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G-5 Policies, credit availability and
Latin American growth*

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This paper assesses the impact of possible alternative scenarios regarding the future behaviour of industrial country growth and dollar interest rates on domestic growth and foreign credit requirements of the four major Latin American debtors – Argentina, Brazil, Mexico and Venezuela. Section 1 describes the sources of present potential instability in the world economy stemming from the huge current account imbalances among the leading industrial countries and discusses the likely impact that financial market sentiment and macroeconomic policies in G-5 countries aimed at reducing these imbalances may have upon OECD output growth and world interest rates. In Section 2 the four major debtors' financial requirements under varying domestic growth rates are quantified for each of these likely G-5 policy scenarios.

1. The Policy Outlook in Industrial Countries

The rapid and surprisingly controlled adjustment of U.S. dollar rates and the co-ordinated interest rate cuts which followed the Plaza Agreement and the collapse of oil prices in late 1985 raised high hopes as to the possibility of an effective coordination of macroeconomic policies among the leading industrial economies. Already in the second quarter of 1986, however, a sequence of events would underline the non-negligible difficulties facing the three leading G-5 countries to gear the conduct of their monetary and fiscal policies to the objectives of international economic stability. On the one hand, it became increasingly clear that the Plaza accord on exchange rates was born out of not much more than credible threats concerning the already visible rise of protectionist feeling in the U.S. Congress, and that an agreement to alter the G-5 policy mix as required to correct the deep U.S. fiscal and current account disequilibria had not been reached.

Indeed, key countries such as Japan and Germany would refrain from abandoning their conservative fiscal and monetary policies to stimulate domestic demand so as to speed up U.S. external adjustment and sustain world trade growth. On the other hand, in spite of the apparently earnest intention of the U.S. government to cut its budget deficit, the results for the last fiscal year – the first since the approval of the Gramm-Rudman-Hollings Bill – were a disappointing record deficit of US\$ 220 billion.

As the difficulties facing the U.S. authorities in their efforts to persuade Germany and Japan to substantially alter their demand management policies became public one year ago, the Americans defined a dual alternative strategy to cooperative and informal action in the G-5. The first step was the attempt to commit the summit countries to the creation of formal mechanisms, within the IMF, to allow periodical and multilateral surveillance of economic policies and performance. The second, and more pragmatist, consisted in assuming an attitude of apparent neglect towards the continuous weakening of the dollar. This had the apparent objective of forcing the relaxation of monetary and

fiscal policies in Europe and Japan as would be needed to countervail the recessive impact of dollar depreciation on the tradeable goods' sector of these economies.

Although it is still difficult to evaluate the impact of the first initiative [see IMF (1987a) and IMF (1987b)], the continuous dollar falls relative to the yen and the deutsche mark proved to be effective. Given the great openness of the German and Japanese economies, the depressive impact of the sharp dollar depreciation was substantial. Moreover, the need for intervention by the Bundesbank and the Bank of Japan to offset too rapid exchange rate appreciation created additional difficulties for the control of domestic monetary aggregates. This is more complicated in the German case, as the Bundesbank faced the additional problem of fine tuning of German mark parities within the EMS.

By the end of last October this less co-operative, unilateral, U.S. strategy of competitive depreciation scored its first important result with the so-called Baker-Miyazawa agreement. According to it, the Japanese government pledged itself to cut the official discount rate and launch a package of public investments, against the American promise of greater co-operation to stabilize the dollar-year rate. More recently, German resistance to an explicit commitment to more expansionary demand management was formally broken by the signing of the important Paris agreement. The joint G-5 plus Canada declaration, signed at the Louvre on 22 February last, formalize the objective macroeconomic policy co-ordination, and surplus countries explicitly commit themselves to follow policies designed to strengthen domestic demand and reduce external surpluses.

One can speculate on somewhat firm ground about the conjunction of events and political motivation leading to the consensus which gave birth to the Paris accord. From the standpoint of Germany and Japan, one basic factor was the deterioration of growth prospects over the previous six months due to the sharp fall in net exports. From the U.S. viewpoint, the disappointing results on the budget front and the» new Democrat majority in both Houses made it appropriate to underline the international commitment to fiscal austerity at the time the President was sending a new budget proposal to Congress, incorporating substantial cuts.

The trigger of the Paris agreement was, however, the rapid dollar slide in January in spite of Baker-Miyazawa. On the one hand, with the dollar effective rate already reaching its parity of the early eighties and a distinct worsening of the prospects for oil prices in the foreseeable future following the new OPEC consensus reached before Christmas, there were fears of rekindling of inflationary pressures in the United States. However, the decisive fact was, no doubt, the fears of a possible bearish market reaction against dollar-denominated assets and its effects upon the stability of international capital flows to the United States and, thus, upon dollar interest rates.

In fact, as non-U.S. resident holders of dollar-denominated assets are subject to a foreign exchange risk – i.e., the *export* earnings depend not only upon dollar earnings on these assets but also on changes in dollar nominal exchange rates in relation to the relevant currency for the investor –

demand for such assets is sensitive to expectations as to the future of the dollar. Therefore, if the markets were to incorporate generalized expectations of a too rapid fall it could lead to a situation in which it would be difficult to sustain the current flows, which presently finance the excess of aggregate demand in the United States, at the ruling interest rate differentials. In such a situation, demand pressure in U.S. financial markets would naturally lead to higher dollar interest rates, which would restore equilibrium at the cost of reduced private sector spending and activity growth, and with unforeseeable consequences for developing debtors and, indirectly, for the stability of the international financial system (Marris, 1986).

