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TO THE NEW INTERNATIONAL
FINANCIAL ARCHITECTURE**

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ABSTRACT

UDROP: A Small Contribution to the New International Financial Architecture*

The purpose of the UDROP proposal is to prevent debt rollover crises for foreign-currency-denominated debt instruments. For such liabilities, there is no international analogue to the domestic lender of last resort or to domestic deposit insurance. UDROP stands for Universal Debt Rollover Option with a Penalty. Our proposal is that all foreign currency loans should have a rollover option attached to them. The 'pure' version of the option would entitle the borrower to extend or rollover his performing debt at maturity for a specified period. The pricing of the option would be left to the contracting parties. A number of variants on the basic version are also considered. These make the individual borrower's ability to exercise his option contingent on the prior declaration of a state of 'disorderly markets', by the national central bank, the International Monetary Fund or an indicator of 'disorderly markets'. All versions of the scheme have the property that no commitment of public money is required, either by national governments or by international agencies such as the IMF or the World Bank.

The UDROP proposal is rule-based and general: it is mandatory for all foreign-currency debt and automatic. That is, it is exercised at the discretion of the borrower. This stands in sharp contrast to the current practice of discretionary and politicised refinancing arrangements cobbled together in an ad-hoc manner on a case-by-case basis by the IMF. UDROP is market-oriented: the terms and conditions on any foreign-currency loan and associated rollover option would be negotiated by the lenders and borrowers.

JEL Classification: F31, F32, F33, F34, G13

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NON-TECHNICAL SUMMARY

Sometimes a solvent borrower with illiquid assets and short-term liabilities faces a liquidity crisis. Consider a bank whose liabilities are convertible on demand into cash and whose assets consist of old-fashioned, non-securitised loans. These loans are all as safe as Fort Knox or the Bank of England, but they have long remaining maturities. As long as most depositors believe that there will not be a run on the bank, there is no reason for any depositor to cash in his deposit and the bank is safe. If, however, a belief arises that enough depositors may withdraw their deposits at short notice, each depositor has an incentive to convert his deposit into cash. In a first-come, first-served environment, where cashable claims exceed the cash in the till, a bank run is the only individually rational response. The bank will fail. This is one reason we have, at the national level, a lender of last resort, deposit insurance, unscheduled bank holidays and other devices aimed at preventing a bank run.

A country with a fixed exchange rate can face the same problem as a bank if its financial sector has a large short-term foreign-currency debt that is not hedged with comparable short-term foreign-currency assets. Imagine an emerging market commercial bank that has borrowed hard currency abroad and made domestic-currency loans. This foreign-currency borrower is solvent and if the short-term debt can be rolled over, it will be serviced in full. But, if its foreign creditors are seized by one of the occasional waves of panic that affect even the doughtiest financiers, the debt rollover will not take place or only on terms little related to the underlying creditworthiness of the borrower. Faced with an urgent need for foreign exchange to repay the maturing short-term debt, the borrower will turn to the central bank. If the value of the maturing debt exceeds the available foreign exchange reserves of the central bank, a foreign exchange crisis results. The local currency plunges, creating an imbalance between foreign-currency liabilities and domestic-currency assets that can wipe out domestic banks' capital. Bank failures may occur and if the government is among the borrowers, it too can default. The crisis spreads to the country's commercial and industrial borrowers. Foreign lenders must write off their loans. If the scale of the problem is large enough, a global financial crisis can ensue.

A foreign-currency version of deposit insurance is not feasible. Domestic deposit insurance is ultimately underwritten by the central bank and the treasury and relies on the central bank's ability to produce the necessary cash to pay off footloose depositors. The deposit insurer, like any lender of last resort, must have deep pockets. Faced with a foreign exchange crisis, a national central bank does not have and cannot borrow the required foreign exchange. Only external entities with full coffers can hope to stop a bank run.

We propose a ***universal debt rollover option with a penalty (UDROP)*** to deal with liquidity crises. All foreign-currency lending must have a rollover option attached to it. This includes private and sovereign, long-term and short-term, marketable and non-marketable debt, including overdrafts and credit lines. This would entitle the borrower, at his sole discretion, to extend maturing debt for a specified period (say three or six months) *at a penalty rate*. The borrower would be entitled to the rollover only if the debt in question had been serviced in full, barring the final repayment. The UDROP would permit no further extensions after the initial rollover. For the scheme to work, the penalty must be large enough to ensure that the borrower would not exercise the rollover option under orderly market conditions. It might be specified as a hefty surcharge on top of the spread over LIBOR that the borrower would normally pay for the currency in question. This 'normal' spread might be computed as a long-run moving average of the actual market spreads.

We expect the penalty spread and other features of the rollover contract, to be negotiated between debtors and creditors, rather than decreed by a government or international body. While borrowers would be obliged to acquire and retain a rollover option for the full face value of the debt, the pricing of these options is up to market participants. One possible pricing structure might be an upfront commitment fee plus a rule for determining the 'penalty spread' over the 'normal spread' on the loan extension if the rollover option is exercised.

The ambitions behind this proposal are modest. It will only be useful when otherwise solvent borrowers are unable to roll over their foreign-currency debt because of a liquidity crisis. It is meant solely to minimise the consequences of disorderly markets. This scheme is ineffective if a debtor (country) is insolvent. In the case of Russia, for example, the government's chronic inability to raise tax revenues commensurate with its spending ambitions, makes our option scheme irrelevant. A country that is able, but unwilling, to service its maturing debt would likewise not be reformed by this scheme. It would roll over its debt at the penalty rate and default at the end of the rollover period. Our proposal only helps when a country is solvent and willing to pay, but is prevented from doing so because international financial and credit markets have a temporary seizure. Korea would have benefited from this scheme. Brazil would be less stressed if its maturing debt had a rollover option attached to it.

The UDROP proposal is only meant to address disorderly market conditions. Large sudden capital inflows or outflows can, even under orderly market conditions, create serious dislocations in the real economy. It does not help countries cope more effectively with overvalued exchange rates and overheating economies, nor does it address the ultimate causes of these common problems.

There are many grander proposals for improving the international financial system. These include proposals for restraining capital flows, either with 'Tobin taxes' or 'Chilean-style' administrative controls and descriptions of mechanisms to facilitate an 'orderly workout' of sovereign debt defaults. Our scheme is compatible with these proposals, but its effectiveness does not depend on their success.

Under the 'pure' version of the scheme, no third party determines whether the conditions for exercising the option have been satisfied. No central bank or national supervisory or regulatory agency nor the International Monetary Fund or any other international financial institution is called upon to judge whether economic and market conditions warrant the exercising of the option. The exercise of the option is at the sole discretion of the borrower. This is attractive because a 'liquidity crisis' is not always verifiable.

We also consider variations on the UDROP proposal where the option cannot be exercised without the prior declaration of a state of disorderly markets by either the relevant central bank, the IMF, or a mechanical 'disorderly markets trigger'. These versions of the scheme retain the attractive property that no commitment of public money is required, either by national governments or by international agencies.

I. Liquidity Crises: the Problem

Sometimes a solvent borrower with illiquid assets and short-term liabilities faces a liquidity crisis.¹ Consider a bank whose liabilities are convertible on demand into cash and whose assets consist of old-fashioned, non-securitised loans. These loans are all as safe as Fort Knox or the Bank of England, but they have long remaining maturities. As long as most depositors believe that there will not be a run on the bank, there is no reason for any depositor to cash in his deposit and the bank is safe. If, however, a belief arises that enough depositors may withdraw their deposits at short notice, each depositor has an incentive to convert his deposit into cash. In a first-come, first-served environment, where cashable claims exceed the cash in the till, a bank run is the only individually rational response. The bank will fail. This is one reason we have, at the national level, a lender of last resort, deposit insurance, unscheduled bank holidays and other devices aimed at preventing a bank run.

A country with a fixed exchange rate can face the same problem as a bank if its financial sector has a large short-term foreign-currency debt that is not hedged with comparable short-term foreign-currency assets.² Imagine an emerging market commercial bank that has borrowed hard currency abroad and made domestic-

¹ The classic paper on bank runs is Diamond and Dybvig [1983]. See also Diamond [1984] and Dybvig [1992]. For international models of self-fulfilling debt crises see Cole and Kehoe [1996] and Krugman [1997].

²For recent reminders see International Monetary Fund [1998], especially Section II, "The Crisis in Emerging Markets" and Section III, "Turbulence in Mature Financial Markets" and Goldstein [1998]. Interesting theoretical models of international contagion and crisis include Caballero and Krishnamurthy [1998], Corsetti, Pesenti and Roubini [1998a], Chang and Velasco [1998a,b], Chan-Lau and Chen [1998], Huang and Xu [1998], Loisel and Martin [1999]. Empirical studies of the most recent crises include Dornbusch, Goldfajn and Valdes [1995], Sachs, Tornell and Velasco [1996], Glick and Rose [1998], Kaminsky and Reinhart [1998], Corsetti, Pesenti and Roubini [1998b] and Eichengreen and Rose [1998]. The role of liquidity is highlighted in Goldfajn and Valdes [1997] and in Demirguç-Kunt and Detragiache [1997].

currency loans. This foreign-currency borrower is solvent and if the short-term debt can be rolled over, it will be serviced in full. But, if its foreign creditors are seized by one of the occasional waves of panic that affect even the doughtiest financiers, the debt rollover will not take place or only on terms little related to the underlying creditworthiness of the borrower. Faced with an urgent need for foreign exchange to repay the maturing short-term debt, the borrower will turn to the central bank. If the value of the maturing debt exceeds the available foreign exchange reserves of the central bank, a foreign exchange crisis results.³ The local currency plunges, creating an imbalance between foreign-currency liabilities and domestic-currency assets that can wipe out domestic banks' capital. Bank failures may occur and if the government is among the borrowers, it too can default. The crisis spreads to the country's commercial and industrial borrowers. Foreign lenders must write off their loans. If the scale of the problem is large enough, a global financial crisis can ensue.

Of course foreign exchange crises can occur without foreign-currency-denominated external loans. Suppose a country has a fixed exchange rate and domestic banks have only home-currency liabilities. If international capital flows are unrestricted, domestic residents can decide to swap their liquid domestic financial assets into foreign exchange. The central bank is stripped of its foreign exchange reserves and must devalue its currency or let it float. However, there are two differences between this and the previous scenario. First, there is no default on external debt and, second, there is no mismatch between foreign-currency liabilities and domestic-currency assets in resident banks' balance sheets. This precludes the defaults and bankruptcies otherwise associated with a currency collapse.

³Including access to borrowed foreign exchange reserves.

Under a floating exchange rate regime, future exchange rates are always uncertain. Sensible and risk averse foreign-currency borrowers take precautions to lower the chances of finding themselves with too large a net short foreign exchange position. However, any open position can turn against a market participant. If the exposure is sufficiently large, this can result in bankruptcy. Supervision and regulation should ensure that the private and social costs and returns to foreign-currency investments are closely matched.

Although banking crises can occur with floating exchange rates, fixed exchange rate regimes may foster a moral hazard problem. In Asia, those who acquired short-term foreign exchange loans assumed that the central bank would underwrite the exchange risk by maintaining the pegged exchange rate.

In principle, central banks can always fight off a speculative attack. All they must do is set overnight and other short-term interest rates high enough to achieve the necessary contraction of domestic credit. The requisite rates depend on the perceived commitment of the central bank, and without credibility they may be very high indeed. For example, a confidently expected 10 percent devaluation of the currency overnight, requires a 10 percent overnight interest rate differential (*at a daily rate*) to discourage speculators. The corresponding annualised rate causes an overflow on most small hand calculators. During the ERM crisis of 1992 - 1993, the central banks of Sweden and Ireland were unable to stave off devaluation even though they set the rates charged by their central banks on overnight reserves at 500 and 300 percent, respectively.⁴

⁴See Buitier, Corsetti and Pesenti [1998a,b].

The political unpopularity of very high rates, and the real economic damage they do to borrowers affected by it, make a policy of defending a fixed exchange rate by interest rate increases '*à l'outrance*' less than fully credible. While there exists an equilibrium where a *credible* peg is defended successfully with relatively low interest rates, the more likely outcome is an unsuccessful attempt to defend an *incredible* peg with very high rates. A few currency pegs, such as the currency boards of Argentina and Hong Kong, have survived. But, for most countries, a currency peg remains a high-risk strategy.

Following the demise of the gold standard after World-War I, righteous academics and self-interested lobbyists recognised the domestic stabilisation role of monetary policy. The notion that monetary policy could be devoted solely to the defence of an exchange rate peg became incredible. During the Bretton Woods era, capital controls were widespread and the vulnerability of currency pegs could be hidden or suppressed for a while. With the nearly unfettered financial capital mobility of today, currency pegs die much more swiftly and spectacularly.

A foreign-currency version of deposit insurance is not feasible. Domestic deposit insurance is ultimately underwritten by the central bank and the treasury and relies on the central bank's ability to produce the necessary cash to pay off footloose depositors. The deposit insurer, like any lender of last resort, must have deep pockets. Faced with a foreign exchange crisis, a national central bank does not have and cannot to borrow the required foreign exchange. Only external entities with full coffers can hope to stop a bank run.

To a small extent, the IMF, other international financial institutions, and the creditor-country governments, have tried to be an international lender of last resort.

They do this either with their own money or by pressuring private financial institutions into involuntary rollovers and other forms of involuntary credit extension.⁵ In the 14 months since the Asian crisis arose, three things have become apparent: first, the G-10s' and multilaterals' pockets are not deep enough; second, their ability or willingness to cajole unwilling creditors into involuntary rollovers is too limited; and third, the adverse selection and moral hazard problems inherent in any conceivable global deposit insurance or lender-of-last-resort arrangement are too severe. Conventional IMF lending, with conditionality and money available only in tranches is inappropriate for dealing with a liquidity crisis.

⁵The truth is not served by the Orwellian practice of calling loans "voluntary" when they are rolled over after arm-twisting by multilateral agencies and G10 governments.

II. UDROP: a Proposal

We propose a *universal debt rollover option with a penalty (UDROP)* to deal with liquidity crises. All foreign-currency lending must have a rollover option attached to it. This includes private and sovereign, long-term and short-term, marketable and non-marketable debt, including overdrafts and credit lines.⁶ This would entitle the borrower, at his sole discretion, to extend maturing debt for a specified period (say three or six months) *at a penalty rate*. The borrower would be entitled to the rollover only if the debt in question had been serviced in full, barring the final repayment. The UDROP would permit no further extensions after the initial rollover. For the scheme to work, the penalty must be large enough to ensure that the borrower would not exercise the rollover option under orderly market conditions. It might be specified as a hefty surcharge on top of the spread over LIBOR that the borrower would normally pay for the currency in question. This ‘normal’ spread might be computed as a long-run moving average of the actual market spreads.

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⁶It is important that the option be for both short and long-term foreign currency debt, because over time over time, long maturities have a habit of becoming short maturities.

⁷This ‘rule’ could of course be as simple as a fixed number.

The ambitions behind this proposal are modest. It will only be useful when otherwise solvent borrowers are unable to roll over their foreign-currency debt because of a liquidity crisis. It is meant solely to minimise the consequences of disorderly markets. This scheme is ineffective if a debtor (country) is insolvent.⁸ In the case of Russia, for example, the government's chronic inability to raise tax revenues commensurate with its spending ambitions, makes our option scheme irrelevant. A country that is able, but unwilling, to service its maturing debt would likewise not be reformed by this scheme. It would roll over its debt at the penalty rate and default at the end of the rollover period. Our proposal only helps when a country is solvent and willing to pay, but is prevented from doing so because international financial and credit markets have a temporary seizure. Korea would have benefited from this scheme. Brazil would be less stressed if its maturing debt had a rollover option attached to it.

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There are many grander proposals for improving the international financial system. These include proposals for restraining capital flows, either with 'Tobin taxes' or 'Chilean-style' administrative controls and descriptions of mechanisms to

⁸ It is a drawback of the proposal that insolvent borrowers can postpone formal default by exercising the rollover option. See Sections III.1 and III.2.

facilitate an ‘orderly workout’ of sovereign debt defaults.⁹ Our scheme is compatible with these proposals, but its effectiveness does not depend on their success.

Under the ‘pure’ version of the scheme, no third party determines whether the conditions for exercising the option have been satisfied. No central bank or national supervisory or regulatory agency nor the International Monetary Fund or any other international financial institution is called upon to judge whether economic and market conditions warrant the exercising of the option. The exercise of the option is at the sole discretion of the borrower. This is attractive because a ‘liquidity crisis’ is not always verifiable.

In Section III.1 we consider variations on the UDROP proposal where the option cannot be exercised without the prior declaration of a state of disorderly markets by either the relevant central bank, the IMF, or a mechanical "disorderly markets trigger". These versions of the scheme retain the attractive property that no commitment of public money is required, either by national governments or by international agencies.

III. UDROP Close Up

In this Section we consider some of the characteristics of the UDROP proposal of Section II in greater detail.

III.1 Why does the roll-over option apply only to foreign-currency liabilities?

There is no lender of last resort for domestic borrowers with foreign-currency liabilities. Our proposal is aimed at filling this gap. For domestic-currency-denominated liabilities, the national central bank is a domestic lender of last resort. It

⁹See Dornbusch [1998] and Fischer et. al. [1998] for a discussion of the former type of plan and Eichengreen and Portes [1995], Sachs [1995, 1996], Kenen [1996], Eichengreen [1998] and Litan [1998] for descriptions of the latter. Eaton [1987, 1989] analyses the welfare costs of capital flight in a second-best world.

can always print any amount of domestic currency to accommodate a sudden surge in demand. In the absence of an international lender of last resort with an unlimited capacity for creating foreign currency, the same does not apply to foreign-currency-denominated liabilities.¹⁰

Applying UDROP only to foreign-currency liabilities creates an additional asymmetry between debtors who differ in the currency in which their debt is denominated.¹¹

Imagine, for example, a bank which has made two loans to domestic residents, one denominated in the domestic currency and one denominated in a foreign currency. If either borrower defaults, the creditor can appeal to the domestic courts and may be able to attach some of the debtor's assets. However, the invocation of default procedures following nonpayment of the loan is immediate in the case of the domestic-currency borrower. In the case of the foreign-currency borrower with UDROP attached, the default procedures are postponed for the duration of the period for which UDROP permits the debt to be rolled over. This need not create a problem, however. Market pricing of the UDROP option will ensure that lenders are indifferent between the two types of loans.

UDROP is not without drawbacks as it may worsen adverse-selection problems in credit markets. An adverse-selection problem may occur when lenders are unable to distinguish between borrowers with different characteristics. For example, some borrowers may be more likely to become insolvent in orderly markets than others and this may not be observable to lenders. If the invocation of the

¹⁰There is of course nothing to stop lenders and borrowers in domestic currency from creating their own, voluntary debt rollover options (VDROP).

¹¹This was pointed out by Bert van Selm during the March 5, 1999 seminar at the Nederlandsche Bank where the UDROP proposal was discussed.

UDROP proposal is at the discretion of borrowers then it can be invoked by insolvent borrowers in orderly markets and well as by fundamentally sound borrowers in disorderly markets. This makes foreign-currency loans with UDROP more attractive to the relatively risky borrowers. If the lenders try to charge a risk premium in the form of a higher penalty rate, then UDROP would become less attractive to the safer borrowers and more attractive to the risky ones. There may be no penalty rate at which lenders want to satisfy foreign-currency loan demand. Adverse selection typically leads to inefficiency.¹²

In Section III.3 we consider mechanisms for minimising the risk of abuse of the option. Even when the exercise of the option is at the sole discretion of the borrower, we believe that the potential for abuse, while real, is unlikely to outweigh the benefits of the proposal. There are two reasons for this.

First, the initiation of legal default proceedings against defaulters on foreign-currency liabilities is postponed for the duration of the rollover (we expect this to be between three and six months), rather than avoided permanently. Second, the lender and the borrower are free to negotiate any terms and conditions for the rollover package. In countries with reasonable debtor-creditor laws, the adverse selection problem may be mitigated with collateral requirements. Lenders can offer both UDROP contracts with high penalty rates and low collateral and UDROP contracts with lower penalty rates and high collateral. Then borrowers will sort themselves by type. Those who

¹²UDROP may also cause moral-hazard problems. Once the option is invoked, borrowers may have an incentive to engage in riskier behaviour than they otherwise would. However, this does not obviously lead to inefficiency. See Besley [1994] and Aizenman [1998] for discussions of adverse-selection and moral-hazard problems in loan markets.

are likely to become insolvent in orderly markets prefer the former contract; those who are unlikely to be insolvent except in disorderly markets prefer the latter.

III.2 Should the option be for one or for multiple roll-overs?

Our proposal is for a mandatory option for one fixed-term rollover only. One could, in principle, envisage a UDROP for a sequence of rollovers, each one at a higher penalty rate than the previous one. There are several reasons for not going this route. First, in the limit it would permit an insolvent borrower (or a borrower who is unwilling to meet the terms of the original debt contract), to engage in what effectively would be Ponzi finance, without the creditor being able to invoke the sanctions of formal default and bankruptcy.¹³ Second, rollover crises tend to be intense but short-lived. A three or six month extension to the original loan should enable the dust to settle.

III.3 Should a party other than the borrower pull the trigger?

In its pure form our proposal envisages calls for the rollover option to be exercised at the sole discretion of the borrower.¹⁴ Wim Boonstra has argued that a possible solution to adverse-selection problems associated with UDROP is to alter the way the option is triggered.¹⁵ The idea is to find a mechanism so that UDROP is exercised only in ‘disorderly market conditions’ rather than in ‘normal’ times.

¹³Consider a sequence of one-period maturity loans. In a Ponzi scheme, the borrower each period borrows an amount at least equal to last period’s principal plus interest due.

¹⁴The ‘European’ option format, according to which an option can be exercised only at a specific date (in our case the expiration date of the original loan contract) seems slightly simpler than the ‘American’ option format, under which the option can be exercised any time before or at a specific date, but no issue of principle is involved.

¹⁵At the March 5, 1999 seminar at the Nederlandsche Bank and in subsequent correspondence.

Boonstra's first proposal involves giving national central banks the power to decide when a liquidity crisis has occurred. The UDROPs can be exercised only after a crunch has been officially declared. We do not believe the central bank should rule on individual cases. The pressure on the central bank to act hastily would preclude the bank from being able to gather sufficient information to do so. It would also create a serious threat of corruption and would encourage wasteful rent-seeking by interested parties.

Even if the central bank remained virtuous and disinterested, its competence in this area can be questioned. In many countries, the central bank is close to being a pure 'monetary authority' with very limited supervisory and regulatory functions. Even when it has significant supervisory and regulatory functions, it is unlikely to have the information necessary to make the 'illiquid' vs. 'insolvent' call with any degree of accuracy. There is also no reason to believe that the most exposed foreign-currency debtors will be central-bank-regulated financial intermediaries. Indeed they may not be classified as financial intermediaries at all.

The allure of the UDROP proposal is that it does not require any intrusive vetting of would-be rollover candidates by some third party. Restricting the role of the central banks to that of determining a state of national disorderly markets might not compromise the strengths of UDROP too much. Note, however, that among the foreign currency debtors who might wish to invoke the rollover option could be a national government or indeed a central bank itself. The potential for abuse of UDROP by the insolvent would therefore not be completely eliminated.

In another version of UDROP, the power to make a determination of disorderly markets (either at the national level or at a wider regional or global level) would rest

with the IMF rather than with central banks. However, one of the strengths of the pure UDROP proposal is that it keeps politically mandated international bureaucrats out of the debt rollover game. Our proposal is rule-based, market-oriented and general. This is at the opposite end of the spectrum from IMF operations, which tend to be discretionary, intensely political and case-by-case. Inevitably, a decision on whether to declare a condition of national disorderly market would be tied up with how happy the IMF felt with a country's general compliance with IMF standards of good behaviour. The experience of the last two decades raises doubts about whether the Fund possesses the expertise, the clout or the political independence to be an effective arbiter.¹⁶

A final restriction on the pure debtor-initiated trigger mechanism, also proposed by Boonstra, would be to base the determination of a condition of national disorderly markets on a mechanical rule, based on observable and 'objective' indicators, rather than on the judgement of a central bank or a multilateral agency. One definition of 'disorderly markets' might be a rapid and large increase in the spread on sovereign debt over the relevant benchmark. Another might be a sufficiently sudden and sizable loss of net foreign exchange reserves. It is essential for this alternative, that the relevant variables are well defined, that they can be measured swiftly and that their values are verifiable. Speed, automaticity, universality and absence of political interference must remain the hallmarks of the UDROP.

III.4 Should the rollover option be mandatory or voluntary?

¹⁶For a more positive view of the IMF's role and performance, see Fischer [1998].

The reason for making the roll-over option mandatory is that rollover risk is not correctly priced in international financial markets. An important reason for this is adverse selection.

Some might object that creditworthy borrowers, unlikely to face a rollover problem, should not be forced to pay for this irrelevant option. In our view, there is a crucial weakness in relying solely on market forces to produce voluntary roll-over schemes (*VDROPS*) or analogous arrangements such as those discussed below.

If borrowers differ in the likelihood that they would invoke the option in times of orderly markets, then safer borrowers might try to signal their type by asking for loans without the rollover option. Refusing the option would become necessary to be judged credit worthy. This could limit or destroy the effectiveness of any voluntary, market-based scheme. This may be the key reason why the reason the markets have not produced any significant amount of *VDROPS*. The negative consequences of adverse selection can be mitigated by mandating. This is well known from other areas of insurance where adverse selection is a problem, such as health insurance. *UDROP* falls squarely in that tradition.

There have already been some plans similar to what we propose. Argentina and Mexico have schemes where the country pays a commitment fee to foreign banks in return for the right to draw upon a foreign-currency facility over a specified time period. This is similar to a foreign-currency overdraft facility or credit line and is a (voluntary) option to borrow foreign currency.¹⁷ The Argentine central bank and a

¹⁷ From Eichengreen [1998], we quote the following information on these credit lines. Argentina agreed a contingent repurchase facility with 13 commercial banks, which provides for \$ 7 billion in standby credits. Mexico has an arrangement with 31 commercial banks which provides for \$ 2.5 billion in facilities. The Argentine Central Bank can swap Argentine Government securities for U.S. dollars up to the specified ceiling, at an effective

group of 14 international banks agreed upon a Contingent Repo Program. This gives the central bank the option to sell certain domestic assets for US dollars subject to a repurchase clause. In 1995, Mexico arranged a contingent-loan facility with a group of international banks. Indonesia arranged stand-by facilities three times during the period 1995-1997 and made drawings totalling \$1.5 billion on two occasions.

In a similar spirit, in May 1998 the Shadow Financial Regulatory Committee proposed that a *haircut* be imposed on foreign-currency creditors who refuse to roll over their loans to countries who have been granted IMF emergency lending.¹⁸ IMF emergency lending should be made conditional on borrowing countries having a mechanism that imposes a financial penalty (the *haircut*) on creditors who refuse to roll over their credit. The haircut does not apply if the creditors roll over their loans at no higher rate of interest until the IMF loan is paid back. We view this proposal as inadequate for dealing with liquidity crises that often erupt with very little notice. If one had to wait until an IMF loan (presumably with an IMF program and associated conditionality attached) was agreed, the damage would already be done. The rollover mechanism has to be automatic. It should be activated at the discretion of the borrower, without any need for time-consuming interventions and assessments by international agencies or national central banks. The pure UDROP proposal satisfies these criteria. The UDROP with central bank determination of national disorderly market conditions comes close.

interest rate of Libor plus 205 basis points. The commitment fee is 33 basis points. Loan length is two to five years, depending on the commercial bank involved. These agreements omit the no-adverse-material-change clause that would otherwise permit banks to back out of their agreement in the event of a crisis.

¹⁸See Litan [1998].

The main problem with these voluntary rollover facilities or credit lines is that they are few and far between. Where they have been arranged, they have covered only a small fraction of the foreign-currency debt potentially subject to rollover problems. No doubt the adverse selection problem already referred to is one cause for the market's under-provision of rollover insurance.

It is easy to overstate the cost of our scheme to credit-worthy borrowers (and even to those who are both credit worthy and confident of never being caught in a rollover crunch). Creditworthy borrowers who are perceived as certain never to exercise the rollover option would not be hurt by the obligation to buy it. An option that will never be exercised has a price of zero. Of course, a borrower's credit worthiness may be his private information, but as we mentioned before, if a country has sensible debtor-creditor laws and an efficient judicial system, collateral may be used to overcome the associated adverse-selection problem. If some countries' country's legal systems are inefficient, we consider the costs due to adverse selection to be a price worth paying if the alternative is the unnecessary liquidity crunches that periodically damage the world economy.

The introduction of UDROPs is likely to discourage some intermediation and we believe this is a good thing. If there is considerable nervousness about the possibility of an international credit crunch, rollover options would be expensive. This would discourage inappropriate intermediation that might have occurred if market participants had not been forced to take a hard look at the risks.

III.5 How can we put the U in UDROP?

If it is indeed desirable that the rollover option be universal, how could it be made legally so? The legal issue could be resolved at the national level if

governments were to declare any foreign-currency debt contracts without a rollover option to be illegal, and non-enforceable. To encourage countries to impose such a legal clause, the IMF could refuse assistance to countries not requiring UDROP. Even better would be an agreement among all IMF members that foreign currency-debt contracts without the option would be unenforceable in any member's courts.

III.6 Could the rollover option be strippable?

While under our proposal every foreign-currency loan would come with a rollover option, it might be efficient to allow the option to be stripped from the associated debt and to be traded separately. While borrowers would not be permitted to sell the right to roll over their debt, the obligation to provide the funds to finance the rollover could be traded by the creditor (either the original creditor or the party to whom the debt instrument has subsequently been sold).

We believe it to be essential that the creditor at the moment the option is exercised, is also the party that has the obligation to roll over the debt. This would ensure that, as far as a debtor caught in a rollover crisis is concerned, the funds to finance the rollover would indeed be there: the maturity of the existing debt would simply be extended. The creditors could, however, avail themselves of private rollover re-insurance. There is no compelling reason for insisting that lending and insurance be provided by the same financial intermediary, as long as it is clear that, should the counterparty in the re-insurance market fail, the obligation to roll over the debt stays with (or reverts to) the party who is the creditor at the moment the option is exercised. UDROP might be ineffective if borrowers had to chase down the purchaser of the option to receive an extension.

Unbundling the loan and the rollover option has two interesting potential consequences. The first is that the borrower, while dutifully holding the rollover option on his debt (that is, holding a long position in rollovers bundled with his debt), could, if rollover options were created and traded separately, go short in the unbundled rollover option (or write such options himself), thus ending up with a zero or even a negative net rollover position. This would not be a problem for UDROP as long as the rollover option is specific: an obligation to roll over, at a specific date, a given amount of foreign currency debt issued by a specific, named borrower.

We are in favour of voluntary rollover insurance, in addition to the mandated roll-over insurance embodied in UDROP. The adverse selection argument for mandating rollover insurance (based on the belief that not demanding the rollover option would be used as a signal of superior creditworthiness) does not apply to trading in unbundled or general roll-over options as long as, as far as the foreign currency debtor is concerned, the original debt obligation remains bundled with a roll-over option for the full face value of the debt at maturity. The original bundled option ensures that the creditor cannot compel the debtor to repay a specific loan at maturity. That feature survives intact regardless of the amount of additional, general, rollover insurance that is written, as long as it is contractually unambiguously clear that a particular loan (or other debt instrument) can only have one rollover option attached to it.

The second consequence, already referred to, is that, if the option is unbundled and sold separately, additional counterparty risk could interfere with the ability of the borrower to exercise the option, if the party to whom the roll-over obligation has been

sold were to default.¹⁹ The solution to this second potential problem would be to make it contractually clear, that it is the holder of the foreign currency credit at the time the option is exercised, who is obliged to roll over the debt. It would be the responsibility of that creditor to try and re-claim the rollover from the party that has written the roll-over option, or to whom the rollover obligation has subsequently been traded.

We agree that the rollover option should be an integral part of the loan and that the creditor at the moment the option is exercised must be obliged to provide the extension if the option is exercised. Subject to that, the option could be stripped and traded, with market participants effectively creating a reinsurance market to spread the risk of UDROPs being exercised.

III.7 Introducing UDROP

It will probably be necessary to ‘grandfather’ existing foreign-currency loans that do not have a rollover option attached. UDROPs would then be required only for new foreign currency borrowing. As long as the stock of outstanding foreign-currency debt without a rollover option is significant, some liquidity crisis risk will remain. As time passes and outstanding foreign-currency loans without UDROP mature, this risk will dwindle.

IV. Conclusion

UDROP is meant to address the situation where a large number of people all try to leave a room simultaneously through a small door, hotly

¹⁹We are grateful to Wim Boonstra and Han de Jong for this point.

pursuing of a limited number of prizes that will be handed out on a first-come, first-served basis. If it works as we expect it to, it will not only allow the system to cope better with a roll-over crisis when one occurs, it will also reduce the likelihood and incidence of such crises.

The UDROP proposal is market friendly and does not involve large administrative, regulatory and enforcement costs. There is no need for an independent agency to monitor any ‘trigger’ that would allow the borrower to exercise the option. The option can be exercised by the borrower when his original loan expires, under any conditions. The penalty ensures that under normal market conditions, no borrower would choose to exercise the option. It does not require any commitment of public (bilateral or multilateral) money.

An added benefit of the options is that it would force the market participants, who have to price these options, to pay serious attention to the prospects of liquidity crises. The mandatory rollover option would force all market participants to assess and price these risks. The pricing, under orderly market conditions, of instruments for dealing with disorderly market conditions will no doubt always be an imperfect science. The cost of not having this international liquidity insurance in place is however, too high to tolerate.

In the past few centuries, financial markets have fluctuated unpredictably between periods of orderly market conditions and episodes where herd instinct and collective panic ruled the roost, liquidity dried up, collateral vanished and asset values collapsed. The harm inflicted on the real economy by such liquidity crises has been out of proportion to the cost of forcing all international financial market players to add UDROPs to foreign currency lending and borrowing.

Professors Merton and Scholes, who may have time on their hands, can derive formulae for pricing these options, bundled or unbundled. Options traders can deal in them. More important, it would make a contribution to global financial stability. The alternatives are continued financial instability, capital controls, foreign exchange controls, taxes on international capital flows and other costly and inefficient interventions, that invite evasion and corruption. It seems worth a try.

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