Debt relief, growth and price stability in Mexico

Beatriz Armendáriz de Aghion b,*, Patricia Armendáriz de Hinestrosa b

a The London School of Economics, Houghton Street, London WC2A 2AE, UK
b Comisión Nacional Bancaria, Mexico City, Mexico

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Abstract

Inspired by the negotiation of the foreign debt of Mexico in 1989 this paper provides a framework to show that, prior to debt relief, an LDC government which is indebted both domestically and externally has an additional incentive not to default on its external obligations. However, repayment of the external debt is shown to involve a delicate tradeoff between growth and inflation: on the one hand the government increases its ability to keep domestic interest rates relatively low thereby promoting investment and growth; on the other hand the government worsens the budget-deficit problem thereby introducing additional inflationary pressures. The way to improve this tradeoff is by negotiating a debt relief operation on the foreign debt.

JEL classification: F34; O11; O16

Keywords: Debt-relief; Risk-premium; Inflation; Stabilization; Growth

1. Introduction

In April 1989 Mexico successfully negotiated a debt-relief package with its foreign creditors, with an immediate impact on domestic interest rates which fell by approximately 35 percentage points. In turn, such a sharp fall in interest rates had an undeniable positive effect on growth, and it reduced the size of the secondary deficit thereby inducing price stability.
Possibly because Mexico was the first beneficiary in a long list of less developed countries (LDCs) qualifying for debt relief under the so-called Brady plan,\(^1\) such positive effects have been widely acknowledged by the press, government officials and economists alike (see, notably, Van Wijnbergen (1991) and Ortiz (1991)). To most observers, the positive effects of debt relief have two distinct explanations: one is the debt-overhang explanation — which had already been pointed out long before the Mexican debt-relief operation, notably by Krugman (1988),\(^2\) and the other is the reduction-of-uncertainty explanation — evidenced by the sudden fall in domestic interest rates. This distinction has prompted a number of empirical studies (see, notably Claessens et al., 1994) suggesting that the latter explanation had indeed been underestimated.

This paper can be viewed as a first attempt at formalizing the reduction-of-uncertainty explanation. More precisely, using a signalling argument à la Spence (1973) we show that an LDC government which is indebted both externally and domestically has an additional incentive not to default on its external obligations. However, repayment of the external debt is shown to involve a delicate tradeoff between growth and inflation: on the one hand, the government increases its ability to keep domestic interest rates relatively low thereby promoting investment and growth; on the other hand the government worsens the budget-deficit problem thereby introducing additional inflationary pressures. A way to improve this tradeoff is by negotiating a debt relief operation on the external debt.

Previous analytical work on growth and stabilization in the LDCs has failed to establish an explicit link between the external and the domestic debt.\(^3\) One notable exception is Calvo (1988). In his model, a default on the external debt by an LDC government is viewed as a transfer of resources from foreign creditors to domestic creditors. Domestic creditors then expect to be reimbursed with a higher probability and thus require a lower premium to hold domestic government debt. However, Calvo’s (1988) model remains unsatisfactory in one important respect: it does not explain why the Mexican government, like several other LDC governments after it, would seek a negotiated debt-relief settlement instead of opting for a more drastic foreign debt reduction as triggered by a (unilateral) default.

In this paper we argue that the main reason why Calvo’s (1988) predictions are

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\(^{1}\) This plan was launched in March 1989 by the US Treasury Secretary Nicholas Brady. It calls for the reduction of the external debt of middle-income countries through the use of international resources for "enhancement" collateral on the replacement of debt instruments. (See Van Wijnbergen, 1991.)

\(^{2}\) This explanation is based on the following (incentive) argument: by being granted debt relief an LDC government has an incentive to improve its economic performance since it knows that any additional benefit (from an improved performance) will no longer accrue (entirely) to the creditors but to the country itself.

\(^{3}\) What we do find, however, is a growing number of descriptive contributions suggesting that debt relief could help to enhance credibility in the stabilization program. (See, for example, Dornbusch (1988), Ortiz (1991), and Van Wijnbergen (1991) for the particular case of Mexico.)
Table 1

Ex-ante and ex-post real interest rates and secondary deficit in Mexico (1985–1990)

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ex-ante real a</td>
<td>16.55</td>
<td>20.90</td>
<td>18.77</td>
<td>24.10</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Ex-post real b</td>
<td>−42.50</td>
<td>−71.14</td>
<td>52.00</td>
<td>44.07</td>
<td>14.87</td>
<td>16.23</td>
</tr>
<tr>
<td>Secondary deficit (% GDP) c</td>
<td>0.8</td>
<td>2.4</td>
<td>−1.8</td>
<td>3.5</td>
<td>1.7</td>
<td>−1.8</td>
</tr>
</tbody>
</table>

b Ex-post interest rates of yearly average CETES. Source: Banamex.

potentially misleading is because debt relief operations are viewed as a purely resource-saving operation. What we show on the contrary is that foreign debt reduction through a (unilateral) default should be dominated by negotiated debt relief operations in lending support to an LDC government’s efforts to bring the economy to a high growth–low inflation equilibrium.

The structure the paper is as follows: In Section 2 we motivate our analysis by providing a brief account of the 1989 debt reduction agreement between Mexico and its foreign creditors. We then introduce the basic (signalling) framework in Section 3, and we extend the model in Section 4 to account for the potential benefits of debt relief operations on growth and stabilization. Finally, we spell out some concluding remarks in Section 5.

2. Mexico before and after debt relief

In December 1987 a harsh (heterodox) stabilization programme was started in Mexico. The programme was introduced by a team of Mexican officials with an outstanding background in economics. Yet, uncertainty about whether stabilization was going to last kept real interest rates high. As we show in Table 1 such (ex-ante) rates increased from 18.77 in 1987 to 24.10 in 1988. This had a drastic impact on the secondary deficit which in 1988 was at a five-year high reaching 3.5 percent of GDP.

In the midst of stabilization and under the Brady plan, in April 1989, Mexico negotiated a debt relief package with its external creditors. In a manner that could accommodate all parties involved with the plan’s main principle, namely, that of debt-service reduction, the external creditors of Mexico were given the choice between the following three options: (a) exchange their original claims against

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4 See Aspe (1993) for a detailed account of the stabilization program itself.
5 See footnote 1 above
new bonds at a floating LIBOR rate but with principal reduced by 35 percent of original face value; (b) exchange their original claims against new bonds paying a fixed (6.25 percent) interest rate; and (c) keep their original claims but provide new money equivalent to 25 percent of the amount brought under this option. Nearly half the creditors favoured the first option, over one third the second, and a relatively small fraction the third. This debt-relief operation amounted to approximately 30 percent of the Mexican foreign debt (or some $13 billion of the $48.9 billion included in the negotiations). In terms of resource transfers, which represented some 5.5 percent of annual GDP in 1982–1988, the debt relief operation was estimated to have reduced such transfers approximately to 2.4 percent for the period 1989–1992 (Ortiz, 1991). Table 2 replicates the resource transfers savings implied by debt relief as estimated by Mexican officials.

The amount of debt relief granted to Mexico was rather low, particularly when one compares it to historical standards. To most observers, however, the main impact of debt relief was on interest rates (see, notably Claessens et al. (1994)). When the debt reduction agreement was announced in April 1989 interest rates collapsed. T-bills, in particular fell by 14 to 19 percentage points. When the agreement was signed in early 1990 they again started a steady downward trend. Overall, by December 1990 interest rates were around 30 percentage points below when compared to the period prior to the agreement. With regards to real rates,
Fig. 1 shows the behaviour of both ex-ante and ex-post real interest rates. These fell by 35 percentage points following the announcement of the agreement and reassumed a steady downward trend after the agreement was signed.

On the other hand the (post debt-relief) growth rate increased to approximately 3.3 percent in 1989 and then to 4.4 percent in 1990 when it reached a ten-year record (see Table 3). Although other considerations can potentially account for such a high rate of growth, the impact of debt relief is undeniable. Both because relatively lower transfer of resources and, more importantly, because it implied substantially lower interest rates. Moreover, the stabilization programme itself benefited from the lower interest rates as these implied a lower operational deficit. The gains in stabilization were remarkable: as shown in Table 3 the inflation rate fell from 114.2 percent in 1988 to 20 percent in 1989, and price volatility was brought down from 2.5 in 1988 to 1.4 in 1989.

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10 Notably progress on the stabilization front and continuation of structural reform.
11 Particularly because Mexico did not default on its external debt throughout the eight-year period prior to debt relief.
12 Van Wijnbergen (1991) has estimated Mexico’s prospective growth rate following debt relief to have increased over the 1990–1994 period by approximately 2 percentage points annually. Of this amount, he argues, one half comes from the direct effect of resource transfer alleviation, and the other half comes from the ‘indirect’ effects, and in particular from the lower interest rate and higher investment.
13 As a matter of fact, the operational component of the government deficit improved from a deficit of 3.5 percentage points in 1988 to a surplus of 1.8 percent in 1990 (See Table 1).
Table 3

GDP growth and inflation in Mexico (1985–1990)

<table>
<thead>
<tr>
<th>Year</th>
<th>GDP growth (real)</th>
<th>Inflation</th>
<th>Price volatility</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985</td>
<td>2.6</td>
<td>57.8</td>
<td>3.9</td>
</tr>
<tr>
<td>1986</td>
<td>-3.8</td>
<td>86.2</td>
<td>5.9</td>
</tr>
<tr>
<td>1987</td>
<td>1.9</td>
<td>131.8</td>
<td>8.3</td>
</tr>
<tr>
<td>1988</td>
<td>1.2</td>
<td>114.2</td>
<td>2.5</td>
</tr>
<tr>
<td>1989</td>
<td>3.3</td>
<td>20.0</td>
<td>1.4</td>
</tr>
<tr>
<td>1990</td>
<td>4.4</td>
<td>26.7</td>
<td>1.9</td>
</tr>
</tbody>
</table>

\(^{a}\) CPI. Accumulated monthly inflation rate, Jan–Dec of each year.

\(^{b}\) Yearly average percent variation in CPI from month to month.

Source: Banco de México

The above stylized facts on the Mexican debt-relief operation and its impact on growth and price stability motivate the following model.

3. The model

Consider a two-period economy, \( T = 1,2 \), with identical consumers and a government. Each (representative) consumer at period \( T = 1 \) has an initial endowment, \( y \), expressed in units of output, which he can either consume or invest. There are two investment opportunities: in real assets, \( k \), which yield \( 1 + r \) units of output in period 2, where \( r \) denotes the real interest rate; or in domestic government bonds, \( b \), which yield \((1 + i)(1 - \theta(b))/1 + \pi^*\) units of output in period 2. \( i \) denotes the nominal interest rate, \( \pi^* \) is expected inflation, and \( \theta(b) \) represents a portion of domestic government debt which is expected to be repudiated. \(^{14}\) Arbitrage between real assets and government bonds requires that the rate of return on both these assets be equalized, that is, \(^{15}\)

\[
1 + r = \frac{(1 + i)(1 - \frac{\theta(b)}{\pi^*})}{1 + \pi^*}
\]

(1)

which, for simplicity can be approximated as follows:

\[
i(b) = r + \pi^* + \theta(b), \quad i'(b) > 0, \theta'(b) > 0.
\]

(2)

Eq. (2) captures the following idea: bond financing can potentially increase the probability of default, \( \theta(b) \). This in turn raises the nominal interest rate, \( i(b) \), and thus crowds out investment (in the first period).

\(^{14}\) This possibility cannot be ruled out when, in particular, a country is unable to raise the required tax revenue (see, for example, Ize and Ortiz (1987)), and/or when repaying the debt by creating money involves (high) inflation costs. Historically, defaults on domestic debt have been observed in, for example, the stabilization programs in Argentina under President Menem in 1989, and in Brazil under President Collor in 1989 (see Cardoso and Helwege, 1992).

\(^{15}\) Eq. (1) is an amended version of the Fisher equation to account for the possibility that the government defaults on its domestic debt.
There is no investment in the second period, that is, we suppose that at period 2 returns from previous period investments are realized and that these are consumed. The government at period 1, on the other hand, has the following (inter-temporal) budget constraint:

\[
g(1 + i(b)) + d - t = \Delta m + \Delta b, \tag{3}
\]

where \(g(1 + i(b))\) is (per capita) government spending (including current spending on domestic debt services), \(d\) is (per capita) government debt owed to external creditors, and \(t\) is the expected (per capita) tax revenue from consumers’ investment returns in real assets.\(^\text{16}\) The RHS of (3) shows the way the government finances its deficit, namely through a combination of money creation, \(\Delta m\), and through the issue of new bonds, \(\Delta b\). Both \(\Delta m\) and \(\Delta b\) are expressed in per capita terms.\(^\text{17}\) Specifically, (2) says that current expenditures, \(g(1 + i(b)) + d\), are financed through a combination of money creation and bonds; and that future expenditures, e.g., domestic debt repayments in period 2, are financed through the second-period taxation of real assets.\(^\text{18}\) We know by (2) that bond financing raises the interest rate. Money financing, on the other hand, raises the (expected) inflation rate:

\[
\pi^e = \frac{\Delta m}{m_1} = \frac{m_2 - m_1}{m_1} = \frac{g(1 + i(b)) + d - t^* - b}{m_1}. \tag{4}
\]

We suppose asymmetric information on the tax revenues. Specifically, we suppose \(t\) is private information. That is, the government is assumed to be better informed than the consumers about the size of the tax revenue, \(t\), expected to be raised in period 2.\(^\text{19}\) Moreover, we will consider the case where, due to the above informational asymmetry, the government’s external-debt repayment may convey

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\(\text{16}\) To make the model as simple as possible we suppose taxation is non-distortory.

\(\text{17}\) Notice that this government cannot finance the deficit by borrowing in the international capital markets. This captures well the reality of the Latin American countries in the 1980s.

\(\text{18}\) In particular, we are making the simplifying assumption that the external debt is to be repaid/defaulted upon before the domestic debt. To make the model more realistic we could have referred to external debt service obligations instead, but this would only have complicated the notation without actually altering our main results in any significant manner. It is not difficult for anyone familiar with the LDC debt crisis to see how such an assumption can be justified. Typically, LDCs throughout the 1980s could no longer borrow abroad to finance government expenditures, and whenever a decision had to be taken regarding the external debt inherited from the past, governments already had an outstanding domestic debt which they had issued at a floating interest rate and/or would systematically issue new bonds to finance government expenditures (including external debt services). In either case a domestic debt (in some instances very large, indeed) would be outstanding after any decision had been taken regarding the external debt.

\(\text{19}\) This assumption is not difficult to justify. In most LDCs (and in industrialized countries too) tax revenues may be ex-post public information, but ex-ante government officials surely have a better estimate. The important point to note thus is that it is asymmetric information on the expected (not the actual) size of the deficit the main assumption which is driving the paper’s main results.
information about the size of the tax revenue, and, in turn, about the size of the deficit. That is, we explore the possibility of a separating equilibrium to exist.\textsuperscript{20} In such an equilibrium, as described below, repayment of the external debt is shown to involve a delicate tradeoff between growth and inflation: on the one hand the government increases its ability to keep domestic interest rates relatively low thereby promoting investment and growth; on the other hand the government worsens the budget-deficit problem thereby introducing additional inflationary pressures. Specifically we suppose the government’s objective function is

\[
\max_b \{ k(i(b)) - c(\pi^s) \}
\]

s.t. (3) and (4).

In words: the government maximises investment returns of a representative consumer, \( k(i(b)) \), net of (per capita) inflation costs, \( c(\pi^s) \), subject to (3) and (4).

The timing of the model is as set out in Fig. 2.\textsuperscript{22}

We now proceed to solving the above signalling model. Instead of considering all possible equilibria we will focus on a separating equilibrium. By separating equilibrium we mean an equilibrium where the government’s repayment strategy fully reveals information about its type. I.e., if the government repays it will signal itself as a \( t \)-type and if it defaults it will signal itself as a \( t \)-type. More formally, we define a separating equilibrium as a triplet \((\mu, \bar{s}, c)\), where \( \mu \) denotes the consumers’ beliefs and \( \bar{s} \) (resp. \( c \)) denotes the \( t \)-government’s (resp. \( t \)-government’s) repayment strategy, such that (a) \( \mu \) is Bayes-consistent with \((\bar{s}, c)\)

\[ T = 1 \quad \downarrow \quad T = 2 \]

\begin{align*}
\text{External debt repayment} & \quad \text{Tax revenues collected and domestic debt repaid} \\
\text{decision and bond/money} & \quad \text{financing decision.} \\
\end{align*}

Fig. 2. The timing.

\textsuperscript{20} As a first approximation to see how this possibility could emerge, it may be useful to illustrate some common perceptions: a government’s debt-repayment policy is likely to signal compliance with IMF conditionality, and, thus, consumers may expect that the government deficit will be relatively small; and a government’s non-repayment (or default) policy may signal non-compliance with IMF conditionality, and thus, consumers may expect that the government deficit will be relatively large. We show below that a separating equilibrium like the one just described, exists.

\textsuperscript{21} Notice that, for simplicity, we are (implicitly) assuming that the consumers’ discount factor is sufficiently high (i.e. close to one) that consumers are perfectly happy to substitute consumption in period 1 for consumption in period 2. One can easily verify that our results will carry over to the case where the consumers’ discount factor is less than one.

\textsuperscript{22} See footnote 18 above.
such that 3 = repayment and s = default; and μ is such that μ(repayment) = \( \bar{t}_i \) and μ(default) = \( t_i \).

Clearly, such an equilibrium will not always exist. In particular, both for sufficiently large and for sufficiently small values of the parameter d a pooling instead of separating equilibrium is obtained. The reason is straightforward: suppose d is sufficiently large. Then, a default decision does not convey information about the (expected) tax revenue to the consumers since both a \( \bar{t}_i \) - and a \( t_i \)-government default. And similarly, when d is sufficiently small, a repayment decision does not convey any information about the (expected) tax revenue either since both a \( \bar{t}_i \) - and a \( t_i \)-government systematically repay. Let us now explore the possibility of a separating equilibrium to exist (for intermediate values of d). More formally, we shall consider first the case of a \( \bar{t}_i \)-government and solve the model by backward induction. Specifically, if the government repays consumers update their beliefs and ask for a lower interest rate, \( \bar{t}_i(b) \), to hold domestic government debt; and by repaying the government in this case gets:

\[
\max_b \left\{ k(\bar{t}_i(b)) - c \frac{g(1+\bar{t}_i(b)) + d - \bar{t}_i - b)}{m_1} \right\}. \tag{6}
\]

If, on the other hand, the government defaults consumers will update their beliefs and ask for a higher interest rate, \( t_i(b) \), to hold domestic government debt. Thus, by defaulting the government gets

\[
\max_b \left\{ k(t_i(b)) - c \frac{g(1+t_i(b)) - \bar{t}_i - b)}{m_1} \right\}, \tag{7}
\]

where

\[
t_i(b) - \bar{t}_i(b) = \frac{\bar{t}_i - \bar{t}_i - d}{m_1 - g} \tag{8}
\]

by substitution of (3) into (2).

\[23\] In this case consumers are unable to distinguish whether the government defaults because its external debt is very large indeed or because the tax revenue is expected to be small.

\[24\] In this case consumers are unable to distinguish whether the government repays because its external debt is very small indeed or because the tax revenue is expected to be large.

\[25\] Specifically:

\[
\bar{t}(b) = r + \Pi^* + \theta(b) = t_i(b) - \Pi^*(b) - \Pi^*(b)
\]

\[= t_i(b) - \bar{t}_i(b) = \left[ (g(1+t_i(b)) - \bar{t}_i - b)/m_1 - \left( (g(1+t_i(b)) + d - \bar{t}_i - b)/m_1 \right) \right]
\]

\[= t_i(b) - \bar{t}_i(b) = \left[ (i - \bar{t}_i - d)/(m_1 - g) \right].
\]
A sufficient condition for a \( t \)-government to repay will thus be that (for all \( b \)):

\[
\begin{align*}
\frac{k(\hat{i}_t(b))}{m_1} - c \frac{(g(1 + \hat{i}_t(b)) + d - \hat{i} - b)}{m_1} \\
> \frac{k(\hat{i}_d(b))}{m_1} - c \frac{(g(1 + \hat{i}_d(b)) - \hat{i} - b)}{m_1}
\end{align*}
\]

(9)

And the effects of repaying the external debt by a \( t \)-government when the above condition is satisfied, e.g., for intermediate values of \( d \), is depicted in Fig. 3.

The \( i \) - and \( \pi \)-schedules in Fig. 3, respectively, show the relationship between the nominal interest rate and the inflation rate as described by (2) and (4). Both schedules are drawn for a given (optimally chosen) quantity of government bonds. When a \( t \)-type government decides to repay, due to the signalling effect the \( i \)-schedule shifts downwards; and due to the resource transfer effect the \( \pi \)-schedule shifts to the right. 26 The shifting of both these schedules will therefore take us from a point like \( E_0 \) to a point like \( E_1 \) in Fig. 3. That is, a repayment strategy involves a relatively lower interest rate and a relatively higher inflation rate.

Clearly, condition (9) will be violated for \( d \) sufficiently large. This is because a repayment policy in this case involves a large ‘resource-transfer effect’ which is not offset by a (positive) ‘signalling effect’.

We should note, however, that condition (9) is not sufficient for a separating equilibrium to exist. We require something else: we need that, for the same value of the parameters \( d, \hat{i}, \hat{i}, \) and \( g \), a \( t \)-government decides to default. Again, to

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26 The relative magnitude of these shifts will depend both upon the sensitivity of the interest rate to the government’s external debt policy, and on the size of the external debt transfer.
analyse how this possibility can arise we reason by backward induction: if a \( t \)-government repays, consumers update their beliefs and ask for \( \hat{i}_c(b) \) to hold domestic government debt, and what the \( t \)-government gets is

\[
\max_b \left( k(\hat{i}_c(b)) - c \frac{g(1 + \hat{i}_c(b)) + d - t - b}{m_1} \right),
\]

and if it defaults consumers will ask for \( \hat{i}_d(b) \) and the \( t \)-government gets

\[
\max_b \left( k(\hat{i}_d(b)) - c \frac{g(1 + \hat{i}_d(b)) - t - b}{m_1} \right).
\]

A sufficient condition for a \( t \)-government to decide to default is that, for all \( b \),

\[
k(\hat{i}_d(b)) - c \frac{g(1 + \hat{i}_d(b)) - t - b}{m_1} > k(\hat{i}_c(b)) - c \frac{g(1 + \hat{i}_c(b)) + d - t - b}{m_1}.
\]

The effects of a default by a \( t \)-government on interest rates and inflation are shown in Fig. 4. Typically, such a government will experience a positive resource-transfer effect and an adverse signalling effect; and both of these combined will lead to a relatively lower inflation rate and a relatively higher interest rate. That is, in terms of the diagram the post-default inflation and interest rates will be at a point to the north-west of \( E_0 \) such as \( E_1 \).

Clearly, condition (12) – and more generally the inequality (11) > (10), would be violated for \( d \) sufficiently small because the (adverse) signalling effect will offset the (positive) resource-saving effect. Therefore, it is only for intermediate
values of \( d \) that we can expect a separating equilibrium to exist; and a sufficient condition is that both inequalities (9) and (12) are satisfied. Specifically, for a separating equilibrium to exist the following is required:

\[
-c \frac{(g(1 + \hat{\iota}_d(b)) - \hat{i} - b)}{m_1} + c \frac{(g(1 + \hat{\iota}_d(b)) + d - \hat{i} - b)}{m_1} > k(\hat{i}_d(b)) - k(\hat{\iota}_d(b))
\]

\[
> -c \frac{(g(1 + \hat{\iota}_d(b) - \hat{i} - b)}{m_1} + c \frac{(g(1 + \hat{\iota}_d(b) + d - \hat{i} - b)}{m_1},
\]

which clearly holds only when the cost function is sufficiently convex. That is, only in this case a \( t \)-government defaults, because inflation costs will otherwise raise too quickly; and the \( i \)-government repays because a relatively small increase in the inflation cost will be offset by a relatively large reduction in the interest rate. This result can now be summarized in the following:

**Proposition 1.** For \( d \) neither too large nor too small and for inflation costs which are sufficiently convex, there exists a separating equilibrium where a \( i \)-government repays and a \( t \)-government defaults.

Clearly, once signalling considerations are taken into account, by deciding to repay the external debt an LDC government can potentially promote investment and growth but at the expense of relatively high inflation; and by deciding to default it can achieve a relatively low inflation rate but will retard growth.\(^{27}\)

4. Debit relief

The idea that debt relief can potentially lend support to an LDC government's efforts to promote growth with price stability has been around for some time now.\(^{28}\) Yet, never has the evidence been so striking as in the case of Mexico where, as argued in Section 2, the debt relief operation was a crucial component of the period of growth and price stability that followed.\(^{29}\)

\(^{27}\) Note that one can easily show that the above tradeoff will arise in a more general signalling framework which is beyond the scope of this paper. Suppose, for example, the external debt is sufficiently small. Then, by repaying there is no positive signalling effect (i.e. this would be a pooling equilibrium) but the transferring of resources abroad can potentially raise both inflation and interest rates. We explore another pooling equilibrium situation below.


\(^{29}\) For more in support of this view, see Ortiz (1991).
This section will therefore extend our basic set-up of Section 3 to account for the Mexican debt relief experience. As illustrated in Fig. 5 the most likely effect of debt relief is to eliminate residual uncertainty about the government deficit. In other words, separating equilibria are likely to be eliminated because, by repaying a sufficiently low level of external debt the government does not convey any information about the (expected) tax revenue, and thus about the deficit. Hence the \( i \)-schedule remains unaltered. At the same time, due to a (positive) resource-saving effect, the \( II \)-schedule shifts leftwards. The final equilibrium is at \( E_1 \) where both the interest rate and the inflation rate have fallen.

Clearly, after debt relief the government will not default for the following reason: if it defaults on a sufficiently small debt the (adverse) signalling effect will come into play, thereby raising interest rates, and retarding investment and growth (e.g., the \( i \)-schedule would shift upwards). And this may in turn explain why creditors may be willing to grant debt relief in the first place!  

5. Concluding remarks

LDCs have experienced debt crises before, yet never as in the 1980s have their external debts interfered so evidently with efforts to bring inflation down and grow out of recession. We have argued first that any resource-transfer saving involved in an LDC defaulting on its external debt can potentially be offset by an adverse signalling effect on that LDC's domestic debt market; and, second, that a

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30 Typically, this would be a pooling equilibrium.

31 Note that debt relief in the above framework comes out naturally without the need of invoking incentive-based arguments such as the (well-publicized) debt overhang idea (see Krugman, 1988).
(negotiated) debt-relief settlement is likely to dominate as a way for an LDC to achieve higher rates of growth while maintaining price stability.

Our framework could be easily extended in at least two potentially interesting directions. Firstly, the model could incorporate considerations of exchange rate expectations. Our conjecture is that this would essentially reinforce the case for a negotiated debt-relief settlement: debt relief implies a lower transfer of (foreign-currency) resources abroad, and it should thus reduce expectations of an exchange rate depreciation. This in turn should further decrease the risk premium on domestic (government) debt. Secondly, the model can easily accommodate incentive-based arguments à la Krugman (1988), and thereby again further strengthen our argument for (negotiated) debt relief.

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