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Author(s): Mihir A. Desai, C. Fritz Foley, James R. Hines Jr.

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A Multinational Perspective on Capital Structure Choice and Internal Capital Markets

MIHIR A. DESAI, C. FRITZ FOLEY, and JAMES R. HINES JR.*

ABSTRACT

This paper analyzes the capital structures of foreign affiliates and internal capital markets of multinational corporations. Ten percent higher local tax rates are associated with 2.8% higher debt/asset ratios, with internal borrowing being particularly sensitive to taxes. Multinational affiliates are financed with less external debt in countries with underdeveloped capital markets or weak creditor rights, reflecting significantly higher local borrowing costs. Instrumental variable analysis indicates that greater borrowing from parent companies substitutes for three-quarters of reduced external borrowing induced by capital market conditions. Multinational firms appear to employ internal capital markets opportunistically to overcome imperfections in external capital markets.

TO WHAT EXTENT DOES CORPORATE BORROWING increase due to the tax deductibility of interest expenses and decline in response to costs imposed by capital market underdevelopment or unfavorable legal systems? Do firms use internal capital markets to substitute for external finance when the latter is costly, and if so, how extensive is such substitution? Empirical attempts to answer these fundamental questions face significant challenges. Limited variation in tax incentives within countries makes it difficult to identify the effects of taxes, and detailed information on the workings of internal capital markets is scarce. Recent efforts using cross-country samples exploit the rich variation that international comparisons offer, but frequently face problems associated with nonstandardized measurement across countries and limited statistical power due to small sample sizes.

Cross-country studies of capital structure commonly ignore the distinctive and illuminating features of multinational firms. These firms face differing tax incentives and legal regimes around the world, making it possible to identify the impact of these factors on financing choices. Analysis of the behavior of

*Desai is from Harvard University and NBER, Foley is from Harvard University, and Hines is from the University of Michigan and NBER. The statistical analysis of firm-level data on U.S. multinational companies was conducted at the International Investment Division, Bureau of Economic Analysis, U.S. Department of Commerce under arrangements that maintain legal confidentiality requirements. The views expressed are those of the authors and do not reflect official positions of the U.S. Department of Commerce. We thank various seminar participants, the referees, Richard Green, René Stulz, and William Zeile for helpful comments, as well as the Lois and Bruce Zenkel Research Fund at the University of Michigan and the Division of Research at Harvard Business School for financial support.

multinational firms promises clean estimates of the sensitivity of capital structure choice to tax incentives, an understanding of the mechanisms by which weak capital markets affect financing choices, and insight into the ways in which internal capital markets can facilitate tax minimization and provide an alternate financing source when external financing is most costly.

This paper analyzes the determinants of the capital structures of foreign affiliates of U.S. multinational firms, thereby obtaining evidence of the workings of their internal capital markets. The use of confidential affiliate-level data makes it possible to distinguish the behavior of foreign affiliates of the *same* parent companies operating in markets with differing tax rates and capital market regimes and to differentiate the determinants of external borrowing and borrowing from parent companies. As a result, it is possible to obtain estimates of the impact of taxation and local capital market conditions, while implicitly controlling for considerations that are common to all affiliates of the same company. The sample includes information on the activities of roughly 3,700 U.S. multinational firms operating in more than 150 countries through approximately 30,000 affiliates in 1982, 1989, and 1994. Since all reporting follows generally accepted U.S. accounting principles, and all financial information is filed through U.S. entities familiar with such practices, it is not necessary to make problematic assumptions normally required in order to analyze financial information collected in different countries. Furthermore, since the data distinguish borrowing from external sources and borrowing from parent companies, it is possible to study aspects of capital markets that are internal to firms.

The analysis first examines the effect on total affiliate leverage of tax incentives and legal and capital market conditions. Then the analysis evaluates the determinants of borrowing from external sources and borrowing from parent companies, using legal and capital market conditions as instruments to measure the extent to which firms substitute loans from parent companies for loans from external sources. Next comes consideration of the effect of legal and capital market conditions on borrowing rates, including differences between interest rates on external debt and interest rates on loans from parent companies. The analysis concludes by measuring the extent to which induced variation in borrowing costs changes debt sourcing decisions of multinational affiliates.

Three main empirical findings emerge. First, there is strong evidence that affiliates of multinational firms alter the overall level and composition of debt in response to tax incentives. The estimates imply that 10% higher tax rates are associated with 2.8% greater affiliate debt as a fraction of assets, internal finance being particularly sensitive to tax differences. While the estimated elasticity of external borrowing with respect to the tax rate is 0.19, the estimated tax elasticity of borrowing from parent companies is 0.35.

Second, the level and composition of leverage are influenced by capital market conditions. In countries with weak creditor rights and shallow capital markets, affiliates borrow less externally and more from parent companies. This suggests that internal borrowing may substitute for costly external borrowing. Instrumental variables regressions in which creditor rights and capital market conditions serve as instruments for the quantity of external debt permit

identification of the degree to which affiliates substitute internal borrowing from parent companies for external debt. The results indicate that affiliates increase internal borrowing to offset approximately three-quarters of the reduction in external borrowing due to adverse legal and capital market conditions. All of these results control for other determinants of leverage and the composition of debt, including political risk and inflation, that also appear to influence affiliate leverage and its composition. Increased political risk is associated with greater overall leverage in the form of expanded external borrowing, while inflation does not appear to affect overall leverage, though higher inflation is associated with greater external borrowing and reduced internal borrowing.

Third, the evidence indicates that external borrowing is more costly in environments in which creditor rights are weak and capital markets are shallow and that affiliates substitute parent for external borrowing in response to these costs. Interest rates on external debt differ for affiliates of the same American parent company located in different host countries in a manner that corresponds to measures of capital market depth and creditor rights; moreover, the wedge between the cost of borrowing from external lenders and the cost of borrowing from parent companies is larger where credit markets are poorly developed. Instrumental variables regressions in which creditor rights and capital market conditions serve as instruments for interest rates allow identification of the degree to which affiliates alter the mix of borrowing from external sources and parent companies in response to differences in borrowing costs. One percent higher interest rates on external debt due to legal and capital market conditions are associated with external borrowing that falls by 1.3% of assets and borrowing from parent companies that rises by 0.8% of assets.

Section I of the paper reviews the studies of the effect of tax incentives on capital structure, the impact of local capital market conditions on financing decisions, and the workings of internal capital markets. Section II describes the affiliate-level data and summarizes the leverage and interest rate measures used in the analysis. Section III analyzes the determinants of affiliate capital structure and the use of loans from parent companies to substitute for external sources of funds. Section IV concludes.

I. Motivation and Hypotheses

The financing of foreign affiliates is likely to be influenced by the effect of local tax rates and capital market conditions on the after-tax cost of funds and by the ability of affiliates to obtain resources from parent companies. As a result, affiliate financing illuminates the importance of taxes in influencing capital structure, the impact of institutions on financing choices, and the workings of internal capital markets.

A. Taxes and Capital Structure

Since interest payments to lenders usually are fully deductible from taxable income, while dividend payments to shareholders are not, tax systems typically

encourage the use of debt rather than equity finance.¹ This incentive grows as the corporate tax rate rises, so high corporate tax rates are often expected to be associated with greater corporate indebtedness. As Auerbach (2002) and Graham (2003) note, however, estimating the sensitivity of capital structure to tax incentives has proven remarkably difficult, due in part to measurement problems. Consequently, it is not surprising that several studies find no effect or unexpected relationships between tax incentives and the use of debt.² One problem in identifying tax effects stems from the lack of variation in corporate tax rates. By focusing on whether a firm is near tax exhaustion, Mackie-Mason (1990) avoids this constraint and identifies evidence of tax effects, in which the deductibility of interest expenses appears to encourage firms to use greater leverage than they otherwise would. Graham (1996), Graham, Lemmon, and Schallheim (1998), and Graham (1999) employ a sophisticated measure of the marginal tax rate in the United States based on simulations and prevailing tax rules to investigate further the use of debt and the relevance of personal taxation. The use of cross-country evidence has the potential to contribute further evidence by analyzing the outcomes when firms simultaneously select capital structures in several tax environments. This approach is able to overcome some of the difficulties that arise in identifying the marginal investor in general equilibrium and in accounting for the numerous factors that might give rise to deviations from a Miller (1977) equilibrium.

Hodder and Senbet (1990) extend the logic of a Miller equilibrium to an international setting to suggest that, in an integrated world capital market, all firms will locate debt in the most tax-advantaged jurisdictions.³ As it is reasonable to posit that multinational firms operate in integrated capital markets, a

¹ There are subtle differences between the tax incentives of domestic and multinational firms. American multinational firms owe taxes to the United States on their foreign incomes, but they defer U.S. taxes until profits are repatriated and are entitled to claim credits for foreign income taxes paid. The upshot of this system is that American firms typically can arrange their finances to benefit from the deductibility of interest expenses in high-tax countries; for analyses, see Hines and Rice (1994) and Hines (1999).

² These results have also generated considerable skepticism on the importance of taxes to capital structure as evidenced in Myers et al. (1998). Such skepticism does not conform to the survey results reported in Graham and Harvey (2001), in which 45% of respondents indicate that tax implications are important or very important determinants of leverage, led only by the implications of borrowing for financial flexibility, credit rating, and the volatility of earnings. Tax considerations were reported to be particularly salient for larger, public firms and for decisions concerning the financing of subsidiaries. Valuation effects of debt usage, as analyzed by Fama and French (1998) and Graham (2000), offer additional evidence of the impact of taxation but are less applicable to multinational affiliates, since they are usually not separately traded.

³ While Hodder and Senbet (1990) predict extreme outcomes, there are other factors (some of which are considered below) that might constrain firms from corner solutions. Some countries impose "thin capitalization" rules that limit the tax deductibility of interest paid by firms deemed to have excessive debt. These rules are typically vaguely worded and seldom, though arbitrarily, imposed, making their effects difficult to analyze quantitatively; any impact they have is likely to reduce the estimated significance of factors influencing total indebtedness. Also, "thin capitalization" rules generally do not affect the choice between different kinds of debt. Other theoretical examinations of the effect of tax incentives on the use of debt within multinational firms include Hines (1994), Chowdry and Nanda (1994), and Chowdry and Coval (1998).

multinational firm faces a single cost of capital, and therefore the relative tax advantage of debt in any market is simply a function of local tax rates. As a result, the sensitivity of foreign affiliate capital structure to foreign tax rates offers a powerful and clean test of the response of leverage to differential tax advantages to debt.⁴

B. Institutions, Markets, and External Borrowing Conditions

A large body of work indicates that there are important differences in the ability of firms to raise capital in different countries. La Porta et al. (1998) trace these effects to differences in legal regimes, and create an index of creditor rights in bankruptcy for a large sample of countries. In La Porta et al. (1997), these authors show that legal regimes have large effects on the size and breadth of capital markets: countries with weak creditor rights have significantly smaller local debt markets. There is evidence of other important determinants of financial development (Rajan and Zingales (2003)), but there is little disagreement that financial development varies widely.

