foreign subsidiary produces output using physical and financial capital, as well as other inputs, and whose production function can therefore be written as $Q(K_t, F_t, \phi)$, in which K_t is an affiliate's physical capital in period *t*, F_t is its financial capital, and ϕ represents characteristics of the host country. The production function notation $Q(\cdot)$ subsumes profit-maximizing choices of labor and other inputs, and output is defined net of depreciation of physical capital. Financial capital is assumed to earn a return of αr^* $(1 > \alpha > 0)$ in addition to contributing to the output of physical capital.

The parent firm chooses the real and financial policies of its subsidiary to maximize the present discounted value of the parent's after-tax cash flow. As an extreme simplification, and merely in order to reduce notation and possible confusion in this section, we abstract from tax effects, thereby treating foreign profits as though untaxed. Let δ denote the instantaneous discount rate used by the parent company in valuing cash flows, D_t denote dividends paid by the foreign subsidiary (by definition, $D_t \geq 0$), and E_t denote equity flows from the parent to the subsidiary. It is possible that $E_t < 0$, but only in those cases in which the subsidiary has already paid out all of its foreign profits, since dividend repatriation precedes equity repatriation.

Let S_t denote the stock of accumulated parent equity in the subsidiary. It is useful to introduce a state variable *W* defined as the net worth of the subsidiary: W_t equals S_t plus accumulated reinvested profits. Affiliates can borrow from their parent companies or from other lenders; let B_t^1 denote the stock of borrowing in period *t* from unrelated parties, and let B_t^2 denote the stock of borrowing from the parent company. In order to simplify the analysis, we

[1] Evidence on the effect of capital controls on overall interest rates is also provided in De Gregorio, Edwards and Valdes (2000) with respect to Chile's unremunerated reserve requirements.

assume that parents are paid risk-free interest at rate δ on their loans to their foreign subsidiaries.

Capital controls have the potential to affect several aspects of the environment facing foreign investors. Controls on domestic capital markets introduce wedges between returns to lenders and interest rates paid by borrowers, particularly foreign investors. Denote by $\hat{r}$ the interest rate paid by multinational firms that borrow capital on local markets, while the same firms are able to earn interest at rate r^* on money loaned locally. Asset market equilibrium suggests that, with binding capital controls, these interest rates satisfy $\hat{r} > \delta > r^*$.

Countries that impose capital controls typically accompany them with limits on remittances to foreigners, including payments of dividends and interest to foreign parent companies of local subsidiaries. Often these limits take the form of requiring multinational investors to obtain permission from government officials in order to remit more than nominal amounts. In order to capture these limits, we introduce costs of interest and dividend payments that are rising functions of amounts paid. Specifically, the cost to the subsidiary of paying a dividend D_t is: $D_t\left[1+c\left(\frac{D_t}{S_t}\right)\right]$, in which $c(\cdot)\geq 0$ is the added cost associated with paying a dividend that is large relative to paid-in capital, and the $c(\cdot)$ function satisfies: $c(0)=0$, $c'(\cdot)\geq 0$ and $c''(\cdot)\geq 0$. Similarly, the cost to the subsidiary of remitting interest at rate δ on loans from the parent is a rising function of the volume of borrowing, so the total cost is $B_t^2\delta\left[1+\gamma\left(\frac{B_t^2}{S_t}\right)\right]$, in which $\gamma(0)=0$, $\gamma'(\cdot)\geq 0$, and $\gamma''(\cdot)\geq 0$.

The parent company maximizes the present discounted flow:

(1) $$\int_{t=0}^{\infty}(D_t - E_t)e^{-\delta t}dt\,,$$

subject to the constraints that:

(2) $$D_t, B_t^1, B_t^2, S_t, W_t, K_t^*, F_t \geq 0$$

(3) $$\max\left[E_t, (S_t - W_t)\right] \geq 0$$

(4) $$W_t + B_t^1 + B_t^2 \geq K_t + F_t$$

(5) $$\frac{dW_t}{dt} = Q(K_t, F_t, \phi) + \alpha F_t r^* + E_t - \hat{r}B_t^1 - B_t^2\delta\left[1 + \gamma\left(\frac{B_t^2}{W_t}\right)\right] - D_t\left[1 + c\left(\frac{D_t}{S_t}\right)\right]$$

(6) $$\frac{dS_t}{dt} = E_t .$$

The current-value Hamiltonian corresponding to the maximization of (1) subject to (2) – (6) is:

(7) $$H = (D_t - E_t)$$

$$+ \lambda_1\left\{Q(K_t, F_t, \phi) + \alpha F_t r^* + E_t - \hat{r}B_t^1 - B_t^2\delta\left[1 + \gamma\left(\frac{B_t^2}{W_t}\right)\right] - D_t\left[1 + c\left(\frac{D_t}{S_t}\right)\right]\right\}$$

$$+ \lambda_2 E_t + \lambda_3 D_t + \lambda_4 B_t^1 + \lambda_5 B_t^2 + \lambda_6 S_t + \lambda_7 W_t + \lambda_8 K_t^* + \lambda_9 F_t$$

$$+ \lambda_{10} E_t\left[1 - \lambda_{11}(S_t - W_t)\right] + \lambda_{12}\left(W_t + B_t^1 + B_t^2 - K_t^* - F_t\right).$$

In expression (7), the multipliers λ_1 and λ_2 correspond to the laws of motion of the state variables W_t and S_t, respectively, and the multipliers $\lambda_3 - \lambda_{12}$ reflect the inequality constraints in (2) – (4).

The first-order conditions that characterize the maximum of (7), assuming the appropriate continuity conditions to hold, are:

(8) $$\frac{\partial H}{\partial D_t} = 1 - \lambda_1\left[1 + c\left(\frac{D_t}{S_t}\right) + \frac{D_t}{S_t}c'\left(\frac{D_t}{S_t}\right)\right] + \lambda_3 = 0$$

(9) $$\frac{\partial H}{\partial E} = -1 + \lambda_1 + \lambda_2 + \lambda_{10}\left[1 - \lambda_{11}(S_t - W_t)\right] = 0$$

(10) $$\frac{\partial H}{\partial B_t^1} = -\lambda_1 \hat{r} + \lambda_4 + \lambda_{12} = 0$$

(11) $$\frac{\partial H}{\partial B_t^2} = -\lambda_1 \delta \left[1 + \gamma\left(\frac{B_t^2}{S_t} \right) + \frac{B_t^2}{S_t} \gamma'\left(\frac{B_t^2}{S_t} \right) \right] + \lambda_5 + \lambda_{12} = 0$$

(12) $$\frac{\partial H}{\partial K_t} = \lambda_1 \frac{\partial Q}{\partial K_t} + \lambda_8 - \lambda_{12} = 0$$

(13) $$\frac{\partial H}{\partial F_t} = \lambda_1 \left[\frac{\partial Q}{\partial F_t} + \alpha r^* \right] + \lambda_9 - \lambda_{12} = 0\,,$$

while the costate equations are:

(14) $$-\frac{d\lambda_1}{dt} = -\delta\lambda_1 + \lambda_7 + \lambda_{12}$$

(15) $$-\frac{d\lambda_2}{dt} = -\delta\lambda_2 + \lambda_6 - \lambda_{10}\lambda_{11}E_t + \lambda_1 \left[B_t^2 \delta \left(\frac{B_t^2}{S_t} \right)^2 \gamma'\left(\frac{B_t^2}{S_t} \right) + \left(\frac{D_t}{S_t} \right)^2 c'\left(\frac{D_t}{S_t} \right) \right].$$

Some aspects of behavior are apparent from an examination of (8) – (15). Capital controls depress returns to foreign investors by raising local borrowing rates, depressing the return to financial investments, and imposing costs on interest payments and dividend remittances to parent companies. Since capital controls also affect local investors and prices on local equity markets, it is nevertheless possible for capital controls to encourage types of foreign investment directed at assets that become underpriced as a result of capital market distortions. This is particularly likely in the case of physical assets, since high local interest rates will depress local investment and offer profit-making opportunities to foreign investors with lower opportunity costs of funds. While it is not possible to identify the net effect of capital controls on foreign investment levels in the general case analyzed in equations (8) – (15), some aspects of investment levels can be identified.

