IMF WORKING PAPER

WP/92/42

INTERNATIONAL MONETARY FUND

Research Department

Market Discipline

Prepared by Timothy D. Lane 1/

Authorized for Distribution by David Folkerts-Landau

June 1992

Abstract

Under what circumstances can market forces prevent unsustainable borrowing? Effective market discipline requires that capital markets be open, that information on the borrower's existing liabilities be readily available, that no bailout be anticipated, and that the borrower respond to market signals. This paper explores the implications of these conditions, and reviews some relevant empirical evidence.

JEL Classification Numbers:
G1; H3

1/ The author thanks Morris Goldstein for helpful suggestions and comments. Any remaining errors are the author's responsibility.

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Summary

Under what circumstances can market forces prevent unsustainable borrowing? Market discipline implies that lenders penalize excessive borrowing, first, by requiring a higher interest rate spread and, ultimately, by excluding the borrower from the market.

For market discipline to work effectively, capital markets must be open; information on the borrower's outstanding liabilities must be readily available; there must be no bailout anticipated; and the borrower must respond to market signals provided by interest rate spreads.

This paper explores these conditions, focusing on four examples. The first is fiscal policy in a currency union, such as the planned Economic and Monetary Union in the European Community, where there is concern that, unless binding fiscal rules are imposed, member countries may incur excessive deficits. Another instance is sovereign debt: can private lenders provide sovereign borrowers with adequate incentives to pursue policies consistent with solvency? Yet another instance pertains to the regulation of financial institutions: can markets induce intermediaries to make prudent lending decisions, or is some direct supervision necessary? Finally, there is the soft budget constraint facing state enterprises in socialist economies: how can these enterprises be induced to behave in a manner consistent with their long-run solvency and to continue to operate only if they are solvent?

The latter part of the paper reviews some empirical evidence on market discipline. First, the experience of federal unions ranges from tight central control of borrowing by lower levels of government to virtually complete reliance on market forces, with no apparent corresponding pattern in the effectiveness of fiscal discipline. While evidence regarding sovereign debt suggests some weakness in market discipline, it also indicates that lenders do discriminate among borrowers on the basis of information regarding their solvency. Models of optimal fiscal policy imply that a government uses its borrowing to smooth tax rates despite variations in economic conditions and expenditure requirements; empirical tests of these models support this implication, but also suggest that borrowing is systematically influenced by the political structure. The evidence therefore suggests that although market discipline is an important force, it is not always strong enough to prevent unsustainable borrowing.

In the diverse cases examined, the conditions required for market discipline to be effective are essentially the same, as are the conditions likely to undermine market discipline. The "no-bailout" condition, in particular, is often the Achilles' heel of market discipline, especially because of the difficulty of making such a condition credible. The solutions are also similar: market discipline may have to be reinforced by some kind of direct controls or rules, but it is also important to implement measures to strengthen market discipline itself.

I. Introduction

Financial markets bring important benefits to their participants. They enable economic units--households, firms, and governments--to maintain temporary imbalances between their receipts and expenditures. The transfer of resources from surplus units, which are saving, to deficit units, which are dissaving, is essential: it allows households to choose an appropriate distribution of consumption over their life cycle; overcomes the limitations that self-financing investment expenditure would impose on firms; and enables governments to meet necessary variations in their expenditures without frequent, disruptive changes in tax rates. Financial markets also enable economic units to adjust the types of claims they hold and issue, so that they can diversify their portfolios of assets and obtain liquidity. The payments system, another important aspect of the financial system, makes a wider range of transactions feasible, permitting a greater degree of specialization in economic activity.

In order to perform these essential functions, financial markets must necessarily permit economic units to maintain temporary imbalances between their receipts and payments. How can they ensure that these imbalances are, in fact, temporary? What prevents some units from following an unsustainable path--borrowing without the means or even the intention of repaying? Market discipline is one force that may limit such abuse of financial markets: as a borrower begins to incur debts that can only with difficulty be serviced, the lenders' response is first to require a higher interest rate--to compensate for the increased risk of default--and eventually to exclude the borrower from further borrowing, thereby depriving the borrower of the benefits of access to financial markets.

Market discipline is a force whose effectiveness--or frequently, its alleged ineffectiveness--plays a pervasive role in financial policy. One example is the problem of ensuring sustainable fiscal policies in a currency union: this is of particular concern in recent European discussions of Economic and Monetary Union (EMU), where there is a perceived need to rein in the mounting debts of some of the intended participants, as shown in Chart 1. The Maastricht Agreement establishing Economic and Monetary Union (EMU) in Europe includes provisions for multilateral surveillance of, and eventually binding limits on, each member country's fiscal stance (Kenen, 1992). The rationale for these provisions is that market discipline is inadequate to induce countries to pursue sound fiscal policies: according to the Delors Report on EMU, "experience suggests that market perceptions do not necessarily provide strong and compelling signals. The constraints imposed by market forces might either be too slow and weak or too sudden and disruptive" (Delors Report, 1989, page 24).

Another instance in which market discipline is in question is the issue of sovereign lending: can private lenders provide sovereign borrowers with appropriate incentives to pursue policies consistent with solvency? Yet

another application pertains to regulation of financial institutions: can markets induce financial intermediaries to make prudent lending decisions, or is some direct supervision necessary? Finally, there is the "soft budget constraint" facing state enterprises in socialist economies: how can these enterprises be induced to behave in a manner consistent with their long-run solvency, and to continue to operate only if they are solvent?

In this paper, it will be shown that market discipline in these and other disparate cases shares some common elements. Several conditions are needed for market discipline to be effective. Financial markets must be open. Information bearing on a borrower's credit-worthiness must be readily available to lenders. Markets must not anticipate that a delinquent borrower would be bailed out; this also implies that the borrower must not have access to central bank financing which would enable it to maintain, or bail itself out of, an otherwise unsustainable position. Finally, for market discipline to work smoothly, the borrower must be motivated to respond to market signals. Failures of market discipline depend on the failure of some of these conditions (Bishop, Damrau, and Miller, 1989; Frenkel and Goldstein, 1991).

If, due to the failure of one or more of these conditions, market discipline cannot work, the alternative is some kind of binding limits or surveillance. This alternative also typically entails some difficulties, as direct limits can often be circumvented or the borrower can influence the level of the limits. In general, the solution is that, where market discipline cannot work effectively, it must be supplemented with direct administrative controls, but care should also be taken to help market forces to buttress rather than undermine these controls.

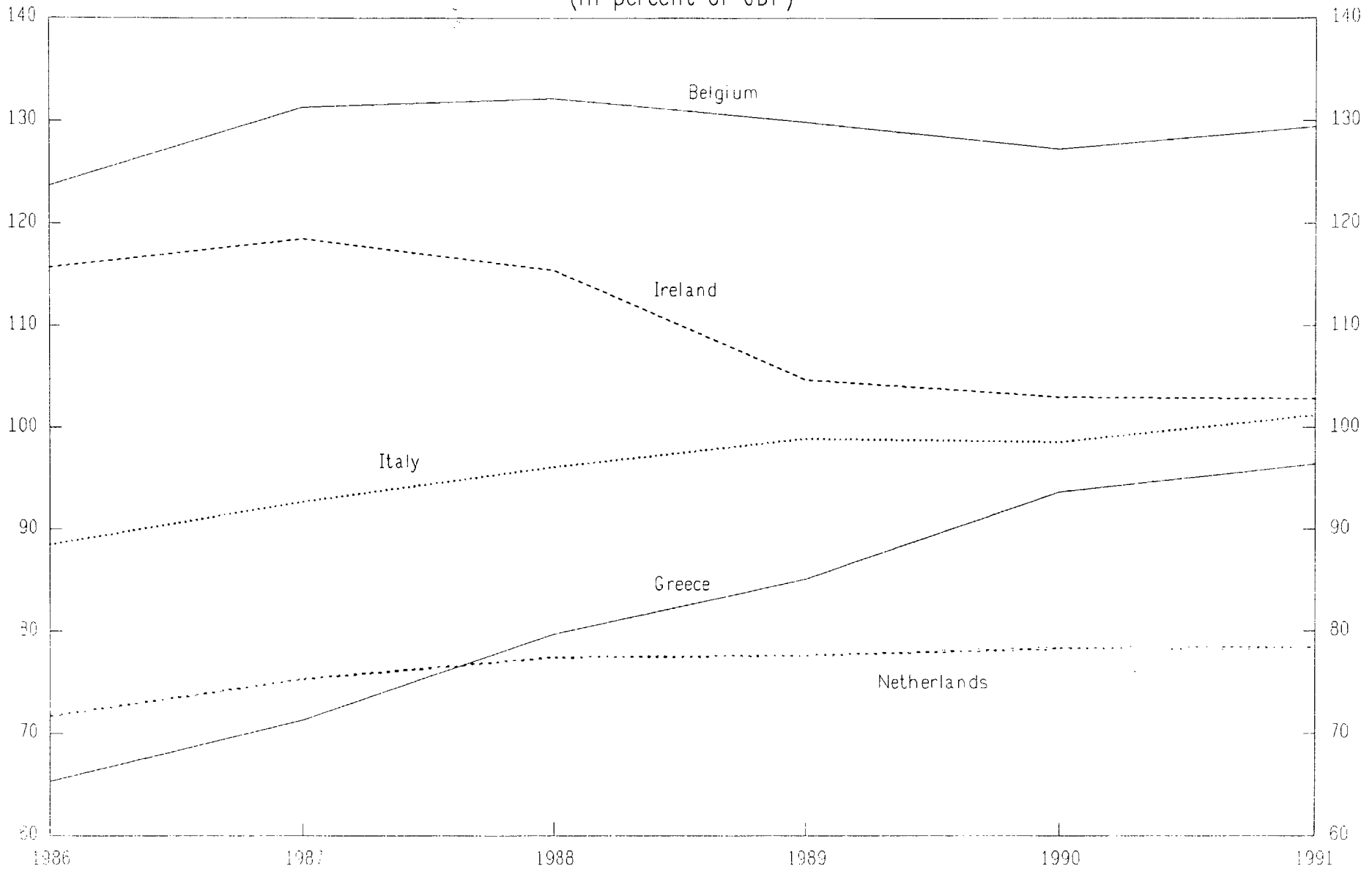
The structure of the paper is as follows. Section II defines market discipline, and discusses some examples of its relevance. Section III discusses the conditions needed for market discipline to be effective. Section IV discusses some evidence on whether the conditions are satisfied for markets to provide the appropriate signals to borrowers. Section V discusses evidence on whether the borrowers respond appropriately. Section VI concludes with a discussion of some policy implications.