Weak local financial markets appear to be associated with lower rates of growth. Evidence of this effect is provided at the country level by King and Levine (1993), at the industry level by Rajan and Zingales (1998), and at the firm level by Demirguc-Kunt and Maksimovic (1998). However, existing work does not detail the extent to which weak capital market conditions affect the cost of external borrowing, capital structure choice, and the use of internal capital markets as substitutes for external capital markets. In their cross-country analysis of the determinants of capital structure choice, Rajan and Zingales (1995) focus on G-7 countries, finding limited evidence of systematic differences across these similar countries. Booth et al. (2001) analyze firms in 10 developing countries, finding that these firms use less long-term debt than do comparable firms in developed countries and that unspecified country factors are significant determinants of capital structure. These studies leave open questions of how capital market conditions might directly alter the cost of external debt and how these conditions might push firms to attempt to substitute for locally provided external capital.⁵

⁴ Other studies examine specific aspects of the effect of taxation on the financing of multinational firms. See Froot and Hines (1995) and Newberry (1998) on the effects of limits to the deductibility of interest expenses due to the U.S. allocation rules, Desai and Hines (1999) on changes in joint venture capital structure in response to foreign tax credit limitations, Altshuler and Grubert (2003) on interaffiliate transactions motivated by tax rules, and Newberry and Dhaliwal (2001) on the decision to issue bonds through the parent or a foreign subsidiary as a function of foreign tax credit rules.

⁵ Studies such as Eichengreen and Mody (2000a,b) examine the determinants of corporate borrowing spreads across countries and the impact of differing legal regimes on sovereign borrowing costs. The alternative of analyzing interest rates paid by multinational firms implicitly controls for a host of unobservable factors by comparing interest rates faced by the same company in different institutional environments. The absence of detailed data on affiliate borrowing makes it infeasible, however, to incorporate term structure considerations emphasized in papers such as Duffee (2002).

In order for multinational affiliate capital structure decisions to illuminate the mechanisms by which local contracting conditions impact borrowing costs, multinational bankruptcies must follow local bankruptcy rules rather than the bankruptcy rules of the home country. This is generally the case. There is a remarkable void in the laws governing multinational bankruptcies, but respect for the laws of the country in which a firm is operating implies that local bankruptcy rules apply to the resolution of insolvency proceedings involving a multinational affiliate.⁶

Because local bankruptcy rules prevail, a multinational firm effectively is faced with the opportunity of borrowing across a variety of creditor rights' regimes. Real interest rates should be higher (all other things equal) in countries in which lenders have fewer rights in the event of default. Shleifer and Wolfenzon (2002) analyze the impact of creditor rights on economic outcomes, and Noe (2000) provides an equilibrium model of capital structure choice for multinational affiliates facing different legal regimes. The ability to renegotiate strategically with creditors in times of fiscal distress is attractive to the distressed firm but reduces its incentive to avoid bankruptcy, creating an agency problem that is reflected in higher borrowing rates.

Since shareholders bear agency costs, they have incentives to minimize renegotiation opportunities and can do so by concentrating their borrowing in jurisdictions providing strong creditor rights. Moreover, internal capital markets can be used to fund subsidiaries in jurisdictions providing weak creditor rights, drawing on capital from operations located in countries offering strong creditor rights. In addition to these predictions on the level and composition of affiliate debt, the interest rates paid by multinational firms should reflect the fact that lenders in countries with weak legal protections receive less in adverse states of the world than do lenders in countries offering strong legal protections. Furthermore, since there is adverse selection in the lending market, and moral hazard once borrowers receive loans, local banks and other lenders need to expend resources to investigate potential borrowers, monitor their behavior once loans are granted, and deploy legal resources to enforce contracts. These are real resource costs that should be reflected in still higher interest rates paid by borrowers and received by lenders in countries with weak creditor rights.

C. Internal Capital Markets

The sensitivity of investment to internal cash flows noted since Meyer and Kuh (1957) has drawn attention to the role of internal capital markets and how they are used by firms in response to any differences between internal

⁶ Desai et al. (2003) offer a detailed discussion of the workings of multinational bankruptcies and the reasons why local laws should dictate the bankruptcy terms of multinational affiliates. Additionally, Bebchuk and Guzman (1999) provide a useful analysis of the tension between local and universal principles for multinational bankruptcies with particular reference to the United States, and Tagashira (1994), Gitlin and Flaschen (1987), and Powers (1993) discuss various efforts at international bankruptcy cooperation and their shortcomings.

and external costs of funds. Many efforts to examine the role of internal capital markets have been limited by relatively small samples, as in Blanchard, Lopez-de-Silanes, and Shleifer (1994) and Lamont (1997), or, as noted by Kaplan and Zingales (1997), by questionable a priori assumptions about what characterizes firms that face sizable wedges between internal and external costs of funds. This paper considers a large sample of firms, looking across environments in which differences between internal and external costs of funds differ systematically for reasons related to the development of capital markets, analyzing the allocation of funds within firms in response to these costs.⁷

Tests of the extent of substitution of internal capital for external capital across different borrowing environments reveal the degree to which multinational firms can use internal markets to overcome shortcomings associated with external credit market conditions. These tests produce powerful evidence of whether weak local capital market conditions constrain local borrowers. If affiliates substitute parent-provided debt for external debt where creditor rights are weak and where locally provided debt is scarce or expensive, then the use of external debt must be a relatively unattractive option in those locations. If local firms rely primarily on local sources of debt, then access to large internal capital markets may give multinational affiliates cost advantages over local firms. Multinational firms are also able to respond to tax incentives by adjusting loans between parent companies and subsidiaries, thereby creating tax planning opportunities not available to local firms. The sensitivity of parent loans to tax rate differences indicates the extent to which firms manage their internal finances to exploit these opportunities.

II. Multinational Affiliate Data

The empirical work analyzes data collected by the Bureau of Economic Analysis (BEA) for its Benchmark Survey of U.S. Direct Investment Abroad in 1982, 1989, and 1994, which includes information on the financial and operating characteristics of U.S. firms operating abroad. As a result of confidentiality assurances and penalties for noncompliance, BEA believes that coverage is close to complete and levels of accuracy are high. The surveys ask reporters for details on each affiliates' income statement, balance sheet, employment, and a variety of transactions between U.S. parents and their foreign affiliates. 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 ownership of the affiliate. In each of the benchmark years considered (1982, 1989, and 1994), 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. Reporters must abide by generally accepted U.S.

⁷ Stein (1997), Shin and Stulz (1998), and Scharfstein and Stein (2000), among others, discuss how internal capital markets can either ameliorate or exacerbate other frictions. Hubbard and Palia (1999) emphasize empirically how conglomerates may use internal capital markets opportunistically in response to costly external financing.

accounting principles and follow FASB 52 when dealing with foreign currency translations.⁸

The top panel of Table I displays the descriptive statistics for the sample of affiliates in each of the three benchmark years. In 1994, 17,898 affiliates of 2,373 parent firms filed forms, and these affiliates had mean and median assets of \$74 million and \$13 million, respectively. The main measure of affiliate leverage used in the analysis that follows is the ratio of current liabilities and long-term debt to affiliate assets. This measure has a mean and median of approximately 0.55 over the sample period. The main reason for focusing the analysis on this measure of leverage is that the data allow this measure to be disaggregated into the amount owed to an affiliate's corporate parent and the amount owed to other lenders. Nonetheless, the analysis in Table II considers a more narrow definition of leverage that removes trade credit, and the ratio of this restricted definition of debt to assets has a mean value of 0.35 over the period.

As the data in Table I indicate, the vast majority of debt comes from nonparent sources. Borrowing from the parent/assets is the ratio of the difference between the level of current liabilities and long-term debt an affiliate borrows from, and lends to, its U.S. parent to total affiliate assets. This variable has a mean of approximately 0.08 over the sample period, and a median that is just larger than zero. External borrowing/assets, the ratio of the level of current liabilities and long-term debt an affiliate borrows from nonparent sources to total affiliate assets, has a mean of 0.44 and a median of 0.41 for the benchmark years. On average, less than 20% of current liabilities and long-term debt comes from parent sources.⁹

The BEA data also contain information on the interest expense associated with affiliate debt, and it is possible to use this information to calculate an affiliate's average interest rate in a year. Because the data do not contain detailed information on interest rates charged on individual loans or on which types of debt are interest-bearing, the analysis uses two estimates of interest rates. The first measure is the interest rate on external borrowing, which is calculated

⁸ Majority-owned affiliates were required to report a broader set of accounting items than were minority-owned affiliates. Larger affiliates were required to file longer forms than were smaller affiliates in 1989 and 1994. Additional information on the BEA data can be found in Mataloni (1995) and Desai et al. (2003).

⁹ Three data shortcomings potentially limit identification of external and parent borrowing. First, there is no information on the extent to which parent companies guarantee affiliate loans. Second, back-to-back loans, in which a parent lends to a multinational bank which in turn lends to an affiliate through a branch located abroad, are recorded as external debt despite significant parent involvement. Third, loans made by an affiliate to another affiliate of the same parent are classified as external borrowing. Since these shortcomings blur the distinction between external and parent borrowing, they may reduce the measured differences between these two forms of debt. As a result, tests that distinguish the responsiveness of external and parent debt to taxes and borrowing conditions that use these data, if anything, underestimate true differences, and tests of the substitution of parent provided debt for external debt, if anything, underestimate the extent of substitution.