Equations (12) and (13) together imply that, in situations in which firms use both physical and financial capital (so that $\lambda_8 = \lambda_9 = 0$),

(16) $$\frac{\partial Q}{\partial K_t} = \frac{\partial Q}{\partial F_t} + \alpha r^*.$$

Capital controls that reduce αr^* therefore increase the value of $\frac{\partial Q}{\partial F}$ relative to that of $\frac{\partial Q}{\partial K}$. With a normal production function this implies that the (K/F) ratio rises, or put differently, that the firm economizes on financial capital.

A second implication of the model is that firms pay dividends every year until accumulated profits are exhausted. This is evident from equation (8), which implies that, for years in which $D_t = 0$, $\lambda_1 = 1 + \lambda_3 > 1$. Since all the lagrange multipliers are nonnegative, and $\lambda_{10} = \lambda_{11} = 0$ for firms whose profits are not exhausted, equation (9) implies that $\lambda_1 = 1 - \lambda_2 \leq 1$. Hence the assumption that $D_t = 0$ leads to a contradiction, from which it follows that firms pay dividends every year. Furthermore, the level of dividends is governed by equation (8), which, together with (12), implies a sluggish response of dividends to changes in affiliate income.

Equations (10) and (12) together imply that, for firms that borrow locally and have physical capital (so that $\lambda_4 = \lambda_8 = 0$), then the marginal product of capital equals the local borrowing rate: $\frac{\partial Q}{\partial K_t} = \hat{r}$. From (14) and (12), it then follows that $\frac{d\lambda_1}{dt} = \lambda_1(\delta - \hat{r}) < 0$, so the shadow value of net worth in the subsidiary falls over time. From equation (8), dividends must therefore rise over time, implying that retained earnings will gradually disappear as part of the capital structure of the affiliate. And more generally, (14) and (12) imply that $\frac{d\lambda_1}{dt} = \lambda_1\left(\delta - \frac{\partial Q}{\partial K_t}\right)$, which is likely to be negative.

Yet another implication of the model is that multinational firms have incentives to use transfer pricing methods to relocate profits out of affiliates in countries with capital controls. The reason is that the shadow value of net worth in such affiliates is less than one, even in the absence of tax considerations. Since firms pay dividends every year, $\lambda_3 = 0$, and therefore equation (8) implies that $\lambda_1 < 1$. Since an affiliate in a country without capital controls is, in the

absence of tax considerations, predicted to have $\lambda_1 = 0$, it follows that the firm benefits from transferring resources out of the capital control country.

4. Data and Descriptive Statistics[2]

The empirical work presented in section 5 is based on the most comprehensive available data on the activities of American multinational firms. The Bureau of Economic Analysis (BEA) annual survey of U.S. Direct Investment Abroad from 1982 through 1997 provides a panel of data on the financial and operating characteristics of U.S. firms operating abroad. These surveys ask reporters to file detailed financial and operating items for each affiliate and information on the value of transactions between U.S. parents and their foreign affiliates. The International Investment and Trade in Services Survey Act governs the collection of the data and the Act ensures that "use of an individual company's data for tax, investigative, or regulatory purposes is prohibited." Willful noncompliance with the Act can result in penalties of up to $10,000 or a prison term of one year. As a result of these assurances and penalties, BEA believes that coverage is close to complete and levels of accuracy are high.

U.S. direct investment abroad is defined as the direct or indirect ownership or control by a single U.S. legal entity of at least ten percent of the voting securities of an incorporated foreign business enterprise or the equivalent interest in an unincorporated foreign business enterprise. A U.S. multinational entity is the combination of a single U.S. legal entity that has made the direct investment, called the U.S. parent, and at least one foreign business enterprise, called the foreign affiliate. In order to be considered as a legitimate foreign affiliate, the foreign business enterprise should be paying foreign income taxes, have a substantial physical presence abroad, have separate financial records, and should take title to the goods it sells and receive revenue from the sale. In order to determine ownership stakes in the presence of indirect ownership, BEA determines the percentage of parent ownership at each link and then multiplies these percentages to compute the parent's total effective ownership.

The foreign affiliate survey forms that U.S. multinational enterprises are required to complete vary depending on the year, the size of the affiliate, and the U.S. parent's percentage of

[2] This description of the data is drawn from Desai, Foley and Hines (2002a).

ownership of the affiliate. The most extensive data are available for 1982, 1989, and 1994, when BEA conducted Benchmark Surveys. In these years, all affiliates with sales, assets, or net income in excess of $3 million in absolute value and their parents were required to file extensive reports. In non-benchmark years between 1982 and 1997, exemption levels were higher and less information is collected.[3] Although majority owned affiliates report many accounting items and information concerning operations each year, minority owned affiliates must only file information about sales, net income, assets, employment, employment compensation, and trade with the United States in non-benchmark years. Majority owned affiliates are foreign affiliates in which the combined direct and indirect ownership of U.S. persons exceeds 50 percent. BEA collects identifiers linking affiliates through time, thereby permitting the creation of a panel.

Table I displays basic information on the incidence and size of affiliates in the three benchmark years – 1982, 1989, and 1994 – and in the most recent year in the panel, 1997. In the most recent benchmark year, 20,898 entities are covered, with median sales and assets of approximately $14 million. In contrast, in 1997, only 13,230 affiliates are surveyed, with median sales of $41.9 million and median assets of $45.7 million reflecting the higher cutoffs employed in the non-benchmark years. The bottom panel of Table I provides descriptive statistics across all affiliate-year observations for the variables employed in the statistical analysis presented in section 5.

Table II provides detail on the two measures of capital account restrictions employed in the statistical analysis that follows.[4] The IMF measure is the one most commonly used in the literature and, as documented in Table II, is one that classifies many countries as having capital controls during the 1980s and 1990s.[5] The IMF capital control classification is a yes-no measure, based on multiple aspects of a country's capital account restrictions, not all of them relevant to multinational firms. It is useful to consider an alternative to the IMF classification

[3] From 1983-1988, all affiliates with an absolute value of sales, assets, or net income less than $10 million were exempt, and this cutoff increased to $15 million from 1990-1993 and $20 million from 1995-1997. BEA uses reported data to estimate universe totals when surveys cover only larger affiliates or when only certain affiliates provide information on particular survey forms. Estimated data is unlikely to have a significant impact on the BEA's published data at the industry or country level as data based on actual reports exceeds 90 percent of the estimated totals of assets and sales in each of the years between 1982 and 1997. To avoid working with estimated data, only affiliates required to provide all the information associated with a particular analysis are considered.

