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The Debt-Equity Composition of International Investment

Prepared by S. Ramachandran *

Authorized for Distribution by Anthony Lanyi

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Abstract

Capital flows to the nonindustrial countries share three striking characteristics. First, the bulk of these flows was in the form of debt, not equity; second, the loans were mostly to, or guaranteed by, debtor governments; and third, these debts were largely bank loans, not bonds. This paper examines the economic factors that may have been responsible.

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*Earlier versions of this paper were presented at seminars in the Research Departments of the International Monetary Fund and the World Bank, whose participants provided valuable comments.

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Summary

Capital flows to the nonindustrial countries share three striking characteristics. First, the bulk of these flows is in the form of debt, not equity. Second, the loans are mostly to, or guaranteed by, debtor governments. Third, these debts are largely bank loans, not bonds. This paper examines the economic factors that may be responsible for capital flows assuming these characteristics.

The Modigliani-Miller proposition sets out conditions under which the debt-equity ratio is "irrelevant" to the cost of funds. Extending the analysis to take account of international differences in tax structures shows that under certain circumstances capital would flow from one country to another as debt, not equity. Furthermore, the costs of employing an agent to secure private funding provide an incentive for governments to issue debt. The guarantee by creditor governments of bank deposits may have enabled commercial banks to undercut bonds and so become the primary intermediaries.

One of the proposed solutions to the debt problem involves converting existing foreign debt into equity. Even if sufficient tradable equity is available (which is not the case), the analysis suggests that debt-to-equity conversions can be undone by private market participants. Some conversions could even induce perverse capital flows. The merit of debt-to-equity conversions may lie not in the benefits of equity per se, but because foreign debt is exchanged at less than its contractual value.

I. Introduction

The international capital flows to nonindustrial countries in the past two decades had three striking features. First, the bulk of these flows was in the form of debt rather than equity; second, the loans were mostly to, or guaranteed by, debtor governments; and third, these debts were largely in the form of bank loans, not bonds. 1/ The reluctance of banks to roll over short-term loans in 1982 triggered the debt crisis. Why banks became reluctant to roll over the debt and what could be done now to alleviate the problems are questions that have been examined elsewhere. 2/

This paper examines the determinants of capital structure and uncovers conditions under which international capital flows would take the form of debt, rather than equity. It is shown that agency costs of privately issued debt provide an incentive for governments to borrow and thus alter the equilibrium debt-equity structure in the financial market. Commercial banks may have become the principal intermediaries in international capital markets because their deposits, unlike bonds, were insured by creditor governments, whose promises are more credible than debtor government guarantees. The analysis is therefore compatible with the salient features of observed international capital flows.

This paper has nine sections including this introduction. The ownership structure in an economy, more general than simply the debt-equity ratio, depends upon the tax structure and monitoring costs. The effects of taxes alone on the ownership structure are outlined in Section II, where the Modigliani-Miller proposition and the Miller extension on the irrelevance of the debt-equity ratio are reviewed.

The effects of agency costs on the ownership structure are described in Section III. Agency costs could preclude the Miller equilibrium, and the cost of capital may depend upon the debt-equity ratio. These are standard results in the modern theory of corporate finance. In Section IV, some additional implications are drawn, such as the distinction between traded and nontraded securities, with data illustrating the ownership structures in different countries.

1/ One could doubtless add to this list of "striking features." Some may be struck by the currency of denomination and by the large estimates of "capital flight" from the indebted countries (e.g., Dooley (1986)). An overvalued currency could account for these but, to narrow the focus of this paper, currency issues are ignored.

2/ The literature is too extensive to list completely. The World Development Report (1985), the World Bank Symposium on International Debt and the Developing countries, the studies of the Institute for International Economics (e.g., Cline (1984), Bergsten, et. al. (1985), and Lessard and Williamson (1985)) are representative.

The analysis is extended in Section V to take account of "outside" government debt, the presence of which is generally ignored in the corporate finance literature. It is shown that if government debt has no agency costs, governments could arbitrage between debt and equity even when private arbitrageurs cannot. Government debt would then alter the financial market equilibrium in some unusual ways.

The effects of linking two financial markets with different capital costs and ownership structures are analyzed in Section VI. With taxes based on the residence of the investor, returns gross of personal taxes, rather than the marginal products of capital, would determine international capital flows. It is shown that under certain circumstances, international capital would flow as debt, not equity. The situation would resemble that in many countries today with large government (or government-guaranteed) borrowings from abroad and little or no foreign direct or portfolio equity investments.

Why international debt may have been incurred through bank loans rather than through bonds is examined in Section VII. It is argued that the insurance of bank deposits in the creditor countries implicitly subsidized bank loans, which therefore undercut bonds. Deposit insurance also provides banks with incentives for risky lending, which in domestic markets is normally reined in by bank regulators. The risks involved in international lending may have been overlooked, unwittingly perhaps in the early stages and intentionally later on in an effort to prop up the domestic banking system or to maintain "order" in international financial markets.

One of the many proposed solutions to the debt problem involves converting the existing debt into equity. In retrospect, the reliance on debt financing seems to have been excessive and there have now been calls for greater equity investment. While these calls would appear reasonable, finance theory (the Modigliani-Miller proposition in particular) suggests that capital structure is irrelevant for the cost of funds and therefore converting debt to equity would not make a difference. It is argued in Section VIII that this conversion by itself could be both inadequate and undesirable. If the economic forces analyzed in this paper operate, then converting the existing debt into equity would not solve the debt problem. Even if there were enough tradable equity to make the conversion, which there is not, such debt-equity conversions could be undone by other market participants through the arbitrage mechanisms that lead to the Modigliani-Miller proposition. Additional capital flows, perhaps as equity, could benefit the debtor economies; but these could be fostered only by changing the tax structure and the costs of monitoring enterprises. As such changes are likely to be slow, equity cannot be expected to immediately replace debt. The summary and the conclusions of the paper are in Section IX.

II. Ownership Structure and Taxes

The Modigliani-Miller proposition (M-M, 1958, 1963) is that in the absence of corporate and personal (income or capital gains) taxes, the cost of capital is unaffected by the capital structure. Miller (1977) extended these results and showed that even with taxes, a firm would still be indifferent between funding through debt or equity but that there is an optimal debt-equity ratio for the economy as a whole. As this paper relies on these propositions, they are explained briefly here.

The cost of capital is a weighted average of the costs of debt and equity. The cost of debt is generally taken to be the interest rate, 1/ and that of equity, its expected rate of return.

Models of asset equilibrium suggest that when investors are risk averse and if equity is riskier than debt, the expected return on equity would exceed that on debt by a risk premium. 2/ Even so, a firm's cost of capital cannot be reduced by increasing its leverage (i.e., by borrowing more, raising the debt-equity ratio) because the risk of equity and its cost are also raised in the process. The relevant marginal cost of additional debt is not just the interest rate but also includes the increase in the cost of equity. Hence the M-M proposition that the debt-equity ratio is "irrelevant" for the cost of capital (debt and equity combined). This irrelevance proposition holds both for a particular firm and for the economy as a whole (which, in corporate finance literature, is taken to be a closed economy).

Miller (1977) extended the M-M proposition taking account of taxes on corporate profits and on personal incomes. A firm's market value and its cost of capital are shown to be independent of its own debt-equity ratio, but there is an equilibrium 3/ debt-equity ratio for the economy as a whole. This economy-wide equilibrium debt-equity ratio depends

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1/ When capital gains or losses on bonds are considered, the returns on debt differs from the interest rate; but this distinction is ignored in this paper for simplicity.

2/ Risk in finance theory is not the variability of return but the covariance of an asset's return with that of other assets that could be included in a diversified portfolio. While the two parameter Capital Asset Pricing Model of Sharpe-Lintner identifies this benchmark portfolio as the entire market, other models measure risk differently.

3/ The finance literature refers to this equilibrium debt to equity ratio as "optimal"; but this optimality is for nongovernment market participants and does not have any welfare connotations. A "suboptimal" debt-equity ratio will raise tax revenue and thus government expenditures (or, if expenditures are kept constant, lower taxes). If governments spend wisely, there may be no welfare loss.

only upon the tax structure and arises because the returns on debt and equity are taxed differently. The interest paid on corporate debt is deducted from profits before corporate taxes are assessed and this would appear to favor debt over equity. Personal income taxes, however, are levied on these interest receipts, while the return on equity is taxed only when the profits are realized.

The return to equity does not accrue from cash dividends alone but also from capital gains on share appreciation. 1/ Only a fraction of these capital gains are taxed as income if realized after a prescribed holding period. 2/ Unrealized capital gains are not taxed at all. As realizing capital gains can be deferred, the present value of this tax is small. Furthermore, the tax could be avoided entirely through clever

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1/ The payment of cash dividends is a puzzle especially when, unlike interest payments, they are not deductible when assessing corporate taxes. In the absence of cash dividends, investors could sell part of their holdings to finance consumption, paying the lower capital gains tax instead of the income tax. Firms with excess funds could simply buy back part of the outstanding shares in the market instead of paying out cash dividends.

Miller and Scholes (1978) have argued that the tax on dividends could be avoided completely because of the various provisions in the United States tax code. While their litany of tax loopholes that may be exploited is impressive, the actual behavior of stock prices around the ex-dividend days does not appear to support their claim that cash dividends are untaxed. The studies include Litzenberger and Ramaswamy (1979, 1980, 1982), Eades, Hess and Kim (1984) and Lakonishok and Vermaelen (1986) for the United States and Poterba and Summers (1985) for the United Kingdom.

Recent explanations of the cash dividend paradox (Easterbrook (1984), Miller and Rock (1985)) involve cash dividends being signals to the capital markets about the firm's performance. These explanations, while plausible, are not wholly satisfactory because share repurchases could serve as a signal too. A different explanation (Shefrin and Statman (1984)) draws on recent developments in cognitive psychology suggesting that investors perceive cash dividends differently from an equivalent amount of capital gains. The trouble with this explanation is that it leaves room for profitable arbitrage.

2/ In the United States, only 40 percent of the capital gain is taxed as income if these gains are incurred on assets held longer than a prescribed holding period. The holding period was one year until 1984 when it was changed to six months. From 1987, however, all of the realized capital gains will be taxed as income. The tax systems of other countries vary. The Japanese effectively pay no tax on capital gains which may also account for their low cash dividend payments. The British tax code is more complex with capital gains up to a specified amount being free of taxes.

financial planning. 1/ The effective tax rate on capital gains is therefore often taken to be zero and is not as important for this analysis as the corporate and personal income tax rates.

Miller showed that corporations have an incentive to collectively issue debt until the marginal personal tax rate equals the marginal corporate tax rate. 2/ If personal tax rates are graduated so they bracket the corporate rate, there will be some debt and some equity outstanding in the economy, although not necessarily for every firm.