Table I
Descriptive Statistics for Affiliates of U.S. Multinationals
in 1982, 1989, and 1994

The top panel provides descriptive statistics for dependent variables for all affiliates of U.S. multinationals by year and for the entire sample. Affiliate leverage is the ratio of affiliate current liabilities and long-term debt to total affiliate assets. Affiliate nontrade account leverage is the ratio of affiliate current liabilities and long-term debt, less trade accounts and trade notes payable, to total affiliate assets. External borrowing/assets is the ratio of current liabilities and long-term debt an affiliate borrows from nonparent sources to total affiliate assets. Borrowing from the parent/assets is the ratio of net current liabilities and long-term debt an affiliate borrows from its U.S. parent to total affiliate assets. The interest rate on external borrowing is the ratio of the affiliate interest payments to nonparents to current liabilities and long-term debt borrowed from nonparent sources. The interest rate on nontrade account borrowing is the ratio of total affiliate interest payments to current liabilities and long-term debt, excluding trade accounts and trade notes payable. The bottom panel reports descriptive statistics for control variables for all affiliates across all years. Country Tax Rate is the median tax rate in an affiliate's host country measured on an annual basis in the manner described in the text. Private credit is the ratio of private credit lent by deposit money banks to GDP, as provided in Beck et al. (1999). Creditor rights is an index of the strength of creditor rights developed in LaPorta et al. (1998); higher levels of the measure, which ranges from 0 to 4, indicate stronger legal protections. Net PPE/assets is the ratio of affiliate net property, plant, and equipment to total affiliate assets. EBITDA/assets is the ratio of affiliate earnings before interest, taxes, depreciation and amortization to total affiliate assets. Log of sales is the natural log of affiliate sales. Political risk is the annual average of the monthly index of political risk presented in the International Country Risk Guide, rescaled to lie between 0 and 1 with higher numbers indicating higher risks. Rate of inflation is the contemporaneous percentage change in the GDP deflator of an affiliate's host country. Growth options is the compound annual growth rate of total affiliate sales in an affiliate's country and industry until the following benchmark year. Share of debt from nonparent sources is the share of affiliate current liabilities and long-term debt owed to lenders other than the affiliate's parent.

	Benchmark Years			All Years
	1982	1989	1994	
Number of affiliates	14,918	15,243	17,898	32,342
Number of parents	1,902	1,989	2,373	3,680
Assets				
Mean	39,213	57,209	73,762	57,861
Median	8,401	10,987	12,704	10,597
Standard deviation	181,507	290,062	356,849	291,098
Affiliate leverage				
Mean	0.5707	0.5434	0.5446	0.5518
Median	0.5574	0.5256	0.5277	0.5364
Standard deviation	0.2893	0.3000	0.3131	0.3023
Affiliate nontrade account leverage				
Mean	0.3435	0.3540	0.3627	0.3499
Median	0.2779	0.2989	0.3149	0.2885
Standard deviation	0.2856	0.2779	0.2749	0.2816
External borrowing/assets				
Mean	0.4626	0.4433	0.4306	0.4439
Median	0.4329	0.4098	0.3840	0.4074
Standard deviation	0.2798	0.2916	0.3008	0.2921

(continued)

Table I—Continued

	Benchmark Years			All Years
	1982	1989	1994	
Borrowing from the parent/assets				
Mean	0.0845	0.0705	0.0846	0.0801
Median	0.0077	0.0032	0.0022	0.0041
Standard deviation	0.2464	0.2357	0.2616	0.2490
Interest rate on external borrowing				
Mean	0.0595	0.0435	0.0298	0.0493
Median	0.0231	0.0138	0.0099	0.0163
Standard deviation	0.1010	0.0883	0.0642	0.0922
Interest rate on nontrade account borrowing				
Mean	0.0919	0.0659	0.0485	0.0765
Median	0.0397	0.0269	0.0180	0.0299
Standard deviation	0.1463	0.1196	0.0974	0.1322
<i>Descriptive Statistics for All Affiliate Years</i>	<i>Mean</i>	<i>Median</i>	<i>SD</i>	
Country tax rate	0.3431	0.3404	0.1228	
Private credit	0.7927	0.7945	0.4478	
Creditor rights	1.9953	2.0000	1.3211	
Net PPE/assets	0.2360	0.1623	0.2357	
EBITDA/assets	0.1479	0.1378	0.2138	
Log of sales	9.5549	9.5540	2.0431	
Political risk	0.2359	0.2050	0.1215	
Rate of inflation	0.5572	0.0571	3.1066	
Growth options	0.0726	0.0613	0.1788	
Share of debt from nonparent sources	0.8148	0.9706	0.2795	

by dividing affiliate interest payments to nonparents by current liabilities and long-term debt borrowed from nonparent sources. This variable has a mean of approximately 0.05 and a median of approximately 0.02 over the sample period. One of the reasons that these average interest rates appear low is that the broad measure of debt used in this calculation includes trade credit, which is often noninterest bearing.¹⁰

In order to ensure that the interest rate regressions do not produce spurious results driven by differences in the use of trade credit, the dependent variable in several of the regressions is the interest rate on nontrade account borrowing, which is the ratio of total interest paid to a measure of current liabilities

¹⁰ Interest rates are based on current interest payments, and therefore exclude payments to creditors in the event of default. Capital market equilibrium implies that interest rates measured in this way should be higher in jurisdictions in which creditor rights are weaker, and expected default payments are lower. Interest payments are recorded in U.S. dollars. The currency denomination of debt may be important to financial decision making within a multinational firm, but it is impossible to tell from the BEA data in which currency debt is formally denominated. See Kedia and Mazumdar (2003) and Allayannis, Brown, and Klapper (2003) for analyses of the determinants of the currency denomination of debt.

and long-term debt that excludes trade accounts and trade notes payable. This alternative interest rate variable has a mean of 0.08 and a median of 0.03. This variable includes interest payments to parents and external sources in the numerator and total debt in the denominator.

The bottom panel of Table I provides summary statistics for independent variables used in the regression analysis. Included among these variables are measures of affiliate characteristics that other studies (Titman and Wessels (1988), Rajan and Zingales (1995)) have shown to be correlated with leverage. These are all drawn from BEA data and include a measure of the tangibility of affiliate assets (the ratio of affiliate net property, plant, and equipment to assets), the cash flow generating capacity of underlying assets (the ratio of affiliate EBITDA to assets), affiliate size (the natural logarithm of affiliate sales), and the scope of growth options (as proxied by future sales growth within a country/industry grouping).¹¹ In addition, the relevant country-level measures of tax incentives, capital market depth, legal protections, and macroeconomic and political stability are summarized. Tax rates are calculated from BEA data by taking the ratio of foreign income taxes paid to foreign pretax income for each affiliate and using the medians of these rates as country-level observations for each country and year.¹² Mean and median country tax rates are equal to approximately 34% over the sample period. Private credit is the ratio of private credit lent by deposit money banks to GDP, as provided in Beck, Demirgüç-Kunt, and Levine (1999). Creditor rights is an index of the strength of creditor rights developed in La Porta et al. (1998) that ranges from 0 to 4, with higher levels indicating stronger legal protections. Political risk is the annual average of monthly assessments from the International Country Risk Guide, rescaled to lie between 0 and 1, with higher values indicating greater risk. Since data for 1982 are unavailable, 1984 values are used in their place. The rate of inflation is the contemporaneous percentage change in a host country's GDP deflator.

III. Results

The first set of regressions reported in this section considers the determinants of total affiliate leverage, emphasizing the effects of local tax rates and

¹¹ The growth options variable is the compound annual rate of sales growth for all affiliates in a country/industry cell between the current and following BEA benchmark survey. For example, an observation for an affiliate in Germany in drug manufacturing in 1982 would have a corresponding growth options value equal to the annual percentage rate of sales growth for German drug manufacturing affiliates between 1982 and 1989. While this is not an ideal measure of growth options, standard alternatives, such as market-to-book ratios, are not feasible in the multinational setting.

¹² Affiliates with negative net income are excluded for the purposes of calculating country tax rates. For a more comprehensive description of the calculation of affiliate tax rates, see Desai et al. (2001). In particular, these income tax rates do not include withholding taxes on cross-border interest payments to related parties, since such taxes are endogenous to interest payments and in any case immediately creditable against home-country tax liabilities. Desai and Hines (1999) report that adjusting country tax rates for withholding taxes does not affect the estimated impact of taxation on affiliate borrowing, due to the combination of creditability and low withholding tax rates on related-party interest payments.

credit market conditions. This framework is then employed to examine whether these determinants have differential effects on internal and external borrowing and to test if affiliates substitute borrowing from parent companies for external borrowing in response to poorly functioning capital markets. Finally, the analysis considers how legal protections and capital depth affect the cost of external borrowing and tests if the composition of affiliate borrowing reflects the variation in these costs.

A. Determinants of Affiliate Leverage

Affiliates in countries with high local corporate tax rates face the strongest incentives to finance their investments with debt rather than equity. Figure 1 depicts the relationship between country tax rates and U.S. affiliate leverage in 1994. Leverage is the ratio of aggregate current liabilities and long-term debt to aggregate assets in each host country as measured in the 1994 BEA benchmark survey and reported by the U.S. Department of Commerce (1998). Figure 1 indicates that affiliates in high-tax countries generally make greater use of debt to finance their assets than do affiliates in low-tax countries. Affiliates in tax havens such as Bermuda and Barbados have aggregate leverage ratios of 0.30 or less, while affiliates in high-tax countries such as Japan and Italy have aggregate leverage ratios that exceed 0.53. Although the scatter plot in

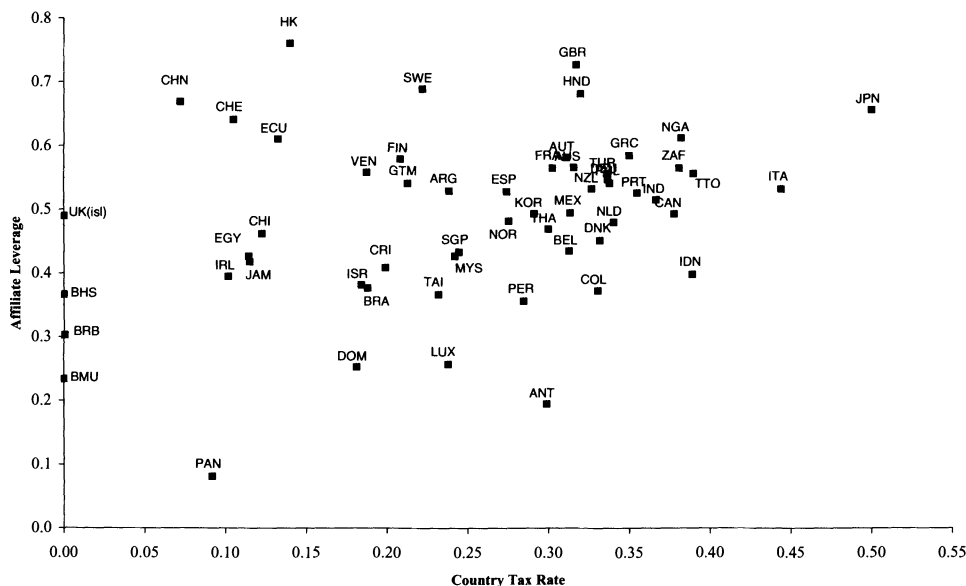


Figure 1. The relationship between tax rates and affiliate leverage, 1994. The figure provides a scatter plot of the relationship between affiliate leverage, on the y-axis, and local tax rates, on the x-axis, for 1994. Affiliate leverage is the ratio of current liabilities and long-term debt to total assets, as measured in the aggregate in the 1994 Benchmark Survey, and the tax rate is measured as the median tax rate, as defined in the text, for affiliates in a given country.