[4] Table II is limited to countries for which the Shatz measure exists. Fortunately, these countries are the hosts to the vast majority of outbound U.S. foreign direct investment.

that emphasizes restrictions that are important to foreign investors; fortunately, Shatz (2000) provides one such measure for the period 1985-1996. For the Shatz measure, capital account restrictions are coded as a dummy variable equal to zero if both the Capital Remittance Score and the Profit Remittance Score are greater than or equal to 3. The comparison between the measures in Table II indicates that the IMF measure is more likely to classify a country as having capital controls than the Shatz measure. Any country that is considered free of capital controls by the IMF measure is likewise classified as free under the Shatz measure. However, numerous countries classified as restricted by the IMF are not considered restricted under the Shatz measure. In 1990, the correlation between the Shatz measure and the IMF measure was 0.30.[6]

The middle panel of Table I provides another vantage on how these measures differ with respect to the activities of U.S. multinationals. By the IMF measure, nearly half of all U.S. multinational affiliates were located in countries with capital controls in 1982, though the fraction dropped to 21.0 percent by 1994. In contrast, 11.3 percent of all U.S. multinational affiliates were located in countries that Shatz classifies as imposing capital controls in 1982, a figure that falls to 3.1 percent by 1994. By both measures of capital account restrictions, affiliates in countries with capital controls have disproportionately fewer assets and sales and greater numbers of employees. Across all affiliate-year observations, as indicated in the bottom panel of Table I, 6.1 percent of all observations were in countries with capital controls as measured by Shatz, while 34.0 percent were in countries with capital controls as measured by the IMF.

5. The Impact of Capital Account Restrictions on Foreign Direct Investment

This section presents estimates of the effects of capital controls on the volume of foreign direct investment by American multinational firms, the assets held by multinational firms, their funding sources, transfer pricing practices, and dividend policies. This evidence is primarily cross-sectional, comparing the behavior of American firms in countries with and without capital account restrictions. The section concludes by analyzing the responses of American firms to capital account liberalizations (as defined by changes in the Shatz score of capital account

[5] The deficiencies in this measure, along with the revised measure, are considered in Eichengreen (2002).
[6] The so-called Quinn index that was originally employed in Quinn (1997) is not employed here as it was not available on a continuous basis and only for two years - 1982 and 1988 – that were in the sample.

restrictions), the evidence of which is consistent with the patterns identified from cross-sectional comparisons.

5.1 Affiliate Size and Asset Allocation Decisions

Table III presents estimates of the effects of capital controls on sizes and asset allocation decisions of U.S. multinational firms investing abroad. The sample consists of the first appearance of affiliates in the BEA data between 1983-1997, so each affiliate is included just once, typically at entry. In order to control for a host of unobservable characteristics at the country level, all specifications include three powers of log GNP as independent variables. In addition, parent, industry, and year fixed effects are included in many of the specifications to control for unobservable characteristics and underlying trends. The specifications presented in columns 1 through 3 of Table III examine the effect of tax rates and the presence of capital controls on overall affiliate size as measured by total assets. The negative estimated coefficients on country tax rates in these initial regressions are consistent with a large literature that finds high tax rates to discourage foreign investment. The –0.2052 coefficient in column 2 of Table III indicates that affiliate assets are 20.5 percent smaller in countries with capital controls as measured by the IMF than in countries without capital controls; estimates using the Shatz measure, reported in column 3, imply that affiliates in capital control countries are 23.8 percent smaller.[7]

The fact that multinational affiliates in capital control countries have fewer total assets than affiliates elsewhere does not necessarily imply that they are smaller in all categories of assets. Columns 4-15 of Table III report regressions identifying the effects of capital controls on asset allocation by multinational affiliates, with special attention to investment in net property, plant and equipment and in financial assets.[8] The logarithm of net property, plant and equipment (PPE) is the dependent variable in the regressions reported in columns 4 and 5 of Table III, while the ratio of PPE to total assets is the dependent variable in the regressions reported in columns 6-9. The level regressions presented in columns 4 and 5 offer answers that vary with capital control measures. The 0.0088 estimated coefficient on the IMF dummy variable in column 4

[7] All standard errors presented in the tables are clustered at the country-year level.

suggests that capital controls have little effect on PPE, while the 0.1953 coefficient on the Shatz dummy implies that affiliate PPE is 19.5 percent larger in capital control countries than elsewhere. The specifications used in the regressions reported in columns 6 through 9, in which the ratio of PPE to total assets is the dependent variable, provides a more consistent answer. The results in columns 6 and 8 imply that the ratio of PPE to total assets is 5.2 percent higher in countries with capital controls as measured by the IMF than it is elsewhere, and 9.6 percent higher in countries with capital controls as measured by Shatz. Controlling for parent, industry, and year fixed effects, as in columns 7 and 9, the ratio of PPE to total assets is 2.2 percent higher in IMF-measured capital control countries and 5.2 percent higher in those with capital controls measured by Shatz.

Columns 10-15 of Table III provide a similar framework for considering the effects of capital controls on investment in financial assets. The logarithm of gross financial assets is the dependent variable in the regressions reported in columns 10-11 of Table III, while the ratio of financial to total assets is the dependent variable in the regressions reported in columns 12-15. The evidence indicates that multinational firms significantly underinvest in financial assets in countries with capital controls. The -0.2684 estimated coefficient on the IMF dummy variable in column 10 implies that affiliate financial assets are 26.8 percent smaller in capital control countries than elsewhere (controlling for parent, industry, and year effects, as well as three powers of log GNP), while the Shatz measure, used in the regression reported in column 11, indicates that financial assets are 38.4 percent smaller. The results in columns 12 and 14 imply that the ratio of financial to total assets is 4.6 percent smaller in countries with capital controls as measured by the IMF than it is elsewhere, and 12.1 percent smaller in countries with capital controls as measured by Shatz. Controlling for parent, industry, and year fixed effects, as in columns 13 and 15, the ratio of financial to total assets is indistinguishably different in IMF-measured capital control countries, and 5.5 percent lower in those with capital controls measured by Shatz.

The smaller size of affiliates in countries with capital controls as measured by total assets masks an interesting set of asset allocation decisions. While the results are not perfectly

[8] Financial assets are defined to include cash, equity investments in other affiliates, receivables, and other non-current assets that are financial in nature. In benchmark years, it is possible to construct a narrower definition of

uniform, the specifications presented in Table III suggest that capital controls raise demand by multinational firms for physical assets and reduce demand for financial assets. These asset demands may reflect general equilibrium effects of local financial repression as well as the opportunities uniquely available to multinational firms. These patterns are explored further by examining the impact of capital controls on the local funding environment and the other margins on which multinational firms react to capital account restrictions.

5.2 Funding Sources

The specifications reported in Table IV follow the format and include the controls of Table III, but consider how capital controls impact the funding sources of U.S. multinational firms. The specifications consider differences in the extent of financing via debt, paid-in-capital, and retained earnings in countries with and without capital controls. While observations are included only the first time an affiliate appears in the sample (as in Table III) for the debt and paid-in-capital specifications (columns 1-12), the specifications with retained earnings as the dependent variable (columns 13-16) are drawn from Benchmark years, as retained earnings are separately available only for these years.