The mathematical proof of the Miller proposition is in the Appendix but the results may be understood intuitively. The risk of one's portfolio may be altered by changing leverage either directly by borrowing or lending through one's personal account, or indirectly through borrowing or lending by the corporations whose equities one owns. In the aggregate, of course, total borrowings must equal total lendings in a closed economy. People differ both in the risk (leverage) they desire and in their marginal tax brackets and there is no necessary relation between the two. In other words, those with high incomes will not necessarily be lenders. Borrowers in high marginal personal, income tax brackets would prefer to borrow directly through their personal accounts because the interest deductibility reduces personal taxes by more than it would reduce corporate taxes had the corporation borrowed instead. Borrowers in low tax brackets on the other hand, would prefer to borrow through corporations, by owning equity in levered firms. Conversely, lenders in high tax brackets would prefer to do so through corporations, while lenders in low tax brackets would lend directly. This "clientele effect" determines asset holdings. Differences in tax rates permit

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1/ In the United States, the many taxpayers who file itemized returns, can deduct charitable donations from income before assessing personal income taxes. If appreciated assets are donated, their market value can be deducted. A donation is not a sale, and no tax is paid on the appreciation. The recipient, being tax-exempt, also pays no tax even if the asset is sold immediately. So the capital gains on the donated asset are untaxed.

Another financial planning technique is to bequeath appreciated assets. The beneficiary's basis ("cost" for the purpose of any subsequent capital gains assessment) is stepped up to the market value at the time of inheritance. The difference between this market value and the old basis, which is a capital gain to the deceased, escapes taxation.

2/ Corporate tax rates are not as steeply graduated as personal taxes and so the adjective "marginal" is omitted. In the United States, where much of this literature has been developed, the top corporate tax rate of 46 percent (34 percent from 1987) is levied on corporate profits above $100,000--which covers all but the smallest of firms. The effective corporate tax rate may be lower than the 46 percent listed for the United States because of investment tax credits and generous depreciation allowances. This also holds for other economies.

intramarginal investors (i.e., those whose personal marginal tax rate is lower than the corporate rate) to profit from schemes 1/ that exploit the different tax rates; but these schemes, though interesting, are not important for this analysis. The corporate tax rate would in effect be the marginal tax rate for the economy. The interest rate on default-free corporate debt would be grossed up above the tax-exempt interest rate by a factor that depends upon the corporate (and personal capital gains) tax rate.

Figure 1 portrays the equilibrium. ARC is the aggregate supply of the stock of debt and is perfectly elastic. At any interest rate smaller than OA [$=i_0/(1-t_c)(1-t_{ps})$, see Appendix for details], firms would find it profitable to issue additional debt and buy back some of their equity. At an interest rate greater than OA, they would sell additional equity and buy back their debt. PQRS is the aggregate demand for the stock of debt and is upward sloping. (The upward sloping demand may be initially disconcerting; but the choice of the axes is now entrenched in the literature.) At low interest rates, those who pay no income taxes (untaxed Universities, foundations and pension funds) hold the debt but the gross-of-tax interest rate needs to be progressively higher to attract holders in the increasingly higher personal income tax brackets. 2/

In equilibrium, the aggregate stock of debt outstanding will be AR. OA is the interest rate gross of taxes and the net return depends upon each person's marginal tax rate. The return on equity cannot be portrayed in this diagram (it is held constant along the aggregate supply of debt) but its risk-adjusted return will be directly related to

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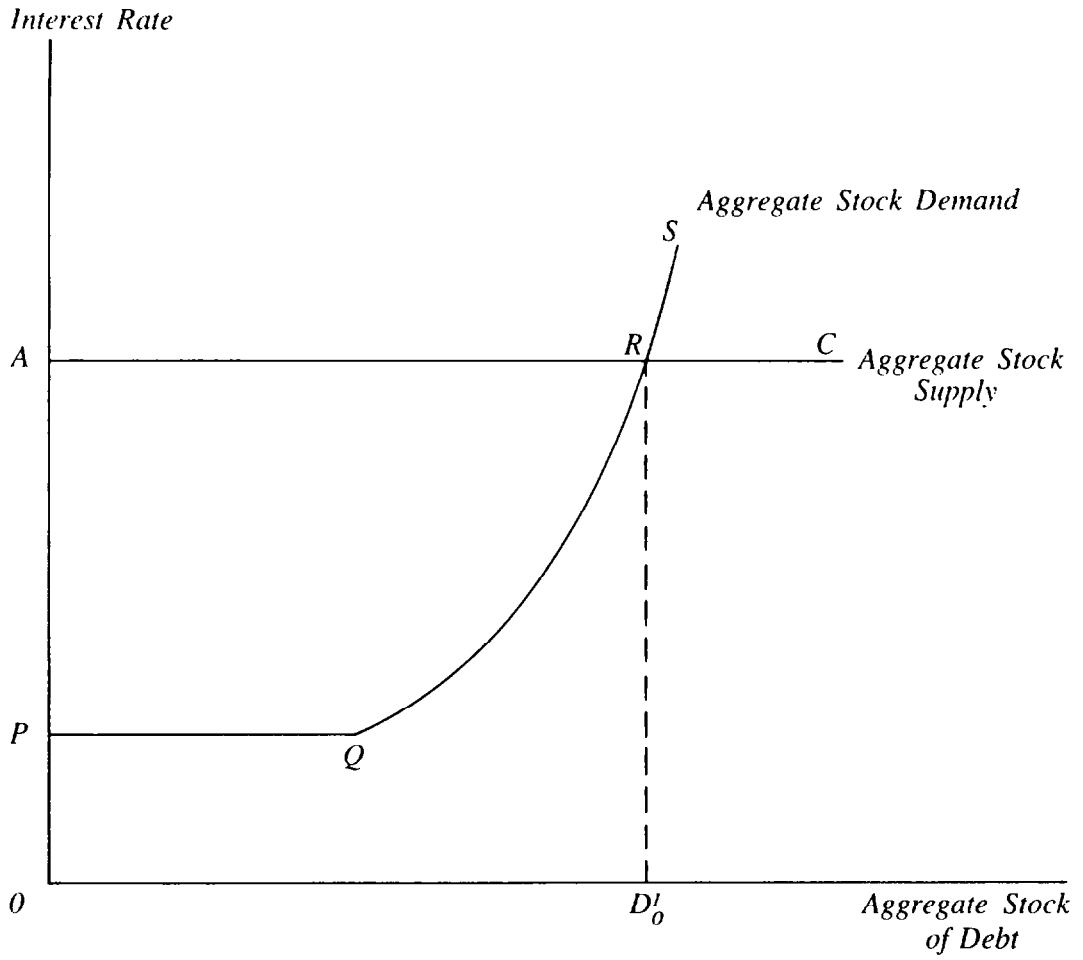
1/ One scheme, that is now being widely used by portfolio managers, involves selling equity cum-dividend to low tax investors (Universities and pension funds, or to corporations because of the 85 percent exemption on inter-corporate dividends) and repurchasing the equities ex-dividend after the stipulated holding period (16 days under the old rules but 45 days since the tax amendments of 1987). Any interim market risk could be hedged through futures and options contracts. Miller and Scholes (1978), Hamada and Scholes (1985) and Constantinedes (1984) describe other complex schemes.

2/ If all personal income taxes could be avoided through loopholes in the tax code, the aggregate demand for debt would be perfectly elastic at the interest rate OP and would not intersect the aggregate supply of debt. This (admittedly unrealistic) extreme case is useful when examining the effects of agency costs (section III) that inhibit individual tax avoidance schemes.

It is convenient, although not entirely accurate (because individuals issue debt when they borrow), to view the supply of debt as coming from corporations and the demand for debt as coming from people either directly or through their pension accounts.

Figure 1: Miller (1977) Equilibrium



the gross return on debt. OA would therefore proxy the marginal product of, or return on, capital. 1/

*This equilibrium aggregate stock of debt in the economy is main*tained through arbitrage and, as there are several arbitrage mechanisms, the result is robust. If, for example, a firm alters its capital structure (perhaps because it mistakenly thinks that it could thereby lower its capital costs), other firms would find it profitable to change their own capital structures, effectively undoing the first firm's actions, thereby restoring the aggregate stock of debt in the economy. Alternatively, arbitrageurs who see the folly of the first firm's actions could buy pro rata shares of all the firm's securities, financing the purchase by issuing that combination of debt and equity that the market desires. In either case, the first firm's cost of capital would be unchanged although its debt-equity ratio is altered. To ensure this *equilibrium, arbitrageurs must have the same access to the financial* markets as the first firm. This may appear at first to be unrealistic, especially when all investors do not have such "equal access." For the proposition to hold, however, it is sufficient if some, rather than all, arbitrageurs (who may be firms or people) can raise funds in this fashion and compete in repackaging the securities. The propositions therefore rely on competitive markets, a far weaker assumption than perfect, frictionless markets.

Despite the logical robustness of the irrelevance propositions, they may not accurately describe the world. Contrary to the implications of the propositions, the debt-equity ratios of firms are not randomly distributed, with firms in the same industry, both within and across countries, having similar ownership structures. Furthermore, the interest rates on taxable and tax-exempt bonds diverge by more than the corporate tax rate (Skelton (1983) and Peek and Wilcox (1986)). The explanation may have to do with agency problems and monitoring costs that M-M and Miller do not consider, and these are described in the next section.

III. Agency Costs and their Effects

Factors other than tax rates that affect a firm's ownership structure fall under the general rubric of "agency." When an owner (the principal) entrusts another (the agent) with a task, the agent has an incentive to shirk or consume unproductive perquisites (the "three martini lunches") at the principal's expense unless the principal ensures that he does not. If the principal could observe the agent's

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1/ Increasing debt reduces equity in the economy because capital stock and investment are held fixed (i.e., are kept constant along these schedules). That is why the marginal product of capital does not change with debt.

effort, or infer it from the outcome, the agent could be rewarded in ways that would eliminate the incentive to shirk. Agency problems arise when the agent's effort cannot be costlessly observed or inferred precisely (as when the outcome is also influenced by factors other than the agent's efforts alone). Such problems are discussed in detail by Jensen and Meckling (1976), Fama (1980) and Jensen and Smith (1985) and this section summarizes the main results of these studies and their implications for financial market equilibrium.

An agent bearing all the risk of an enterprise collects the entire benefits of his effort and pays the entire penalty of any malfeasance irrespective of whether these efforts could be observed. So the best contract would have the agent bear all the risk (i.e., own all the equity) and for outside inventors to be promised a return (i.e., fund through debt). This arrangement could, however, create at least three problems.

First, a risk-averse agent may prefer to share the risk of the venture, especially if an adverse outcome wipes out the bulk of his wealth. This would be true a fortiori if the agent's skills are largely firm-specific, making the agent's wealth (including human capital) undiversified. Any sharing of the agent's risk with another, however, would reintroduce the agent's incentive to shirk. Principals, aware of these incentives but unable to prevent the agent from acting against their interests, would value the firm less than they otherwise would, thus compensating themselves for the agent's likely malfeasance. 1/ Agency costs, therefore, cause the return on capital (the marginal product of capital) to be larger than the cost of non-agent supplied equity.