The formal commitments embodied in the Paris agreement give the impression of considerable progress in relation to the previous situation of acid public confrontation between the Americans and, especially, the German government, as to the need of additional demand stimuli in surplus countries. However, the probability that coordinated action on the lines of the agreement would rapidly lead to an effective reduction of present potential instability with little further change in the structure of exchange rates would depend on a substantial alteration in the geographical composition of OECD demand growth.

One can gauge the magnitude of the required changes in this direction by looking at some IMF forecasts presented in Table 1. The data shows, for each of the three leading OECD economies, the pattern of GDP growth rates compatible with price stability and the current account balances determined by end-1986 structure of exchange rates, and oil prices at US\$ 5 per barrel in real terms during the forecasting horizon. Table 1 also shows prospective government budget balances under the assumption that present declared fiscal policies will be maintained. Net private sector savings are determined as a residual; thus, forecasting private sector savings propensities one can determine the rate of private investment needed to generate growth at the initially given rates.

Analysis of data for Table 1 for the United States shows that, as the fall in the current account deficit falls short of the reduction in the government budget deficit, net private sector savings will have to fall to sustain growth at the potential output trend rates. However, even assessing that private sector savings will stabilize at current – historically low-levels, private investment will have to grow to the tune of 0.4 percent of GDP a year. Considering the expected reduction of idle margins in the tradeable goods sector following the substantial readjustment in dollar effective exchange rates, this does not seem unlikely to happen.

Data for Japan and, especially, Germany, illustrate the weakness of present fiscal stimuli, as the depressing effect of current account deterioration is not countervailed by equivalent increases in the budget deficit. In the case of Germany, where the projected fall in current account surplus is larger, the maintenance of the present fiscal stance has, in fact, a contractionary effect.

Table 1

Output Growth and aggregate demand components in the United States, Germany and Japan
(In % per year and demand components in % of GDP)

	Effective			Projected		
	Average 1975/84	1985	1986	1987	1988	Average 1989/91
United States						
Real GDP growth	2.8	2.7	2.5	2.0	2.8	2.8
Current Account	0.4	-2.9	-3.3	-3.0	-2.9	-2.9
Government Budget						
Balance	1.9	-3.5	-3.4	-2.7	-2.4	-1.6
Net Private Savings	1.5	0.5	0.1	0.3	-0.4	-1.3
Private Savings	17.8	17.0	16.4	16.3	16.6	16.4
Gross Private	16.3	16.5	16.3	16.6	17.0	17.7
Investment						
Japan						
Real GDP growth	4.3	4.7	2.3	2.8	3.5	4.0
Current Account	0.7	3.7	4.4	3.7	3.5	2.9
Government Budget	3.8	-1.0	-1.1	-1.4	-1.3	-0.4
Balance						
Net Private Savings	4.5	4.7	5.5	5.1	4.8	3.8
Private Savings	29.3	28.4	28.7	28.5	28.6	28.0
Gross Private	24.8	23.7	23.2	23.4	23.8	24.2
Investment						
Germany						
Real GDP growth	1.9	2.5	2.5	2.5	2.6	2.7
Current Account	0.3	2.1	4.0	3.3	2.6	1.3
Government Budget	-3.1	-1.1	-1.1	-1.0	-0.9	-0.2
Balance						
Net Private Savings	3.2	3.2	5.0	4.1	3.5	1.5
Private Savings	19.6	19.4	20.7	20.1	20.1	20.1
Gross Private						
Investment	16.4	16.2	15.7	16.0	16.6	18.6

Source: IMF

Thus, to guarantee growth at non-inflationary maximum rates without further fiscal stimulus it will be necessary to sustain a rise in private investment ratios in these economies, with particular intensity in Germany. Given the current recession affecting important industries in their tradeable goods sector – note that investment ratios have already fallen in 1986 in both countries – this does not seem likely without substantial incentives which, at present, still seem unlikely to materialize.

The most worrying feature of the projections displayed in Table 1 is, however, the downward

rigidity of the U.S. current account deficit at present exchange rates, which stabilizes at around 3 percent of GDP – that is, around US\$ 120 billion at current prices – even if growth in the leading industrial countries is sustained at maximum rates compatible with price stability. This is so basically because only a minor part of U.S. current account deficit can be attributed to the dollar appreciation occurred between 1980 and 1985. An important part of the deterioration is explained by higher relative demand growth in the United States (OECD (1986) pp. 21-22) and the scenario projected in Table 1 is one of convergence in growth rates and not one of reversal of the past growth gap.

Moreover, since 1980 U.S. imports of manufactured goods doubled as exports stagnated, shrinking to below half of the former. Starting from such a precarious basis, exports would have to grow over twice as fast as imports only to stabilize the trade deficit. Last but not least, the recent steady and substantial growth of net interest payments abroad and the prospects of increasing foreign indebtedness will require even better trade performance to balance the current account.