Two patterns appear in the regressions reported in columns 1-6 of Table IV. The first is that affiliates use less debt in countries imposing capital controls than they do in other countries. The –0.1542 coefficient in column 1 of Table IV indicates that debt levels are 15.4 percent lower in countries with capital controls as measured by the IMF than in countries without capital controls; estimates using the Shatz measure, reported in column 2, imply that debt levels in capital control countries are 15.7 percent lower (though not significantly so). The second pattern is that ratios of debt to assets are largely unrelated to capital controls. This fact is revealed by the small, and statistically insignificant, estimated coefficients on capital control measures in the regressions reported in columns 3-6, in which the dependent variable is an affiliate's debt/asset ratio.

Capital controls appear to encourage firms to finance their affiliates with equity, known in the foreign direct investment statistics as paid-in capital. The regression reported in column 7 indicates that that affiliate paid-in capital is 18.6 percent higher in countries imposing capital

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financial assets that excludes receivables and results are very similar. The excluded asset category is inventories.

controls as measured by the IMF, while the regression reported in column 8 reveals that paid-in capital is 41.7 percent higher in countries with capital controls as measured by Shatz. Since capital controls are associated with smaller assets and larger paid-in capital, it is not surprising that capital controls are also associated with higher ratios of paid-in capital to total assets. The regressions reported in columns 9-12 of Table IV indicate that the ratio of paid-in capital to total assets is 4.6-5.6 percent higher (depending on the inclusion of parent, industry, and year fixed effects) in countries with capital controls measured by the IMF, and 10.0-15.1 percent higher in countries with capital controls measured by Shatz.

Capital controls discourage the use of retained earnings as a source of equity finance, as indicated by the regressions reported in columns 13-16 of Table IV, in which the dependent variable in is the ratio of retained earnings to total assets. The regressions reported in columns 13-14 indicate that this ratio is 6.4 percent lower in countries with capital controls as measured by the IMF, and is 6.9 percent lower in the same countries after controlling for parent, industry, and year fixed effects. The ratio of retained earnings to total assets is 9.1 percent lower in countries with capital controls as measured by Shatz, and is 9.4 percent lower in the same countries after controlling for various fixed effects. These lower levels of retained earnings in countries with capital controls do not appear to be associated with lower average levels of profitability. In fact, preliminary evidence indicates that affiliates are more profitable in countries with capital controls than they are elsewhere, suggesting that lower retained earnings reflect something other than profitability differences.

There are certain pronounced effects of capital controls on the financing of American-owned foreign affiliates. Multinational parent companies overcapitalize their affiliates with equity infusions, which is surprising given that capital controls are usually thought to restrict investments by multinationals. Equity investments no doubt reflect attractive profit opportunities in countries with capital controls, and the expectation that firms will be able to extract future profits in spite of repatriation restrictions. The process of profit extraction is amenable to more detailed analysis, which is the subject of the next section.

5.3 Capital Controls and Profit Extraction

Evidence that affiliates in countries with capital controls make greater use of equity capitalization, retain fewer earnings, and tilt asset allocation toward physical and away from financial assets suggests that multinationals may not be constrained by capital controls to the same degree that local competitors might be. In order to explore this possibility, this section analyzes the effect of capital controls on trading relationships between affiliates and their U.S. parent companies, the repatriation patterns of affiliates, and the local borrowing environment faced by U.S. multinationals.

It is possible for multinational firms to sidestep repatriation restrictions by manipulating the prices at which foreign affiliates trade with their American parent companies, since overinvoicing exports from the United States, or underinvoicing imports to the United States, serve to relocate profits. Governments typically insist that firms use arm's length prices in trade with other members of the same controlled group, but such prices are notoriously difficult to enforce, particularly when (as is often the case for multinational firms) traded goods have unique characteristics that make it difficult to identify perfectly comparable items. As a result, affiliates located in countries with high tax rates or binding repatriation controls are likely to run sizable trade deficits with their parent companies, since firms have incentives to structure and record such trades in ways that extract as many profits as possible.

The regressions reported in Table V consider this issue by analyzing the effect of capital controls on a measure of affiliate-specific trade balance with its parent. The dependent variable in these specifications is a ratio, the numerator of which is the difference between exports by the U.S. parent to its foreign affiliate and imports from the foreign affiliate to the U.S. parent; the denominator is the sum of these exports and imports. Clausing (2001) develops this measure at an aggregate country level and employs it to explore the extent to which firms relocate profits in response to local tax incentives.

Tax incentives encourage American parent companies to run larger trade surpluses with their affiliates in high-tax countries than with those in low-tax countries, since doing so reduces total tax burdens. The estimated positive coefficients on the tax rate variable in the regressions reported in Table V are consistent with these incentives, and indeed, are consistent with the aggregate country results reported by Clausing (2001). In the regressions reported in columns 1-

2, ten percent tax rate differences are associated with 2.6 percent differences in intrafirm trade surpluses, and 1.2 percent differences after controlling for parent, industry, and year fixed effects.

Binding capital controls create incentives similar to those of high tax rates, since firms have incentives to relocate profits by changing the prices used in intrafirm transfers. The results reported in columns 3-6 of Table V are consistent with such behavior, since affiliates located in countries imposing capital controls consistently report greater trade deficits with their parent companies than do affiliates located in other countries. The estimated 0.0557 coefficient reported in column 3 implies that affiliates in capital control countries (as measured by the IMF) run 5.6 percent greater trade deficits with their parent companies than do affiliates in other countries. Together with the estimated 0.2620 tax coefficient reported in column 3, this implies that the imposition of capital controls have the same effect on affiliate trade surpluses as a 21 percent higher tax rate. The inclusion of parent, industry, and year fixed effects, as in column 4, and the use of the Shatz capital control measure, as in columns 5-6, yield similar results, in which capital controls increase affiliate trade deficits by between 3.7 and 5.4 percent, and have the same trade effects as would 22-48 percent higher tax rates.

Capital controls typically include repatriation restrictions that operate on annual bases, thereby indirectly encouraging affiliates to remit dividends to their parent companies every year, lest low-cost repatriation opportunities otherwise be lost. In order to investigate the extent to which firms respond to this incentive, the regressions reported in Table VI are logit specifications in which the dependent variable is a dummy equal to one if an affiliate pays a dividend to its parent, and zero otherwise. In order to control for the various tax motivations that influence dividend repatriation (higher tax rates generally reduce the cost of paying dividends to American parent companies), country tax rates are included as independent variables.[9] Parent and year fixed effects are included in the regressions reported in columns 2, 4, 6, and 8.

The estimates reported in columns 1-2 of Table VI indicate that the likelihood of paying a dividend is significantly higher in capital control countries as measured by the IMF, and that this effect persists with the inclusion of parent and year fixed effects. Capital controls have the same

effect on the likelihood of paying dividends as would 24-45 percent higher tax rates in these specifications. The regressions reported in columns 3-4 repeat these specifications with the Shatz capital control measure, again indicating that capital controls significantly increase the likelihood of paying dividends. The specifications reported in columns 5-8 add net income as an independent variable in order to guard against the possibility that affiliates in capital control countries pay dividends more frequently simply because they are more profitable than other affiliates. This specification change only increases the magnitude and significance of the estimated coefficients on the capital control dummy variables. It appears, therefore, that capital controls are associated with greater likelihood of paying dividends, which is consistent with rational behavior on the part of constrained firms.