II. What Is Market Discipline?

Market discipline means that financial markets provide appropriate signals and constraints to induce borrowers to behave in a manner consistent with their solvency. For example, effective market discipline of fiscal policy would prevent national governments from incurring exponentially increasing deficits which, if continued, would eventually lead to government default. Market discipline of sovereign borrowers would imply that future foreign exchange earnings will be adequate to service external debt. Market discipline of financial institutions--such as banks or savings and loan associations--would mean that these institutions could not obtain funds from depositors to make loans whose expected return is less than the cost of

Chart 1: Debts of Selected EC Countries

(in percent of GDP)



Source: EC Commission

funds, nor could they continue to have access to funds once they become insolvent. Market discipline of state enterprises would prevent these enterprises from borrowing to finance loss-making productive activities if these activities are never expected to turn profitable.

Market discipline implies that the borrower's behavior is sustainable--that the borrower follows a course of action that can be continued without eventually either defaulting on its obligations or making an abrupt change in policy (Horne, 1988). This implies that "debt grows asymptotically at a rate less than the interest rate. Debt, in other words, is not serviced indefinitely by borrowing" (Horne, 1991, page 5). 1/

Sustainability is not as ambitious as the requirement that the borrower's behavior be optimal: optimality is a stronger condition, whose satisfaction also depends on the absence of non-pecuniary externalities and other distortions. For example, in a currency union, effective market discipline would imply that no country would incur unsustainable deficits, but not that the overall stance of policy would be a global optimum; there might still be a need for policy coordination, to the extent that one country's fiscal policies affected the other countries' economies in ways that were not captured by market prices (Mussa, 1991; Masson and Melitz, 1990). 2/ Likewise, in the case of a sovereign borrower, even effective market discipline could not be expected to guarantee optimal borrowing, to the extent that the political process may not accurately reflect the public welfare; even if the resulting path were consistent with solvency, for example, it might still require an excessive debt burden on future generations (Modigliani, 1986). For a financial intermediary, market discipline would not imply an efficient allocation of credit across different sectors, if lending is subject to distortions such as from taxes and subsidies. Likewise, given the agency problems associated with a lack of managerial incentives, a state enterprise's managers may not maximize its profits, even if market discipline ensures that it can survive only by maintaining its solvency; efficiency, in this case, would be achieved only with the enterprise's privatization.

In general, market discipline involves two elements. The first is that markets must respond to the borrower's behavior; the second that the borrower must respond to the signals provided by the market. If the borrower starts on a path of borrowing that may turn out to be unsustainable, lenders must respond first by requiring a higher interest rate spread to compensate them for the increased risk of default that this path entails. The higher interest rate, however, itself increases the debt

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1/ This rules out, in particular, a situation in which a borrower follows a Ponzi game; see e.g., Bartolini and Cottarelli, 1991. It does not require that default never occurs--it may still occur if the debtor is hit by unusually large adverse stocks.

2/ In Kenen's (1992) terminology, market discipline can only address the solvency problem, and not the stabilization and the policy mix problems.

burden on the borrower, so that beyond a certain point no increased spread can compensate the lenders for the increased default risk; beyond this point, the borrower is simply excluded from the market, and prevented from borrowing any more.

These principles are illustrated in Chart 2, showing the supply of funds to an individual borrower. If the amount borrowed is quite small, lenders would be prepared to make funds available at the comparable risk-free interest rate r_f. As borrowings become larger, lenders insist on a higher interest rate, to compensate them for the increasing risk of default, which may be associated with the possibility that revenues may be insufficient to service the debt fully. As both a larger debt and a higher interest rate increase the amount to be repaid in the future, additional debt increase the risk of default at an increasing rate; if debt increases, a point is eventually reached at which the supply curve is vertical. At this level of debt D_{max}, and corresponding interest rate r_{max}, no increase in the promised interest rate can compensate for the accompanying increase in default risk, so this puts an effective maximum on the market's willingness to supply the borrower with funds. 1/

This relationship between the interest rate and the volume of borrowing has been discussed in the context of credit rationing in domestic credit markets (Modigliani and Jaffee, 1969, Jaffee and Russell, 1976, Stiglitz and Weiss, 1981), and has also been applied to sovereign lending (Eaton and Gersovitz, 1981). The same general principle applies in a variety of contexts: as borrowing increases, the market initially insists on a higher interest rate spread, and eventually excludes the borrower from further lending.

In the case of a government, the problem of market discipline is somewhat different than for a private debtor, since there is no established way of determining a sovereign borrower's net worth, and sovereign immunity implies that a sovereign borrower's assets cannot be liquidated. It is also not clear what sanctions can be imposed on a delinquent debtor government, other than excluding it from further borrowing, and uncertainty about those sanctions makes it harder for markets to assess default risk. Moreover, a government that borrows in its own currency need not actually default, but can monetize its debt. In this case, market discipline often takes a different form: higher interest rates may be associated with anticipated exchange rate depreciation. Under a flexible exchange rate regime, government deficits may be monetized, either immediately or eventually. To the extent that they are monetized immediately, this results in immediate

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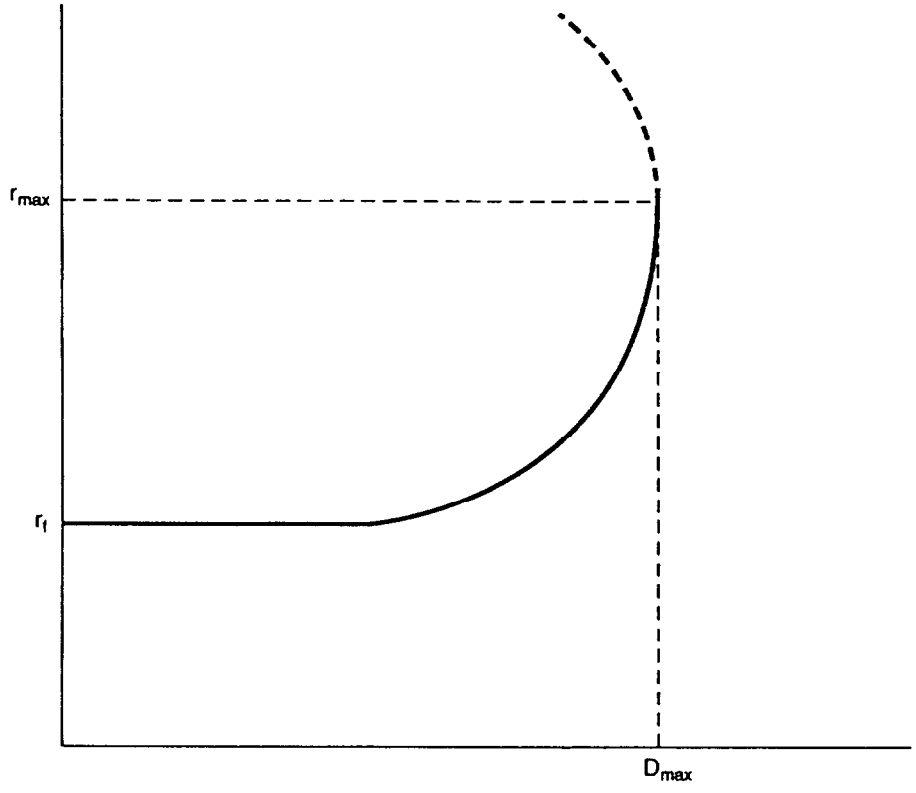
1/ The upper part of the backward-bending curve reflects the fact that, if the interest rate were at a level higher than r_{max}, this would further increase the default risk and further reduce the amount that lenders would be prepared to provide at that rate. This part of the curve is economically irrelevant, though, since the corresponding points on the lower part of the curve offer the same return to the lender at a lower cost to the borrower.

CHART 2

THE SUPPLY OF LOANS TO A BORROWER



inflation and exchange rate depreciation so in effect the government collects revenues through the inflation tax on both money and public debt; nominal interest rates on domestic-currency-denominated debt adjust to compensate for this inflation, and this is an indirect channel by which interest-rate differentials reflect fiscal policy differences. Even if deficits are not monetized immediately, markets may expect that they will be eventually, in which case this expectation results in higher interest rates even before the monetization takes place (Sargent and Wallace, 1986); this change in relative interest rates may initially be associated with an appreciation of the country's currency. These are also other factors that affect the relationship between borrowing and the need for exchange rate depreciation, though, particularly under an exchange rate arrangement like the European Monetary System (EMS). This is illustrated by the juxtaposition of debt ratios and interest rates in EC member countries, in Charts 3 and 4. 1/ Note, for example, that Belgium and the Netherlands, which have relatively high debt ratios, have small interest rate spreads; this may be attributable to the fact that the EMS limits countries' ability to monetize their debt. Within the EMS, or under fixed but adjustable exchange rates, it is only to a limited extent that inflation rate--and thus the rate of money growth--in one country can differ from rates elsewhere in the same currency area; in that case, monetization of the debt is associated with a financial crisis, in which the exchange rate must be devalued (Eichengreen, 1990, Giavazzi and Pagano, 1989). In effect, the risk of a crisis is the spur of market discipline. From this perspective, crises have a necessary, or even salutary, role (Mussa, 1991) in forcing governments to follow sustainable policies, and attempts to avoid crises by imposing exchange controls and other restrictions dull this spur.

Capital flight may be viewed as another mechanism whereby financial markets exercise a disciplinary role. Capital flight is an extreme form of market discipline: other forms of market discipline will at worst exclude a country from further external borrowing, but with capital flight domestic borrowers also lose access to the country's residents' savings. Capital flight often occurs in response to policies that are perceived as unsustainable, as domestic residents believe that these policies will result in inflation, exchange rate depreciation, and perhaps heavy taxation. Conversely, when sustainable policies are adopted, flight capital frequently returns home; such repatriation of flight capital has recently been observed in Argentina and Mexico, for example.

Market discipline may fail by being too lax--that is, by failing to penalize a borrower for behavior that entails an increased risk of default. There is also the possibility that discipline may fail by being too harsh--that is, by excluding borrowers that are actually credit-worthy. This may happen, for example, as a result of contagion effects, whereby all borrowers

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1/ Nominal rather than real interest rate spreads are shown because, within the EMS, the former reflect the risks of realignment that might be associated with divergent fiscal positions.

in a particular category--for example, developing countries in a particular region--are excluded from the market, or subjected to a high interest rate spread, regardless of their performance. Such an over-reaction could be as detrimental to the efficient allocation of funds as an underreaction that permits unsustainable borrowing. If market discipline is to be effective, it must avoid both of these dangers.