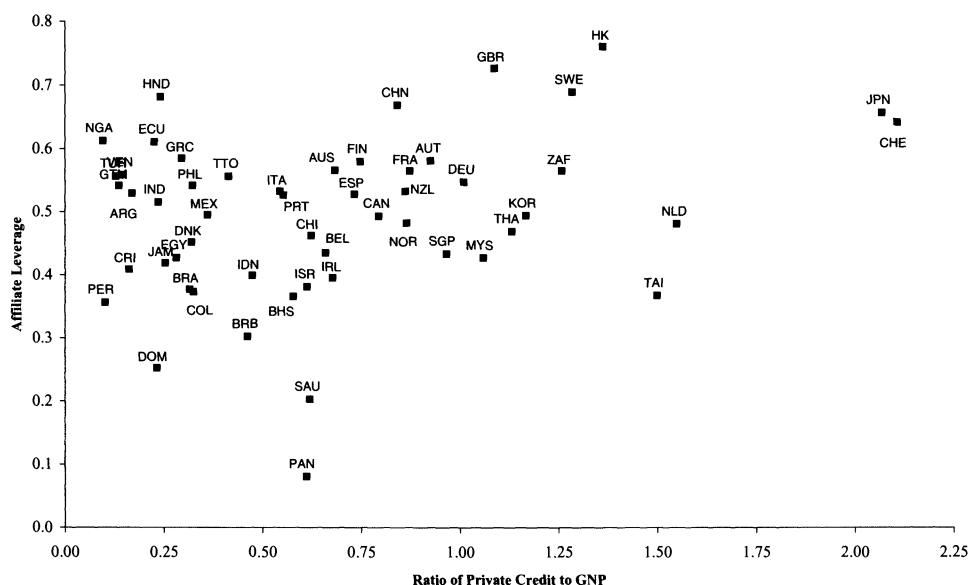


Figure 2. The relationship between capital market depth and affiliate leverage, 1994. The figure provides a scatter plot of the relationship between affiliate leverage, on the y-axis, and the ratio of private credit to GNP, on the x-axis, for 1994. Affiliate leverage is the ratio of current liabilities and long-term debt to total assets, as measured in the aggregate in the 1994 Benchmark Survey, and the ratio of private credit to GNP is the ratio of private credit lent by deposit money banks to GNP, as provided in Beck et al. (1999).

Figure 1 does not control for characteristics of affiliates or nontax features of host countries, it does provide suggestive evidence that multinational parents capitalize their affiliates differentially in response to the incentives associated with the relative tax advantage of debt.

Figure 2 provides a similar descriptive scatter plot but emphasizes the relationship between capital market depth, measured as the ratio of private credit lent by deposit money banks in the host country to GDP, and aggregate leverage ratios of U.S. affiliates in 1994. The upward-sloping pattern in Figure 2 suggests that there is a positive correlation between levels of affiliate leverage and the local availability of credit. U.S. affiliates exhibit high leverage ratios in countries such as Japan and Switzerland, which have very deep credit markets, and considerably lower leverage ratios in countries such as Peru, the Dominican Republic, and Panama, where domestic private credit is scarce. There are exceptions to this pattern: affiliates have high leverage ratios in Honduras, Ecuador, Nigeria, Venezuela, and some other countries in which they seem to overcome shortcomings in local credit markets. In order to isolate more carefully the relationship between affiliate leverage, corporate tax incentives, and the strength of local credit markets, while also controlling for confounding factors, it is helpful to run regressions, the results of which are presented in Table II.

Table II
The Impact of Taxes and Capital Market Conditions on Multinational Affiliate Leverage

The dependent variable in columns 1 to 5 is the ratio of affiliate current liabilities and long-term debt to total affiliate assets; in columns 6 to 10, the dependent variable is the ratio of affiliate current liabilities and long-term debt, less trade accounts and trade notes payable, to total affiliate assets. All regressions are estimated by ordinary least squares and include parent, industry, and year fixed effects. Country tax rate is the median tax rate in an affiliate's host country. Private credit is the ratio of private credit lent by deposit money banks to GDP, as provided in Beck et al. (1999). Creditor rights is an index of the strength of creditor rights developed in LaPorta et al. (1998); higher levels of the measure, which ranges from 0 to 4, indicate stronger legal protections. Net PPE/assets is the ratio of affiliate net property, plant, and equipment to total affiliate assets. EBITDA/assets is the ratio of affiliate earnings before interest, taxes, depreciation and amortization to total affiliate assets. Log of sales is the natural log of affiliate sales. Political risk is the annual average of the monthly index of political risk presented in the International Country Risk Guide, rescaled to lie between 0 and 1 with higher numbers indicating higher risks. Rate of inflation is the contemporaneous percentage change in the GDP deflator of an affiliate's host country. Growth options is the compound annual growth rate of total affiliate sales in an affiliate's country and industry until the following Benchmark year. Standard errors that correct for clustering of errors across observations in country/industry cells are presented in parentheses.

Dependent Variables	Affiliate Leverage					Affiliate Nontrade Account Leverage				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Constant	0.6827 (0.0665)	0.6878 (0.0799)	0.5782 (0.0496)	0.2906 (0.1043)	0.4745 (0.1558)	-0.2114 (0.0855)	0.1470 (0.1659)	0.7448 (0.0986)	0.5849 (0.0598)	0.6976 (0.0681)
Country tax rate	0.2646 (0.0205)	0.2608 (0.0235)	0.3206 (0.0226)	0.2446 (0.0328)	0.2698 (0.0314)	0.1281 (0.0225)	0.1257 (0.0257)	0.1714 (0.0249)	0.1297 (0.0274)	0.1640 (0.0270)
Private credit		-0.0051 (0.0052)		-0.0050 (0.0076)			-0.0086 (0.0059)		-0.0011 (0.0072)	

Creditor rights				0.0047 (0.0024)				0.0033 (0.0019)
Net PPE/assets				-0.0207 (0.0169)			0.0717 (0.0156)	0.0679 (0.0163)
EBITDA/assets				-0.4304 (0.0171)			-0.2755 (0.0148)	-0.2764 (0.0150)
Log of sales				0.0017 (0.0023)			-0.0047 (0.0021)	-0.0037 (0.0021)
Political risk				0.1171 (0.0277)			0.0797 (0.0254)	0.0703 (0.0239)
Rate of inflation				-0.0018 (0.0008)			-0.0006 (0.0008)	0.0000 (0.0008)
Growth options				0.0202 (0.0173)			0.0077 (0.0162)	-0.0027 (0.0166)
Parent, industry, and year fixed effects?	Y	Y	Y	Y	Y	Y	Y	Y
No. of obs.	44,460	42,639	39,995	18,109	26,580	25,179	18,775	18,132
R ²	0.2286	0.2329	0.2460	0.3411	0.2240	0.2253	0.2859	0.2933

The dependent variable in the specifications reported in columns 1 to 5 of Table II is the same measure of leverage employed in Figures 1 and 2 but is constructed at the affiliate level, so it equals the ratio of affiliate current liabilities and long-term debt to total assets. The data consist of affiliate-year observations for affiliates of U.S. firms in 1982, 1989, and 1994. Given that many potential determinants of affiliate leverage, particularly those that vary between companies and over time, might confound this analysis, Table II reports the estimated coefficients from regressions that include a full set of year dummy variables, parent company dummy variables, and affiliate industry dummy variables. As a result, firm-specific considerations and industry-specific considerations implicitly do not affect the estimates reported in Table II (or those reported in subsequent tables); Desai et al. (2003) report the estimates of the same regression specifications without fixed effects, the results of which are broadly consistent with those reported in Tables II to VI. All regressions treat each affiliate-year observation in the panel as a separate observation; the standard errors in all of the tables correct for clustering of errors across observations in country/industry cells.

The regression reported in column 1 of Table II suggests that affiliate leverage responds strongly to local tax incentives. The 0.2646 estimated coefficient on the country tax rate implies that 10% higher tax rates are associated with affiliate leverage that is 2.6% greater as a fraction of assets. The specifications presented in columns 2 to 5 of Table II also consider the effect of capital market development and investor protections on levels of affiliate leverage. The specification reported in column 2 indicates that the level of private credit has a negative, but insignificant, effect on aggregate leverage. In contrast, the regression reported in column 3 indicates that stronger legal protections for creditors are associated with significantly greater use of debt. In the regression reported in column 3, a one-point increase in the (five-point) creditor rights index is associated with 0.82% greater affiliate leverage as a fraction of assets.

These regressions may in part reflect the impact of heterogeneous affiliate and country characteristics that are unrelated to tax rates and creditor rights, but happen to be correlated with them. It is possible to control for relevant observable aspects of heterogeneity, such as the tangibility of affiliate assets, the cash flow generating capacity of underlying assets, affiliate size, the scope of growth options, the political risk associated with operating in the affiliate's host country, and the annual inflation rate in the affiliate's host country. The regressions reported in columns 4 and 5 of Table II add these variables to the specifications reported in columns 2 and 3. The sample size in these specifications is significantly smaller because information required to construct the additional controls is collected only for a smaller set of affiliates.¹³

¹³ The reduced sample includes all majority-owned affiliates that report in 1982, and all majority-owned affiliates that are large enough to file the long form in 1989 and 1994. As a result of reporting requirements, smaller samples are also used for many specifications in Tables III to VI.