Second, funding through debt could introduce other agency-type problems also. Black (1976) describes an extreme example when "there is no easier way for a company to escape the burden of a debt than to pay out all of its assets in the form of a dividend, and leave the creditors holding an empty shell." Bond covenants could prevent some obvious expropriations by equity holders but cannot prevent less obvious actions that impoverish bondholders. For example, equity holders (who appoint the manager or agent) could increase the variance of ventures after

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1/ Expected returns on non-agent held equity may not decline because the value of the firm, both now and in the future, is lower. The expected returns on equity and of capital would diverge.

borrowing funds. 1/ This attraction of gambles remains even when the equity holders are risk-averse, because their holdings in one firm could be diversified by including other investments in their portfolio. So, even if the agent bears all the risk in a venture which is financed by bonds, thus avoiding the agency cost of outside equity financing, a similar agency problem remains between the equity and debt holders. This gives rise to the agency costs of debt financing.

Third, additional debt could also increase the likelihood of "bankruptcy." Liquidation and reorganization must be clearly distinguished. Liquidation involves disbanding a firm and selling its assets to pay the creditors (in whole or in part). In a reorganization, however, the firm continues to operate but its liabilities are restructured, with the old equity holders losing their stake and the creditors converting the unpayable loans into new equity. Miller (1977) has argued, citing empirical studies, that actual "bankruptcy" (liquidation) costs are very small, especially considering the low probability of liquidation. Be this as it may, a firm with operating profits but unable to service its debt could be reorganized rather than liquidated. Reorganization costs are even smaller than liquidation costs and could therefore be ignored (Haugen and Senbeth (1978). If, however, several entities hold the debt, each debt holder has an

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1/ Black and Scholes (1973) showed that equity is equivalent to a call option because equity-holders have the right, but not the obligation (because of limited liability), to buy the firm back from the bond-holders by repaying the principal plus interest (the exercise price) when the debt matures. An option is more valuable the greater the variance of the return on the underlying asset. Equity-holders benefit when the venture does well but the bond-holders share in the loss if it fails. Equity-holders would therefore prefer high variance projects.

One way to raise the variance of equity returns (without altering the investment project) is to increase leverage. Debt holders could protect themselves by "me first" rules that secure their position in the queue in the event of "bankruptcy."

incentive to hold out for a larger share of the benefits from a reorganization, resulting in the agency costs of widely-held debt. 1/

When a firm finances its operations in the least expensive manner, it minimizes total agency costs. The optimal debt-equity ratio would be where the marginal costs of debt equals that of outside (i.e. non-agent) equity. Figure 2A portrays a firm's agency costs to its debt-equity composition and the optimal fraction of outside equity financing is OB. If the cost curves are shaped differently, the firm may issue only equity while in other cases, as shown in figure 2B, the firm may issue as much debt as possible (some equity being essential to incorporate).

For the economy as a whole, the aggregate supply of the stock of debt would no longer be perfectly elastic. Firms would issue additional debt only if the interest rate is lower to compensate for the added agency costs that additional debt entails. The aggregate supply of the stock of debt would therefore slope down, as shown by AUD in Figure 3.

It is worth emphasizing that for the aggregate supply of debt to be downward sloping, the debt of every entity (firm or individual) would have to entail agency costs. If even a few entities could issue unlimited amounts of debt without additional agency costs, the Miller equilibrium of Figure 1 would be restored.

Agency costs could also alter the aggregate demand for the stock of debt. Without agency costs, the upward slope of the aggregate demand for debt only reflects the added inducement needed to attract investors in increasingly higher personal income tax brackets. If the costs of tax-avoidance by individuals are an increasing function of income to be sheltered, then the demand for debt would be more elastic than in Figure 1; perhaps PTUW as in Figure 3. The aggregate demand for debt, however, does not play a major role in this paper and so is not developed further.

The equilibrium aggregate stock of debt could be higher or lower than that in the absence of all agency costs (Figure 1), depending upon

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1/ This particular aspect of the agency cost of debt stems from the free-rider problem and could be avoided if all the debt of a firm is held by a single entity. Once the debt is widely held, however, it cannot be amassed into one block except through the use of two-tiered bids as in the mergers and acquisitions market. Grossman and Hart (1980) analyze this issue in the market for corporate control.

Creditors of countries also have to contend this free-rider problem as each creditor would prefer to be paid off although, collectively, they cannot all be. Sachs (1984) describes mechanisms to prevent this; the most obvious being cross-default clauses that ensure pro rata repayments or additional lending. These clauses, however, prevent the "me first" rules that protect the claims of the initial lenders.

Figure 2a: Optimal Firm Ownership Structure

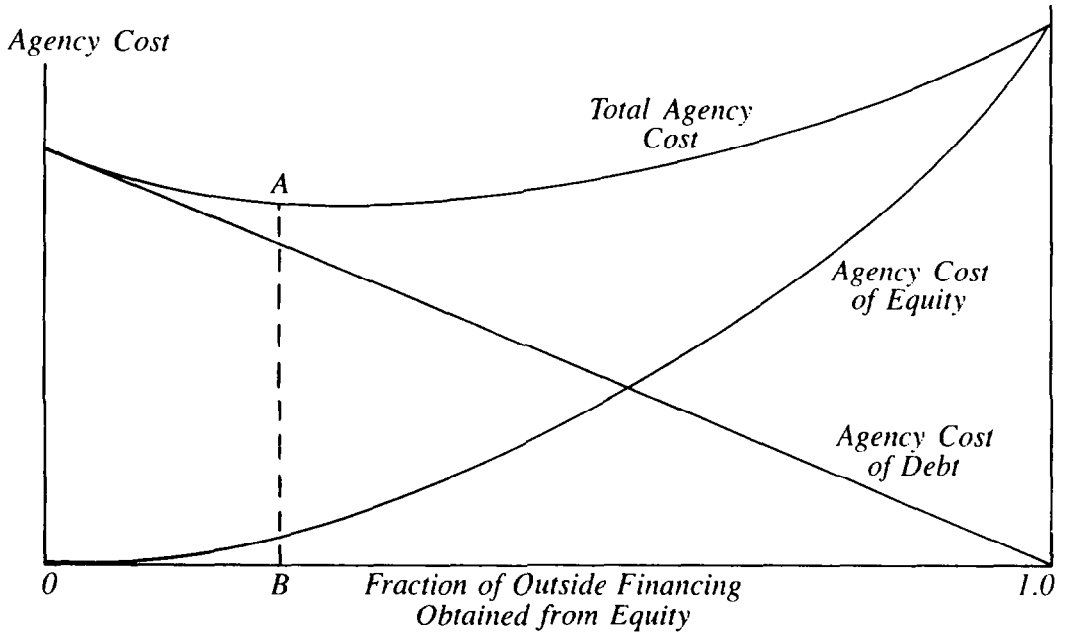


Figure 2b: Optimal Firm Ownership Structure (No Outside Equity)

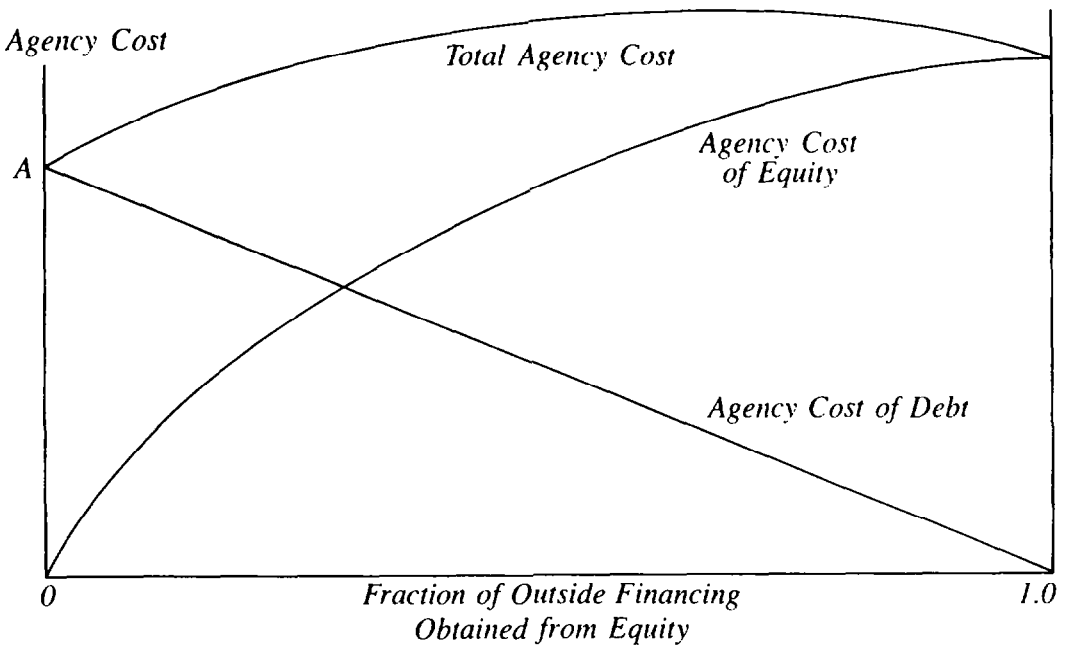
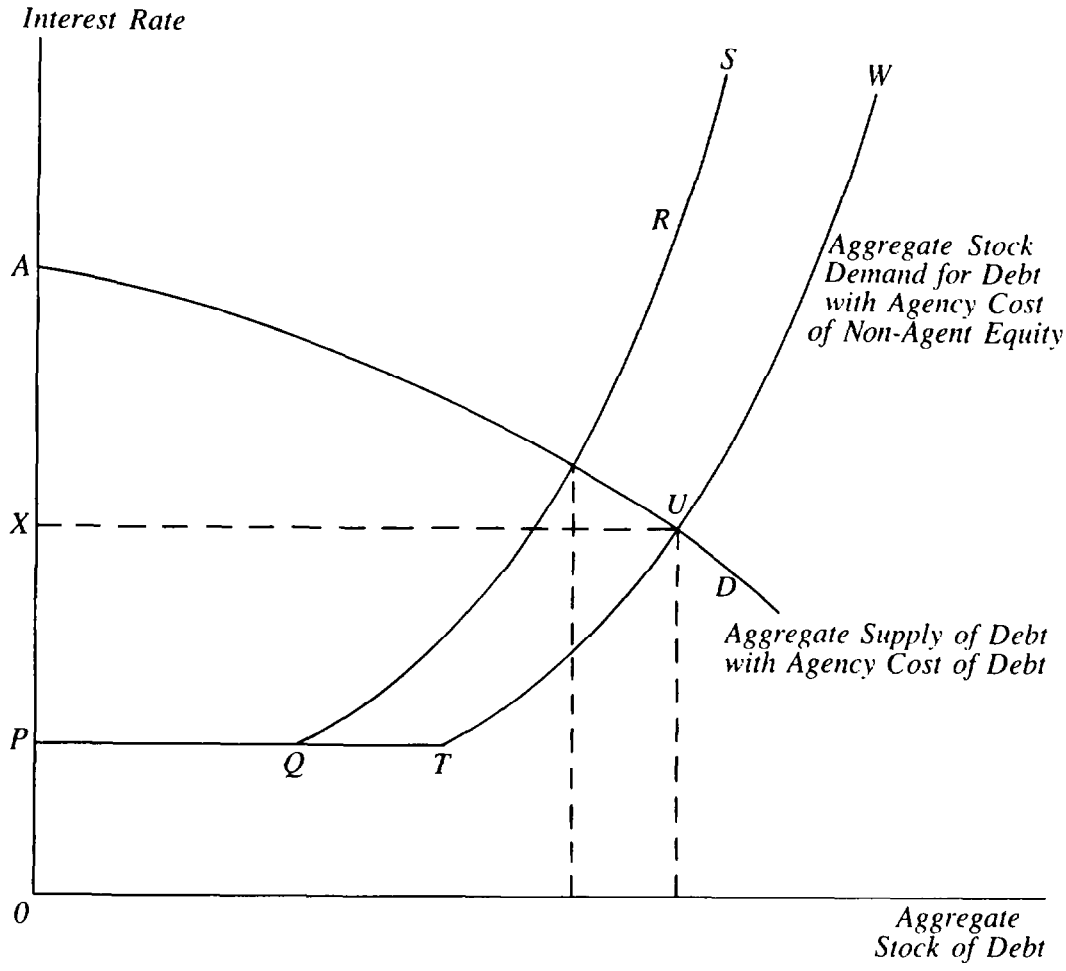


Figure 3: Equilibrium Aggregate Debt With Agency Costs



the extent of these shifts; but the cost of capital to a firm now depends on its ownership structure, contrary to M-M or Miller. Predictably, the greater the agency cost of debt, the smaller the aggregate stock of debt, while the greater the agency cost of (outside, or nonagent held) equity, the more debt there would be.