Firms with incentives to repatriate funds on a regular basis are likely to have dividend streams that are less responsive to changing conditions than are remittances by unconstrained affiliates. In order to test this possibility, it is convenient to estimate a standard Lintner model of dividend payments by foreign affiliates,[10] in which current dividends are regressed on current after-tax income and lagged dividends. The concept behind the Lintner model is that target dividend levels are functions of current income, but that actual dividends adjust only slowly to desired dividends. The estimated adjustment parameter is equal to one minus the coefficient on lagged dividends, while the estimated steady state dividend payout ratio equals the ratio of the coefficient on net income and the adjustment parameter.

The results indicate that dividend repatriations adjust more slowly to income changes in capital control countries than they do in other countries. Columns 1-3 of Table VII report estimated coefficients from Lintner specifications run on the whole sample with and without parent and affiliate fixed effects. The results are similar to those in Desai, Foley and Hines (2001), the estimated 0.2588 coefficient on lagged dividends in column 2 for example implying an adjustment parameter of 0.74. Columns 4-6 report specifications adding interactions of net income and lagged dividends with dummy variables indicating capital controls as measured by the IMF; these interactions permit the effects of net income and lagged dividends to differ

[9] For a detailed analysis of the ways in which dividend repatriation patterns respond to tax incentives, see Desai, Foley and Hines (2001).
[10] For an elaboration of the Lintner dividend model, and its application to remittances by foreign affiliates, see Desai, Foley and Hines (2001, 2002b).

between affiliates located in countries with and without capital controls. The positive estimated coefficients on the interaction of lagged dividends and the IMF dummy imply that dividend remittances from affiliates in countries with capital controls adjust more slowly to income changes than do remittances from affiliates in other countries, though the difference is not statistically significant.

Columns 7-9 of Table VII report estimates using the Shatz measure of capital controls, and in these specifications, adjustment parameters and implied steady-state payout ratios differ sharply between affiliates located in capital control countries and affiliates located elsewhere. The estimates reported in column 7 imply that affiliates in capital control countries have adjustment parameters of 0.44, while those in countries without capital controls have adjustment parameters of 0.77. Affiliates in capital control countries have steady-state payout ratios of 99.1 percent, compared with payout ratios of 56.3 percent for other affiliates. Hence it appears that affiliates in capital control countries repatriate larger fractions of their income as dividends than do other affiliates, and that their dividends are significantly less responsive to changing conditions. Both of these features are consistent with incentives created by repatriation restrictions.

Table VIII presents regressions that consider the effect of capital controls on the borrowing environments facing multinational firms. The dependent variable is the average interest rate paid on debt, constructed by taking the ratio of interest payments made during a year to the stock of debt as reported by the affiliate. While not a perfect measure of the borrowing environment, the descriptive statistics for this variable presented at the bottom of table 1 suggest that it is relatively well-behaved. As in previous tables, parent, country, and year fixed effects are included in regressions reported in even-numbered columns and standard errors reflect clustering at the country-year level.

The specifications in columns 1-4 test for differences between interest rates in countries with capital controls and countries without capital controls, using the simple expedient of adding dummy variables for capital control countries. The results reported in columns 1-2 indicate that interest rates are 3.0 percent higher in countries with capital controls as measured by the IMF, though this difference does not persist after controlling for parent, country, and year fixed

effects. The regressions reported in columns 3-4 indicate that interest rates are 8.2 percent higher in countries with capital controls as measured by Shatz and that after controlling for fixed effects this difference remains 7.4 percent. Since these are dollar-denominated interest rates, the sample mean of which (as reported in Table I) is 4.6 percent, these are sizable differences.

These interest rate differences need not reflect only local conditions in capital control countries, since the foreign affiliates of multinational firms borrow locally and internationally. In particular, it is possible that higher interest rates on intrafirm borrowing by affiliates in capital control countries represent efforts by parent companies to extract profits. In order to isolate the extent to which interest rates differ locally, it is useful to introduce interactions between capital control dummy variables and the share of debt that is borrowed locally; the coefficient on this variable is the difference in average interest rates between local and international debt. The regressions reported in columns 5-8 confirm that local interest rates in capital control countries exceed those available elsewhere. The 0.0272 coefficient reported in column 5 indicates that local interest rates in countries with capital controls measured by the IMF are 2.7 percent higher than elsewhere; this difference falls to 2.2 percent after controlling for fixed effects in the regression reported in column 6. Interest rates in countries with capital controls as measured by Shatz are higher still: the estimates reported in columns 7-8 indicate that interest rates are 6.9 percent higher in capital control countries, and remain 4.2 percent higher after controlling for country, year, and parent fixed effects.

Taken together, these results suggest that borrowing is expensive for firms in countries with capital controls. Since intra-company loans are often carefully regulated, multinational firms respond by increasing their level of initial equity capitalization and then distribute profits more readily than they would otherwise to their parents, resulting in lower levels of retained earnings. Additionally, multinational firm respond by redeploying profits worldwide through their trading relations. Although multinationals hold fewer assets in countries with capital controls, their ability to circumvent certain restrictions appears adequate to facilitate, or even encourage, investment in physical capital.

5.4 The Impact of Liberalizations

The evidence of behavioral responses to capital controls carries implications for their removal. If capital account restrictions impact multinational firms in the varied ways described above, then it follows that liberalizations should be associated with identifiable reversals of these effects. This section exploits changes in national policies between 1982 and 1997 to identify the effects of capital account liberalizations on asset allocation by the foreign affiliates of American multinational firms, their funding, transfer pricing and dividend behavior.

Table IX presents the results of regressions that evaluate the effects of liberalizations on asset sizes and allocation by American affiliates. Since all the specifications include affiliate-specific fixed effects, these regressions can be thought of as first-difference versions of the regressions presented in Table III, in which the sample is limited to the activities of affiliates operating in the liberalizing countries. Regressions reported in even-numbered columns employ year fixed effects to control for secular, underlying trends, so the coefficient on the post liberalization dummy variable identifies the changed behavior of individual affiliates subsequent to liberalizations.

The estimates reported in columns 1-2 indicate that affiliate asset sizes grow following liberalizations. In the specification (column 1) without year fixed effects, the estimates imply that affiliates are 59.8 percent larger following liberalizations; this estimated effect falls to 11.8 percent once year effects are included. The regressions reported in columns 3-4 indicate that net PPE investment likewise increases following liberalizations, though the estimated 9.6 percent effect reported in column 4 does not differ significantly from zero. The estimates reported in columns 5-6 reveal that the ratio of net PPE to total assets falls slightly after liberalizations, though this effect is insignificant when year fixed effects are included. In contrast, financial assets when measured both in levels and as a fraction of total assets rise dramatically following liberalizations. The specifications reported in columns 7-8 imply that financial assets rise by 77.2 percent following a liberalization, and do so by 17.7 percent after controlling for year effects. The ratio of financial to total assets rises by 5.6 percent according to the estimates reported in column 9, and by 1.8 percent (though not significantly) in the regression reported in column 10 that includes year effects. These results are consistent with earlier results indicating that capital controls reduce investment levels of multinational firms, encouraging greater investment in physical assets and reduced investment in financial assets.