To sum up, any short to medium term scenario should take into account two important sources of instability. The first is that present demand management policies may bring no substantial fall in the U.S. current account deficit. In this circumstance, the crucial element for the stability of the dollar in the foreseeable future will be the very volatile market sentiment as to the success or failure of current efforts at policy coordination aimed at reversing the current account gap between the United States and the rest of the OECD. The probability that the three leading G-5 members will effectively proceed along these lines seems to have increased after the recent Paris agreement. However, in the absence of clear signs of change in the intensity of demand stimuli in the United States and in the other leading industrial economies, one should not rule out the possibility of strong downward pressures on the dollar which will bring about rising dollar interest rates and a slowdown in industrial country growth.

The second source of instability stems from the possibility of effective action on the U.S. fiscal front not being matched by compensatory demand stimuli in other leading economies. The immediate outcome of this scenario would be a weakening of the already low growth projected under present policies scenario. This would, however, be accompanied by a fall in interest rates in major financial centers, led by a fall in dollar rates in the wake of the reduction in U.S. federal government borrowing requirements. In Section 2, below, the impact of the occurrence of each of these possible outcomes on Latin American borrowing requirements and domestic growth is assessed.

2. The unfolding of present uncertainties and the prospects for Latin American growth

The actual outcome of the policy mix in the major industrial countries has an important bearing upon the medium-term growth prospects for the Latin American debtors, as the latter's credit

availability requirements to finance a given level of output growth clearly vary under different future patterns of OECD growth and world interest rates (Abreu and Fritsch (1986)). To discuss the feasibility of sustaining economic growth in the region one should, therefore, try to assess debtor countries' financial requirements for different levels of output growth under alternative scenarios for the world economy and compare these results with the likely supply of fresh funds.

Borrowing requirements are estimated below with the help of a simulation model for the group of four major Latin American debtors – Argentina, Brazil, Mexico and Venezuela – which, by end 1985, were together responsible for 76.4% of the region's total net foreign debt (ECLAC (1986), Table 13). This exercise is undertaken for the period 1987-89 under four different scenarios regarding industrial country growth and interest rates. For each of these, output growth in the debtor country is simulated to proceed at four different (and constant) rates throughout the simulation horizon: at the "historical" growth rate attained by the debtor country over the past twenty years, or at levels 1%, 2% or 3% below that rate. The formal structure of the model is described in the Appendix.

The first International scenario assumes that even with no further substantial change either in the present structure of exchange rates, in US fiscal restraint, or in demand stimuli outside the US, continued periodical signs of G-5 allegiance to policy coordination towards reducing the present world current account imbalances succeed in avoiding disruptive developments in financial markets in the simulation horizon – which, as discussed above, could lead to a sharp rise in interest rates. In this muddling-through scenario, OECD growth recovers slightly under the influence of better US performance stemming from balance of trade improvement without a substantial fiscal restraint, and also, to a minor extent, of timid counter cyclical measures eventually introduced in the other leading industrial countries. Inflationary expectations, rekindled by past dollar depreciation, and no substantial reduction in US federal government borrowing requirements at a time in which net private sector savings are falling with the recovery, put mild but persistent upward pressure in nominal dollar interest rates. The time pattern of the two basic exogenous variables in this scenario is, presented in Table 2.

Table 2
The Muddling-through Scenario (figures in %)

	1987	1988	1989
Real OECD growth	2.5	2.75	2.75
Dollar interest rates	7.0	7.5	8.0

The second scenario is one of a temporary but sharp interest rate shock in the second half of 1987, arising from an increasingly bearish attitude towards dollar-denominated assets in world

financial markets, described as notionally possible in Section 1. Both because of the difficulty to gauge the extent of the likely interest rate overshoot in such a situation of asset market disequilibrium as well as to get a better grasp of the sensitivity of the debtors' financial requirements to interest rate shocks, the simulations are performed under three different variants regarding the extent of the rise in rates. Such a shock is also supposed to negatively affect OECD growth performance, as illustrated in Table 3:

Table 3
The Financial Shock Scenario (figures in %)

	1987	1988	1989
Variant I			
Real OECD growth	2.5	2.25	2.25
Dollar interest rates	9.0	8.5	8.0
Variant II			
Real OECD growth	2.5	2.25	2.0
Dollar interest rates	11.0	9.5	8.0
Variant III			
Real OECD growth	2.5	2.25	2.0
Dollar interest rates	13.0	10.5	8.0

Thirdly, an optimistic scenario as to the prospects of successful policy coordination in the G-5 is simulated. It presupposes a continued reduction in the US fiscal deficit, which allows a further fall in American interest rates. The recessive impact of fiscal contraction in the US is compensated by greater fiscal stimuli elsewhere and coordinated interest rate cuts in the major financial centres following the FED's lead. Figures for OECD growth and interest rates in this scenario are shown in Table 4:

Table 4
The Policy Coordination Scenario (figures in %)

	1987	1988	1989
Real OECD growth	2.5	2.75	3.0
Dollar interest rates	6.5	6.0	5.0

The fourth and last International scenario is one which could occur if action on the US budget front were not matched by other demand-supporting measures, and OECD expenditure would not react to interest rate cuts with the speed and to the extent necessary to counteract the fall in US fiscal impulse. In a situation such as this, and considering the long lags of fiscal policy action, one could

assume a sharp fall in OECD growth towards the second half of 1988 accompanied by an equally sizeable reduction in interest rates, as shown in Table 5.

Table 5
The US Fiscal Overkill Scenario (figures in %)

	1987	1988	1989
Real OECD growth	2.5	2.0	1 .5
Dollar interest rates	6.5	5.0	3.5

To insulate the impact of different patterns of industrial country activity growth and world interest rates on the financial requirements of the debtor countries, the behaviour of import and export prices is considered to be invariant in all scenarios: oil prices are assumed to stabilize around US\$ 17 per barrel, and prices of other importable and exportable are kept stable throughout the simulation horizon. The values for these and other exogenous variables and structural parameters for each of the four large debtors are presented in the Appendix.

Simulation results showing, for each of the four sample countries, the amount of fresh funds plus reserve losses – that is, the increase in net foreign debt – required to sustain growth at different levels with reference to historical trend rates are presented in Tables A.2 to A.7 in the Appendix, for the various international scenarios discussed above.

Country by country comparison under the low interest rate scenarios highlights the medium-term difficulties likely to be faced by Brazil and the net oil exporters, especially México. Argentina's external position shows signs of improvement if output growth is brought to somewhat below recent levels – well above long-term trend rates – and if the assumption of constant export prices under which the projections were made is not falsified by the unfolding of present uncertainties affecting the world market for grains. On the other hand, the prospects for Brazil changed markedly from those of one year ago, reflecting the dramatic trade balance deterioration of 1986 and the adverse terms of trade shock following the recent oil price rise. México and Venezuela, although helped by the readjustment in oil prices, will also require a not negligible increase in net debt to sustain growth near trend rates, even under the favourable behaviour of the trade elasticities assumed in the projections to capture the effect of recent exchange rate adjustment in those countries.

However, to assess the impact of the various possible international scenarios resulting from macroeconomic policy interaction in industrial countries upon the feasibility of maintaining the present approach to the developing country debt problem one should examine the *aggregate* credit requirements for all the major debtors, and compare these figures with the likely maximum net supply of finance coming from multilateral and official agencies and private institutions.

Aggregate credit requirements for Argentina, Brazil, Mexico and Venezuela are shown in Table

6 below. Inspection of these figures show that requirements for 1987 – except in the financial shock scenario in which they rocket up to around US\$ 15-16 billion – are roughly invariant in relation to possible developments in the North. However, when the horizon is extended beyond the current year, comparison between the three no-shock scenarios reveals a crucial difference between action and inaction in the conduct of demand management policies in the US and her G-5 partners. On the one hand, the present paralysis generates requirements in the range of US\$ 16.7 to US\$ 13.8 billion to sustain growth between 1% and 2% below trend rates over the next two years. On the other hand, in case active fiscal and monetary policies aimed at reducing the present global current account imbalances were to be implemented – as in either the Policy Coordination or in the US Fiscal Overkill scenarios – financial requirements to sustain similar growth performance over 1988-89 fall to between US\$ 0.5 and US\$ 4.3 billion.

Table 6
Four Major Latin-American Debtors
External Financial Requirements under alternative international scenarios
(Changes in net foreign debt in US billions)

Scenario	1987	1988	1989
Muddling Through			
Growth at historical rate	6.5	8.8	11.4
1% below	5.8	7.7	9.0
2% below	5.2	6.4	7.4
3% below	4.5	5.2	6.2
Financial Shock (Var. II)			
Growth at historical rate	16.9	15.9	14.1
1% below	16.2	14.6	12.3
2% below	15.6	13.5	10.5
3% below	15.1	12.3	8.7
Policy Coordination			
Growth at historical rate	4.9	4.7	2.8
1% below	4.4	3.5	0.8
2% below	3.7	2.3	-0.9
3% below	3.1	1.2	-2.6
US Fiscal Overkill			
Growth at historical rate	4.9	2.5	0.3
1% below	4.4	1.3	-1.8
2% below	3.7	0.2	-3.3
3% below	3.1	-0.9	-5.0

Comparison of these figures with recent public and private long-term net financial flows to highly indebted countries helps gauging the crucial differences for Latin American growth performance of the occurrence of alternative international scenarios. As Table 7 shows, after a dramatic fall from 1981, net financial flows to those countries stabilized at roughly US\$ 5 billion over the past couple of years.

If these flows are maintained at current levels over the next three years and distributed roughly in proportion to outstanding debt, it would imply a supply of funds to our four sample countries of not more than US\$ 4 billion a year. This, as the figures from Table 6 show, would be enough to sustain growth at acceptable rates in the no-shock scenarios during 1987.

Beyond that, however, only the two more optimistic scenarios allow the maintenance of politically feasible domestic growth rates. To sustain growth in 1988-89 near historical rates under present policies – the Muddling-Through Scenario – would require doubling credit availability from current levels.

Highly Indebted Countries*: 1981-86

Public and private long-term debt and financial flows (in US\$ billions)

	1981	1982	1983	1984	1985 ^a	1986 ^a
Debt disbursed and outstanding	244.4	276.5	329.2	354.0	367.6	382.0
Disbursements	69.5	60.1	39.7	32.3	22.4	21.0
Private Creditors	60.9	50.9	29.7	22.5	13.6	12.0
Other	8.6	9.2	10.0	9.8	8.8	9.0
Principal Repayments	26.1	25.8	19.1	18.4	17.1	16.0
Net Inflows	43.4	34.3	20.6	13.9	5.3	5.0

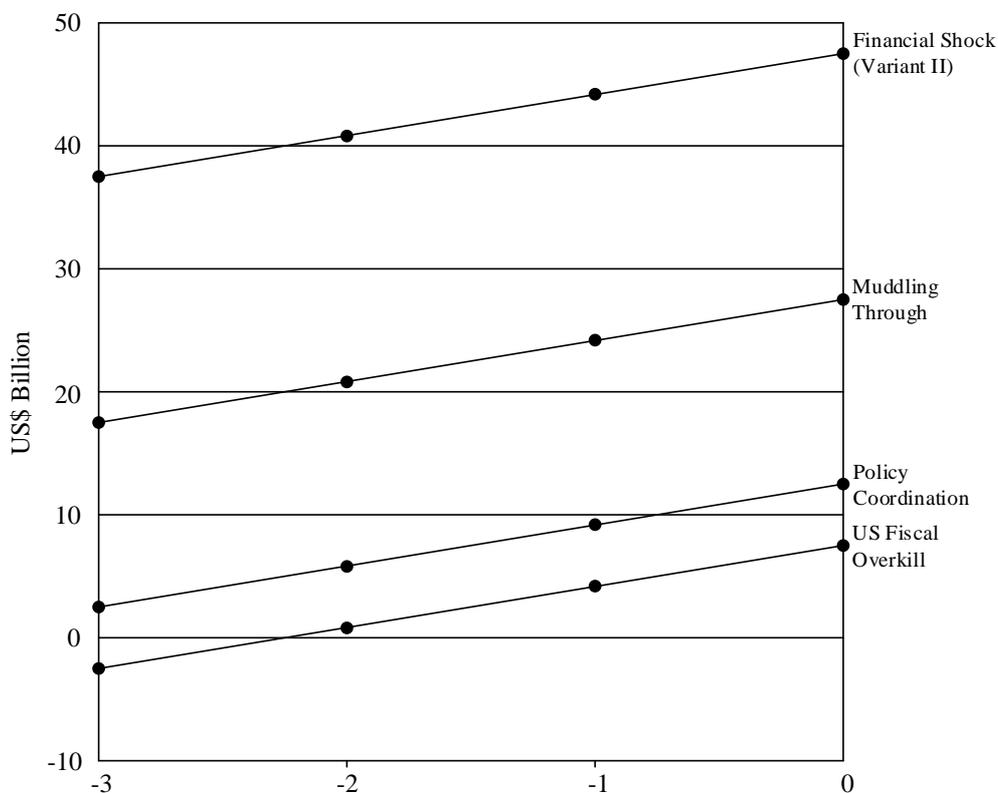
* Include Argentina, Brazil, Mexico and Venezuela plus Bolivia, Chile, Colombia, Costa Rica, Côte d'Ivoire, Ecuador, Jamaica, Morocco, Nigeria, Peru, Phillipines, Uruguay and Yugoslavia.

a. Estimates.

Source: World Bank (1987), Table 2, p. xiii.

The crucial importance of the external environment defined by the G-5 policy mix for the feasibility of their present strategy towards the debt problem is vividly illustrated in Chart 1, where total requirements for the period 1987-89 are displayed under each of the four alternative International scenarios. It can be seen that with a total supply of US\$12 billion over the three-year period, growth near historical rates is feasible only under the Policy Coordination and the US Fiscal Overkill scenarios. The Chart also illustrates the greater relative importance of the occurrence of either of these optimistic scenarios *vis-à-vis* contraction in domestic growth in reducing total credit requirements over the simulation horizon. Limiting growth at 3% below historical rates – which would mean near stagnation or very low growth in output per head for all sample countries – would reduce about US\$ 10 billion in total requirements. This is considerably less than what would be needed if policy action in the North would fail to bring about either of the two more favourable scenarios.

Chart 1
Four major Latin-American debtors
External Financing Requirements: 1987-89



Finally, it is interesting to note that our numerical exercise reveals that the US Fiscal Overkill Scenario dominates that of Policy Coordination, perhaps reflecting the present sensitivity of current account performance to interest rate changes resulting from recent rises in debt to export ratios in the sample countries. This result depends, of course, on the assumed impact of drastic budget cuts in the US on interest rates, as well as on strong hypotheses regarding the invariance of export elasticities and the terms of trade in face of rapid OECD slowdown. Nevertheless, it highlights the fact that, from a Latin American standpoint, fast US fiscal adjustment, if accompanied by a fall of a few percentage points in dollar interest rates, may well be a superior scenario in the longer run. This may be so even considering its perverse transient effects on world trade growth since, by accelerating current account adjustment in the US, it may help defusing the present tensions in foreign exchange markets from which a financial shock could eventually result. Indeed, as argued in Section 1, the rates of growth of G-5 countries implicit in the Policy Coordination scenario are not conducive to fast US current account adjustment under the present structure of exchange rates, and as the figures in Table 6 show, if a sharp rise in interest rates take place in the near future there can be little hope that Latin American countries will be able to honour their debts.

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APPENDIX

1. The Simulation Model

The accounting identity between the balance of autonomous foreign exchange transactions in a debtor country and the change in her international reserves in the absence of compensating capital movements can be written as:

$$X(t) - M(t) - NFS(t) - I(t) - OFS(t) + DI(t) + L(t) - A(t) = R(t) - R(t - 1) \quad (1)$$

Where:

$X(t)$ – value of exports in period t ;

$M(t)$ – value of imports in period t ;

$NFS(t)$ – non-factor Service payments and unilateral transfers in period t ;

$I(t)$ – net interest payments in period t ;

$OFS(t)$ – net payments for other factor Services in period t ;

$DI(t)$ – net direct investment in period t ;

$L(t)$ – new loans disbursed in period t ;

$A(t)$ – amortization payments in period t ;

$R(t)$ – international reserves at end of period t .

Since $OFS(t)$ is basically composed of payments by foreign firms' profit and dividend remittances one can define:

$$NDI(t) = DI(t) - OFS(t) \quad (2)$$

as the net foreign exchange balance of foreign enterprise transactions in period t .

Defining the net foreign exchange proceeds from foreign loans (new money) as

$$NM(t) = L(t) - A(t) \quad (3)$$

and calling $GD(t)$ the gross foreign debt at end of period t .

$$NM(t) = GD(t) - GD(t - 1) \quad (4)$$

One can rewrite (1) using (2) and (4) as

$$X(t) - M(t) - NFS(t) - I(t) + NDI(t) + GD(t) - GD(t - 1) = R(t) - R(t - 1) \quad (5)$$

Nothing that the net external debt at the end of period t can be expressed as

$$ND(t) \equiv GD(t) - R(t) \quad (6)$$

and assuming that the earnings on interest-bearing foreign assets held by the monetary authority is equal to the average interest rate $i(t)$ plus spread $SPR(t)$ paid on outstanding foreign debt at the beginning of period t , one can write that

$$I(t) = [i(t) + SPR(t)]ND(t - 1) \quad (7)$$

Thus, from substitution of equations (6) and (7) into (5) it follows that

$$ND(t) = ND(t - 1)[1 + i(t) + SPR(t)] - X(t) + M(t) + NFS(t) - IDL(t) \quad (8)$$

and, given the initial value $ND(0)$ for the net debt of a given country, equation (8) allows the

iterative projection of the evolution of her net foreign debt for discrete values of t for any given scenarios regarding the time pattern of $X(t)$, $M(t)$, $i(t)$, $SPR(t)$, $NFS(t)$ and $NDS(t)$ in a finite time horizon $t = 1, 2, \dots, n$.

The simulation model used to generate the results presented in Section 2 of this paper is based on some simplifying hypothesis concerning the specification of $X(t)$, $M(t)$, and $NFS(t)$. Firstly, it is assumed that nominal export values grow at the rate

$$x(t) = y^*(t) \cdot e^*(t) + p_x(t)$$

where:

$y^*(t)$ – real aggregate GDP growth in the OECD in period t

$e^*(t)$ – debtor country export elasticity in relation to OECD real output

$p_x(t)$ – change in the export price index of the debtor country, are exogenously fixed parameters. In other words, one assumes that given the initial level of exports $X(o)$.

$$X(t) = X(o) \prod_{j=1}^t [1 + y^*(j) \cdot e^*(j) + p_x(j)] \quad (9)$$

Secondly, it is assumed that the value of imports grows at rate

$$m(t) = y(t) \cdot e(t) + p_m(t)$$

where:

$y(t)$ – real domestic GDP growth in the debtor country;

$e(t)$ – debtor country import elasticity in relation to domestic output in period t ;

$p_m(t)$ – change in debtor country import price index in period t , are exogenously given parameters. Thus, given the initial value of imports $M(o)$, it is assumed that

$$M(t) = M(o) \prod_{j=1}^t [1 + y(j) \cdot e(j) + p_m(j)] \quad (10)$$

Finally, a linear stable relation between the value of non-factor services and imports is assumed, that is:

$$NFS(t) = k \cdot m(t) \quad (11)$$

Under these hypotheses, equation (8) can be rewritten as

$$ND(t) = i(t)ND(T-1) - X(o) \cdot \prod_{j=1}^t [1 + y^*(j)e^*(j) + p_x(j)] + (1+k)M(o) \prod_{j=1}^t [(1 + y(j)e(j) + p_{m(j)}) - NDI(t) + NDI(t-1)] \quad (12)$$

Thus, given a set of initial values for the debtor country exports, imports and net foreign debt, equation (12) allows the iterative forecast of the time pattern of her net foreign debt corresponding to a given domestic output growth rate $y(t)$, for any exogenously defined set of structural parameters and future time patterns of the terms of trade and net direct investment:

$$\{e^*(t), e(t), k, p_x(t), p_m(t), IDL(t), SPR(t)\}, \quad t = 1, 2, \dots, n$$

and alternative international scenarios.

$$\{y^*(t), i(t)\}, \quad t = 1, 2, \dots, n$$

concerning future OECD growth and interest rates. Foreign exchange requirements result from the simulated variation in net foreign debt in each period.

2. Structural parameters and exogenous variables used in the projections and simulation results.

Table A.1 below presents the values of $e^*(t)$, $e(t)$, k , $p_x(t)$, $p_m(t)$, $IDL(t)$ and $SPR(t)$, used in the simulation of foreign exchange requirements for the four major Latin American debtors presented in Section 2. Tables A.2 to A.7 show the simulated financial requirements for the four Latin American major debtors under each of the International scenarios discussed in Section 2.

Table A.1
Assumed values for structural parameters and exogenous variables

	Argentina			Brazil			Mexico			Venezuela		
	1987	1988	1898	1987	1988	1898	1987	1988	1898	1987	1988	1898
e^*	1.2	1.2	1.2	1.0	1.5	1.5	1.3	1.3	1.3	0.4	0.4	0.4
E	1.5	1.0	1.0	1.5	1.0	1.0	1.3	1.0	1.0	1.5	1.3	1.0
K	0.2	0.2	0.2	0.13	0.13	0.13	-0.08	-0.08	-0.08	0.2	0.2	0.2
P_x (%)	0.0	0.0	0.0	0.0	0.0	0.0	14.0	0.0	0.0	21.0	0.0	0.0
P_m (%)	0.0	0.0	0.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IDL (US\$ billion)	100	100	100	0.0	100	200	500	500	500	100	100	100
SPR (%)	1.125	1.125	1.125	2.0	1.8	1.6	0.875	0.875	0.875	0.875	0.875	0.875

Table A.2

Major Latin-American Debtors

Sensitivity of Financial Requirements to Domestic GDP Growth; Muddling-Through Scenario
(changes in net foreign debt in US\$ billions)

	1987	1988	1989	1987-89
Argentina				
Growth at historical rate**	-0.3	-0.2	-	-0.5
1% below	-0.3	-0.4	-0.2	-1.0
2% below	-0.4	-0.5	-0.5	-1.4
3% below	-0.5	-0.6	-0.7	-1.8
Brazil				
Growth at historical rate	3.0	3.6	4.3	10.9
1% below	2.7	3.3	2.9	8.9
2% below	2.5	2.8	2.6	7.9
3% below	2.3	2.4	2.5	7.2
Mexico				
Growth at historical rate	3.0	3.9	5.0	11.9
1% below	2.8	3.6	4.5	10.9
2% below	2.6	3.2	3.9	9.7
3% below	2.5	2.8	3.4	8.7
Venezuela				
Growth at historical rate	0.8	1.5	2.1	4.4
1% below	0.6	1.2	1.8	3.6
2% below	0.5	0.9	1.4	2.8
3% below	0.4	0.6	1.0	2.0
Total of above countries				
Growth at historical rate	6.5	8.8	11.4	26.7
1% below	5.8	7.7	9.0	22.4
2% below	5.2	6.4	7.4	19.0
3% below	4.7	5.2	6.2	16.1

* For a description of the scenario, see text.

** Average GDP growth rate over past twenty years.

Table A.3

Major Latin American Debtors

Sensitivity of financial requirements to domestic GDP growth: financial shock scenario
(Variant I)* (changes in net foreign debt in US\$ billions)

	1987	1988	1989	1987-89
Argentina				
Growth at historical rate**	0.6	0.5	0.2	1.3
1% below	0.6	0.3	-0.1	0.8
2% below	0.5	0.2	-0.3	0.4
3% below	0.4	-	-0.5	-0.1
Brazil				
Growth at historical rate	4.8	4.9	5.0	14.7
1% below	4.6	4.5	4.3	13.4
2% below	4.4	4.0	3.7	12.1
3% below	4.1	3.6	3.0	10.7
Mexico				
Growth at historical rate	4.9	5.2	5.4	15.5
1% below	4.8	4.8	4.9	14.5
2% below	4.6	4.5	4.3	13.4
3% below	4.4	4.1	3.8	12.3
Venezuela				
Growth at historical rate	1.3	1.8	2.3	5.4
1% below	1.1	1.5	1.9	4.5
2% below	1.0	1.3	1.5	3.8
3% below	0.9	1.0	1.1	3.0
Total of above countries				
Growth at historical rate	11.6	12.4	12.9	36.9
1% below	11.1	11.1	11.0	33.2
2% below	10.5	10.0	9.2	29.7
3% below	9.8	8.7	7.4	25.9

* For a description of the scenario, see text.

** Average GDP growth rate over past twenty years.

Table A.4

Major Latin-American Debtors

Sensitivity of Financial Requirements to Domestic GDP Growth: Financial Shock Scenario

(Variant II)* (changes in net foreign debt in US\$ billions)

	1987	1988	1989	1987-89
Argentina				
Growth at historical rate**	1.6	1.0	0.4	3.0
1% below	1.5	0.9	0.2	2.6
2% below	1.4	0.8	-0.1	2.1
3% below	1.3	0.6	-0.3	1.6
Brazil				
Growth at historical rate	6.6	6.2	5.5	18.3
1% below	6.4	5.7	4.8	16.9
2% below	6.2	5.3	4.2	15.7
3% below	6.0	4.9	3.5	14.4
Mexico				
Growth at historical rate	6.9	6.5	5.8	19.2
1% below	6.7	6.1	5.3	18.1
2% below	6.5	5.8	4.8	17.1
3% below	6.4	5.5	4.3	16.2
Venezuela				
Growth at historical rate	1.8	2.2	2.4	6.4
1% below	1.6	1.9	2.0	5.5
2% below	1.5	1.6	1.6	4.7
3% below	1.4	1.3	1.2	3.9
Total of above countries				
Growth at historical rate	16.9	15.9	14.1	46.9
1% below	16.2	14.6	12.3	43.1
2% below	15.6	13.5	10.5	39.6
3% below	15.1	12.3	8.7	36.1

* For a description of the scenario, see text.

** Average GDP growth rate over past twenty years.

Table A.5

Major Latin-American Debtors

Sensitivity of Financial Requirements to Domestic GDP Growth: Financial Shock Scenario

(Variant III)* (Changes in net foreign debt in US\$ billions)

	1987	1988	1989	1987-89
Argentina				
Growth at historical rate**	2.5	1.6	0.5	4.6
1% below	2.4	1.5	0.3	4.2
2% below	2.3	1.3	0.1	3.7
3% below	2.3	1.2	-0.1	3.4
Brazil				
Growth at historical rate	8.5	7.4	5.9	21.8
1% below	8.2	7.0	5.2	20.4
2% below	8.0	6.5	4.5	19.0
3% below	7.8	6.1	3.9	17.8
Mexico				
Growth at historical rate	8.9	7.8	6.2	22.9
1% below	8.7	7.4	5.6	21.7
2% below	8.5	7.1	5.1	20.7
3% below	8.3	6.7	4.6	19.6
Venezuela				
Growth at historical rate	2.3	2.5	2.5	7.3
1% below	2.2	2.2	2.1	6.5
2% below	2.0	1.9	1.7	5.6
3% below	1.9	1.7	1.3	4.9
Total of above countries				
Growth at historical rate	22.2	19.3	15.1	56.6
1% below	21.5	18.1	13.2	52.8
2% below	20.8	16.8	11.4	49.0
3% below	20.3	15.7	9.7	45.7

* For a description of the scenario, see text.

** Average GDP growth rate over past twenty years.

Table A.6

Sensitivity of Financial Requirements to Domestic GDP Growth: Policy
 Coordination Scenario* (changes in net foreign debt in US\$ billions)

	1987	1988	1989	1987-89
Argentina				
Growth at historical rate**	-0.5	-0.9	-1.5	-2.9
1% below	-0.6	-1.0	-1.8	-3.4
2% below	-0.7	-1.2	-2.0	-3.9
3% below	-0.8	-1.3	-2.1	-4.2
Brazil				
Growth at historical rate	2.4	2.1	1.3	5.8
1% below	2.2	1.7	0.6	4.5
2% below	2.0	1.3	-	3.3
3% below	1.8	0.9	-0.7	2.0
Mexico				
Growth at historical rate	2.5	2.4	1.7	6.6
1% below	2.3	2.0	1.1	5.4
2% below	2.1	1.7	0.6	4.4
3% below	2.0	1.3	0.1	3.4
Venezuela				
Growth at historical rate	0.6	1.1	1.3	3.0
1% below	0.5	0.8	0.9	2.2
2% below	0.3	0.5	0.5	1.3
3% below	0.2	0.3	0.1	0.6
Total of above countries				
Growth at historical rate	4.9	4.7	2.8	12.4
1% below	4.4	3.5	0.8	8.7
2% below	3.7	2.3	-0.9	5.1
3% below	3.1	1.2	-2.6	1.7

* For a description of the scenario, see text.

** Average GDP growth rate over past twenty years.

Table A.7

Sensitivity of Financial Requirements to Domestic GDP Growth:
US Fiscal Overkill Scenario* (changes in net foreign debt in US\$ billions)

	1987	1988	1989	1987-89
Argentina				
Growth at historical rate**	-0.5	-1.3	-2.0	-3.8
1% below	-0.6	-1.4	-2.2	-4.2
2% below	-0.7	-1.6	-2.4	-4.7
3% below	-0.8	-1.6	-2.6	-5.0
Brazil				
Growth at historical rate	2.4	1.4	0.6	4.4
1% below	2.2	1.0	-0.1	3.1
2% below	2.0	0.6	-0.7	1.9
3% below	1.8	0.2	-1.3	0.7
Mexico				
Growth at historical rate	2.5	1.6	0.7	4.8
1% below	2.3	1.2	0.1	3.6
2% below	2.1	0.9	-0.4	2.6
3% below	2.0	0.5	-0.9	1.6
Venezuela				
Growth at historical rate	0.6	0.8	1.0	2.4
1% below	0.5	0.5	0.6	1.6
2% below	0.3	0.3	0.2	0.8
3% below	0.2	-	-0.2	-
Total of above countries				
Growth at historical rate	5.0	2.5	0.3	7.8
1% below	4.4	1.3	-1.8	3.9
2% below	3.7	0.2	-3.3	0.6
3% below	3.2	-0.9	-5.0	-2.7

* For a description of the scenario, see text.

** Average GDP growth rate over past twenty years.