Agency costs, however, are not immutable and depend upon the principal's ability to monitor the agent. 1/ If the costs of monitoring are more likely to vary by industry than by firms within an industry, firms in the same industry would have similar ownership structures even across national boundaries with different tax structures. 2/ Furthermore, it may also explain why, in the presence of tax-exempt bonds, taxable bond returns are not grossed up by the full amount of the corporate tax rate. Most important for the analysis in this paper, however, is that agency costs cause the gross-of-tax returns on nonagent funds (OX in Figure 3) to be less than the returns on capital (proxied by OA in Figure 3).

IV. Traded Securities

While the agency literature distinguishes between securities held by the principal and those by the agent, nothing is implied about whether these securities would be traded. Securities markets emerge to trade the claims of the principals primarily, not those of the

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1/ Agency costs could be reduced, but probably not entirely eliminated, by complex securities involving contingent claims (Haugen and Senbet 1981). Callable debt, for example, avoids the free-rider problems associated with reorganizing the firm when the debt is widely held. The agency cost of equity arising from unproductive consumption by agents (or managers), for example, could be reduced by substituting stock options for some of the agent's salary. The option protects the agent's wealth from adverse outcomes but provides the incentive to expend the effort needed to obtain favorable outcomes. So long as other equity holders share in some of the gain, however, the incentive to shirk or enjoy unproductive perquisites cannot be eliminated. In a large enterprise, where the agent bears only a small fraction of the risk, the marginal (as opposed to the total) agency cost of outside equity may be close to zero. Another mechanism to reduce malfeasance is the value of the agent's reputation in the managerial labor market (Fama (1980)).

2/ For example, earnings variability makes it difficult to distinguish between managerial ability and effort from luck. Firms in an industry are likely to have similar earnings variability.

agents. 1/ When monitoring is difficult and agency costs are high, as in many countries, ventures are largely self-financed, and a securities market (if one exists) would be small with few securities traded. Debt may be incurred through moneylenders or commercial banks and equity would be held, though rarely traded, by the agents themselves. Despite the absence of a stock market, the equity could be substantial, with almost all of it held by the entrepreneurs.

Table 1 presents data on debt and traded equity in several countries. 2/ Countries differ in the ratio of traded equity to national product, with industrial countries having a higher ratio. Three categories of debt are included in the Table: (1) corporate bonds (that could be traded) (2) debt incurred through financial intermediaries such as banks and (3) government debt (whose effects on the corporate finance propositions will be discussed in the next section). The ratios of total nongovernment debt to national product, however, seem remarkably similar across countries, implying similar ratios of the debt to total (traded plus nontraded) equity across countries--an interesting, and perhaps surprising, finding. Debt-equity ratios of nonindustrial

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1/ Trading by corporate "insiders" is limited by the Securities and Exchange Commission in the United States and many of the managers' ("qualified") stock options are explicitly made nontradable to comply with the Internal Revenue Service definitions of taxable income. Occasionally, as during mergers and takeovers, the agents are replaced and their holdings repurchased, or sold, but the equities market is primarily for the trading of the principals' claims and not those of the agents.

2/ The value of traded equity is obtained from the market valuation of the stock exchanges. The value of nontraded equity cannot be easily ascertained, but one estimate would be to subtract debt and traded equities from total wealth. Total wealth, naturally, is difficult to value but could be estimated as the present value of nonlabor income which then raises the issue of labor's share of income (difficult to measure in many countries), and future growth and discount rates to use. To avoid these contentious issues, the ratios of the stocks of debt and traded equity to GNP (a flow that is related to wealth) are presented.

Table 1. Debt and Traded Equity Estimates

	Units	1985 Nominal GNP	1985 (end) Market Value of Traded Equity: Local Currency 1/	U.S.$ 2/	% GNP	1984 (end) Corporate Debt (Market Value): Local Currency 3/	% GNP	1984 (end) Government Debt (Par Value): Local Currency 3/	% GNP	1984 (end) Financial Intermediaries Assets: Local Currency 3/	% GNP
United States	US$ bn.	4,010.3	1,955.4	1,955.4	48.8	2,402.8	59.9	1,945.7	48.5	6,643.8	165.7
Japan	¥.tril.	317.3	182.3	909.1	57.5	213.2	67.2	140.0	44.1	809.6	255.2
United Kingdom	£. bn.	355.0	227.4	328.3	64.1	218.0	61.4	115.1	32.4	611.6	172.3
Canada	Can$ bn.	461.8	205.3	146.9	44.5	223.9	48.5	119.9	26.0	747.5	161.9
West Germany	DM bn.	1,844.9	440.6	179.0	23.9	1,376.0	74.6	226.5	12.3	2,893.8	156.9
Switzerland	Sw F bn.	241.5	187.5	90.3	77.6						
France	F bns	4,692.5 4/	593.5	78.5	12.6	587.5	12.5	852.6	18.2	9,925.8	211.5
Italy	Lit tril.	679.0	108.6	64.7	16.0						
Australia	$A bn.	228.8	91.8	62.5	40.1						
Netherlands	NLG bn.	414.0	143.0	51.6	34.5						
Sweden	SKr bn.	840.5	228.5	30.0	27.2	563.6	67.1	356.9	42.5	1,706.6	203.0
Belgium	BF bn.	4,777.0	1,057.6	21.0	22.1						
Denmark	DKr bn.	588.1	116.6	13.0	19.8						
Subtotal				3,930.3 (bn.)							
Argentina	₳ mn.	39,673.3 4/	1,128.0	1,409.0	2.8						
Brazil	Cz$ tril. (old)	1,364.0	448.6	42,870.0	32.9	101.1	7.4	93.3	6.8	516.7	37.9
Chile	Ch$ bn.	2,576.6 4/	369.9	2,010.0	14.4						
Greece	Dr. bn.	4,580.4	113.1	765.0	2.5						
India	Rs. bn	2,129.1 5/	156.2 6/	12,550.0	7.3	179.9	8.4	320.6	15.1	1,766.3	83.0
Jordan	JD mn.	1,849.2	1,000.0	2,719.9	54.1	900.0	48.7	0.1	—	3,900.0	210.9
Korea	W tril.	72.9	6.6	7.380.0	9.1	10.4	14.3	3.7	5.1	139.6	191.5
Malaysia	M$ bn.	71.8	39.9	16,462.0	55.6	39.9	55.6	0.03	--	147.5	205.4
Mexico	Mex$ bn.	45,588.5 4/	1,547.5	4,163.0	3.4						
Pakistan	PRs bn.	516.3 5/	22.3	1,392.0	4.3						
Philippines	₱ bn.	379.3 7/	18.2 7/	1,298.0	4.8						
Taiwan	NT$ bn.	2,394.8	415.7	10,420.0	17.4						
Thailand	B bn.	1,000.4	49.0	1,860.0	4.9	46.7	4.7	206.9	20.7	1,087.1	108.7
Zimbabwe	Z$ mn.	8,099.0 4/	591.2	360.0	7.3						
Subtotal				105,658.0 (mn.)							
Others				2.1 (bn.)							
World Total				4,038.1 bn. U.S. dollars							

Sources: International Finance Corporation (IFC), and International Monetary Fund.

1/ For the industrial countries, IFC gathers these data from F.I.B.V., an association of stock exchanges. Developing country data are from IFC's own correspondents.

2/ Official exchange rates are used which, in some instances, differ from free market values.

3/ IFC's data

4/ GDP.

5/ 1984/85.

6/ 1984.

7/ 1983.

countries are not large, despite high debt-equity ratios of firms traded on exchanges. 1/

There are, however, some important differences among countries. Much of the debt in the nonindustrial countries is held through banks and other financial intermediaries and little is traded. These countries have few tradable securities, whether debt or equity, and most enterprises may be self-financed, suggesting that agency costs of outside funding could be high. The data in Table 1 do not, however, include loans made through unregistered entities, such as moneylenders, which could be substantial in some countries.

Implicit in all of the foregoing analysis is that people structure their ownership claims to avoid, not evade, taxes. Tax evasion involves fraudulent accounts which, by their very existence, make monitoring the agent more difficult, expensive and perhaps impossible. Tax evasion would, of course, affect the ownership structure (it could be analyzed as a reduction in the "effective" tax rate) and could, if it affects nonagent held equity more than it does debt, reduce tradeable (nonagent held) equity. This is consistent with the data in Table 1, which show that countries with the smallest proportions of traded equity (namely, France, Italy, Denmark and Belgium) also have the highest tax rates in Europe. Tax evasion could reduce or even eliminate the trading of debt instruments if trade, rather than ownership, is more easily traced.

V. Effects of Government Debt

The earlier sections described the standard results of corporate finance theory on the ownership structure of firms, together with a few additional implications. The debt was "inside" debt because there was no net debt outstanding in the aggregate. In this section, the analysis is extended to take account of "outside," or government, debt which is shown to alter the financial market equilibrium even if future tax liabilities are discounted and government bonds are not net wealth (i.e., under "Ricardian equivalence").

1/ It is easy to ignore untraded securities. Sundararajan (1985), for example, states that "The average debt-equity ratio of firms in the industrial sector in (South) Korea has grown from about 100 percent in the early 1960s to about 500 percent in recent years." He then proceeds to examine the effects of a high debt-equity ratio on the economy.

The debt-equity ratio for traded securities, and its changes over time, may not be representative of the economy. They may only reflect changes in monitoring technology of that industry or, more likely, access of those particular firms to subsidized loans. South Korea's ratio of debt to national product resembles that of other countries examined in Table 1.