Table X presents additional evidence of the impact of capital account liberalizations, doing so with a format similar to that of Table IX. Instead of emphasizing asset allocation decisions, the regressions reported in Table X emphasize the role of capital account liberalizations in influencing funding decisions, the local borrowing environment, and dividend policy. The results reported in columns 1-4 are consistent with the borrowing evidence presented in Table IV. Debt levels increase by 47.6 percent following liberalizations, and do so by 12.3 percent after controlling for year effects, but change very little as a fraction of total assets. Columns 5-6 offer evidence that local interest rates fall sharply following liberalizations, the estimated decline being 9.1 percent without year controls and 7.2 percent with year effects included.[11] As with debt, paid in capital levels appear to increase significantly after a liberalization, the estimates in columns 7-8 indicating that they grow by 45.6 percent, or 11.6 percent after controlling for year effects. The ratio of paid-in capital to total assets is unaffected by liberalizations, however, as indicated by the results reported in columns 9-10. Finally, the specifications presented in columns 11-14 examine the changed propensity to pay out dividends subsequent to a liberalization. The results of the logit specifications reported in columns 11 and 12 imply that the probability of paying a dividend *declines* after a liberalization. The results reported in columns 13-14 indicate that the ratio of retained earnings to total assets does not change significantly in response to liberalizations.

The evidence on liberalizations provided in Tables IX and X confirms many of the results provided in the earlier examination of capital controls. Affiliates grow in overall size subsequent to a liberalization, signifying an investment boom and that the previous underinvestment in financial assets is reversed in part. Similarly, dividend payments become less likely after a liberalization, and the borrowing environment improves substantially. Other evidence is less clear, due in part to identification that comes from changes in the same affiliates only in liberalizing countries. Taken as a whole, however, the liberalization evidence is quite consistent with cross-sectional evidence of the effects of capital controls.

6. Conclusion

[11] These results suggest, as conjectured in Chari and Henry (2002), that substantial improvements in the risk free rate may provide for the largest effects in spurring investment booms subsequent to a liberalization.

Capital controls have the potential to influence the performance of national economies, though the direction and magnitude of their effects are hotly disputed. This paper offers evidence that capital account restrictions are likely to influence local firms and foreign investors quite differently. The affiliates of American multinational firms respond to capital account restrictions by paying larger and more regular dividends to their parent companies, and by relocating reported profits to the United States. Multinational firms also use higher levels of initial equity capitalization in response to the inimical borrowing environments that exist under capital controls. The difficult local environment created by capital controls and the ability of multinational firms to overcome these restrictions carry implications for the level and allocation of investment by multinational firms. Affiliates are smaller in countries imposing capital controls, and these affiliates overinvest in physical assets and underinvest in financial assets. Taken together, these results suggest that capital account restrictions depress local investment, doing so in a way that tilts the playing field in favor of multinational firms and against local investors.

This evidence implies that capital account liberalizations are likely to be associated with changes in the composition as well as the level of aggregate investment. Multinational firms demonstrate a reduced proclivity to repatriate profits following liberalizations and their borrowing conditions improve substantially following liberalizations. While other patterns observed under capital controls do not disappear as sharply upon liberalization, the evidence does point to an overall investment boom following liberalizations, with a reversal of some of the underlying asset allocation patterns observed under capital controls.

One of the difficulties of interpreting recent experience is that countries choosing to impose capital controls differ in many ways from those that do not, and it is impossible to control for all the relevant differences in evaluating the impact of capital controls. Put concretely, the smaller asset demands of American affiliates in countries imposing capital controls might stem either from the capital controls themselves or from the economic conditions that motivated governments to impose the controls. In this circumstance, the subtler behavioral choices of U.S.-owned affiliates – their financing, investment allocation, transfer pricing, and dividend repatriation proclivities – also conform to the predicted effects under capital controls and

liberalizations thereby substantiating the evidence on the ways in which capital controls impact local and multinational firms.

Evidence provided in this paper on the impact of capital controls suggests a number of additional tradeoffs to governments contemplating their imposition or removal. How do the presumed benefits of capital controls compare with the higher interest rates that accompany capital controls, the distortions to foreign investment patterns and the consequences for domestic industries? And how can the evidence on the changed trade and repatriation patterns of multinational firms be reconciled with the goal of controlling capital movements? Awareness of these tradeoffs will hopefully further inform the debate over whether national capital controls are sustainable in a world economy in which capital inflows are so often the engine of economic growth.

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Table I

Descriptive Statistics of U.S. Multinational Affiliates

		Benchmark Years			
		1982	1989	1994	1997
Number of Affiliates		18,579	18,899	20,898	13,230
Median Sales		10,875	12,788	14,079	41,911
Median Assets		9,823	13,120	14,385	45,661
Median Employees		79	64	68	138
Share of Activity in Countries with Capital Controls	***Measured by:***				
Number of Affiliates	IMF	46.9%	40.4%	21.0%	NA
	Shatz	11.3%	9.8%	3.1%	NA
Assets	IMF	38.2%	28.4%	11.6%	NA
	Shatz	6.4%	4.7%	1.1%	NA
Sales	IMF	35.9%	30.0%	13.5%	NA
	Shatz	6.3%	6.4%	1.2%	NA
Employees	IMF	47.8%	40.8%	28.7%	NA
	Shatz	14.2%	13.1%	3.8%	NA

Descriptive Statistics for all Affiliate Years	Mean	Median	St. Dev
Log of Affiliate Assets	10.264	10.142	1.563
Country Tax Rate	0.326	0.341	0.134
IMF Capital Control Dummy	0.340	0.000	0.474
Shatz Capital Control Dummy	0.061	0.000	0.238
Log Net PPE	8.009	8.159	2.298
Net PPE/Assets	0.210	0.135	0.232
Log Financial Assets	9.847	9.744	1.694
Financial Assets/Total Assets	0.606	0.608	0.297
Log of Affiliate Debt	9.313	9.271	1.630
Debt/Assets	0.563	0.526	0.348
Log Affiliate Paid in Capital	7.302	7.747	2.793
Paid in Capital/Total Assets	0.225	0.093	0.333
Retained Earnings/Total Assets	0.179	0.121	0.336
Affiliate Intrafirm U.S. Trade Surplus	0.543	1.000	0.720
Pay Dividend Dummy	0.295	0.000	0.456
Dividends	3,869	-	28,318
Net Income	5,795	937	35,786
Average Interest Rate Paid on Debt	0.046	0.025	0.076
Share of Debt Borrowed Locally	0.640	0.741	0.342

Notes: The top panel provides the number count, median sales, median assets and median employees for all affiliates of U.S. multinationals in the sample by ownership form of the affiliates for 1982, 1989, 1994 and 1997. In 1982, 1989, and 1994, Benchmark Surveys were conducted and, consequently, the cutoff for inclusion in the sample is lower than other years as discussed in the text. The top panel also provides the share of affiliates, assets, sales and employees in countries with capital controls as characterized by the IMF and Shatz measures discussed in the text. The bottom panel reports descriptive statistics for all affiliates across all years for the variables employed in the regression analysis.