These other affiliate and country characteristics appear also to influence leverage ratios. Affiliates with greater shares of assets in tangible property use less debt, but this effect is not statistically significant. Affiliates characterized by greater cash flow generating capacity have significantly lower levels of affiliate leverage, while inflation has only a modest effect on affiliate leverage. Multinationals use greater debt in politically risky countries, which is consistent with other evidence such as Novaes's (1998) study of foreign affiliates in Brazil. Finally, an affiliate's growth potential has limited influence on capital structure, suggesting, as one might expect, that the debt-overhang problem is ameliorated for subsidiaries of multinational parents. The inclusion of these additional affiliate and country variables has little effect on the estimated impact of taxation and creditor rights on affiliate leverage.¹⁴

The measure of affiliate leverage employed in columns 1 to 5 includes a component associated with trade credit. Given the distinct features of trade credit, it is useful to conduct similar analysis with trade credit stripped out of the numerator of the affiliate leverage measure, making it comparable to the non-trade account measures of leverage common in the literature. Unfortunately, this restriction comes at some cost, as this nontrade account measure of leverage can be calculated only for a subset of affiliates and cannot be broken into debt from external sources and debt from parents. Nonetheless, it is useful to repeat the analysis reported in columns 1–5, using this measure of debt as the dependent variable. The estimated sensitivity of borrowing to taxes, capital market depth, and creditor rights in the regressions reported in columns 6 to 10 of Table II are all consistent with those obtained using the more inclusive measure of debt as the dependent variable. Indeed, the only notable and significant distinction between the previous results and the results for the nontrade account measure of leverage is the impact of the tangibility of assets, as this variable now has a positive and significant coefficient. The negative estimated coefficients on the measure of asset tangibility in the regressions reported in columns 4 and 5 most likely reflect that affiliates within some industries that provide considerable trade credit also have low levels of tangible assets (e.g., manufacturing affiliates engaging in some wholesale trade), so the right panel of Table II provides clearer evidence of the link between asset tangibility and leverage, by emphasizing nontrade account borrowing. The similarity of the results with and without trade account credit as a component of leverage suggests that the subsequent analysis of borrowing from parents and external sources, for which data limitations make it impossible to strip out trade credit, is unlikely to harbor important biases.

¹⁴ As an alternative to pooling observations across years and using year fixed effects, it is possible to conduct the same analysis for each year separately. Doing so significantly reduces the degrees of freedom in these regressions because each includes a full set of parent and industry fixed effects and because sample sizes are limited by reporting restrictions on the EBITDA variable. The regressions were rerun on annual cross-sections, using return on equity in place of EBITDA in order to obtain larger samples, and the results are broadly consistent with those reported in Tables II to VI.

B. The Composition of Affiliate Leverage and Substitutions in Quantities

The finding that aggregate affiliate leverage responds to tax incentives and capital market conditions may mask divergent responses of external borrowing and borrowing from parent companies. The evidence presented in Figures 3 and 4 suggests that legal and capital market conditions influence these two types of borrowing very differently. Figure 3 displays the relationship between the depth of local credit markets and aggregate borrowing from nonparent sources. The scatter plot implies a positive relationship between capital market depth and external borrowing. Comparing Figures 2 and 3 suggests that borrowing from nonparent sources is more sensitive to local capital market conditions than is total leverage. Affiliates located in many of the countries with weak credit markets, such as Honduras, Ecuador, Guatemala, Argentina, and Venezuela, rely heavily on their parents for debt.

Figure 4 offers additional evidence of the effect of the borrowing environment on the composition of debt by graphing the relationship between creditor rights and different types of debt. There is a subtle rise in the ratio of total current liabilities and long-term debt to assets as the creditor rights' index increases from 0 to 4. However, this aggregate measure obscures divergent effects of creditor rights on borrowing from parents and borrowing from nonparent sources. The

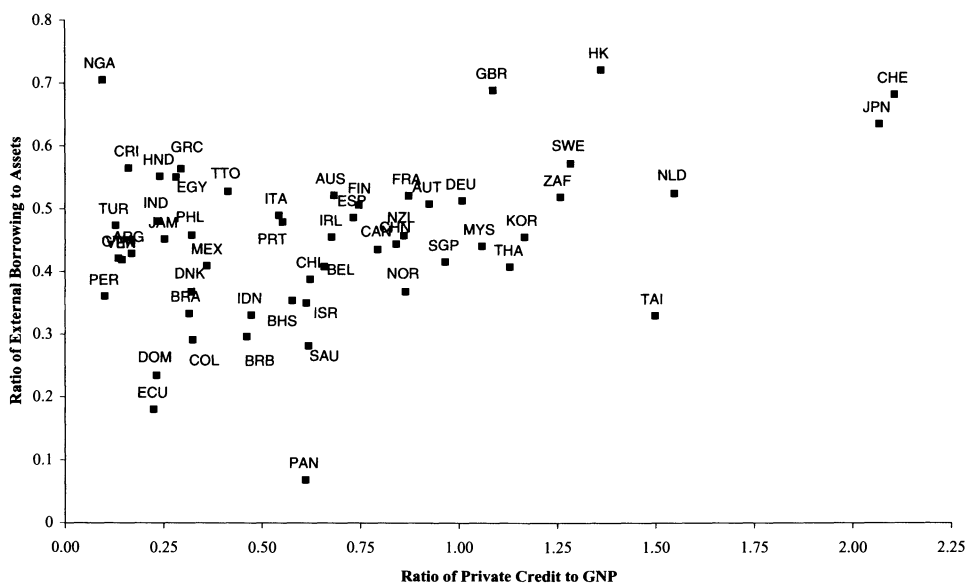


Figure 3. The relationship between capital market depth and external borrowing, 1994.

The figure provides a scatter plot of the relationship between the ratio of external borrowing to assets, on the y-axis, and the ratio of private credit to GNP, on the x-axis, for 1994. The ratio of external borrowing to assets is the ratio of borrowings from unrelated parties to total assets, as measured in the aggregate in the 1994 Benchmark Survey, and the ratio of private credit to GNP is the ratio of private credit lent by deposit money banks to GNP, as provided in Beck et al. (1999).

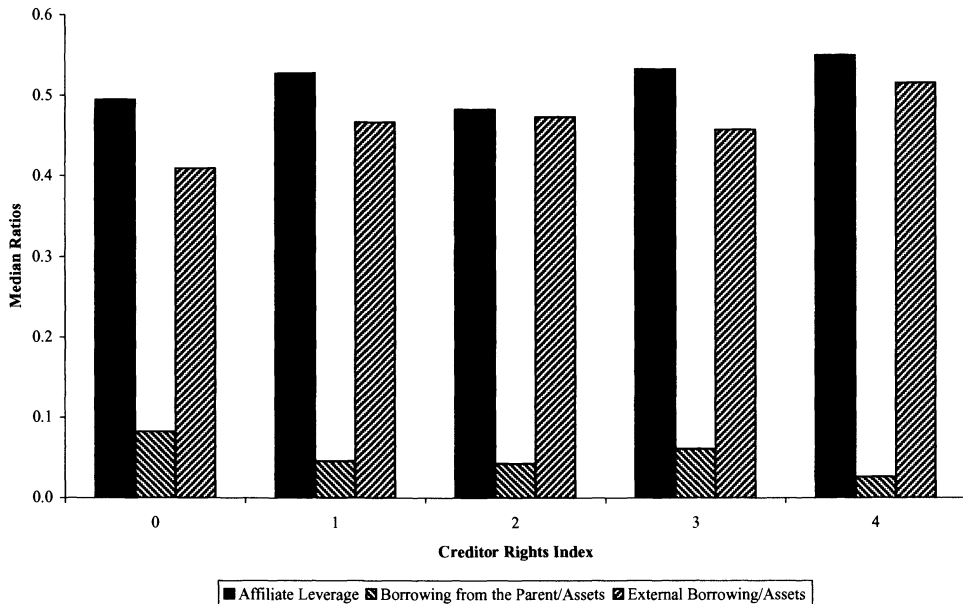


Figure 4. The relationship between creditor rights and affiliate leverage, 1994. The figure provides the median affiliate leverage ratio, median ratio of borrowing from the parent to assets, and median ratio of external borrowing to assets in 1994 by rating for creditor rights. Affiliate Leverage is the ratio of current liabilities and long-term debt to total affiliate assets, as measured in the aggregate in the 1994 Benchmark Survey. Borrowing from the Parent/Assets is the ratio of net current liabilities and long-term debt affiliates borrowed from U.S. parents to total assets, as measured in the aggregate in the 1994 Benchmark Survey. External Borrowing/Assets is the ratio of current liabilities and long-term debt borrowed from nonparent sources to total assets, as measured in the aggregate in the 1994 Benchmark Survey.

ratio of net parent borrowing to assets decreases as creditor rights improve, while the ratio of aggregate external borrowing to aggregate assets increases as creditor rights improve.

In order to analyze these differences, the two panels of Table III present regressions that evaluate the impact of tax incentives and measures of capital market depth on external borrowing and borrowing from parent companies. In the regressions reported in columns 1 to 5 of Table III, the dependent variable is the ratio of current liabilities and long-term debt owed to nonparents to total affiliate assets. In the regressions reported in columns 6 to 10 of Table III, the dependent variable is the ratio of the difference between the current liabilities and long-term debt an affiliate owes to and borrows from its parent to total affiliate assets. All specifications employ parent, industry, and year fixed effects so that firm-specific and industry-specific considerations implicitly do not affect the estimates.

The regressions reported in columns 1 and 6 indicate that borrowing from external sources and borrowing from parents are both sensitive to tax incentives; the regressions reported in columns 2 to 5 and 7 to 10 indicate that adding

Table III
The Impact of Taxes and Capital Market Conditions on the Composition of Leverage

The dependent variable in columns 1 to 5 is the ratio of current liabilities and long-term debt an affiliate borrows from nonparent sources to total affiliate assets; in columns 6 to 10, the dependent variable is the ratio of net current liabilities and long-term debt an affiliate borrows from its U.S. parent to total affiliate assets. All regressions are estimated by ordinary least squares and include parent, industry, and year fixed effects. Country tax rate is the median tax rate in an affiliate's host country. Private credit is the ratio of private credit lent by deposit money banks to GDP, as provided in Beck et al. (1999). Creditor rights is an index of the strength of creditor rights developed in LaPorta et al. (1998); higher levels of the measure, which ranges from 0 to 4, indicate stronger legal protections. Net PPE/assets is the ratio of affiliate net property, plant and equipment to total affiliate assets. EBITDA/assets is the ratio of affiliate earnings before interest, taxes, depreciation, and amortization to total affiliate assets. Log of sales is the natural log of affiliate sales. Political risk is the annual average of the monthly index of political risk presented in the International Country Risk Guide, rescaled to lie between 0 and 1 with higher numbers indicating higher risks. Rate of inflation is the contemporaneous percentage change in the GDP deflator of an affiliate's host country. Growth options is the compound annual growth rate of total affiliate sales in an affiliate's country and industry until the following benchmark year. Standard errors that correct for clustering of errors across observations in country/industry cells are presented in parentheses.

Dependent Variables	External Borrowing/Assets					Borrowing from the Parent/Assets				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Constant	0.2535 (0.0292)	0.2706 (0.0298)	0.5963 (0.0633)	0.4088 (0.1449)	0.6867 (0.0976)	-0.1683 (0.1691)	-0.0649 (0.0387)	0.1000 (0.0806)	0.2552 (0.0452)	0.1736 (0.0599)
Country tax rate	0.2831 (0.0197)	0.2472 (0.0226)	0.3218 (0.0229)	0.2100 (0.0327)	0.2461 (0.0323)	0.0515 (0.0156)	0.0689 (0.0162)	0.0501 (0.0190)	0.0841 (0.0249)	0.0822 (0.0272)
Private credit		0.0218 (0.0053)		0.0131 (0.0079)			-0.0314 (0.0038)		-0.0192 (0.0063)	

variables that capture capital market conditions and other affiliate controls does not change this result. Given the distinct shares of external and internal borrowing, it is useful to translate these coefficient estimates into corresponding elasticities in order to make them comparable. The 0.2461 estimated tax rate coefficient in the regression reported in column 5 of Table III, together with a sample mean external borrowing-to-assets ratio of 0.4439, and a sample mean tax rate of 0.3431, implies a tax elasticity of external borrowing equal to 0.19. While the estimated 0.0822 tax rate coefficient in the parent borrowing regression reported in column 10 of Table III is significantly smaller, the implied elasticity of parent borrowing is 0.35, reflecting the much smaller (0.0801) ratio of parent borrowing to total assets. The greater tax rate sensitivity of parent borrowing than external borrowing is consistent with the hypothesis that multinational firms fine-tune their internal financial transactions to avoid taxes.

While external and parent borrowing respond to tax incentives with different magnitudes but in similar ways, they respond to capital market depth and creditor rights in distinct ways. For example, the 0.0057 estimated coefficient reported in column 5 of Table III indicates that a one unit increase in the creditor rights' index raises borrowing from external sources by 0.57% of assets. In contrast, the -0.0035 estimated coefficient reported in column 10 of Table V implies that a one unit increase in the creditor rights' index is associated with borrowing from parents that falls by 0.35% of assets. A similar pattern appears in the regressions using capital market depth as the explanatory variable. These regressions imply that the aggregate borrowing behavior considered in the regressions reported in Table II masks distinct and contrary effects of capital market conditions on the components of borrowing. Estimated coefficients on other control variables are comparable between the regressions explaining external and parent borrowing with a few exceptions. Net PPE/Assets has a positive and significant coefficient in the specifications explaining parent borrowing but is insignificant in explaining external borrowing. One possible interpretation of this difference is that it reflects the purchase and financing of capital goods from multinational parents. Finally, external borrowing increases with affiliate size, while internal borrowing does not, suggesting that large affiliates are better able to access capital markets.

The fact that multinational affiliates use less external debt and more related party debt as capital markets weaken suggests that these forms of finance are substitutes. The extent to which firms substitute parent debt for external debt can be measured directly, and that is the purpose of the regressions reported in Table IV, in which borrowing from parent companies is the dependent variable and external borrowing is an independent variable. In this setting, a coefficient of -1.0 on external borrowing would correspond to perfect substitutability between parent and external debt. The regressions reported in columns 1 and 2 of Table IV imply a smaller, though statistically significant, degree of substitutability: borrowing from parent companies offsets between 12 and 16% of changes in external borrowing.

Table IV
The Substitutability of Parent and External Debt

The dependent variable is the ratio of net current liabilities and long-term debt an affiliate borrows from its U.S. parent to total affiliate assets. The specifications in columns 1 and 2 are estimated by ordinary least squares, and all specifications include parent, industry, and year fixed effects. External borrowing/assets is the ratio of current liabilities and long-term debt an affiliate borrows from nonparent sources to total affiliate assets. The specifications in columns 3 and 4 instrument for external borrowing/assets using private credit. Private credit is the ratio of private credit lent by deposit money banks to GDP, as provided in Beck et al. (1999). The specifications in columns 5 and 6 instrument for external borrowing/assets using creditor rights. Creditor rights is an index of the strength of creditor rights developed in LaPorta et al. (1998); higher levels of the measure, which ranges from 0 to 4, indicate stronger legal protections. The specifications in columns 7 and 8 instrument for external borrowing/assets using both private credit and creditor rights. Country tax rate is the median tax rate in an affiliate's host country. Net PPE/assets is the ratio of affiliate net property, plant, and equipment to total affiliate assets. EBITDA/assets is the ratio of affiliate earnings before interest, taxes, depreciation, and amortization to total affiliate assets. Log of sales is the natural log of affiliate sales. Political risk is the annual average of the monthly index of political risk presented in the International Country Risk Guide, rescaled to lie between 0 and 1 with higher numbers indicating higher risks. Rate of inflation is the contemporaneous percentage change in the GDP deflator of an affiliate's host country. Growth options is the compound annual growth rate of total affiliate sales in an affiliate's country and industry until the following benchmark year. Growth options is the compound annual growth rate of total affiliate sales in an affiliate's country and industry until the following benchmark year. Standard errors are presented in parentheses, and in columns 1 and 2 these errors correct for clustering of errors across observations in country/industry cells.

Dependent Variable	Borrowing from the Parent/Assets							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant	0.0824 (0.0178)	0.3204 (0.1845)	0.2478 (0.2276)	1.3236 (0.6527)	0.0588 (0.1683)	0.0349 (0.4131)	0.1110 (0.1771)	-0.0160 (0.4295)
External borrowing/assets	-0.1177 (0.0063)	-0.1619 (0.0099)	-0.9693 (0.1224)	-1.5245 (0.6913)	-0.4758 (0.0944)	-0.6309 (0.2356)	-0.6111 (0.0690)	-0.7557 (0.1612)
Country tax rate		0.1085 (0.0245)		0.4007 (0.1479)		0.2263 (0.0588)		0.2388 (0.0390)

(continued)

Table IV—Continued

Dependent Variable	Borrowing from the Parent/Assets							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Net PPE/assets		0.1111 (0.0162)		0.0636 (0.0262)		0.0779 (0.0128)		0.0719 (0.0131)
EBITDA/assets		-0.2645 (0.0140)		-0.6240 (0.1837)		-0.3893 (0.0641)		-0.4222 (0.0448)
Log of sales		-0.0012 (0.0022)		0.0064 (0.0050)		0.0008 (0.0021)		0.0015 (0.0018)
Political risk		0.0782 (0.0207)		0.1574 (0.0445)		0.1169 (0.0241)		0.1348 (0.0242)
Rate of inflation		0.0013 (0.0007)		-0.0028 (0.0022)		0.0000 (0.0009)		-0.0005 (0.0008)
Growth options		-0.0296 (0.0151)		0.0282 (0.0373)		-0.0260 (0.0151)		-0.0163 (0.0156)
Parent, industry, and year fixed effects?	Y	Y	Y	Y	Y	Y	Y	Y
IV w/private credit?	N	N	Y	Y	N	N	Y	Y
IV w/creditor rights?	N	N	N	N	Y	Y	Y	Y
No. of obs.	44,855	18,705	42,996	18,200	40,293	17,612	39,651	17,237
R ²	0.2490	0.3180						

Since borrowing from external sources and borrowing from parent companies are jointly determined, it is essential to instrument for the level of external borrowing in order to obtain unbiased measures of their degree of substitutability. Failure to do so, as in the regressions reported in columns 1 and 2 of Table IV, is likely to produce estimates that understate the true extent of substitution, given the many omitted variables that can be expected to affect external and parent company loans in the same direction. Fortunately, measures of capital market depth and creditor rights are suitable as instruments for external borrowing, since they affect the cost of external borrowing but are unlikely to affect the cost of borrowing from parent companies. Parent companies need not rely on local legal regimes in order to obtain appropriate compensation from their own affiliates, and they face internal costs of funds that are not functions of capital market conditions in individual foreign countries.¹⁵ The instrumental variables regressions reported in columns 3 to 8 of Table IV impose that the estimated coefficients reflect the degree to which parent borrowing responds to changes in external borrowing induced by capital market depth or legal protections for creditors.¹⁶

The -0.9693 coefficient reported in column 3 of Table IV implies that parent debt substitutes almost perfectly for external debt. This estimated degree of substitution comes from using private credit as an instrument for the availability of external borrowing, and is larger (though still statistically indistinguishable from unity) once affiliate and country controls are included, as in the regression reported in column 4. Use of the creditor rights' variable as an alternative instrument produces estimated coefficients of -0.48 and -0.63 in the regressions reported in columns 5 and 6, corresponding to partial substitutability, in which parent lending makes up for roughly half of any external debt reduction due to weak legal protections. The regressions reported in columns 7 and 8 of Table IV use both instruments. The -0.7557 estimated coefficient on external borrowing/assets in column 8 implies that 75% of changes in external borrowing due to capital market conditions is compensated by parent lending. All of the specifications imply significant substitutability of parent borrowing for external borrowing in response to local capital market conditions. By

¹⁵ One potential concern is that capital market conditions may influence borrowing from the parent through other channels. For example, it is possible that parents, like local credit providers, are reluctant to lend to firms in environments where it is difficult for lenders to recover their loans. This effect would increase the correlation of borrowing from parents and measures of credit market conditions. In this case, the estimated coefficient on external borrowing/assets would be biased upward, thereby reducing the estimated degree of substitutability. In order for bias to induce evidence of substitutability, it would have to be the case that parents would want to lend to affiliates in countries with poor capital markets for reasons other than the difficulties associated with obtaining external debt. This seems unlikely. As a result, potential shortcomings of the instruments should, if anything, reduce the estimated degree of substitutability between borrowing sources.

¹⁶ F -tests of the significance of the first-stage specifications, which are similar to those shown in the left panel of Table III, are all significant at the 1% level. The right panel of Table III effectively provides a reduced-form version of the instrumental variable analysis that is provided in Table IV. This reduced form has the virtue of making more transparent the differences between the determinants of external and parent borrowing.

implication, local firms not affiliated with multinational parent companies, and without access to alternate sources of capital, face more difficulty obtaining credit.

Given that the measures of internal and external borrowing used in the regressions reported in Table IV are normalized by assets, and debt levels are highly correlated with total assets, it is conceivable that the measured substitutability of parent for external debt might simply be a function of the way in which the variables are constructed. For example, if all assets were financed with debt (which is not the case), then the sum of the parent debt ratio and the external debt ratio would equal 1, and the estimated coefficient in an OLS regression of parent debt on external debt would be -1 . This issue does not arise in the instrumental variables estimates, which exploit only the part of the variation in external debt that is attributable to capital market considerations, but it is nevertheless useful to consider alternative specifications for which the concern would not arise even in an OLS setting. The Appendix Table I of Desai et al. (2003) presents regressions using specifications similar to those presented in Table IV, with the main difference that the parent and external debt measures are normalized by affiliate owners' equity instead of affiliate assets. The results are consistent with those reported in Table IV, suggesting that the measured substitutability of parent for external debt in the regressions reported in Table IV is not the product of the way in which the variables are constructed.

C. The Determinants of Interest Rates and Substitution in Response to Prices

To the extent that legal protections for creditors and capital market conditions influence the use of external debt and parent debt, they must do so by affecting the relative cost of external finance. This implication can be tested directly by measuring the impact of legal protections and capital market conditions on pretax interest rates faced by affiliates of the same parent and by examining whether affiliates substitute internal for external debt in response to these cost differences.

Table V presents estimated coefficients from regressions with interest rates as dependent variables. The dependent variable in columns 1 to 4 is the interest rate on external borrowing. Again, all specifications include parent, industry, and year fixed effects, and the reported standard errors control for clustering at the country/industry level. Since not all affiliates report every item to BEA, the sample used in these specifications is limited by data availability.

The estimated -0.0385 coefficient reported in column 1 indicates that 10% greater host country use of private credit as a fraction of GDP is associated with 0.4% lower interest rates. The results presented in column 2 suggest that stronger legal protections for creditors reduce interest rates, a one-point improvement in legal protections being associated with 0.9% lower interest rates. Columns 3 and 4 include controls for local tax rates and country-level variation in political risk and inflation. Greater private credit availability and stronger creditor rights continue to be associated with lower interest rates, though the magnitudes of the estimated effects are somewhat smaller in these regressions

Table V
Determinants of Local Interest Rates

The dependent variable in columns 1 to 4 is the ratio of the value of affiliate interest payments to nonparents to current liabilities and long-term debt borrowed from nonparent sources; in columns 5 to 8, the dependent variable is the ratio of total affiliate interest payments to current liabilities and long-term debt, excluding trade accounts and trade notes payable. All regressions are estimated by ordinary least squares and include parent, industry, and year fixed effects. Country tax rate is the median tax rate in an affiliate's host country. Private credit is the ratio of private credit lent by deposit money banks to GDP, as provided in Beck et al. (1999). Creditor rights is an index of the strength of creditor rights developed in LaPorta et al. (1998); higher levels of the measure, which ranges from 0 to 4, indicate stronger legal protections. Political risk is the annual average of the monthly index of political risk presented in the International Country Risk Guide, rescaled to lie between 0 and 1 with higher numbers indicating higher risks. Rate of inflation is the contemporaneous percentage change in the GDP deflator of an affiliate's host country. Standard errors that correct for clustering of errors across observations in country/industry cells are presented in parentheses.

Dependent Variables	Interest Rate on External Borrowing				Interest Rate on Nontrade Account Borrowing (from all sources)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant	-0.0387 (0.0337)	0.0254 (0.0223)	-0.0689 (0.0362)	0.0538 (0.0253)	-0.0690 (0.0383)	0.0617 (0.0212)	0.0051 (0.0331)	-0.0202 (0.0215)
Country tax rate			-0.0277 (0.0117)	-0.0275 (0.0127)	-0.0149 (0.0139)	-0.0092 (0.0148)	-0.0177 (0.0139)	-0.0093 (0.0147)
Private credit	-0.0385 (0.0034)		-0.0119 (0.0023)		-0.0099 (0.0034)		0.0074 (0.0085)	

(continued)

Table V—Continued

Dependent Variables	Interest Rate on External Borrowing				Interest Rate on Nontrade Account Borrowing (from all sources)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Creditor rights		-0.0093 (0.0008)		-0.0071 (0.0007)		-0.0079 (0.0009)		-0.0033 (0.0027)
Share of debt from external sources							0.0267 (0.0089)	0.0220 (0.0079)
Share of debt from external sources * private credit							-0.0213 (0.0091)	
Share of debt from external sources * creditor rights								-0.0056 (0.0030)
Political risk			0.1112 (0.0113)	0.1662 (0.0136)	0.1243 (0.0145)	0.1911 (0.0174)	0.1354 (0.0145)	0.2023 (0.0171)
Rate of inflation			0.0066 (0.0007)	0.0064 (0.0007)	0.0064 (0.0008)	0.0061 (0.0008)	0.0064 (0.0008)	0.0060 (0.0008)
Parent, industry, and year fixed effects?	Y	Y	Y	Y	Y	Y	Y	Y
No. of obs.	20,587	19,687	18,988	18,226	19,023	18,171	18,519	17,747
R ²	0.1791	0.1758	0.2338	0.2569	0.2505	0.2692	0.2524	0.2713

than in the corresponding regressions reported in columns 1 and 2. Higher levels of political risk and inflation also significantly increase local borrowing rates.

The regressions presented in columns 1 to 4 of Table V indicate that interest rates are higher in countries with underdeveloped capital markets and poor creditor legal rights. It is noteworthy that, since parent company fixed effects are included as independent variables, these interest rate effects appear between affiliates of the same companies. This evidence is, however, subject to two limitations. The first is that the denominator of the interest rate variable is total liabilities, including trade credits on which explicit interest is seldom paid. As a result, measured interest rates are somewhat low and may vary between countries due to trade financing practices. The second limitation is that borrowing from external sources and borrowing from parent companies are treated symmetrically, which while statistically appropriate nonetheless obscures what might be an important distinction. Since creditor rights are considerably less important for intrafirm contracting than they are for contracts between unrelated parties, it follows that the interest rate effects of creditor rights (or capital market development) should be much smaller in the case of borrowing from parent companies.

Columns 5 to 8 of Table V report estimated coefficients from regressions designed to address these issues. The dependent variable is again the interest rate, in this case constructed as the ratio of total affiliate interest payments to other current liabilities and long-term debt, excluding trade accounts. The estimated capital market effects obtained using this dependent variable, reported in columns 5 and 6 of Table V, have the same signs and almost exactly the same magnitudes as those obtained using the first interest rate variable and reported in columns 3 and 4 of Table V.

Data limitations make it impossible to measure average interest rates paid to external sources when the denominator of the calculated interest rate excludes trade account debt. It is nonetheless possible to evaluate circuitously the difference between interest rates on parent loans and external loans, and the effect of capital market conditions on this difference, using a measure of interest rates that does not include trade account debt. Columns 7 and 8 of Table V present estimated coefficients from regressions in which the dependent variable is the same as that in the regressions reported in columns 5 and 6, but adds two independent variables: the share of debt from external sources¹⁷ and the interaction between this share and measures of capital market development or creditor rights. If the wedge between the costs of borrowing from external sources and borrowing from parents increases as capital market measures deteriorate, two patterns should emerge. First, the coefficient on the share of debt from external sources should be positive, indicating that when measures of creditor legal protections or credit market development are at extreme low values, affiliates pay higher interest rates on loans from external sources relative to borrowing from

¹⁷ The share of debt from nonparent sources equals one minus the ratio of current liabilities and long-term debt owed to the parent to total current liabilities and long-term debt.

parents. Second, the coefficient on the interaction between the share of debt from external sources and measures of credit market development should be negative, signifying that the wedge between external and internal borrowing costs declines as credit markets improve.

The results indicate that greater borrowing from external sources is associated with higher interest rates where capital markets are poorly developed or creditor rights are weak. For example, the 0.0220 coefficient on the share of debt from nonparent sources reported in column 8 indicates that external debt carries 2.20% higher interest rates than does borrowing from parents in countries with creditor rights' indices of zero. The -0.0056 coefficient on the interaction of creditor rights and nonparent debt share in the same column implies that the higher interest rates associated with external relative to parent borrowing decline as creditor rights strengthen, disappearing at highest level of the creditor rights' index. The estimated effects of capital market development and creditor rights not interacted with the share of external debt do not differ significantly from zero in the equations reported in columns 7 and 8, suggesting that borrowing from parent companies is no more expensive due to these capital market considerations.

It is possible to apply these results to measure the extent to which changes in the composition of borrowing can be traced to differences in interest rates induced by credit market conditions. The regressions presented in Table VI identify the degree to which borrowing from external sources and borrowing from parent companies reflect interest rate differences. The left panel (columns 1 to 4) of Table VI presents regressions in which the dependent variable is external borrowing/assets, while the right panel (columns 5 to 8) presents regressions in which the dependent variable is borrowing from the parent/assets. The independent variable of most interest in these regressions is the interest rate on external borrowing. Columns 2 to 4 and 6 to 8 report estimated coefficients from instrumental variable regressions in which measures of creditor rights and capital market development are used as instruments for interest rates.¹⁸ The advantage of specifying these equations as instrumental variable regressions is that doing so makes it possible to trace the effect of capital market conditions on the cost of external borrowing and its subsequent impact on leverage obtained from external sources and parent companies. In order for measures of creditor rights and credit market conditions to be valid instruments in the specifications in Table VI, they must affect external and parent lending only through their impact on costs of external borrowing.¹⁹

¹⁸ *F*-tests of the significance of the first-stage specifications, which are similar to those shown in the left-hand panel of Table V, are all significant at the 1% level.

¹⁹ This condition for the validity of the instruments corresponds to the intuition that costs of external borrowing fully reflect the variation in capital market conditions. If instead, credit markets are rationed, then credit market conditions could have a direct effect on external borrowing that is not fully mediated by interest rates. In this case, the estimated coefficients on the interest rate on external borrowing in specifications using external borrowing as a dependent variable would be biased downward and would overstate the extent to which affiliates avoid external borrowing in response to interest costs. However, as discussed in footnote 15, it is very unlikely that adverse

Table VI
The Responsiveness of External and Parent Debt to External Interest Rates

The dependent variable in columns 1 to 4 is the ratio of current liabilities and long-term debt an affiliate borrows from nonparent sources to total affiliate assets; in columns 5 to 8, the dependent variable is the ratio of net current liabilities and long-term debt an affiliate borrows from its U.S. parent to total affiliate assets. The specifications in columns 1 and 5 are estimated by ordinary least squares, and all the specifications include parent, industry, and year fixed effects. The interest rate on external borrowing is the ratio of the value of affiliate interest payments to nonparents to current liabilities and long-term debt borrowed from nonparent sources. The specifications in columns 2 and 6 instrument for the interest rate on external borrowing using private credit. Private credit is the ratio of private credit lent by deposit money banks to GDP, as provided in Beck et al. (1999). The specifications in columns 3 and 7 instrument for the interest rate on external borrowing using creditor rights. Creditor rights is an index of the strength of creditor rights developed in LaPorta et al. (1998); higher levels of the measure, which ranges from 0 to 4, indicate stronger legal protections. The specification in columns 4 and 8 instrument for interest rate on external borrowing using both private credit and creditor rights. Country tax rate is the median tax rate in an affiliate's host country. Net PPE/assets is the ratio of affiliate net property, plant, and equipment to total affiliate assets. EBITDA/assets is the ratio of affiliate earnings before interest, taxes, depreciation, and amortization to total affiliate assets. Log of sales is the natural log of affiliate sales. Political risk is the annual average of the monthly index of political risk presented in the International Country Risk Guide, rescaled to lie between 0 and 1 with higher numbers indicating higher risks. Rate of inflation is the contemporaneous percentage change in the GDP deflator of an affiliate's host country. Growth options is the compound annual growth rate of total affiliate sales in an affiliate's country and industry until the following benchmark year. Standard errors are presented in parentheses, and in columns 1 and 5 these errors correct for clustering of errors across observations in country/industry cells.

Dependent Variables	External Borrowing/Assets			Borrowing from the Parent/Assets				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant	-0.4545 (0.1751)	-0.4801 (0.4724)	-0.4878 (0.4509)	-0.4919 (0.4758)	0.2203 (0.1600)	0.3871 (0.4107)	0.2441 (0.2079)	0.3605 (0.3493)
Interest rate on external borrowing	0.0107 (0.0286)	-1.1999 (0.5368)	-0.8523 (0.2332)	-1.3209 (0.2480)	0.2544 (0.0274)	1.6832 (0.4712)	0.4887 (0.1795)	0.8337 (0.1830)
Country tax rate	0.2240 (0.0303)	0.1775 (0.0266)	0.2259 (0.0224)	0.1590 (0.0259)	0.0844 (0.0242)	0.1306 (0.0228)	0.0887 (0.0171)	0.1178 (0.0190)

(continued)

Table VI—Continued

Dependent Variables	External Borrowing/Assets			Borrowing from the Parent/Assets				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Net PPE/assets	-0.0266 (0.0168)	0.0372 (0.0325)	0.0224 (0.0184)	0.0412 (0.0193)	0.0881 (0.0153)	0.0018 (0.0283)	0.0581 (0.0140)	0.0402 (0.0141)
EBITDA/assets	-0.2553 (0.0164)	-0.2629 (0.0122)	-0.2672 (0.0117)	-0.2729 (0.0126)	-0.2087 (0.0126)	-0.2031 (0.0103)	-0.2034 (0.0088)	-0.2006 (0.0091)
Log of sales	0.0038 (0.0022)	0.0055 (0.0019)	0.0050 (0.0017)	0.0058 (0.0018)	-0.0034 (0.0019)	-0.0062 (0.0016)	-0.0040 (0.0013)	-0.0048 (0.0013)
Political risk	0.0309 (0.0274)	0.2283 (0.0827)	0.2271 (0.0482)	0.3482 (0.0535)	0.0372 (0.0204)	-0.1714 (0.0724)	-0.0174 (0.0370)	-0.0953 (0.0393)
Rate of inflation	-0.0026 (0.0007)	0.0051 (0.0036)	0.0030 (0.0017)	0.0055 (0.0018)	-0.0008 (0.0006)	-0.0105 (0.0032)	-0.0024 (0.0013)	-0.0044 (0.0013)
Growth options	0.0388 (0.0170)	0.0369 (0.0157)	0.0143 (0.0162)	0.0162 (0.0171)	-0.0293 (0.0144)	-0.0230 (0.0135)	-0.0311 (0.0123)	-0.0263 (0.0125)
Parent, industry, and year fixed effects?	Y	Y	Y	Y	Y	Y	Y	Y
IV w/private credit?	N	Y	N	Y	N	Y	N	Y
IV w/creditor rights?	N	N	Y	Y	N	N	Y	Y
No. of obs.	18,404	17,912	17,335	16,962	18,469	17,975	17,399	17,026
R ²	0.2977				0.2978			

The results indicate that borrowing is highly responsive to interest rate differences induced by credit market conditions. The OLS regressions reported in column 1 of Table VI show little impact of interest rates on external borrowing, but this is neither surprising nor particularly informative, given the potential endogeneity of interest rates to borrowing levels. The instrumental variables results reported in columns 2 and 6 indicate that multinational firms reduce external borrowing and increase parent borrowing in response to higher interest rates driven by reduced capital market depth. One percent higher interest rates due to capital market underdevelopment are associated with 1.2% reduced external borrowing and 1.7% greater parent borrowing, as a fraction of total assets. The use of creditor rights as an instrument in the regressions reported in columns 3 and 7 produces somewhat smaller, but otherwise similar results. In these regressions, 1% higher interest rates due to poor creditor rights are associated with 0.9% reduced external borrowing and 0.5% greater parent borrowing, as a fraction of total assets. Finally, the use of both instruments suggests that 1% higher interest rates due to legal and capital market conditions are associated with 1.3% reduced external borrowing and 0.8% greater parent borrowing, as a fraction of total assets. The smaller estimated magnitude of the interest rate effect on parent borrowing implies that substitution of parent for external debt, while considerable, is incomplete—which is consistent with the results reported in Tables III and IV.

Estimated coefficients on control variables included in the regressions reported in Table VI are consistent with the substitutability of parent and external debt. While other variables have coefficients of the same sign in the regressions for parent and external borrowing, multinational parents are particularly likely to lend to smaller affiliates (as measured by sales) that may have difficulty borrowing locally. Affiliates borrow more externally and less internally in high-inflation countries. Assuming that external debt is more likely denominated in local currencies, greater external borrowing and reduced parent borrowing in high-inflation countries is consistent with the common claim that affiliates hedge inflation risk through greater local borrowing.²⁰ Similarly, estimated coefficients on the political risk index in the instrumental variables regressions suggest that multinational firms hedge political risk through greater external borrowing and somewhat reduced borrowing from the parent.

credit market conditions would increase borrowing from parent companies except through their effects on external borrowing. As a result, estimates of the coefficient on the interest rate on external borrowing in specifications using internal borrowing as an independent variable are unlikely to reflect possible shortcomings of the instruments.

²⁰ The estimated effect of inflation on the composition of borrowing in Table VI differs from that in Table III. Given that the results in Table III do not explicitly control for interest rates and that interest rates are positively correlated with inflation rates, the instrumental variables setting provided in Table VI is more appropriate for inferring the effect of inflation on borrowing levels.

IV. Conclusions

Understanding the causes and consequences of differences between external and internal costs of finance—whether they arise from informational asymmetries, government policies, poor contracting environments, or agency problems—is an important agenda in finance. While theory illuminates many possible responses of capital structure to cost differences, the empirical literature has struggled with the limited institutional variation available to study these determinants of financing choices. Even identifying the responsiveness of firms to the tax advantage of debt has proven challenging, much of the best evidence coming from subtle differences introduced by firms transiting between taxable and tax-loss status. One of the advantages of examining these issues across countries is that doing so permits the use of rich variation in tax rates and government policies. The common difficulty that cross-country studies encounter in comparing the behavior of heterogeneous firms whose actions are measured using very different accounting conventions is greatly attenuated by analyzing variation in the financing choices of affiliates of the same U.S. multinational parent operating in countries with varied tax incentives and capital market conditions.

Certain patterns appear consistently in the results. Higher tax rates increase the use of debt from all sources, with borrowing from parent firms exhibiting greater responsiveness to tax rate differences than borrowing from external sources. Affiliates borrow less from external sources and more from their parents in countries with underdeveloped credit markets and weak creditor protections, greater parent lending replacing approximately three-quarters of the reduction in external borrowing. Interest rates on external borrowing are higher, and differences between interest rates on external and parent borrowing greater, in countries with underdeveloped credit markets and weak creditor protections. Differences in the use of external and parent debt can be traced to differences in interest rates on external debt induced by legal protections and credit market conditions.

These findings not only offer evidence of the tax and capital market determinants of capital structure but also illustrate factors influencing the choice between external and internal finance. While the centrality of internal finance to investment is widely appreciated, the allocation of funding within a firm is not well understood. This paper illustrates that firms use internal capital markets opportunistically when external finance is costly and when there are tax arbitrage opportunities.

The results also suggest that their internal capital markets give multinational firms significant advantages over local firms where credit markets are poorly developed. Local firms that borrow from external sources face high costs of debt in countries with shallow capital markets or weak creditor rights. Although weak credit markets also reduce external borrowing by multinational firms, affiliates are able to compensate by borrowing more from parent companies. The use of internal capital markets to attenuate the impact of adverse local economic conditions appears in other contexts, such as when host

countries impose capital controls (Desai et al. (2004)). The ability to substitute internal funds for external funds gives multinational firms opportunities not available to local competitors with more limited access to global capital markets.

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