Effective market discipline consists of two parts: the first is relatively gentle, an increase in the interest rate spread signalling that the market perceives an increased risk of default (or devaluation crisis), and warning the borrower to temper its borrowing. The second is harsh: an exclusion from any further lending unless the existing debt is reduced to an acceptable level. It would be preferable if this harsh second stage--as typified, for example, by the LDC debt crisis beginning in 1982, or by the threat of massive bankruptcies of state enterprises in reforming socialist economies--were never reached. Critics of market discipline (Lamfalussy, 1989) have argued that this discipline is effective only to the extent that borrowers are actually excluded from the market; these critics therefore argue for some other kind of limitation on borrowing, such as binding fiscal rules.

If increased interest rate spreads do not prevent the borrower from following an unsustainable course of borrowing, it might be because the appropriate signals are not sent--i.e., because market lenders do not incorporate an accurate assessment of default risks into interest rates. It might also be that the borrower does not respond to these signals, and persists in unsustainable borrowing until actually excluded from the market. In examining the conditions required for market discipline to work, both of these possibilities must be taken into account.

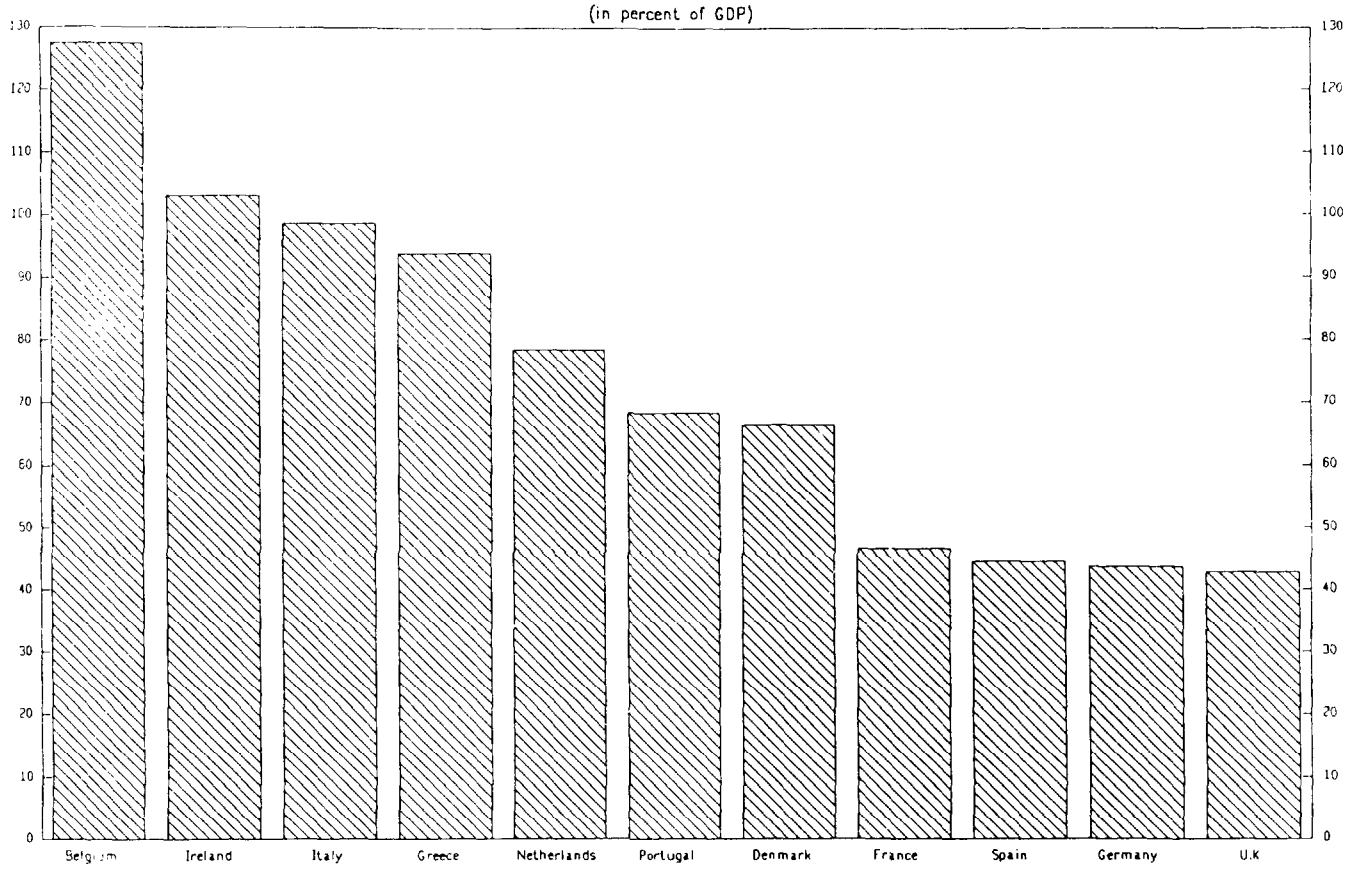
III. Conditions for Market Discipline

In order for market discipline to be effective, four general conditions are needed. One is that financial markets be free and open. A second is that adequate information must be available about the borrower's existing debts, and the prospects of repayment. A third is that there be no possibility that lenders would be bailed out in case of an impending default. A fourth is that the borrower respond to market signals before being excluded from the markets. Each of these conditions will be discussed in turn.

1. Open markets

The first condition for market discipline to be effective is that financial markets be free and open. This is required so that unsustainable borrowing will face the borrower with increased interest rates. This means, in particular, that the borrower must not face a captive market, in which lenders do not face alternatives to lending to a particular borrower. In particular, in the case of borrowing by a sovereign government, this rules

Chart 3: Debts of EC Countries, 1990
(in percent of GDP)



Source: EC Commission

Chart 4: Interest Rate Spreads on Long-Term Government Bonds
in Relation to Germany
(in basis points, April 22, 1991)

Source: Bishop (1991), page 3

out capital controls: these controls, if effective, might enable a government to increase its debt without driving up interest rates, by limiting domestic residents' ability to seek alternative assets abroad. Capital account liberalization may therefore play an important role in strengthening market discipline of government policy, preventing unsustainable policies from being pursued; this would be a case for capital account liberalization, and liberalization of financial markets generally, at an early stage in a program of restructuring and reform.

Even where capital markets are generally open, market discipline of fiscal policy may be weakened if the government has access to privileged sources of financing. In some countries, for example, liquidity requirements on the banks create a captive market for Treasury bills, providing the government with a source of borrowing at below-market interest rates. Some governments have access to pension funds, and can use these to finance deficits. This need not weaken market discipline: for example, in the Canadian province of Ontario, all but about 3.5 percent of provincial government debt is placed with various pension funds, but because this funded debt is in the form of long-term non-marketable securities at market-related interest rates, the government's cost of borrowing is still linked to market conditions (Kitchen, 1991).

The importance of unrestricted capital markets can also be shown in other examples of market discipline. In the case of financial institutions, if legal restrictions that limit competition for deposits--such as restrictions on the geographic scope of activities, or on the activities permitted to particular categories of institutions--give particular institutions a degree of market power, this may reduce the market's ability to discriminate between prudent and imprudent financial intermediaries, and thereby render market discipline ineffective. In the case of state enterprises in reforming socialist economies, if financial institutions are directed by the authorities to lend to particular enterprises regardless of their credit-worthiness, this nullifies financial discipline. In all cases, financial market liberalization helps financial markets to perform their disciplinary function.

2. Information

A second requirement for market discipline to be effective is that lenders be able to obtain the relevant information about the borrower's outstanding debts. This is important in the case of borrowing by governments: first, there are methodological problems with choosing a relevant measure of the government deficit (Blejer and Cheaty, 1991). This problem is frequently exacerbated due to governments' widespread practice of incurring off-balance-sheet liabilities. Governments in many countries do much of their borrowing through indirect channels, particularly when their borrowing is subject to legal restrictions or must be approved by the electorate. Some forms that this off-balance-sheet activity takes includes the establishment of special agencies or foundations whose borrowing is not included in the state budget but is nonetheless an implicit or explicit

obligation of the government, or through the use of government loan guarantees for particular activities in lieu of subsidies (Bennett and DiLorenzo, 1983). In addition, borrowing can take place in forms that are not included in conventional measures of government debt: for instance, one of the circumstances leading up to the 1974 New York City default was the immense issue of so-called "Tax Anticipation Notes" and "Revenue Anticipation Notes," which were issued--on the strength, respectively, of taxes and of the proceeds from the sale of goods and services by the city government--for the purpose of circumventing restrictions on borrowing, as well as concealing the overall volume of government borrowing. These devices enabled the city to incur unsustainably large deficits which eventually resulted in its bankruptcy.

A similar issue arise in connection with sovereign debt. In this case, creditors are concerned, not only with government borrowing, but with all foreign borrowing by residents of the country, the servicing of which is a claim on the available foreign exchange reserves. For lenders to provide effective signals to check unsustainable external borrowing, they must have accurate and timely information about such credit flows--that is, for accurate data on international capital flows. If important information is not available to lenders, there is the danger that an unsustainable path of borrowing would be unchecked until the problem is so serious that it leads the debtor not only to be faced with an increasing interest rate spread, but to be excluded from the market. This also creates the possibility of contagion effects, as, in the absence of reliable information, debt servicing difficulties by one borrower is regarded as signalling impending problems with all borrowers in the same category (Goldstein, Mathieson, and Lane, 1991). Contagion weakens the role of market discipline, as it excludes all borrowers, solvent and insolvent alike, from the markets.

The importance of information can also be illustrated with reference to the other two examples discussed. It is seen in the regulation of financial intermediaries, as losses can be concealed both from creditors and regulators. Some examples of intentional dissimulation of an institution's financial state are provided by some of the savings and loan scandals in the US, and the alleged falsification of accounts by officials of BCCI. A less extreme example is the practice of tobashi by some Japanese investment companies--selling bad assets, with an agreement to repurchase, in order to dress up accounts at the end of the fiscal year.

In the case of state enterprises in socialist economies, the need for timely information to assess enterprises' credit-worthiness underlies the importance of training bank loan officers to find and process the relevant information. This has been given some priority in technical assistance efforts (World Bank, 1990).

The failure of market discipline due to inadequate information often has an obvious remedy: improve the quality of information, and disseminate it to the markets. This, of course, is not adequate to deal with deliberate concealment of information, but fraud poses the same problems for direct

regulation as for market discipline. In the case of government borrowing within a currency union, or of sovereign debt, though, these considerations call for cooperation in gathering and releasing relevant data on government borrowing--both on- and off-balance sheet--and on international capital movements (Bishop, Damrau, and Miller, 1989).

Another reason that adequate information on a borrower's status may not be fully incorporated in borrowing costs is that lenders may be locked into the terms of existing debt contracts. Even though each increment to borrowing results in an increased interest rate spread, as lenders consider default increasingly likely, the cost of servicing existing long-term debt may be contractually fixed; lenders who provide funds earlier would then incur capital losses. This would be particularly a problem in the absence of seniority rules, which would give earlier borrowings priority in debt servicing. In this case, it is only the cost of new borrowing that reflects the new information on the borrower's financial status, and market discipline is weakened. This is an example of how the maturity structure of public debt, and other features such as seniority rules, may affect markets' ability to impose financial discipline; this effect may in turn be incorporated into the relative costs of borrowing at different maturities, and sometimes the lenders' willingness to provide funds at longer maturities.

3. No bailout

For market discipline to be effective, it is necessary that there be no anticipation of a bailout in case of (actual or impending) default. This condition--limiting the safety net, explicit or implicit, that is in place--is the most crucial, and its failure is probably the most important reason for failure of market discipline. What makes the "no bailout" condition so difficult to achieve is the essential role of credibility: it is not enough that outside agencies promise not to carry out a bailout, but market participants must also believe that they will not bail out a delinquent borrower when the chips are down. Credibility thus depends not just on making a "no bailout" commitment, but on the incentives to abide by this commitment--which will influence market participants' perception of the probability of a bailout. In particular, if the borrower is perceived as "too big to fail," it will be widely believed that, regardless of what the outside authorities say, a bailout would take place anyway. In this case, interest rate spreads will not rise in response to unsustainable borrowing, and market discipline would be thwarted.

The source of the credibility problem is time inconsistency. Ex post, bailouts are often beneficial, as frequently, they compensate individuals for losses due to circumstance beyond their knowledge and control, and may prevent one default from having systemic consequences. Ex ante, however, the promise of a bailout leads to a moral hazard problem: it reduces the incentive for lenders to monitor the borrower's behavior and take this behavior into account in lending decisions, as well as reducing the borrower's incentive to maintain solvency. Therefore, a commitment to avoid

bailouts might be appropriate even if each individual bailout is, in itself, defensible.

Bailouts can take a number of forms. One prominent recent example is the role of deposit insurance in recent failures of banks and savings-and-loan associations (S&Ls) in the United States. If deposits are fully insured, depositors do not need to assess a bank's solvency, since they will receive the full value of their deposits even if the bank fails. Therefore, institutions approaching insolvency are not subject to market discipline in the form of exclusion from the markets, or even a sharply rising cost of funds. Moreover, if an insured institution's net worth is close to zero, it faces perverse incentives with regard to risk: if a large risky venture is successful, the institution's owners benefit, while in case of failure, the losses are borne by the insurer (i.e., the taxpayer). Thus, risky ventures are undertaken even if their expected return is negative. As a result, in the presence of full deposit insurance, banks and S&Ls that are close to failure not only have access to deposit funds, but frequently use these funds to engage in very risky activities, which may exacerbate their losses should failure occur.

Various proposals for deposit insurance reform have attempted to address this problem (Fries, 1990). One solution may be to change the deposit insurance scheme to provide only partial and limited coverage. Here, the credibility issue enters again: even where formal deposit insurance coverage has been partial, in practice a larger bailout often occurs. For example, depositors in the Home State Savings Bank in the mid-1980s were compensated by the Ohio state government in the absence of any legal obligation to do so. In Canada, when two regional banks failed in 1985, full compensation was provided for the depositors, despite the fact that deposit insurance ostensibly covered only the first $60,000 of deposits. Another example is the Bank of England's bailout of the depositors in Johnson Matthey (Bentson and Kaufman, 1988). Thus, credibly limiting the bailout provided by deposit insurance is not a straightforward matter.

One way of providing a substitute for the market discipline lost through deposit insurance is to set risk-based deposit insurance premia. This approach would, in effect, simulate the market's role in pricing banks' riskiness and restoring their incentives for prudent behavior; it would have to be supplemented by an administrative decision of regulators to shut down the bank when its net worth reaches zero or some other critical level. One way of implementing risk-based deposit insurance premia would be to use the information embodied in the price of the bank's shares traded on the stock market. Deposit insurance can be interpreted as an option of the bank's owners to sell its entire portfolio of assets and liabilities to the deposit insurance corporation for a fixed price; since a bank's share is the market price of the bank's portfolio (including the value of deposit insurance), the stock market's evaluation of the bank's shares can provide information on which a fair risk-adjusted deposit insurance premium can be based (Fries and Perraudin, 1991). This deposit insurance premium would be determined

together with a rule for the appropriate point at which to shut down the bank, since the shutdown rule itself affects the bank's share value, as well as the relationship between the share price and the bank's earnings (Brickley and James, 1986). Bankers and policy-makers, however, have resisted proposals to make deposit insurance premiums depend on bank share prices,as these are viewed as too noisy a signal (Bentson and Kaufman, 1988). There may also be concern that the complementary rules for shutting down banks would violate the owners' property rights (Kareken, 1988). As a result, no country has established a risk-based system for pricing its deposit insurance premia. Another problem in the U.S. context is that the budgetary costs of the existing failures of banks and S&Ls, not to mention the political costs of additional closures, are so large that it is viewed as too expensive to put an appropriate incentive mechanism in place, because this would initially mean shutting down more institutions than could be financed with the available resources. Failing some reforms, however, there is a the danger that regulators would have to keep insolvent institutions open, and, given continued deposit insurance coverage, these institutions would be subject to no effective market discipline.

The "no bailout" condition is also relevant to government borrowing, as for example in the context of EMU in Europe. Here, there has been concern that EMU may further weaken the fiscal balances of countries that are already following unsustainable fiscal policies. 1/ With EMU, governments of member countries would borrow in their common currency, ECU. If effective market discipline could be established, this would imply that high-deficit countries would be subject to rising interest rate spreads reflecting the greater default risk associated with these policies, and these spreads would be a spur to fiscal adjustment. There is some concern, however, that market discipline would be thwarted by the possibility of a bailout. Although the Maastricht agreement explicitly prohibits any kind of bailout, this prohibition may not be fully credible. As European investors' portfolios become increasingly diversified as a result of EMU, the abolition of capital controls, and the Single Market Program for financial services, it will become increasingly difficult for governments to stand back and watch the default of another member government: a bailout by member governments could therefore become increasingly likely (Bovenberg, Kremers, and Masson, 1990). There is evidence that membership in the European Communities (EC) is itself associated with an increased perceived probability of a bailout: for instance, it has been argued (Xafa, 1990) that Greek membership in the EC may be partly responsible for its avoiding the kind of financial crisis experienced by other countries (Mexico and Turkey) with similar debt and debt service ratios. The deepening of the EC implies not only that member countries' could have a stronger incentive to bail out a financially troubled member, but also that a wider range of means could be available to carry out a bailout discreetly. In particular, the increasing size of the EC's budget, and provisions for interregional

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1/ Corsetti and Roubini (1991) suggest that Italy, Belgium, Ireland, and Greece might fall into this category.

transfers may permit a thinly-disguised bailout to be implemented. Moreover, the establishment of a European Central Bank (ECB) may provide a means of bailout, if the bank is not accorded an adequate degree of independence: there is a danger that an ECB could be pressured to intervene in debt markets to support the price of the debt of a near-insolvent member country, or to provide financing for a more general bailout. These dangers point to the importance of ensuring that the ECB is fully autonomous, with a clear mandate for price stability, and not subject to influence by the member governments; this principle was formally recognized in the Maastricht agreement, but requires concordant actions by the member governments and by the management of the bank itself to make the ECB's autonomy credible.

Another particularly important instance in which market discipline may have been thwarted by an implicit bailout is the role international policy coordination may have played in protecting the U.S. from the consequences of its fiscal policies in the second half of the 1980s. It has been argued that the coordination in exchange rate management since 1985 "has been the cover under which other countries finance the U.S. budget and trade deficits, thereby protecting the United States from the consequences of its fiscal policy" and preventing market forces from forcing it "into more fundamental fiscal contraction" (Fischer, 1990, page 107).

Another possible example of the role of bailouts is in the origins of the LDC debt crisis of the 1980s. It has been argued that the prospect of a bailout played some role in the excessive lending of the 1970s that set the scene for the crisis. Some element of bailout is built into creditor countries' tax structures, as loan writeoffs are deductible. In some countries, notably France and Germany, provisioning against questionable sovereign loans is also tax deductible (Bird, 1989). In these respects, the fiscal authorities act as a "silent partner" in risky ventures. Deposit insurance may also have played a similar role, as creditor banks' deposit liabilities were essentially guaranteed by their respective governments. There is also the danger that banks would hope to benefit from official debt reduction through an increased probability of repayment of their own claims; unless the principle of equal treatment of creditors is strictly adhered to, banks may expect this to reduce their losses, and market discipline of bank lending would be ineffective. Lending by international financial institutions (IFIs) would constitute a bailout if it enabled banks to be repaid but the IFIs' lending were not repaid; avoiding the distortion of market forces that this kind of bailout would entail is one important reason for insisting that IFIs' loans to heavily indebted countries be serviced in full and for imposing conditionality to those loans. If the latter criteria were met, lending by IFIs might actually strengthen market discipline, by facilitating the rescheduling of debt and thus reducing the probability that the borrower will escape responsibility for the debt through debt repudiation (Folkerts-Landau, 1985). Similarly, the IFIs' support for debt reduction operations might either strengthen or weaken market discipline: if the funds set aside for this purpose were repaid, debt reduction could be a way of converting outstanding debt into a form whose servicing could be more readily enforced--or, at worst, a formal recognition of an existing

situation in which debt was not being serviced. The availability of such facilities may increase lenders' prospects of repayment, and therefore increase their willingness to lend to developing countries; if repayment ultimately came from the debtor's own resources, rather than constituting a transfer from the IFIs to the other creditors, this could strengthen rather than weakening market discipline.

The prospect of bailout is an important element of the "soft budget constraint" that typifies state enterprises in socialist economies (Kornai, 1980). Even as reforms in these countries proceed, banks are often content to continue lending to insolvent enterprises in the belief that the authorities will make good on the loans. Given the prospect of a bailout, managers' and workers' incentives for effort, initiative, and painful restructuring may be limited; some of the results may be inefficiency as well as overmanning and excessive risk-taking (Shaffer, 1989, Hardy, 1991). Establishing market discipline in this context is difficult, however. To begin with, there is the credibility problem: even if the authorities would like to promote efficiency by committing themselves not to bail out insolvent enterprises, such a commitment may not be credible, since once a large enterprise's failure is impending, the government's best response, in view of the possible losses of output and employment, may yet be to bail out the enterprise (Shaffer, 1989, Hardy, 1991). Moreover, a commitment not to cover loan losses, if it is believed by lenders, may lead to a general contraction in credit in the economy (Calvo and Coricelli, 1992)--particularly if there are contagion effects because enterprises' creditworthiness cannot be accurately assessed. Borrowers may well therefore not believe that the authorities would follow through on such a commitment. 1/

The problem of establishing market discipline is exacerbated by the "bad loan problem" of the banks in many formerly-planned economies (FPEs): due to the legacy of lending on political principles, or lending for projects whose return was evaluated at prices distorted by subsidies, a substantial proportion of the banks may be insolvent. It is widely agreed that a once-for-all recapitalization of the banks is needed to shake off this historical legacy, and make them viable, but how big a recapitalization is needed? This is unknown, as it depends on what proportion of loans will eventually turn out to be non-performing--which itself depends on the nature of the economic restructuring that must take place. Thus, there has been no final solution to the bad loan problem in any of the FPEs of Central and Eastern Europe (IMF, 1992). Attempts have been made (e.g., in Czechoslovakia) to avoid the moral hazard problem by setting a cutoff date, and committing the government to compensating banks only for loan losses incurred before that date. It is not clear how credible such cutoff rules

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1/ Governments' ability to follow through may also be limited. For example, anecdotal evidence from Poland suggests that in some cases the courts may be unwilling to enforce debt contracts, even though the government itself had stated the intention of making bankruptcy possible.

will turn out to be, however, as banks may well believe that they will also be compensated if they run into serious problems at a later date.

Minimizing the moral hazard problem associated with a safety net can be viewed as a problem of setting the net at the right level. There are some individuals whose protection may be regarded as socially unavoidable and/or ethically desirable, while there are others who could withstand the associated losses, and if unprotected could perform a valuable monitoring function; it is important to demarcate these groups and design the rules for intervention accordingly. For example, the imposition of standardized, risk-based capital requirements on financial institutions may be viewed as designed to raise the safety net so that losses are initially borne by holders of equity and subordinated debt before the deposit insurance plan is exposed. Deposit insurance itself can be seen as a way of ensuring that depositors, not banks are bailed out, so that banks' other creditors have to take their losses. Recent proposals by the U.S. Treasury would strengthen this mechanism by exposing nondeposit creditors to normal pro rata bankruptcy losses even if uninsured deposits are made whole by the actions of the Federal Deposit Insurance Corporation. The rates of return that banks must offer on non-deposit sources of financing then reflect the risks to which the bank is exposed: for example, in the U.S. the cost of raising subordinated notes has recently been 400-500 basis points over the rates on comparable U.S. Treasury Notes (see Leipold et al., 1991a).

Similar considerations are involved in the establishment of social safety nets in FPEs: bailing out individuals instead of enterprises. Establishment an unemployment insurance plan may be viewed as an essential step in making enterprise financial discipline credible, by making it more likely that the government would actually stand firm on a commitment not to bail out failing enterprises (Hardy, 1991). Federally supported social safety nets may play a similar role in reinforcing market discipline of the fiscal policies of state or provincial governments, by establishing a mechanism whereby individuals' incomes can be maintained without bailing out the government and their creditors.

Establishing credibility for a no-bailout rule is perhaps the most crucial task in establishing effective market discipline. In some cases, a bailout may be regarded as unavoidable, and in some cases desirable; in that case, some degree of direct control of the borrower's behavior may be necessary. In addition, any bailout should also impose sufficient costs on imprudent borrowers and lenders that it does not destroy all incentive for prudent behavior. This means, for example, taking steps to close off avenues for implicit, discreet bailouts, and ensuring that any bailout that does occur be embarrassing to the parties concerned. 1/

1/ A contrary idea, of "constructive ambiguity"--deliberately creating uncertainty about the scope of possible bailout--is sometimes expressed (see Leipold et al., 1991a). The point is debatable, but it would appear to be more difficult to establish credibility for an ambiguous commitment.

4. Borrower response

It has already been mentioned that market discipline takes two forms: initially, the borrower faces a rising interest rate spread; eventually access to further credit is denied. The second stage, while dictated by the logic of the situation (see section II), is a rough one, associated with a financial crisis; some would argue that, if market discipline depends on such market exclusion, it is not an acceptable mechanism of control (Delors Report, 1989, Lamfalussy, 1989). Thus, a condition for the smooth operation of market discipline is that borrowers respond to the signals provided by the market in time to avoid a crisis.

A rational agent, when faced with a higher interest rate, would respond by reduced borrowing in order to get back onto a sustainable path. In fact, if a rational agent possessed as much information as the lenders did, it would not even wait for the market signal: a rational borrower would anticipate that further borrowing would lead to a higher interest rate spread, and, taking that knowledge into account would refrain from unsustainable borrowing. In some cases, this anticipatory mechanism does appear to work in practice--for example, the recent decision of the New York City government to cut its borrowing in order to avoid undermining its bond rating (Purdum, 1992).

Why might a borrower fail either to respond to market signals or to anticipate them? There are two main reasons: first, if the borrower in question is a government, its response to market signals may not be the same as that of a private agent, depending on the nature of the public choice mechanism. In particular, governments may have excessively short time horizons, as they are primarily concerned with re-election, so they may have a bias toward excessive deficits which leave their successors with a debt burden. It is possible that there might also actually be a strategic element to this policy: for example, a government might actually try to saddle its successor with a large public debt in order to tie the successor government's hand and limit its ability to carry out spending that does not conform to the current government's preferences (Persson and Svensson, 1989; Alesina and Tabellini, 1990). It is also possible that, if governments are assembled from weak coalitions of political parties or of legislators representing various special interest groups, they may be less able to resist making compromises that satisfy the coalition members' demands for spending projects and tax relief, at the expense of increasing the overall deficit (Roubini and Sachs, 1989). These imperfections of the public choice mechanism would also weaken governments' responsiveness to market discipline.

A second reason that market discipline might be ineffective is if the borrower does not intend to repay the debt anyway; in this case, a rising interest rate is immaterial. The problem of adverse selection--meaning that some borrowers do not plan to repay their debts, and the lender may not be able to identify these borrowers--has been used as the basis of an explanation of credit rationing in private credit markets (Stiglitz and

Weiss, 1981). There is no limit to how much a borrower who plans to be delinquent would like to borrow, so there is a need for credit to be rationed. The same logic applies to borrowers who believe that there is a high probability that they will be insolvent: they have nothing to lose by borrowing, even at a high interest rate. One example of this principle is banks and S&Ls that are at or near the point of insolvency: even if they must pay high interest rates to attract deposits, this does not affect their behavior much since they do not expect to survive to pay these rates anyway. Another example is the use of interest rates to ration credit in FPEs, where many of the state enterprises are near insolvency: in the absence of adequate credit evaluation system, high interest rates may provide a disincentive for solvent enterprises to borrow, while insolvent enterprises will still want to borrow large amounts because there is a low probability that they will repay the loan in any event (Dooley and Isard, 1991). In short, market discipline does not work through interest rate spreads if borrowers are already near insolvency; it can only work by excluding insolvent borrowers from the market.

In this section, it has been shown that, in diverse examples of market discipline, many of the same principles apply. Market discipline depends on the conditions that capital markets be open; that lenders have the relevant information about the borrower's existing liabilities; that there be no anticipation of a bailout; and that the borrower respond to market signals. These conditions are needed to ensure that the markets reflect the borrowing behavior and that this spurs the borrower onto a sustainable path. In the next section, some empirical evidence will be brought to bear on the effectiveness of market discipline in practice.

IV. Some Evidence

It is difficult to establish empirically how effectively markets discipline borrowers to follow sustainable paths. The evidence can be drawn from a variety of sources: one is the experience of federal unions, in which the lower-level governments are subject to varying degrees of market discipline and direct regulation. A second pertains to sovereign debt, and in particular the extent to which interest rate spreads, secondary market prices, and market access reflect the debtor country's fiscal decisions. A third type of evidence is drawn from tests of optimizing models of fiscal policy; if the latter models are consistent with the data, this would suggest that governments are more likely to be responsive to changes in the cost of borrowing.

1. Federal unions

The experience from federal unions offers a variety of different examples of the role of market discipline. There are wide differences in the degree of autonomy granted to the lower-level governments. For example, in Australia, any borrowing by a state government must receive formal approval from a central government body. In Germany, likewise, the Länder

have little fiscal autonomy (Lamfalussy, 1989; Bishop, Damrau, and Miller, 1989). In the US and Switzerland, there is no central restriction on the deficits and debt of the states or cantons, respectively, but there are other restrictions: all but 12 of the US state governments are subject to formal fiscal restraints, consisting of balanced budget requirements (of varying stringency), debt limits, or both. In Canada, there are no formal legal limitations on borrowing by the provincial governments or their agencies.

Thus, the international experience reflects a combination of fiscal rules and market discipline. The existence of a diversity of rules in itself suggests that there is no clear case for constitutional limits or binding central control of the deficits of lower-level governments. Moreover, when the different countries are compared, there is no apparent tendency for countries with stricter rules to have more appropriate fiscal policies. If anything, the tendency is the opposite: in Australia, whose state governments have perhaps had the least autonomy of any of those mentioned, there has been chronic concern at excessive borrowing by the two most populous states (New South Wales and Victoria). In Canada, by contrast, market-based fiscal discipline appears to have worked relatively well in the absence of binding restrictions.

The same lack of systematic beneficial effects of binding rules appears in comparing different states within the United States, where there is a diversity of fiscal rules: von Hagen (1991) found that states with more stringent fiscal rules had no significant differences in their levels of debt or borrowing, and that more stringent limits were actually associated with a greater frequency of extreme outcomes (i.e., very high or very low levels of debt or borrowing).

Market-based discipline requires that interest rate spreads reflect differences in credit risk associated with different degrees of fiscal laxity. In general, in federal states in which there is some degree of reliance on market discipline, markets do in fact differentiate among different government units. For example, in Canada, there are noticeable spreads among bonds issued by different provinces and their agencies, as illustrated in Chart 5. 1/ Anecdotal evidence suggests that these spreads are indeed affected by budgetary policies--as witnessed, for example, by the downgrading of Ontario's Aaa rating in the wake of its 1992 budget. Some have argued that these spreads are too small to have a significant effect on fiscal policies (Bredenkamp and Deppler, 1990)--perhaps suggesting a perception that bailout (explicit or implicit) would be likely if any province were on the verge of default. However, the narrowness of the spreads may also, to some extent, reflect the anticipatory behavior discussed in the previous section: governments do not wait for their

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1/ Spreads shown in Chart 5 are for bonds whose term to maturity is eight or nine years; this range was chosen because of the availability of comparable data for all ten provinces.

deficits to lead to increased spreads, but try to a sustainable fiscal stance in order to avoid facing increasing borrowing costs. This is supported, for example, by the frequency with which "preserving the province's credit rating" has been given as a rationale for fiscal austerity (Maslove, Prince, and Doern, 1986). This interpretation can be examined with reference to the actual fiscal performance of the provinces, as shown in Chart 6: although some observers have complained of the rising burden of provincial debt, from this chart suggests that even the three most heavily indebted provinces (with the possible exception of Quebec) have not seen sharply rising debt ratios. Moreover, by the standards of national governments, the overall debt ratios are quite low, and, as shown in Chart 7, provincial budgetary imbalances are dwarfed by those of the federal government. Thus, the low interprovincial spreads may simply reflect the fact that the differences in debt ratios are not great enough to lead to substantial differences in default risks. This seems to provide some support for the view that "fiscal prudence is inversely proportional to the authorities' leverage over monetary policy, that is the access to the inflation tax" (Bredenkamp and Deppler, 1990).

In the U.S. context, some formal empirical studies have explored the sensitivity of yield spreads to fiscal behavior. The spreads faced by the state governments are shown in Table 1. Liu and Thakor (1984) examined a cross-section of 38 U.S. states, and found that both total and per capita debt had a significant effect on both a state's bond rating and the interest rate spread it faced. Goldstein and Woglom (1992) examined the determinants of yield spreads for general obligation bonds issued by state governments. These authors found, not only that fiscal variables had the predicted effect on the interest rate spread, but that this effect increased with the amount of borrowing, as implied by the backward-bending supply curve shown in Chart 2. In another paper, Goldstein and Woglom (1991) examined a sample of US municipalities, seeking to explain the yield spread faced by these municipalities; they found that the ratio of debt to GDP, the deficit, and the trend of growth in the municipality's debt all had significant explanatory power in accounting for the yield spread. These and other similar results indicate that interest rates <u>do</u> incorporate information pertaining to the borrowing governments' behavior and the resulting credit risks.

How should one interpret the experience of federal unions in assessing the likely strength of market discipline of other governments--in particular, of national governments in a European EMU? Like a federal union, EMU would deny national government access to control bank financing. Some observers have pointed, however, to the fact that fiscal imbalances have typically been larger among European countries than among government units in most federal states, viewing this as evidence that market discipline in the EC would have to deal with much larger imbalances than in most federal states (Lamfalussy, 1989). The focus has been on the problem of <u>convergence</u> from the substantial existing divergences in fiscal positions, and it has been argued that imbalances are too great for market forces to bring about such convergence--particularly because, with EMU,

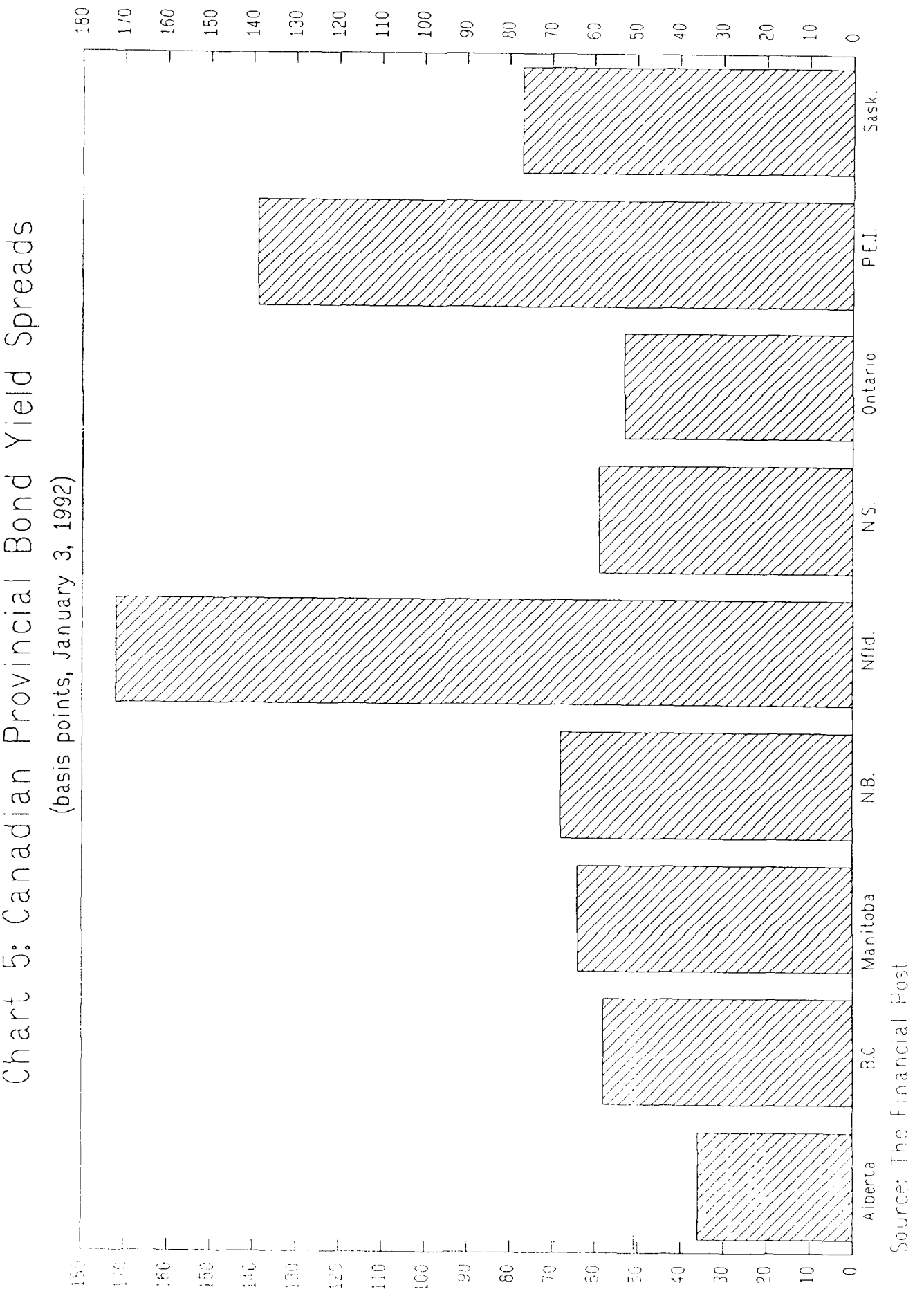
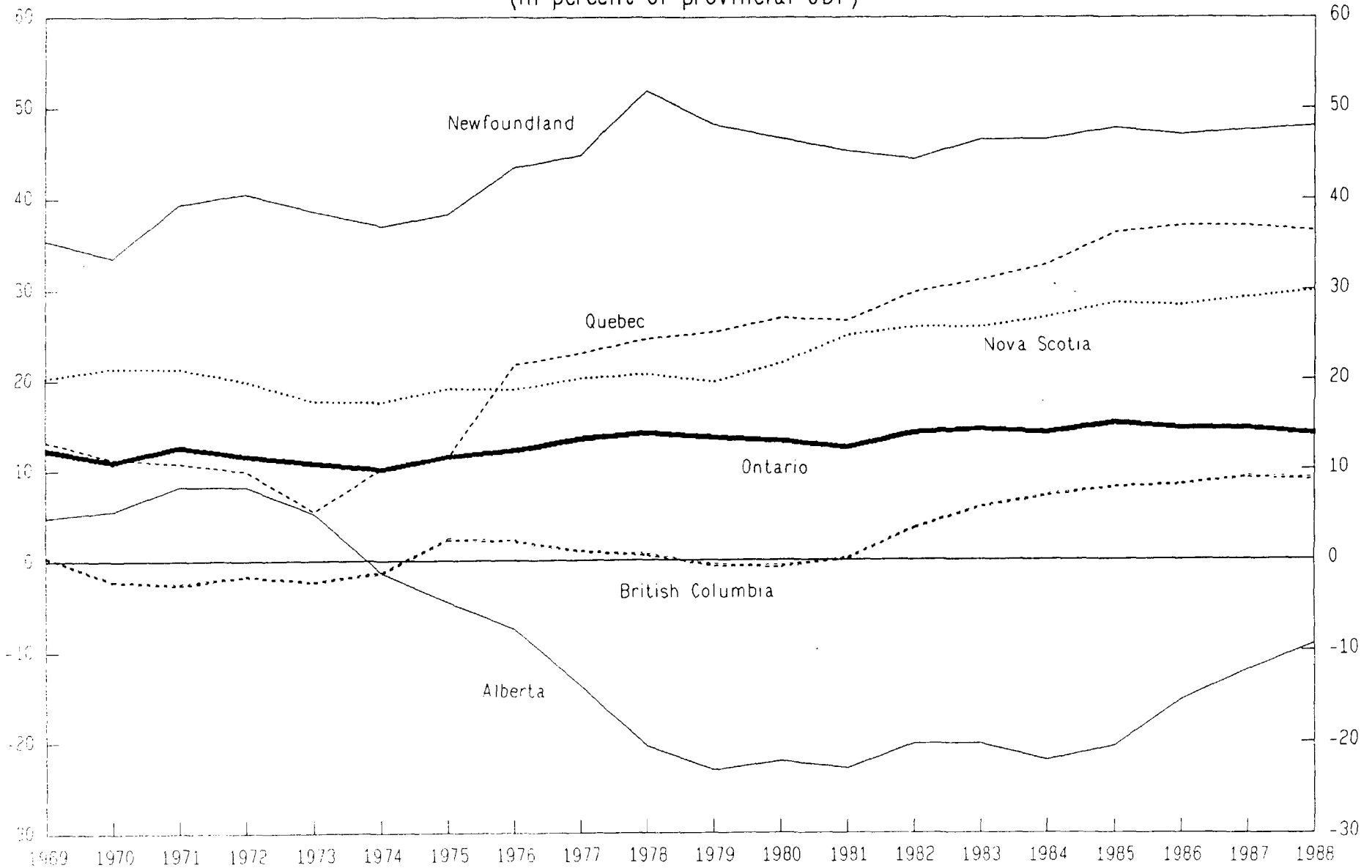


Chart 5: Canadian Provincial Bond Yield Spreads
(basis points, January 3, 1992)
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Sask.
P.E.I.
Ontario
N.S.
Nfld.
N.B.
Manitoba
B.C
Alberta
Source: The Financial Post

Chart 6: Debts of Selected Canadian Provinces, 1969-1988

(in percent of provincial GDP)



Source: Ip (1991), page 59

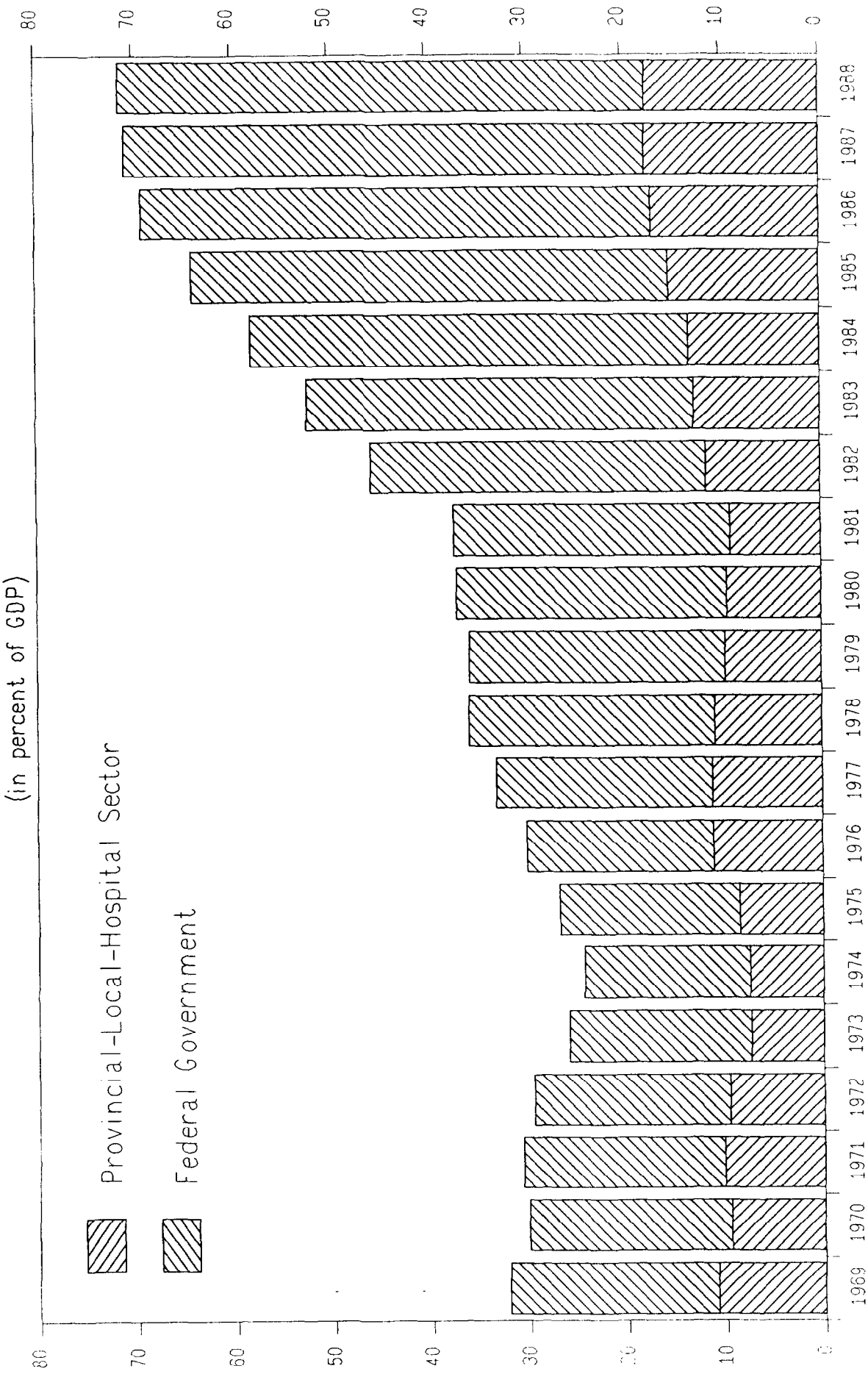


Chart 7: Canada: Debts of Federal Government
and Provincial-Local-Hospital Sector
(in percent of GDP)
Provincial-Local-Hospital Sector
Federal Government
80
70
60
50
40
30
20
10
0
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988

Table 1. Interest Rate Spread on 20-Year State Bonds, Relative to California, December 1989

(In basis points)

		Spreads
1.	California	--
2.	North Carolina	2
3.	Virginia	3
4.	Connecticut	4
5.	Missouri	6
6.	South Carolina	7
7.	Georgia	8
8.	Maryland	9
9.	Tennessee	10
10.	New Jersey	14
11.	Ohio	15
12.	Utah	20
13.	Maine	21
14.	Minnesota	22
15.	Montana	22
16.	Delaware	23
17.	Kentucky	23
18.	New Hampshire	24
19.	Rhode Island	24
20.	Vermont	25
21.	Alabama	26
22.	Wisconsin	26
23.	Pennsylvania	27
24.	Mississipi	27
25.	Hawaii	28
26.	Michigan	28
27.	New Mexico	29
28.	Illinois	29
29.	Oregon	31
30.	Florida	31
31.	Nevada	33
32.	New York	34
33.	Oklahoma	36
34.	Texas	37
35.	North Dakota	37
36.	Washington	39
37.	Alaska	41
38.	West Virginia	42
39.	Puerto Rico	62
40.	Massachusetts	76
41.	Louisiana	84

Source: Goldstein and Woglom (1992), p. 15a.

countries will lose access to seignorage as a source of financing. It has also been pointed out that the Community budget is very small in relation to the central government budgets of federal states, and this implies that fewer central resources are available to smooth regional adjustment without generating large budgetary imbalances for the individual national governments (Eichengreen, 1990). These considerations have led some to argue that budgetary imbalances among member states under EMU would be too great for market discipline to keep them in check.

The differences between the circumstances of the EC and federal unions also have other interpretation, however. First, the wide differences in member states' existing budgetary imbalances reflect in part the differences in these countries' cost of debt servicing, associated with differences in these countries' inflation rates. A convergence of inflation rates under EMU would therefore do much to reduce the member countries' budgetary imbalances. The assiduous pursuit of price stability by a European central bank would reduce these imbalances still further (Bishop, 1991). A second point is that the existing imbalances may to some extent also reflect the lack of existing market discipline, as the governments of some member countries (notably Italy and Belgium) have until recently had access to "captive" capital markets due to capital controls, and all have had access to a bailout through debt monetization. The Single Market Program, together with EMU, may therefore strengthen the forces of market discipline. Finally, the small size of the Community budget may actually increase the credibility of the "no bailout" clause in the Maastricht Agreement, as the resources available for a bailout may be smaller. This consideration would actually suggest the possibility of stronger market discipline in the EC than in many federal states. 1/

Nevertheless, there is a risk that EMU would entail a substantial weakening of market discipline in comparison with the present situation. The increased solidarity among the participants in EMU may make a bailout more likely. It is also possible that some heavily indebted EC countries could be viewed "too big to fail," so the no-bailout commitment included in the Maastricht agreement may not be credible. The loss of exchange rate flexibility inherent in EMU cuts both ways: removing the "soft option" of a partial default through debt monetization and exchange rate depreciation may enforce fiscal responsibility, but also eliminates the warning signals that exchange market pressure might otherwise provide. 2/ In summary, while evidence from federal unions suggests that market forces may play an

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1/ Another typical aspect of many federal systems is an elaborate structure of conditional and unconditional intergovernmental transfers. This, however, may also tend, if anything, to undermine fiscal discipline, since it dissociates the collection of taxes from the provision of services, and, in the case of conditional grants, subsidizes expenditures by the lower levels of government.

2/ For a discussion of these issues, see also Frenkel and Goldstein, 1991.

important role in disciplining borrowing in a common currency area, and there is reason to believe that these forces could also be important in Europe after EMU, this is certainly not a reason for complacency about the member countries' fiscal imbalances.

2. Sovereign debt

A second source of evidence on the probable effectiveness of market discipline pertains to sovereign lending. The LDC debt crisis is sometimes cited as prima facie evidence that markets cannot work in disciplining borrowers (Delors Report, 1989). This interpretation is somewhat simplistic, however. To begin with, the external shocks--to commodity prices, interest rates, and economic activity in the industrial countries--to which many indebted developing countries were subjected in the early 1980s were unquestionably large. 1/ Moreover, the provision of adjustment financing by international financial institutions, by tiding over heavily indebted countries until their ability to service debt was at least partially restored, enabled loans to developing countries to be rescheduled, rather than canceled; this limited the potential losses for which interest rate spreads were required to compensate (Folkerts-Landau, 1985). There were also some elements of a prospective bailout: the creditor banks' deposit liabilities were guaranteed by deposit insurance, and the tax deductibility of loan losses implied a partial bailout of lenders through the tax system. 2/ These factors may account for slowness of loan spreads to rise as the creditworthiness of many sovereign borrowers deteriorated.

Recent experience also suggests that markets are becoming increasingly effective at discriminating among different sovereign borrowers. Country risk analysis generally takes account of variables, such as debt and debt service ratios, which have a bearing on a sovereign borrower's ability to repay (see Chart 8). One criticism levelled at banks has been that, although they make use of much pertinent information, the information is analyzed and interpreted using techniques that are arbitrary, with little scientific basis and little evaluation of the results' sensitivity to the underlying assumptions. There are indications, however, that banks' risk assessment practices may be improving in this regard (Bird, 1989).

One indication of the working of market forces is the recent restoration of voluntary market lending to some, but not all, Latin American countries--and in particular, to Mexico, Argentina, and Chile (El-Erian, 1992). Similarly, the markets clearly distinguish between different countries in Central and Eastern Europe: Hungary and Czechoslovakia, by fulfilling their current debt service obligations, have been able to

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1/ Moreover, in the 1970s there was not yet a wide range of market-based hedging instruments with which indebted developing countries could hedge against such shocks; see Mathieson et al., 1989.

2/ This, of course, applies to any bank lending, not just sovereign lending.

maintain access to voluntary market financing; other countries (Poland), because of their debt servicing difficulties, have been able to obtain only short-term financing, while others, with more serious payments difficulties (Bulgaria and Romania) have been denied market access. As market participants become better able to assess sovereign risk, the possibility that markets can exert a disciplinary role against unsustainable policies is increased.

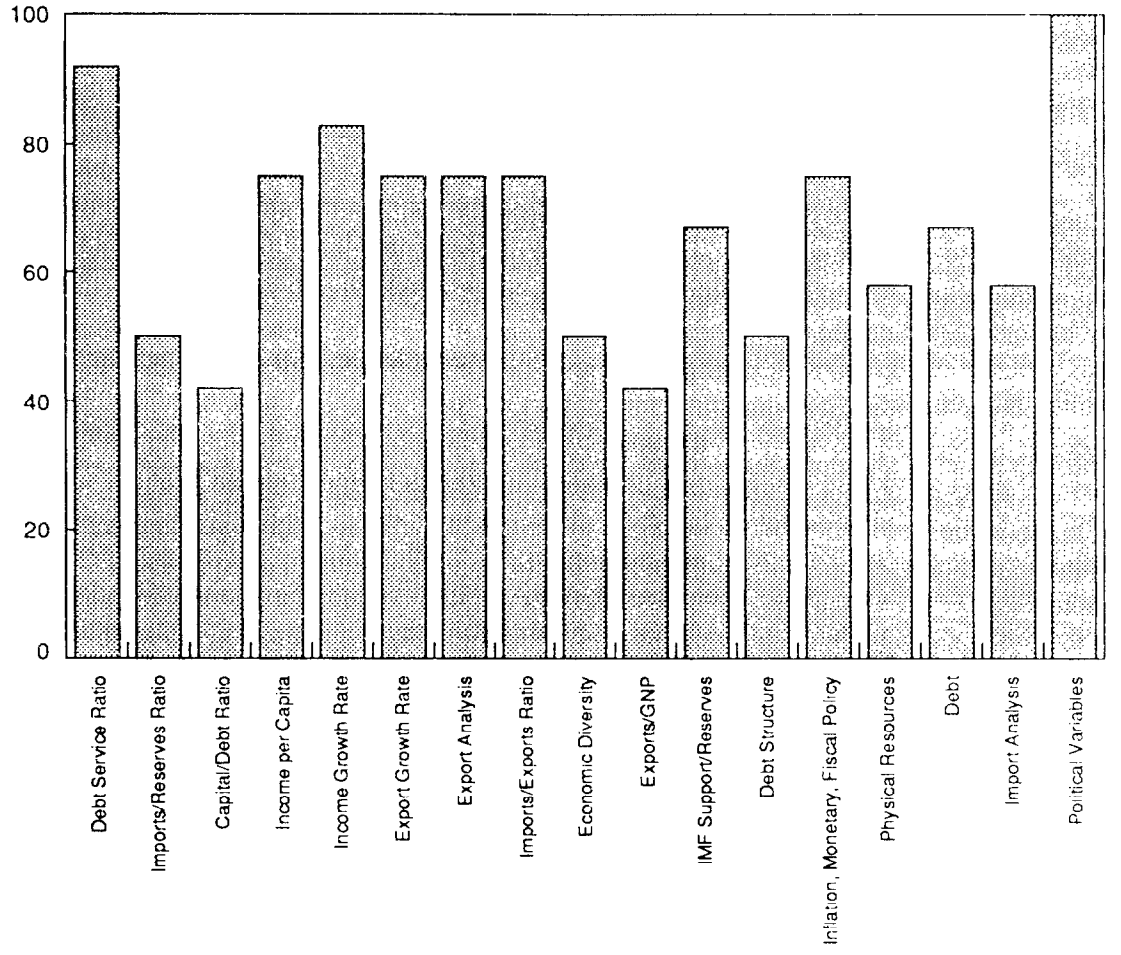
Attention has also been turned to interest rate spreads, and the extent to which these have reflected credit risks. Some recent variations in these spreads for selected developing countries are shown in Table 2. The determinants of spreads has also been the subject of systematic study. For example, Edwards (1986) tests a simple model of borrowing, using interest rates on both bank loans and bonds for 26 countries in the 1976-1980 period. His results are generally supportive, and in particular, confirm the model's prediction that the interest rate spread increases with increased borrowing. He also finds that the determination of interest rates is significantly different for bonds than for bank loans, as is consistent with the view that the possibility of rescheduling, as well as the potential for cooperative behavior among the banks belonging to a syndicate, increases the scope for rescheduling rather than default, implying that the risks associated with bank loans are different from those associated with bonds.

Another aspect of sovereign debt is the pricing of debt in the secondary market. Evidence shows that the secondary market valuation of debt is responsive to debt restructuring arrangements, including both general developments such as the Brady Plan and country-specific agreements, as well as to variables that have a bearing on these countries' capacity to service debt (Stone 1990). Secondary market valuations of Latin American countries' debt have recently increased, as these countries' debts have been restructured and their capacity to service debt has increased (Leipold et al., 1991b).

The recent trend toward securitization of lending and the declining role of banks and other financial intermediaries may impinge on financial markets' ability to discipline borrowers. To the extent that these developments are associated with financial market liberalization, market discipline may be enhanced, as there is a decrease in the extent to which sovereign and other borrowers have access to "captive markets." Intermediaries may also, however, be able to specialize in gathering information about borrowers, and be able to collaborate in enforcing debt contracts; this consideration suggests that disintermediation may lead to a weakening of financial discipline, although even more specialized agencies, such as credit rating agencies, may be doing much to fill the gap. Bailouts are perhaps less likely in a securitized financial system, as the risks associated with particular borrowers may be widely dispersed, reducing the political pressure for a bailout and making it more difficult to implement or justify a discreet, indirect bailout.

CHART 8

CRITERIA FOR RISK ASSESSMENT[1]



Source: Bird (1989), pages 38-39.
1 Percent of institutions surveyed using each criterion in their country risk assessment.

Table 2. Interest Rate Spread on Syndicates and Bank Credits: Selected Developing Countries

(In basis points over LIBOR)

	1989	1990	Jan.-May 1991
Bahrain	51	38	65
Bulgaria	40	--	--
China	63	61	142
Colombia	87	--	150
Hong Kong	31	62	72
Hungary	53	82	--
India	30	30	--
Indonesia	95	78	99
Korea	38	48	54
Malaysia	22	58	--
Mexico	300	175	--
Pakistan	92	--	90
Singapore	73	26	137
Thailand	51	56	89
Average for Eastern European countries	49	50	--
Of which:			
U.S.S.R.	49	50	--

Source: Organization for Economic Cooperation and Development (OECD).

3. Government behavior

Another critical requirement for market discipline to function smoothly is that the borrower respond to the signals provided by the market. In cases in which the borrower is a government, this requires that spending and taxing decisions be influenced by the interest rate, which determines the intertemporal tradeoff between present and future taxes.

Recent empirical work bearing on this issue has centered on tests of the hypothesis that government borrowing is consistent with the predictions of a model of intertemporal optimization. Robert Barro (1979) presented a simple model of optimizing behavior by an infinitely-lived government, and showed that this model implies tax smoothing--that is, given the assumption that the distortionary effects of taxes increase with the tax rate, a government would appropriately maintain tax rates relatively stable in the face of variations in both government spending and national income. An optimizing government would therefore incur debt during periods of unusually high expenditure (e.g., wartime) and during cyclical downturns. Barro found that the tax-smoothing hypothesis was borne out by US data since World War I (Barro, 1979, 1986). However, as pointed out by Modigliani (1986), these results are also consistent with other models of the determination of fiscal policy, which do not have the same implications that government behaves like an infinitely-lived optimizing agent. In particular, Barro's results largely reflect the observation that U.S. deficits rose during both World Wars--a fact that would be unsurprising to many who would nonetheless be skeptical about the optimality of fiscal policy.

There have recently been several further explorations of the optimizing model of government. Mankiw (1987) found some results supporting the tax smoothing hypothesis, using U.S. data, but other authors found that these results could not be extended to other OECD countries (Roubini and Sachs, 1989, Grilli, 1989), or to developing countries (Roubini, 1991). Thus, evidence in favor of the optimizing model must be characterized as weak and limited.

One potentially important reason that the time paths of government spending, taxation, and borrowing might fail to be optimal is some weakness in the country's political structure. A study by Roubini and Sachs (1989) examined the influence of the political structure on a country's fiscal stance--examining, for instance, whether weak coalition governments have an inherent tendency to run deficits. Their empirical results using OECD data for the 1970s and 1980s provided some confirmation for the hypothesis that political structure matters. Roubini (1991) found similar results data from developing countries. These results suggest that political factors may make governments behave in ways that may not be optimal.

Thus, the optimizing model of fiscal policy finds only limited support from the data. Of course, confirmation of this model is not needed for the notion that governments may respond to their borrowing costs to have some validity. This returns to the point, made earlier that sustainability of

policy is a weaker condition than optimality: although optimality generally implies sustainability, the reverse is not true. It is quite conceivable that the distribution of taxes over time is quite far from optimal--for example, by giving insufficient weight to the tax burdens faced by future generations--but that nonetheless the policies taken will not, in general, actually lead to Staatsbankrott. In short, there is no conclusive evidence on whether a government is likely to respond to market signals, or whether it is likely to pursue unsustainable policies until fiscal adjustment is forced by the markets' denying it access to credit.

V. Conclusion

Market discipline means that financial markets can send appropriate signals to prevent a borrower from maintaining an unsustainable path through borrowing. Four general conditions required for market discipline to be effective and to work smoothly: there must be open capital markets; lenders must have good information about the borrower's existing liabilities; there must be no prospect of a bailout; and the borrower must respond to the signals provided by the market. The evidence suggests that these conditions may be met under some, but not all circumstances. The "no bailout" condition appears to be the Achilles' heel of market discipline, particularly because of the difficulty of making a no bailout commitment credible.

Where the conditions for market discipline are not satisfied, there may be a case for direct control or supervision. Here, care must be taken, however, since some of the conditions that undermine market discipline may also thwart direct controls. For example, the kind of government that is likely to be unresponsive to market discipline, persistently incurring unsustainable deficits, and limiting the information available to lenders, is also likely seek ways of avoiding surveillance and circumventing any direct legal limits on its deficits. It is important to remember, for example, that the New York City default of 1974 took place <u>despite</u> a constitutional balanced budget requirement.

Therefore, one must not view coordination, surveillance, and legal restrictions on deficits as an <u>alternative</u> to market discipline as a way of preventing unsustainable policies. Rather, where these non-market mechanisms are needed, they should be <u>complemented</u> by doing what is possible to strengthen market forces (Bishop, Damrau, and Miller, 1989). For example, capital market and capital account restrictions should, where possible, be removed in order to prevent a "captive market" and strengthen the market's role as a disciplining device. The relevant information bearing on a country's credit-worthiness should be disseminated to market participants so that it can be incorporated into market prices. The costs and benefits of a bailout should be evaluated, and, where this is possible, the circumstances under which a bailout would occur, and the scope of such a bailout, should be determined; this should be done with a view to <u>limiting</u> the likelihood and scope of a bailout, and therefore limiting the attendant

moral hazard problems that make it more likely that there would be the occasion for a bailout.

Although one probably cannot rely solely on market forces to prevent unsustainable behavior, the financial markets have the potential to play an important disciplinary role. To the extent that institutions are designed to work with market forces, rather than attempting to suppress them, this is likely to increase their effectiveness, as well as enhancing the efficiency and stability of the financial system.

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