Governments can issue bonds but not equity because any residual claims on earnings from public sector activities accrue to the taxpayers. Governments do not have the same incentive as do firms with limited liability, to borrow and then undertake higher variance ventures than promised, because government bonds must be repaid in full from tax receipts even if the financed venture fails. 1/ Government debt would therefore be free of agency costs that are associated with private debt, thereby enabling governments to arbitrage between private debt and equity even when private participants cannot. This theme is developed further in this section.

First consider the equilibrium in the absence of all agency costs (the Miller world). Any additional government debt would cause firms or arbitrageurs to reduce private debt and issue more equity, leaving the aggregate debt (private plus government) unchanged at AR (Figure 1). Government debt would therefore displace an equal amount of private debt, leaving the financial market equilibrium unchanged.

When agency costs of private debt preclude the Miller equilibrium (Figure 3), however, issuing government bonds alters the financial market equilibrium. The government could use the bond proceeds in one of three ways. First, it could increase expenditures or collect fewer taxes; second, it could purchase and hold private debt; or third, it could purchase and hold equity. The effects of each of these actions are examined in turn.

If the government uses the bond proceeds to increase expenditures or reduce tax collections, the situation would be as shown in Figure 4A. 2/ Government debt augments the aggregate stock of debt and shifts the supply curve to ABVE by the amount of the government debt AB. The new equilibrium is at V, not U, with government debt displacing some, but less than an equal amount, of private debt, raising the aggregate debt stock and the interest rate, gross of personal taxes. The

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1/ It is assumed that the government can raise enough revenue to service the additional debt. If the government is nearing the limits of its taxing ability, then its debt may have agency costs.

Although international issues are deferred to a later section, government borrowing abroad is constrained not merely by its taxing ability but also by the economy's ability to generate a trade deficit to transfer resources now and to generate the necessary trade surplus in the future to service the debt.

2/ It is assumed that tax collections are reduced without changing the marginal corporate or personal tax rates. If the tax rates were changed, there would be additional effects. Government spending could, of course, change the structure of output in the economy or have other distributional effects, but these effects do not directly influence the financial market equilibrium portrayed in Figure 4A.

trapezium XUVY represents the increase in consumer surplus (area "below" the demand curve) from the government's actions.

If the government purchases private debt with the bond proceeds, the effect would depend upon precisely how this is done. If private bonds are purchased in the market, private debt is exchanged for government debt of equal value, leaving the aggregate debt stock with the public unchanged and the financial market equilibrium unaltered at U (Figure 4A). 1/ If, on the other hand, the government undertakes to buy a specified fraction of all the bonds that firms issue, then it effectively reduces the agency costs of private debt. The aggregate supply of debt would be more elastic than before, shown as AU'D' (Figure 4B) with the equilibrium at U', which could lie on either side of V (Figure 4A) depending upon the demand schedule for debt.

If the government purchases equity in private 2/ firms with the bond proceeds (the third alternative), the result would be identical to the first case examined, namely the government spending the proceeds. The government's purchase would reduce equity held by the public, but would not alter the price of risk or other asset prices in the financial market. Fluctuations in equity returns of the government's portfolio

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1/ The supply and demand curves of debt are unchanged if the horizontal axis measures debt with the public. If total debt (including what the government holds) is measured, both the supply and demand curves shift by the same amount, leaving the equilibrium interest rate unchanged.

2/ There are many ways of separating the private from the government sectors. The measure used by the International Monetary Fund in designing programs only includes the production of public goods (the courts, the military, and the like) in the government sector.

For this paper, however, it is more useful to include all wholly government financed enterprises (the post office, the national airline, etc.) in the government sector. Partially government financed enterprises are considered to be in the private sector with the government owning some of the claims (be they debt or equity).

If the government buys all the outstanding equity in a firm, there will be no other equity holders to monitor the agents. Bureaucrats are unlikely to monitor agents as well as portfolio managers motivated by profit. A wholly government owned firm would therefore be poorly run and be unable to compete with better run enterprises. If government-owned firms are inefficient, the deficiencies could be effectively hidden if the competitors are legislated out of existence. Governments may be quite willing to grant their own enterprises a monopoly, arguing conveniently that they serve a greater purpose than profit.

So while the reasoning here may only account for the partial ownership of firms by governments, it suggests a "slippery slope" towards outright nationalizations and subsequent monopolization.

Figure 4a: Equilibrium with Government Debt

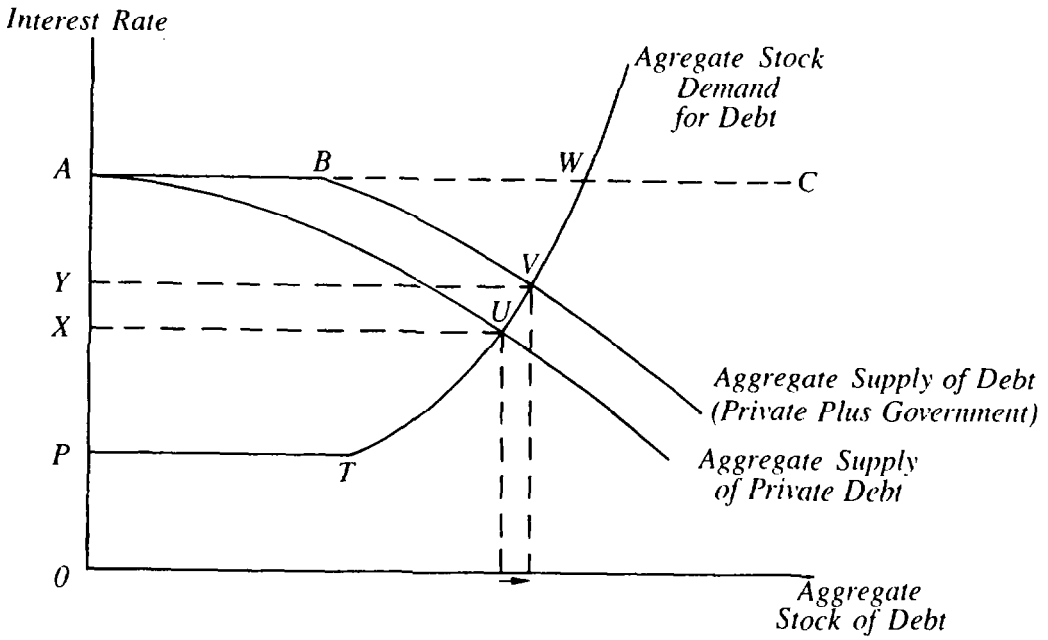
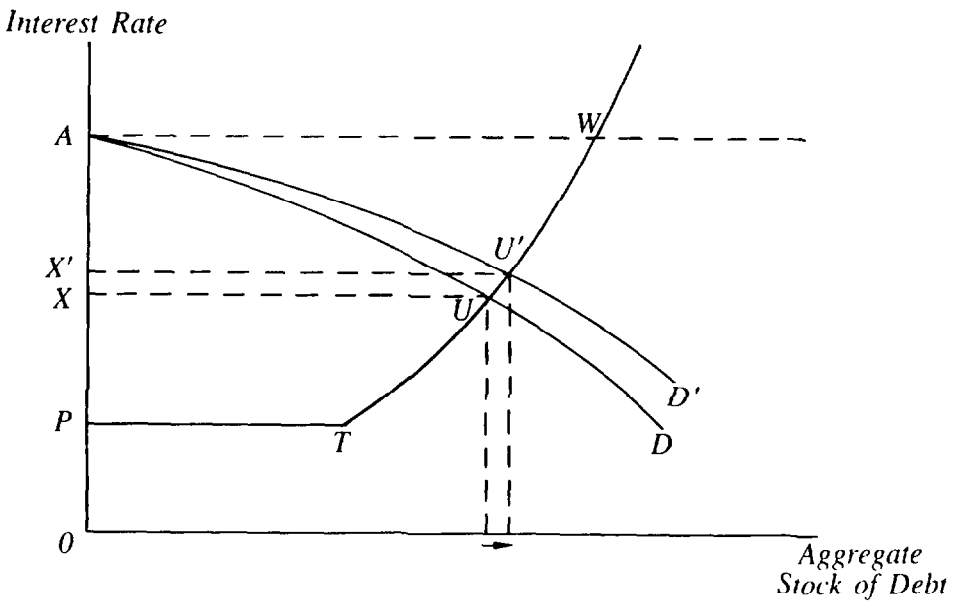


Figure 4b: Equilibrium with Government Debt Government Buys Fraction of Private Debt Issued



would correspond to changes in the budget surplus or deficit 1/ which, under Ricardian equivalence, would be properly discounted by the public. Alternatively, if the budget is always balanced, fluctuating returns on the government's equity portfolio would translate as variations in taxes and, because financial markets price after-tax returns, asset prices would be unchanged.

Although financial equilibrium would be unaltered when the government holds some of the equity, the issuance of government bonds to finance the purchase would affect the financial equilibrium. Issuing government debt would displace less than an equal amount of private debt and raise the gross interest rate. The government could, if it so chose, continue this "arbitrage" until the aggregate supply intersects the aggregate demand at W (Figures 4A or 4B). Beyond this aggregate stock of debt, though, private market participants could effectively undo any additional government debt by issuing less debt and more equity. If enough government debt is issued that all private debt is eliminated, any additional government debt would still result in an equilibrium at W because firms could issue equity to purchase government debt. The aggregate supply schedule of debt would therefore never be upward sloping. The resulting equilibrium would be similar to that which Miller (1977) described. 2/

The intuition behind these results is that the Government effectively acts as an arbitrageur in the financial market. Private arbitrageurs are hampered by the agency costs of their debt from ensuring the Miller equilibrium. By issuing debt, the government is essentially stepping into the breach.

To sum up, if government debt has no agency costs but private debt does, then issuing government bonds alters the financial equilibrium and raises the gross-of-tax return on debt. This has important implications, which are described in the sections that follow.

1/ The statement holds when the government's accounts are kept on an accrual basis. Even if, as is commonly done, the government's budget is on a cash basis, the public is assumed to properly discount unrealized gains and losses.

2/ Similar, but not identical, to Miller (1977) because the aggregate demand for debt may be greater due to the agency cost of outside equity (PTUVW instead of PQRS, Figure 3). The interest rate gross of taxes would be the same as in Miller although the aggregate stock of debt would be greater.

VI. International Investment

Countries differ in their tax structures and the marginal products of, or returns on, capital. When financial markets of two countries are linked, the tax clienteles described earlier would determine the composition of international investment. It is shown that under certain conditions, capital would flow between countries only as debt. Furthermore, there are circumstances when no capital would flow even if the returns on capital differ in the two countries; but issuing government bonds could induce international capital flows, sometimes perversely (from a country where it is scarce to one where it is abundant).

Consider two countries: A, where capital is relatively more abundant with lower returns on capital, and B. Capital would indeed flow in the desirable direction from A to B until the two returns are equal if there were no impediments to trade in goods or securities and no agency costs or taxes. In equilibrium, gross and net returns equal the marginal product of capital, which would be the same in the two countries.

Taxes are assumed to be levied by the investor's country of residence. 1/ An investor in either country, comparing the after-tax returns would find the country with the higher gross return also has the higher net return. Gross returns would therefore also indicate the direction of incipient net capital flows between countries and, in the absence of agency costs, equilibrium would be attained when sufficient capital flows to equalize the net of tax returns across countries. 2/ As many would find this equilibrium to be "unrealistic," one way to analyze the composition of capital flows would be to examine what happens when two isolated financial markets are first linked. This situation is shown in Figure 5. The composition of investment is shown

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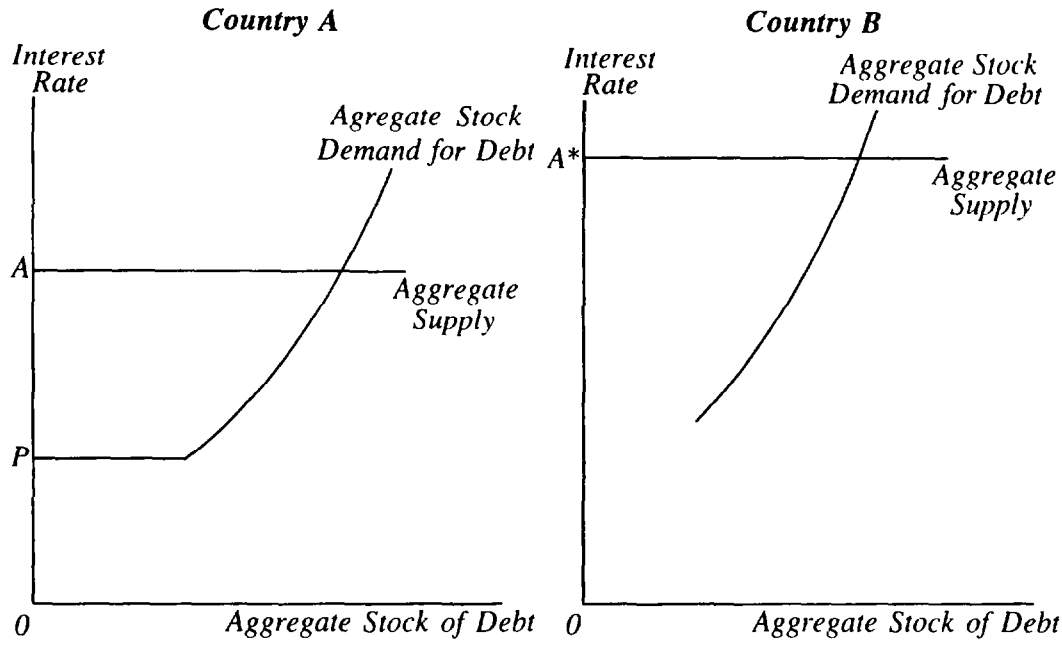
1/ This appears to be how taxes are generally levied. An American investor's return from foreign securities is taxed at the same rate as that on American securities. (The $100 dividend exclusion for single, or $200 for married, taxpayers is not allowed for dividends on foreign companies; but at the margin, this exclusion may be irrelevant. In any event, this exclusion will not be allowed from 1987.)

Even if the foreign government taxes the American investor's return, these foreign taxes may be credited towards U.S. taxes, making the U.S. rate the relevant marginal tax rate to the American investor.

2/ Capital can only flow if there is an imbalance in goods trade. The rising stock of capital in B (falling stock in A) will reduce (in A, increase) the marginal product of capital and with it, the return gross of personal income taxes. Actually, Mundell (1957) showed that under certain circumstances, factor prices (and returns are the factor price of capital) could be equalized through goods trade alone and that capital flows are not even necessary.

Figure 5: Linking Countries with Different Costs of Capital



below to depend upon the distribution of investors in the various tax brackets.

It was argued in Section II that in the absence of agency costs, the corporate tax rate is the marginal tax rate in the economy. People with marginal personal income tax rates higher than the corporate rate would prefer to own unlevered equities, because they could borrow on their personal accounts, while those in lower tax brackets would obtain a greater benefit if the corporations borrowed on their behalf. This clientele effect is a bit more complicated with two countries, each with a different corporate tax rate.

Suppose that country B's corporate tax rate is higher than in country A. 1/ Investors in both countries may be classified into three groups; H, for highly-taxed investors whose personal marginal income tax rates are higher than B's corporate tax rate; M, for medium-taxed investors whose personal income tax rates are higher than A's corporate tax rate but lower than B's; and L, for low-taxed investors whose personal income tax rates are lower than A's corporate tax rate. H investors would prefer unlevered equities of either country's firms, because they could obtain a greater tax advantage by levering their portfolios through their personal accounts. Similarly, L investors would prefer levered firms of either country. M investors, on the other hand, would prefer the equities of unlevered firms in country A and levered firms in country B. These preferences would hold irrespective of the country the investor resided.

If the two countries' economic structures were identical, there would be no diversification prospects beyond what was already available in each country, even if the rates of return on capital differed. 2/ The diversification gains arise from the covariance structure of returns and not the levels of the returns. (Besides, any diversification benefits would result in cross-equity investments rather than in a one-way flow of equities.) In analyzing net capital flows, one could

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1/ When comparing tax rates across countries, one should not only examine the published rates but should also take account of the numerous provisions, exemptions and allowances. Furthermore, inflation and accounting conventions may also affect the effective tax rate as would tax evasion. Such a comparison is therefore outside the scope of this paper.

2/ To use a familiar analogy, trade results from differences in endowments or differences in tastes. Capital flow is trade in securities; and this results either from differences in the mean-variance frontier (analogous to "endowments," working with the familiar CAPM) or differences in risk aversion ("tastes"). The investment possibility frontiers differ only if the characteristics of the underlying assets (the structure of the economies) are dissimilar.

therefore ignore diversification by assuming that the the effects of stochastic shocks on asset returns are identical in each country.

Firms in country B--or at least those with traded equities--would therefore be more highly levered than those in country A. If most country B residents were H investors and most country A residents were L investors, there would be considerable international cross investments in equities because of the difference in firms' leverage. If, on the other hand, most country B residents were L investors and country A residents were H investors, there would be very little international investment in equities. The geographic distribution of investors in different tax brackets would therefore determine the direction and extent of equity investment. 1/

The flow of debt may be obtained as a residual. Net capital flows are from A to B and, having determined the direction of equity flows, the difference would be debt. Thus, if most country B residents are L investors and H investors are in country A, capital would flow from A to B as debt. Country B firms would be highly levered, with H investors in country A holding the debt.

Agency costs of debt would cause the returns on capital (OA in Figure 3) to exceed the returns gross of personal tax returns on non-agent funds (OX in Figure 3). Gross returns determine capital flows and Figure 6 illustrates how agency costs could cause capital to flow. 2/ In Figure 6A, the returns gross of taxes are higher in country B than in country A (OX^* is larger than OX), inducing a desirable capital flow

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1/ These results are similar to those of Gordon (1986) whose paper was brought to my attention since this was first drafted. Gordon's model is more restrictive in some respects, with PPP holding and the returns on equities being identical, suggesting that the marginal products on capital are also equal across countries. Countries differ only in their inflation rates and, because nominal coupon payments are taxed as income, the real pretax returns have to be higher in high inflation countries to compensate for the higher effective taxes. Gordon's tax clienteles, as in this paper, are based on tax rates.

Gordon also mentions the possibility of governments arbitraging; but this involves governments in a low-inflation rate country issuing debt to buy bonds of a high-inflation country whose coupon rate is grossed up because of the higher effective tax rate. There is no incentive, as in this paper, to arbitrage between debt and equity or to induce flows by overcoming agency costs of private debt.

2/ Agency costs arise because of the inability to monitor the agent, and exists irrespective of whether the principal lives in the same country as the agent. It is implausible that different domiciles of the principal and agent add to agency costs especially when the costs of communications are not substantially higher internationally than domestically.

Figure 6a: Returns Gross of Personal Taxes are Higher in Country B

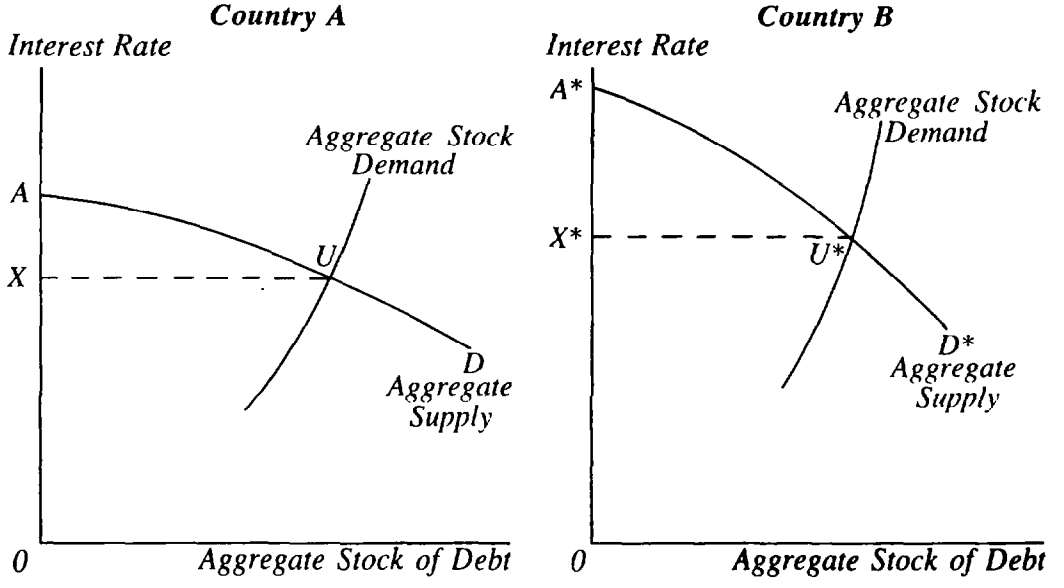


Figure 6b: Returns Gross of Personal Taxes are Higher in Country A

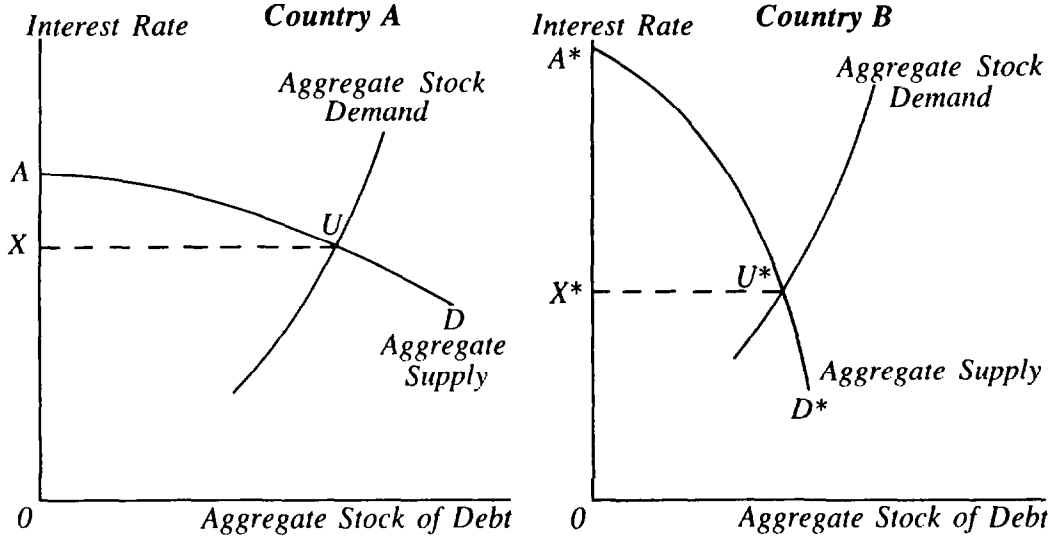
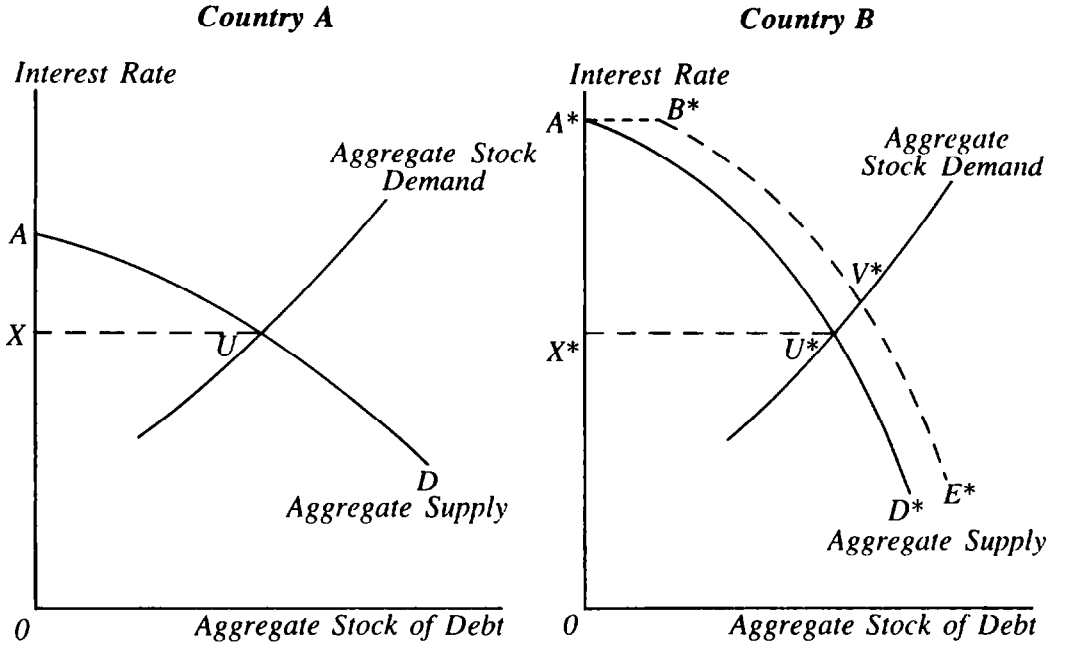


Figure 7: Equilibrium with Differing Marginal Products of Capital.



from country A to country B. Whether this would flow as debt or as equity depends, as shown earlier, on where investors in various tax brackets reside.

If the agency costs of debt were sufficiently high in country B, the gross-of-tax return to the principal could be lower than in country A, although the return on capital is higher. This is portrayed in Figure 6B, where OX^* is smaller than OX although OA^* is larger than OA. Capital would flow perversely from country B to country A where its marginal product was higher. Country B's investors would prefer to hold additional debt, but agency costs prevent B's firms from supplying this. Country B investors would, therefore, hold the debt of A's firms, raising B's holdings of debt; while in A, debt holdings fall while the aggregate debt issued is initially unchanged.

International financial markets could be in equilibrium even when the returns on capital differ. When the gross-of-tax returns are equal, capital ceases to flow despite unequal marginal products of capital. This is portrayed in Figure 7, where the gross-of-tax interest rates are equal in the two countries ($OX=OX^*$), while the return on capital in B exceeds that in country A ($OA^* > OA$).

If country B's government issues bonds, then as analyzed in section V, the gross-of-tax interest rate would rise because the supply of debt shifts to the dotted line $A^*B^*V^*E^*$ in Figure 7. This would encourage the desirable capital flow from country A to B. Government B's actions would have overcome the adverse effects of the agency costs of private debt.

Government intervention would not, however, always be desirable. If instead, country A's government issued debt in an effort to overcome the agency costs in its own financial market, capital would flow perversely from country B to A. This result conforms with the Theory of the Second Best, which states that with two distortions, in this case agency costs in the two countries, reducing the "wrong" distortion always exacerbates the problem.

If country A is the United States and B is Brazil, the analysis has troubling implications for the large issues of U.S. government bonds. Aside from possible macroeconomic effects of persistent U.S. budget deficits, the absence of agency costs to U.S. government borrowing could

induce, or exacerbate, perverse international capital flows. This is as yet a conjecture with little evidence to support it. 1/

To summarize this section, the flow of capital between countries is determined by gross-of-tax returns, rather than returns on (marginal products of) capital. Capital could flow as debt, not equity if investors in particular tax brackets resided in each country. Agency costs of debt cause the net and gross returns on capital to diverge, and could induce perverse international capital flows. The issuance of government debt free of agency costs, could eliminate this perversity; but if the wrong government intervenes, the problem could be exacerbated. It is possible, although not established, that the increasing stock of U.S. government debt could induce perverse capital flows.

VII. Why Bank Loans, not Bonds?

If residents of one country hold the debt of another, they could do so either directly or through a variety of financial intermediaries. It appears that commercial banks have been the dominant intermediaries in international lending, in contrast to the 1920s when most lending was through bonds. What could account for this difference?

Some "explanations" of this phenomenon rely on institutional, rather than economic factors. It is claimed that the OPEC countries, running up vast current account surpluses following the rise in petroleum prices, invested the funds with commercial banks, which in turn lent to countries with current account deficits. This accurately describes what happened, but does not explain why. Why did the OPEC countries lend through banks rather than directly? And why did the OPEC countries lend rather than invest in equities? The OPEC countries' alleged lack of financial sophistication cannot be the reason, because anyone with sizable funds could hire investment advisors.

1/ The analysis suggests that increasing U.S. government debt widens the spread between taxable and tax-exempt bonds (OX increasing to OY in Figure 4A). This spread has actually narrowed in recent years but this could be the result of other simultaneous changes. Limits on issuing new tax-exempt bonds resulted in a flood of new issues before the effective date of the law (January 1, 1986), and may be (temporarily) narrowed the yield differences. Divergences known to be temporary cannot normally exist in an efficient market. Tax-exempt bonds could, however, be an exception because tax laws hamper the use of short sales, a common arbitrage technique. Interest cannot be deducted if the loans are used to buy tax-exempt bonds. There have also been changes in the tax rates in the United States with the prospect of a major tax reform. A careful study of the issues is therefore needed, and is outside the scope of this paper.

Banks got the business because of their slim markups over LIBOR. It is alleged, with the infallible wisdom of hindsight, that banks may have been "imprudent" in charging such small markups. The slim spreads over LIBOR, however, reflect competition between banks in attracting deposits and making loans, rather than the folly of any particular bank or banker. Even if some sympathetic (or overly optimistic) bankers had been willing to charge countries a low markup, they would have been prevented from doing so by an efficient financial market that raised the cost of funds to them.

The cost of bank funds is determined in the same financial markets as the bonds of countries. If the markets perceive the loans as risky, as they have undoubtedly done because of the higher interest rates on bonds that were directly placed, the default risk would be unchanged when the same loans go through banks or other intermediaries. The banks' ability to diversify risks cannot reduce their cost of funds because individuals could also diversify their portfolios by holding the bonds of several issuers. One could argue that financial markets do not look through the intermediary, but this would imply financial market inefficiency; and there is abundant evidence to the contrary. 1/ So the explanation must lie elsewhere.

It is also implausible to argue that commercial banks charged lower interest rates than bond markets did, because they processed loans more

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1/ Besides the voluminous literature on the efficiency of the financial markets in general, there are studies specific to banks. Swary (1986) examines the effects of the Continental Bank crisis and finds that information was quite rapidly digested and accurately reflected in the equity prices of other banks. Also see references in Guttentag and Herring (1986).

cheaply than bond syndicators. 1/ Commercial banks maintain offices in several countries in which they lend, but this does not give them a cost advantage, because investment banks also have, or could easily set up, similar offices. Nor is it plausible to argue, given the phenomenal growth in so-called "junk bonds," that rules on fiduciary prudence preclude the traditional bondholders (pension funds and similar entities) from lending to nonindustrial countries. Yet it is clear that banks were willing to lend to countries at a lower interest rate than those charged by the bond market. This is the paradox to be explained. The argument here is that commercial banks were subsidized through deposit insurance. 2/

The primary difference between a bank deposit and a bond is the government guarantee of the deposit (either explicit through the FDIC or, as the recent experience with Continental Illinois or the earlier Herstatt Bank demonstrated, implicit for a bank that "is too large to fail"). The risk of bank lending is ultimately borne by the insuring agency and not by the lenders to the bank (the depositors). The insurance premium (charged through reserve requirements that pay no, or

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1/ One could similarly ask why bank loans and bonds exist simultaneously in domestic financial markets when bank intermediation is taxed through reserve requirements.

Fama (1985) argues that the tax is borne by the bank's borrowers, because the supply of funds to banks is perfectly elastic when bank CDs compete with commercial paper and bankers' acceptances for depositor funds. If borrowers pay the tax, there must be something special about bank loans, as distinct from commercial paper or bonds.

For some borrowers, especially small ones, the fixed floatation costs of issuing bonds may make bank loans cheaper. However, other untaxed entities (such as insurance companies or pension funds) could be the intermediaries. The continued existence of banks suggests that there may be something special about them.

Fama argues that commercial banks could monitor borrowers better than other intermediaries because they are aware of every transaction of the borrower (when they clear checks). Bank lending may therefore even signal the creditworthiness of the borrower to the market. It could also explain why some firms simultaneously borrow from banks and the bond market.

This explanation not wholly satisfactory for countries or very large firms. Banks could monitor the borrower better than other entities only if they have access to all transactions of the borrower. This is not the case with very large firms with multiple accounts in several banks. It is even less the case with countries.

2 Frankel (1984) argues that the manner is which U.S. banks are taxed affected their portfolio choice between domestic and foreign assets. While this may have also contributed to the commercial banks' role, it would not by itself explain the sizable divergence between commercial banks' lending rates and those charged in the bond market.

less than market, interest rates), however, does not distinguish among banks whose assets differ in risk. Each bank, therefore, has an incentive to gamble. Bank equity holders gain from successful ventures but their loss is limited to paid in capital and, as the depositors are insured, any remaining loss is borne by the insuring agency. 1/

This subsidized insurance of deposits enables banks to undercut bonds. People were, and still are, willing to lend to banks with risky international loans because they look to the insurance of the deposit, rather than to the banks' asset values. Depositors therefore require a lower interest rate than on bonds of the same ultimate borrower. Folkerts-Landau's (1985) calculations showing the higher interest rates on directly placed bonds buttress this reasoning.