Table II

Descriptive Statistics of Capital Control Measures, for those countries measured by Shatz

	Capital Control Measure	
	IMF Measure (covers 1982-1995)	**Shatz Measure (covers 1986-1995)**
Argentina	1982-1992	1986-1989
Australia	1982-1984	
Austria	1982-1990	
Bahamas	1982-1995	
Barbados	1982-1995	
Belgium-Luxembourg		
Brazil	1982-1995	1986-1991
Canada		
Chile	1982-1995	1986-1991
China	1982-1995	1986-1995
Colombia	1982-1995	1986-1991
Costa Rica	1982-1994	
Denmark	1982-1987	
Dominican Republic	1982-1995	1986-1995
Ecuador	1986-1987, 1993-1994	1986-1992
Egypt	1982-1995	1986-1991
Finland	1982-1990	
France	1982-1989	
Germany		
Greece	1982-1995	1986
Guatemala	1982-1988	
Honduras	1982-1992	
Hong Kong		
India	1982-1995	1986-1995
Indonesia		
Ireland	1982-1991	
Israel	1982-1995	
Italy	1982-1989	
Jamaica	1982-1995	
Japan		
Korea	1982-1995	
Malaysia		
Mexico	1982-1995	
Netherlands		
Netherlands Antilles	1982-1995	
New Zealand	1982-1983	
Nigeria	1982-1995	1986-1995
Norway	1982-1994	
Panama		
Peru	1984-1992	1986-1992
Philippines	1982-1995	1986-1991
Portugal	1982-1992	
Saudi Arabia		
Singapore		
South Africa	1982-1995	
Spain	1982-1993	
Sweden	1982-1992	
Switzerland	none in 1992-1995, other years NA	
Thailand	1982-1995	
Trinidad and Tobago	1982-1993	
Turkey	1982-1995	
United Arab Emirates		
United Kingdom		
Venezuela	1984-1995	1986-1989

Notes: The table provides the years for which the IMF and Shatz characterize countries as having capital controls, as discussed in the text, for those countries studied by Shatz.

Table III

The Impact of Capital Controls on Multinational Affiliate Size and Allocation

Dependent Variable:	Log Affiliate Assets			Log Net PPE		Net PPE/Total Assets				Log Financial Assets		Financial Assets/Total Assets			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Constant	132.0529	106.4369	105.7203	168.1440	178.6119	4.1814	8.6517	0.2553	-1.9794	76.1874	111.0531	36.6585	16.7697	40.1569	23.2362
	(23.1598)	(21.7114)	(36.9247)	(42.4483)	(76.3402)	(5.2790)	(4.2452)	(7.9344)	(5.3892)	(42.2058)	(68.9613)	(10.2005)	(8.3006)	(12.2257)	(9.7788)
Country Tax Rate	-0.2904	-0.3213	-0.4083	-0.3800	-0.3401	0.0751	-0.0231	0.1253	-0.0061	-0.7081	-0.7882	-0.3199	-0.0559	-0.3510	-0.0587
	(0.1546)	(0.1476)	(0.1709)	(0.2982)	(0.3450)	(0.0516)	(0.0307)	(0.0520)	(0.0322)	(0.2451)	(0.2777)	(0.0651)	(0.0524)	(0.0704)	(0.0552)
IMF Capital Control Dummy		-0.2052		0.0088		0.0517	0.0222			-0.2684		-0.0468	0.0038		
		(0.0336)		(0.0608)		(0.0162)	(0.0092)			(0.0475)		(0.0128)	(0.0102)		
Shatz Capital Control Dummy			-0.2382		0.1953			0.0962	0.0518		-0.3843			-0.1211	-0.0549
			(0.0498)		(0.0983)			(0.0176)	(0.0124)		(0.1112)			(0.0289)	(0.0210)
Parent, Industry, and Year Fixed Effects?	Y	Y	Y	Y	Y	N	Y	N	Y	Y	Y	N	Y	N	Y
GNP Controls?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
No. of Obs.	20,941	17,578	16,555	14,054	13,309	16,336	16,336	15,488	15,488	6,625	5,908	6,785	6,785	6,013	6,013
R-Squared	0.4999	0.4887	0.4998	0.4887	0.4704	0.0158	0.4912	0.0143	0.4932	0.5176	0.5249	0.0206	0.5685	0.0239	0.5745

Table IV

The Impact of Capital Controls on Multinational Affiliate Financing

Dependent Variable:	Log Affiliate Debt		Debt/Assets				Log Affiliate Paid in Capital		Paid in Capital/Total Assets				Retained Earnings/Total Assets			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Constant	65.9387	1.1467	-32.4493	-21.3169	-55.8262	-44.3923	71.9760	13.4696	16.9138	15.6153	27.6626	20.5371	12.2979	8.6440	15.4169	7.2121
	(33.1958)	(55.1883)	(9.8822)	(9.1011)	(16.4507)	(14.9227)	(70.4157)	(90.4839)	(9.5001)	(8.9071)	(14.2702)	(10.2227)	(8.8287)	(7.2133)	(14.7056)	(12.8497)
Country Tax Rate	0.1281	-0.0128	0.1657	0.1550	0.1041	0.0958	0.4353	0.6386	0.0113	-0.0072	0.0696	0.0583	-0.0027	-0.0291	-0.0763	-0.1392
	(0.2089)	(0.2506)	(0.0768)	(0.0641)	(0.0822)	(0.0680)	(0.4345)	(0.4765)	(0.0837)	(0.0606)	(0.0765)	(0.0579)	(0.0840)	(0.0618)	(0.0967)	(0.0852)
IMF Capital Control Dummy	-0.1542		-0.0056	0.0178			0.1862		0.0557	0.0457			-0.0644	-0.0692		
	(0.0555)		(0.0151)	(0.0139)			(0.0820)		(0.0236)	(0.0151)			(0.0173)	(0.0160)		
Shatz Capital Control Dummy		-0.1570			-0.0221	0.0003		0.4165			0.1507	0.0996			-0.0906	-0.0943
		(0.0900)			(0.0305)	(0.0266)		(0.1421)			(0.0216)	(0.0254)			(0.0161)	(0.0172)
Parent, Industry, and Year Fixed Effects?	Y	Y	N	Y	N	Y	Y	Y	N	Y	N	Y	N	Y	N	Y
GNP Controls?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
No. of Obs.	13,389	12,658	13,558	13,558	12,814	12,814	12,310	11,655	13,455	13,455	12,741	12,741	47,488	47,488	47,310	47,310
R-Squared	0.4305	0.4388	0.0075	0.3247	0.0084	0.3332	0.3695	0.3756	0.0064	0.3161	0.0119	0.3085	0.0163	0.2225	0.0165	0.2231

Table V

The Impact of Capital Controls on Transfer Pricing and Trade Behavior of U.S. Multinationals

Dependent Variable: (U.S. Exports - U.S. Imports)/(U.S. Exports + U.S. Imports)						
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	0.4535	0.7165	0.4454	0.8398	0.4645	0.8494
	(0.0188)	(0.2314)	(0.0237)	(0.1981)	(0.0267)	(0.1830)
Country Tax Rate	0.2605	0.1201	0.2620	0.0920	0.1688	0.1118
	(0.0552)	(0.0372)	(0.0617)	(0.0426)	(0.0799)	(0.0480)
IMF Capital Control Dummy			0.0557	0.0428		
			(0.0183)	(0.0120)		
Shatz Capital Control Dummy					0.0369	0.0541
					(0.0455)	(0.0306)
Parent, Industry, and Year Fixed Effects?	N	Y	N	Y	N	Y
No. of Obs.	84,902	84,902	72,212	72,212	52,422	52,422
R-Squared	0.0018	0.3425	0.0028	0.3430	0.0007	0.3633

Notes:

Table VI

The Impact of Capital Controls on the Dividend Policy of U.S. Multinationals

Dependent Variable: Dummy Equal to One if Dividend Payment Made								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant	-1.2845 (0.0224)		-1.0990 (0.0259)		-1.5273 (0.0234)		-1.2845 (0.0224)	
Country Tax Rate	0.8076 (0.0573)	0.3291 (0.0705)	0.2075 (0.0729)	0.0005 (0.0867)	1.1108 (0.0590)		0.4635 (0.0751)	0.0521 (0.0880)
IMF Capital Control Dummy	0.3674 (0.0135)	0.0782 (0.0165)			0.4198 (0.0138)			
Shatz Capital Control Dummy			0.4265 (0.0311)	0.0877 (0.0365)			0.4828 (0.0317)	0.1351 (0.0368)
Net Income					2.62E-05 5.36E-07		2.56E-05 5.73E-07	1.28E-05 4.18E-07
Parent/Year Fixed Effects?	N	Y	N	Y	N	Y	N	Y
No. of Obs.	113,725	88182	80,388	60,423	113,406		80,377	60,417
Log Likelihood	-68,625	-42,648	-46,690	-28,484	-66,296		-44,843	-27,411

Notes:

Table VII

The Impact of Capital Controls on the Dividend Policy of U.S. Multinationals

Dependent Variable: Dividend Paid									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Net Income	0.4132	0.4122	0.3567	0.4022	0.3969	0.3385	0.4311	0.4244	0.3174
	(0.0197)	(0.0209)	(0.0233)	(0.0206)	(0.0215)	(0.0250)	(0.0223)	(0.0232)	(0.0259)
Lagged Dividends	0.2747	0.2588	0.0822	0.2540	0.2382	0.0280	0.2342	0.2141	0.0047
	(0.0276)	(0.0277)	(0.0240)	(0.0322)	(0.0325)	(0.0311)	(0.0311)	(0.0307)	(0.0268)
IMF Capital Control Dummy				-0.0162	-0.0222	-0.0545			
Interacted with Net Income				(0.0426)	(0.0420)	(0.0421)			
IMF Capital Control Dummy				0.0629	0.0621	0.1118			
Interacted with Lagged Dividends				(0.0815)	(0.0800)	(0.0582)			
Shatz Capital Control Dummy							-0.1229	-0.1228	-0.1216
Interacted with Net Income							(0.0545)	(0.0544)	(0.0679)
Shatz Capital Control Dummy							0.3307	0.3247	0.2799
Interacted with Lagged Dividend							(0.0733)	(0.0735)	(0.1403)
Parent Fixed Effects?	N	Y	N	N	Y	N	N	Y	N
Affiliate Fixed Effects?	N	N	Y	N	N	Y	N	N	Y
No. of Obs.	87,339	87,339	87,339	74,482	74,482	74,482	56,689	56,689	56,689
R-Squared	0.3954	0.3836	0.5157	0.3821	0.3702	0.5005	0.3833	0.3735	0.5430
Payout ratio	No Capital Controls			0.5392	0.5210	0.3483	0.5629	0.5400	0.3189
	Capital Controls			0.5651	0.5354	0.3302	0.9907	0.9201	0.4437
Adjustment Parameter	No Capital Controls			0.7460	0.7618	0.9720	0.7658	0.7859	0.9953
	Capital Controls			0.6831	0.6997	0.8602	0.4351	0.4612	0.7153

Notes:

Table VIII

Capital Controls and Local Borrowing Rates

Dependent Variable: Average Interest Rate Paid on Debt								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant	0.0362	0.0947	0.0400	0.0516	0.0351	0.0347	0.0377	0.0124
	(0.0028)	(0.0115)	(0.0028)	(0.0132)	(0.0033)	(0.0061)	(0.0039)	(0.0143)
IMF Capital Control Dummy	0.0303	-0.0034			0.0176	-0.0088		
	(0.0088)	(0.0070)			(0.0091)	(0.0088)		
Shatz Captial Control Dummy			0.0823	0.0741			0.0476	0.0156
			(0.0201)	(0.0156)			(0.0187)	(0.0258)
Share of Debt Borrowed Locally					0.0048	-0.0002	0.0077	0.0038
					(0.0021)	(0.0018)	(0.0031)	(0.0023)
Share of Debt Borrowed Locally Interacted with IMF Capital Control Dummy					0.0272	0.0224		
					(0.0116)	(0.0057)		
Share of Debt Borrowed Locally Interacted with Shatz Capital Control Dummy							0.0687	0.0416
							(0.0172)	(0.0124)
Parent, country and year fixed effects?	N	Y	N	Y	N	Y	N	Y
No. of Obs.	35,238	35,238	35,217	35,217	18,661	18,661	18,791	18,791
R-Squared	0.0353	0.2759	0.0825	0.2899	0.0483	0.3558	0.1151	0.3547

Notes:

Table IX

Capital Control Liberalization, Multinational Affiliate Size, and Asset Allocation

Dependent Variable:	Log Affiliate Assets		Log Net PPE		Net PPE/Total Assets		Log Financial Assets		Financial Assets/Total Assets	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Constant	9.8495	9.7481	8.2204	8.1133	0.2926	0.2984	9.1808	9.0555	0.4897	0.5881
	(0.0249)	(0.0363)	(0.0263)	(0.0377)	(0.0031)	(0.0062)	(0.0266)	(0.0394)	(0.0030)	(0.0130)
Post Liberalization Dummy	0.5978	0.1175	0.5170	0.0964	-0.0230	-0.0031	0.7716	0.1771	0.0560	0.0183
	(0.0599)	(0.0593)	(0.0516)	(0.0770)	(0.0067)	(0.0090)	(0.0923)	(0.0712)	(0.0089)	(0.0106)
Affiliate Fixed Effects?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year Fixed Effects?	N	Y	N	Y	N	Y	N	Y	N	Y
No. of Obs.	17,810	17,810	13,788	13,788	14,867	14,867	12,477	12,477	12,734	12,734
R-Squared	0.8575	0.8699	0.8825	0.8871	0.8269	0.8286	0.8392	0.8586	0.7982	0.8021

Notes:

Table X

Capital Control Liberalization and Multinational Affiliate Financing

Dependent Variable:	Log Affiliate Debt		Debt/Assets		Average Interest Rate Paid on Debt		Log Affiliate Paid in Capital		Paid in Capital/Assets		Pay Dividend Dummy		Retained Earnings/Assets	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Constant	8.9880	9.6573	0.5357	0.4907	0.1392	0.1311	8.0373	8.0114	0.3587	0.3100			0.1208	0.2174
	(0.0221)	(0.0799)	(0.0046)	(0.0197)	(0.0100)	(0.0173)	(0.0273)	(0.0533)	(0.0073)	(0.0302)			(0.0151)	(0.0321)
Post Liberalization Dummy	0.4762	0.1228	-0.0327	0.0032	-0.0914	-0.0719	0.4555	0.1156	-0.0156	-0.0076	-0.7196	-0.5881	0.0506	-0.0333
	(0.0621)	(0.0662)	(0.0086)	(0.0125)	(0.0215)	(0.0229)	(0.0398)	(0.0478)	(0.0146)	(0.0192)	(0.0639)	(0.1386)	(0.0312)	(0.0357)
Affiliate Fixed Effects?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year Fixed Effects?	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y
No. of Obs.	13,026	13,026	13,087	13,087	3,552	3,552	12,401	12,401	13,040	13,040	7,617	7,617	5,160	5,160
R-Squared	0.8389	0.8500	0.7381	0.7392	0.7632	0.7646	0.8269	0.8316	0.7418	0.7478			0.8193	0.8223
Log Likelihood											-3,091	-3,055		

Notes: