

**IMF WORKING PAPER**

This is a working paper and the author would welcome any comments on the present text. Citations should refer to an unpublished manuscript, mentioning the author and the date of issuance by the International Monetary Fund. The views expressed are those of the author and do not necessarily represent those of the Fund.

WP/86/14

INTERNATIONAL MONETARY FUND

Research Department

An Analysis of the Debt Crisis

Prepared by Michael P. Dooley

December 4, 1986

Abstract

In this paper it is argued that in circumstances where the contractual value of a country's external debt remains above the market's valuation of that debt, gross capital formation will be constrained. Moreover, the persistence over time of such a divergence between market and contractual values represents a failure of the institutional framework, not a failure of policies pursued by debtor or creditor countries. In fact, even policies that would succeed in reducing external debt over time may do little to establish a climate in which residents and nonresidents will undertake productive investment in the debtor country.

MASTER FILES  
ROOM C-130  
001

Contents

Abstract	1
Contents	11
Introduction	1
Contractual and market values of debt	1
Market valuation of existing and new credits	2
Investment in physical capital	4
Alternatives for resolving the crisis	5
The market valuation of existing debt	8

factors equal to the market discount on existing debt. It is important to note that the price of a new capital good is determined in goods markets and is independent of the price at which financial claims on existing capital are currently traded. Thus, an expected tax on the returns of the capital good has the result of restraining real investment. 1/

The relevance of the market valuation of existing debt to new real investment decisions is a fundamental issue in analyses of the debt crisis. Much of the analytical work on the debt issue has focused on the determinants of countries' ability and willingness to service their external debts. While such analysis may be useful in choosing among policy options that would alter the debtors' ability or willingness to service its debt, it tends to direct attention away from the fact that the market's current evaluation of such factors is summarized in the price of existing debt. More important, it is this market valuation of existing debt which determines economic behavior.

Although it seems natural to focus on external debt, it is argued here that all existing private and official debt of residents of the debtor country represents claims on the future output of that country. If "external" credits are traded at a discount that reflects the expectation that contractual obligations will not be completely satisfied, it is very likely that all existing credits to residents of the debtor countries, including those held by other residents, are also in doubt. In fact, all activities and forms of wealth that are potentially taxable by the debtor country should earn a rate of return that reflects the expected incidence of the currently unallocated tax burden. If external debt carries a higher market yield (larger discount) than internal debt, residents should attempt to sell internal debt and purchase external debt (thereby making it "internal") until their yields (discounts) are equalized. This arbitrage would not be profitable only if it were expected that the government would tax the owners of certain types of credits regardless of the residence of the owner of such credits.

#### Market valuation of existing and new credits

The importance of the market valuation of existing debt derives from the proposition that new debt of residents of the country in question will immediately fall to the same discount as the existing debt. This

---

1/ It is assumed that investment depends on a comparison of the present value of the expected after-tax income stream generated by a unit of physical capital and the replacement cost of physical capital. Potential investors are concerned because the authorities are legally committed to tax some activity in order to service existing debt but are not currently expected to be willing or able to do so. It follows that successful new domestic investments are at risk.

## Introduction

For 15 heavily indebted countries real gross investment relative to GNP has fallen by about one-third in recent years compared with its level before 1982. <sup>1/</sup> While many factors have contributed to this decline, it is argued in this paper that the failure to allocate expected losses on existing debt may have been an important independent factor in discouraging investment. The argument presented is based on the idea that in evaluating new physical investment opportunities in an indebted country, a resident or nonresident investor must consider his standing relative to existing creditors. In cases where the "property rights" of existing claimants are poorly defined, it is not possible to define clearly the rights that a new credit would bestow on its owner. Since a new credit cannot be convincingly differentiated from existing credits, potential investors must assume that the market value of their new claims would immediately become identical to the value of all existing claims. This value is summarized by the market discount on existing debt. In cases where that discount exceeds the expected return on all new investment opportunities the immediate capital loss will ensure that no new gross physical investment will occur in the debtor country.

## Contractual and market values of debt

The "contractual" value of the debt can be defined as the present value of the stream of payments set out in the initial contract between the debtor and creditor on the assumption that such payments will be made with certainty. The market valuation of the contract is the present value of the market's expectation as to the stream of payments that will actually be made to the holder of the contract. In most cases the contractual value of a contract will be somewhat above the market valuation since there is some chance that the debtor will be unwilling or unable to carry out his obligations as set out in the contract. For example, if a country pays a 2 percent premium over LIBOR on a floating rate credit, the contractual value of its debt instruments is above the market's valuation even when issued. If the risk-free rate was 10 percent and if this was a long-term contract, the contractual value of the debt would be about 20 percent above the market valuation of the debt when issued.

The fact that a country's debt sells at a discount relative to its contractual value is always a "problem" in the sense that the country would have a larger stock of investment projects that are profitable if there was a smaller discount. This condition, which holds to some extent for most countries, can become a "crisis" in circumstances where all or most new domestic investment projects are unprofitable when penalized by

---

<sup>1/</sup> See IMF World Economic Outlook April 1986, p. 186.

results from the fact that even if a new investment project is expected to be profitable, the creditor cannot be sure that he will not be thrown into the pool with other creditors. 1/

The institutional framework that allows such a situation to persist is seriously deficient. In circumstances where contractual obligations are not expected to be honored, property rights among debtors and creditors are poorly defined. In normal circumstances the hierarchy of claims is established by the contract. But in the event that it is expected that all such obligations can or will not be discharged, there is no way to tell who will suffer the expected loss. This circumstance is dangerous because it must also be true that new investors will be uncertain as to whether or not new claims will also be forced to share an expected loss.

The inability to subordinate existing credits to new credits is the factor that distinguishes the current international debt crisis from the more familiar problems presented in domestic financial arrangements. It is quite common for debtors and creditors to enter into agreements which in some future circumstances will be impossible to carry out. The value of such agreements is that they are simple and are not dependent, or "contingent" upon, the large number of factors that might affect the debtor's willingness or ability to carry out the terms of credit agreements. The development of a standard "non-contingent" contract facilitates secondary trading of the obligation, thus making such contracts more attractive to creditors. It is recognized, however, that should the debtor be unable to satisfy the terms of the contract, both parties would be uncertain as to how the situation would be resolved. In the case where both debtor and creditor share a national legal residence, the conflict is resolved by the courts in a bankruptcy proceeding. Since the general outlines of this solution are known to both parties at the outset, it is reasonable to include this mechanism as an implicit element of the original agreement. Moreover, in the event that some contracts are subordinate to others, it is known how the court will enforce the property rights of various creditors.

The procedure by which a debtor asks the courts to "protect him from his creditors" serves to free the debtor (at perhaps considerable cost) from his obligations. The view that this procedure "benefits" the debtor derives from the fundamental problem faced by such a debtor.

The debtor's problem is that all potential new creditors will be subject to sharing in the existing "expected" loss. The term "expected" is used in a specific sense in this regard. The expected loss is simply

---

1/ In fact, the problem is even more serious if successful investments are likely to be more heavily taxed in order to satisfy "old" creditors.

the difference between the market's valuation of the debtors' obligations and their contractual value. In the event, the debtor either will or will not be willing and able to fulfill his obligations. But in the meantime the behavior of all creditors is shaped by the market valuation of the likelihood of various outcomes. 1/

The argument developed in this section does not depend on a complete inability to subordinate existing to new credits. It may be possible to assure some new creditors that their investments will be protected from the legal claims of existing creditors. However, it seems unlikely that such assurances would be completely or widely credible unless the existing legal claims are brought into line with their market values.

#### Investment in physical capital

The above argument suggests that the key to the current debt crisis is the lack of a legal structure that comes into play in cases where the market valuation falls to a point where the debtor country is unable to attract new investments in productive capital. In fact, it is not clear which of several national legal systems would decide the property rights of various creditors. In this environment it is impossible to convincingly subordinate existing claims to new claims regardless of what forms these new credits might take.

The drag on new investment caused by the inability to shield the rewards of such investment from participating in the expected loss on existing credits is not an "all or nothing" problem. Because the debt crisis occurred at a well-defined point in time it seems natural to assume that once some threshold of creditworthiness is re-established, the situation will return to normal. As will become clear in the discussion below, the "best" solution to the "debt" problem, or what could more appropriately be called the "investment" problem, would be to alter the market valuation of existing credits by improving the outlook for the debtor country. In particular, in cases where changes in economic policies or structures can contribute to such a revaluation, the implementation of a sound adjustment program is the first priority. However, while some changes in the economic environment could lead to a return to a normal investment climate, not all eventual cures for the debt problem will have this property. In particular, "solutions" that are characterized by gradual amortization of debt, and a slowly rising market value for remaining debt, may also be situations in which domestic investment in debtor countries is depressed for an extended time. For this reason it is important to distinguish between the debt problem and the investment problem.

---

1/ If a potential new creditor believes that the market's valuation is incorrect he should buy existing debt and enjoy the expected profits. Even so he would not make new loans to the debtor unless the rate of return compensated him for sharing in the existing expected loss.

It should again be noted that the basis for the market's valuation of the debt has not been discussed. Although a number of arguments have been advanced that suggest that the debt of developing countries is "really" worth more than its market valuation, such arguments appear unconvincing. These issues are taken up below but until then the analysis focuses on the incentives faced by various parties given the market valuation of the debt.

#### Alternatives for resolving the crisis

In cases where the market's valuation of the existing debt is well below the contractual value there are four basic strategies for resolving the problem, each of which has different implications for debtors and creditors. The first is not to allocate the expected loss among existing creditors and to hope that things turn out better than expected. The second is for creditors to realize the loss but not reduce the debtor's obligation. The third is for creditors to realize the loss and reduce the debtor's obligation. The fourth is for the debtor to default. For each strategy it might be useful to analyze the implications for the creditor commercial banks, all residents of the debtor country, and the nonbank residents of the creditor country.

The "wait and see" strategy has different implications for various parties. The commercial banks that hold the debt may have strong incentives to carry the existing debt at book value and limit new lending to a portion of accrued interest payments. A popular explanation for this strategy is that given time the banks and the debtor countries will eventually grow out of the debt problem. It should be noted that, in an inflationary environment, bank assets will grow in nominal terms because of inflation. In this circumstance we must be careful to distinguish between real interest payments and "interest" payments that should be considered amortization because they reflect inflation premia. If nominal interest rates exceed real interest rates, payments by debtor countries may, for example, cover only a part of the nominal rate but all of its real portion. In cases where the debtor country is paying all of the real interest charges and some part of the remaining interest charges there is no realized loss to the creditor. Under these conditions commercial banks could shrink their exposure by diverting amortization payments implicit in the inflation premium to the purchase of alternative investments.

For banks whose capital might be exhausted by realizing the losses on existing credits, there is no doubt that the strategy of waiting to see whether a good outcome for the country could save the bank from liquidation is preferred to a solution that would involve realizing expected losses immediately. In the interim, as long as governments implicitly or explicitly insure the value of bank liabilities, the bank can continue to attract deposits and carry on a normal business.

The "wait and see" strategy has an important negative impact on the debtor country. As argued above, the expected but unallocated loss on existing external credits will affect current investment decisions. Nonresident investors will assume that their claims will be merged with existing credits. Perhaps more disturbing are the implications for the decisions of residents in allocating their savings. If the government is not expected to be able to service its internal and external debt, a successful domestic investment project would provide an attractive tax base for a hard pressed fiscal authority. To avoid this potential tax liability residents might choose to acquire claims on nonresidents or "unproductive" domestic investments, such as gold, that are difficult for the debtor country's fiscal authority to tax.

The "wait and see" strategy affects nonbank private residents in creditor countries in a number of ways. As depositors in creditor banks they may be tempted to exercise their claims on the banks' capital. In general, however, explicit and implicit deposit insurance has greatly reduced this incentive. As taxpayers, the wait and see strategy allows residents of the creditor country to avoid realizing any residual loss that accrues to the insurance fund in the event the commercial banks' capital is exhausted. Finally, the nonbank public also avoids the disruption to the payments mechanism that might accompany the failure or possible failure of one or several money center banks. This incentive for waiting and hoping might be particularly strong for bank regulators.

The serious problem with the wait and see approach is that even if it is successful in "wearing" the debt away, it involves a reduction in the capital stock of the debtor country for an extended time period. The consequences for the capital stock can be quantitatively important because debtor countries stand to lose not only new foreign savings but also some part of the productive domestic investment made possible by domestic savings.

A second strategy would be to realize and allocate the expected loss among creditors but not to alter the debtor country's legal obligations. This strategy is generally not in the interest of the creditor banks, since their capital is partially or completely lost. Moreover, the debtor country is no better or worse off as compared to the wait and see option discussed above. Its liabilities are simply owned by a different creditor.

The nonbank private residents of creditor countries may be better off since the uncertainty as to how losses will affect various institutions is removed. However, they would also suffer whatever ill effects are associated with the impact on the payments mechanism of the losses realized by commercial banks. This solution does not seem to be in anyone's interest.

A third strategy would be to both realize and allocate the expected loss and to relieve or forgive debtor countries' legal obligations to pay. This strategy is similar to the second discussed above in that the creditor banks will be forced to realize the expected loss. In this case, however, the debtor country is relieved of some part of its legal obligations. As argued above, some level of forgiveness would in most cases create conditions in which physical investments that were profitable in their own right would be undertaken. It seems unlikely that existing creditors will see it in their interest to undertake such an action voluntarily, either as individuals or as a group. It follows that some third party must either force creditors to take the loss and renegotiate the credits, or what seems more promising, purchase the existing credits and then forgive some part of the debt. 1/

This strategy is clearly attractive to the debtor country. Moreover, if we consider banks and nonbanks of creditor countries together they may, as a group, be better off. A difficult question is whether such a write-off will lead other debtors to demand similar treatment. It may be true that such a demonstration effect may be sufficient to make this an unattractive alternative.

The fourth strategy would be a unilateral default by the debtor country. This default could be partial in that some payments would be made but the existing legal contracts would not be fully honored. The creditor banks would retain a legal claim on the country--but this claim would probably be judged nonperforming by the regulatory authorities. It is unlikely however that the debt would be formally forgiven by creditors.

---

1/ One plan would be to offer to purchase a certain type and amount of debt at an auction where sellers submit offers to sell various amounts at different prices. The authority purchasing the debt could also announce that it would replace the existing debt with obligations that had a present value somewhat below the current contractual value, perhaps equal to the auction price. Market participants would anticipate the need to revalue debt not sold to the authorities and this would of course affect their offers to the authority. By manipulating the size of the offer to buy at the auction the authority could move the discount on existing debt to a level consistent with real investment objectives. The "cost" of this operation would be the difference between the buying and selling prices obtained by the authority.

As a part of this strategy, new credits could be better designed to reflect the risks inherent in the debtor's ability to pay. However, the value of such credits would probably not be much higher than the expected value of existing credits. Thus, a restructuring of the debt toward equity type instruments might serve to avoid future problems, but would not in itself have an important effect on the magnitude of the loss that must be realized in order to resolve the debt crisis.

The debtor country would suffer a reduction in its reputation as a potential borrower. Thus, although the repudiation of debt might make the country a good risk in terms of ability to pay, creditors might doubt the country's "willingness" to pay. Moreover, the legal claims on the debtor country would remain and continue to threaten new creditors. The effects on residents of creditor countries would be similar to the previous case except that the immediate impact on financial markets would be more pronounced. The greatest problem with a repudiation strategy is that the long-term reputation of the debtor is damaged.

#### The market valuation of existing debt

The market value of existing debt plays a central role in the analysis presented above. This "value" is important because it summarizes the forecasts of many actual and potential owners of such claims. Thus, it frees the analysis of the task of providing a definitive estimate of the "true" value of external debt. It is useful to model the factors that might lie behind the market valuation of debt since this allows analysis of factors that might alter the market valuation. But ultimately market valuations depend on the collective wisdom (or ignorance) of those who are willing to risk their wealth in acquiring claims on debtor countries. It is clear that it is this forecast that will determine the economic behavior of debtors and creditors.

It is sometimes argued that the depressed market value of the external debt of developing countries is caused by the behavior of existing creditors. To be more specific, suppose that the present value of the expected payments of the debt as estimated by individual holders is equal to the contractual value. However, for some reason, perhaps regulatory constraints, creditors have become uncertain that other creditors will continue to lend to the country. In this case new credits made by an individual creditor may be lost, since without other credits payments cannot be maintained.

It is sometimes argued that the concentration of credits to developing countries in commercial banks leads to such a problem. For example, commercial banks may face regulatory constraints over the amount of loans to individual countries. If all banks reach this position, or if the desired position is for some reason reduced, the country might be said to have experienced a "liquidity crisis." If no new creditors enter the market at this point the market value of the country's debt will fall and voluntary new credits will stop. It has been argued that new creditors will not enter the market because, while the new credits will increase the value of the existing credits, most of the benefit will go to the existing creditors. Therefore new credits are most likely to come from existing but constrained creditors.

This idea is intuitively appealing but wrong. Suppose, for example, that the market value of claims on a country had fallen for this reason to 50 cents on the dollar of contractual value. By assumption a potential new creditor knows that his new credits will increase the present value of the existing debt. His strategy should be to agree to buy some of the existing debt at 50 cents and then advertise and grant additional new credits. This would cause the market value of existing debts to rise. The profits can then be offered as an additional credit. By repeating this process the new entrant will eventually move the market value to the contractual value.

In general, it is difficult to imagine a case in which a new creditor's property rights would not be at least as good as those of existing creditors. It follows that if an arbitrage opportunity exists, that is, if the expected value of existing debt is above the market valuation, it will be exploited by new creditors.

Finally, it should be noted that the market value of existing debt is not a good indicator of the extent to which the contractual value of debt would have to fall in order to restore the debtor to a "normal" status in credit markets. At a minimum, as the discussion above suggests, the market's valuation of debt remaining after a default or some forgiveness of existing debt would depend on a whole set of new expectations about the future behavior of the debtor country and others.