It was shown in Section III that the Miller equilibrium could be restored by any entity whose debt is free of agency costs. Government-insured bank deposits, like government bonds, are free of the agency costs of debt; but they would not restore the Miller equilibrium, because U.S. banks are prevented from owning equity under the Glass-Steagall Act of 1933. Other countries also have similar restrictions, either explicitly or implicitly. 2/ Because banks can only hold the debt of other firms, government-guaranteed deposits displace an equal amount of private (unguaranteed) debt with agency costs which, as shown in Section V, would not restore the Miller equilibrium.

1/ Black and Scholes (1973) demonstrated that equity holders own a call option to buy the firm from the bond holders who (despite legal fiction to the contrary) effectively own the firm. Bank depositors, like lenders, own the bank's assets; but in addition to selling a call option to the bank equity holders, they own a put option giving them the right to sell the assets to the deposit guarantor for the insured amount. These put options will, of course, only be exercised when the put is "in the money," or when the bank fails.

2/ Banks in West Germany can, and do, hold equity in firms. Bank deposits are not formally guaranteed, although depositors of the failed Herstatt Bank were compensated. Domestic banks in Germany may not be as competitive and may heed the authority's hints with greater alacrity in order to preserve their privileges. So they may not aggressively arbitrage between debt and equity.

A recent decision (August 1987) allows U.S. commercial banks to hold equity of private nonfinancial corporations in the highly indebted countries for up to 5 years. This is presumably to encourage debt to equity conversion schemes. If there are no limits imposed, this breach of Glass-Steagall could have interesting implications. But this issue is not examined further in this paper.

VIII. Converting Debt into Equity

One set of proposals to solve the debt problem involves converting the existing external debt into equity. It is thought that this conversion would reduce debt service payments and free the debtors from worrying about cash flows in the short run. 1/ The conversion is also claimed to benefit lenders who would thereby avoid protracted, and sometimes acrimonious, rescheduling. It is thought that the desirable flow of funds to the capital-scarce countries would resume and, because equity would be in private (or privatized) firms, would reduce the extent of government enterprises in the economy thereby making them more efficient.

The conversion of debt into equity has a variety of implications and only a few of these may be captured by this paper's approach. It is important to emphasize this caveat, because the primary purpose of this paper is to develop a simple framework that could account for the salient characteristics of the observed capital flows, and not to prescribe remedies. If, however, economic forces analyzed in this paper account for the form of past international investment, then pointing out some implications of debt to equity conversions would be appropriate.

If private debt is being converted into equity, there would be nothing remarkable about this reorganization of a firm's liabilities (as under bankruptcy), save perhaps for the magnitudes involved. The problem, however, is that much of the external debt (for example, about 90 percent of Argentina's external debt of US$45 billion in 1983) is that of the government's. As there is no concept of "government equity," the debt could only be converted into the equity of a public sector enterprise which would become "privatized," in the recent jargon. This conversion would therefore be the exact reverse of the transaction analyzed in Section VI, where the government issued bonds and bought equity. The reduction in government bonds outstanding would, when private debt has agency costs, reduce the gross-of-taxes interest rate and so induce perverse capital flows. This may be seen as a shift to the left of the aggregate supply of debt, $A^*U^*D^*$ in Figure 7. Were this to happen, the conversion of debt into equity would clearly not be desirable.

1/ The common but fallacious notion that the cash flows needed to service debt are smaller than that required for equity arises because cash dividends are generally smaller than interest on an equivalent amount of debt. When foreigners collectively wish to sell their equities, however, the cash flows would exceed debt service. So the cash flow benefits of converting debt to equity are likely to be illusory, unless accompanied by restrictions on dividend payments and capital repatriation which obviously reduce the value of the equity.

During the 1970s and early 1980s, some governments incurred large debts to increase current rather than investment expenditures. Furthermore, investments that produce public goods would have to remain under government control. They may not therefore own public sector enterprises which could now be hived off into private hands. In this rather typical situation, the debt to equity conversion would still be possible, but would entail a complex set of transactions whereby the foreign holder of government debt (usually denominated in foreign currency 1/) is paid off in domestic currency (usually at close to the market exchange rate, rather than at the official rate), with the proceeds earmarked for the purchase of private sector equities. The resulting increase in the stock of domestic currency could be siphoned out of the economy by increased domestic government borrowing. The net result of these transactions would be that the government owes domestic, rather than foreign, investors; the domestic private sector owns more government bonds but fewer equities than before; and foreign investors own private equities instead of government debt. Unless there were binding restrictions earlier on such portfolio holdings, that people did not hold such portfolios suggests that they preferred not to. If preferences were unchanged, such debt to equity conversions would be undone by subsequent trades in the financial markets resulting in a series of transactions that in the end will have accomplished little.

Taking Chile as an example, if foreign investors bought all the traded equities (worth about $2 billion as seen from Table 1, and dwarfed by the $20 billion external debt) the former (domestic) equity-holders in Chile would hold part of the government debt and the foreigners the equity. While some Chilean entrepreneurs would continue to hold some untraded equities in their portfolios, other Chileans, bereft of local (traded) equities, would buy foreign equities to diversify their portfolios. Illegal capital outflows could circumvent attempts to proscribe such portfolio investments.

Simply converting external debt into equity would therefore only reshuffle portfolios in this manner. Direct foreign or portfolio investment in country B's equities may be desirable; but this would occur spontaneously only if agency costs in country B are reduced. Better monitoring technology (better accounts, reducing the incentive to evade taxes, and the like) is required, but effecting these change would be a slow process with no quick solutions in sight.

This is not to dismiss debt to equity conversions as wholly without merit. The benefits could arise, not from the conversion per se, but from indirectly reducing the contractual value of the outstanding external debt to an amount closer to its market value. The external

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1/ The analysis in this paper does not focus on the currency of denomination. Differences in inflation rates and changes in exchange rates may complicate, but not invalidate, the analysis.

debt of heavily indebted countries are traded in the secondary market at substantial discounts from their contractual values.

External debt would trade at a discount when the contractual value exceeds what could be serviced from net export earnings or from spontaneous capital inflows. This discount from contractual value could adversely affect the economy. Dooley (1987) has argued that the discount would inhibit foreign capital inflows because any new investment, being serviced from the same export earnings as the old, would immediately be worth less. It would therefore be advantageous to narrow or eliminate the discount which, if the amount available to service the debt in relatively infexible, would only be possible by reducing the contractual value of the existing debt. The debt could be written down without converting it into equity, but the debt holders may then have to recognize an accounting loss on all similar loans. The banks balk at this.

Recognizing an accounting loss generally has no economic significance, because the financial markets have long been aware that the debt is worth far less than the banks' book value. 1/ Banks, however, have to maintain capital requirements based on book, not market, values and banks would have to raise more equity if foreign loans (bank assets) were written down.

The M-M proposition and Miller extension, described in the earlier sections, suggest that banks should be indifferent between funding their operations with debt (deposits) or with additional equity. Yet banks appear extremely reluctant to raise additional equity. The conventional reason given for banks' reluctance to raise additional capital is that bank equity is now trading at "too low" a price. 2/ Bank equity prices may be lower now than before, but this reflects the rash of bad loans, both domestic (to the depressed farm and oil sectors) and foreign. If the equity prices were, in fact "too low," banks or bankers should be buying back their equity, as oil firms have recently, rather than investing their funds elsewhere. Banks are reluctant to raise additional capital precisely because equity holders prefer to be highly levered, especially when the debt (bank deposits) is subsidized through government guarantees (deposit insurance).

Converting country debt into equity (that may be subsequently sold) could be one way to avoid the explicit writedown of country debt and

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1/ This is revealed, for example, in the stock market prices for bank equity.

2/ The price to earnings ratio of bank stocks on the New York Stock Exchange was around 6 when the market as a whole was about 20. The market obviously discounts the reported accounting earnings. In fact, when banks reported large accounting losses in the second quarter of 1987, bank equity prices did not decline.

conform with banking supervision rules on adequate bank capital. The debtor could also benefit from such conversions if the terms implicitly value the external debt at about its secondary market price.

IX. Summary and Conclusions

Many countries have accumulated large external debts that worry observers. This paper examines some facets of the phenomenon, namely, why capital flowed as debt through commercial banks with debtor government involvement.

The explanation in this paper is based on standard corporate finance propositions on the "irrelevance" of the debt-equity composition for the cost of capital, and the influence of the tax structure and agency costs on the ownership structure. This paper extends the standard analysis to take account of government debt and the international differences in tax structures. It is shown that there are circumstances under which capital would flow across countries as debt, not equity. This explanation could also account for the involvement of debtor governments, which is another striking feature of international capital flows in recent years.

If these economic forces account for the preponderance of debt in international capital flows, merely converting the existing international debt into equity is unlikely to help matters. There is a vast disparity in the magnitudes of tradable equity and the existing external debt. More importantly, if economic forces operate as analyzed in this paper, such conversions into equity could be effectively undone in the capital markets, or worse, could induce additional perverse capital flows. Converting debt into equity could be valuable, however, if it is a convenient and politically acceptable way to write down the contractual value of the debt and reduce its secondary market discount.

Proof of the Miller Proposition

The financial market is in equilibrium when arbitrage between debt and equity is not profitable. Securities would be priced such that changing leverage does not add value. This "no arbitrage profit" condition is derived below.

One could buy any fraction, α, of the outstanding equity in a (levered) firm which has borrowed D, or the same fraction of the equity in an identical unlevered firm. Let the corporate tax rate be t_c, the personal tax rate on the return to equity be t_{ps} (which may be close to zero), and the personal tax rate on interest receipts be t_{pb}. The portfolios would have identical values in every state of the world if the equity purchase in the unlevered firm is financed by borrowing the amount $\{D(1-t_c)(1-t_{ps})\}/(1-t_{pb})$. The net investment and payoffs of each of the two portfolios would be

Net Investment	Payoff after taxes
In a levered firm:	
αS_L	$\alpha(X-iD)(1-t_c)(1-t_{ps})$
In a unlevered firm:	
$\alpha[S_U-\{D(1-t_c)(1-t_{ps})\}/(1-t_{pb}]$	$\alpha(X-iD)(1-t_c)(1-t_{ps})$

where X is the cash flow, i the interest rate on the debt, S_L the value of the total equity of the levered firm, and S_U the total value of the unlevered firm (or equity). As the payoffs are identical, the two portfolios should sell for the same price. Thus,

$$\alpha S_L = \alpha[S_U-\{D(1-t_c)(1-t_{ps})\}/(1-t_{pb})]$$

The value of the levered firm (equity plus debt), V_L, is

$$V_L = S_L + D = S_U + D[1 - \{(1-t_c)(1-t_{ps})\}/(1-t_{pb})]$$

APPENDIX

The expression $D[1 - \{(1-t_c)(1-t_{ps})\}/(1-t_{pb})]$ represents the addition to the firm's value because of debt financing. This gain arises because of the different tax rates and not because the interest rate is lower than the expected return on equity (which is why the interest rate does not enter in the expression). There is no gain from leverage when $(1-t_{pb}) = (1-t_c)(1-t_{ps})$. The "no arbitrage profit" condition ensures that this holds. A graduated scale of personal taxes which brackets the corporate tax rate would have both debt and equity outstanding in equilibrium.

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