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EXTERNAL DEBT AND DEVELOPING COUNTRY GROWTH

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ABSTRACT

This paper examines the question of how the path of real GDP in four important Latin American countries, Argentina, Brazil, Chile and Mexico, might have differed if the sharp run-up in borrowing during the late 1970s and early 1980s had not occurred. Specifically, we ask whether these countries are better off or worse off for having borrowed heavily prior to the debt crisis, and we attempt to gauge the extent to which they would have received greater benefits if policies that improve economic efficiency had been followed. A simple macroeconomic model is developed, and the simulation results are compared to the historical outcomes.

EXTERNAL DEBT AND DEVELOPING COUNTRY GROWTH

Steven B. Kamin, Robert B. Kahn, and Ross Levine[1]

I. Introduction and Summary

It has become popular to measure the "cost" of the developing country debt crisis by the decline or slow growth of real GDP per capita in heavily indebted countries during the 1980s. However, the debt-servicing problems of the heavily indebted countries had their origins in the uses of the external debt as it was accumulated, the macroeconomic shocks of the late 1970s and early 1980s, and the consequent sharp decline in bank lending beginning in 1982. Although developing countries received benefits from the preceding build-up in debt, the decline in real growth in these countries in the 1980s depended importantly on how borrowed funds were spent and the economic policies that were pursued. This paper addresses the question of how the path of real GDP in four important Latin American debtor countries might have differed if the sharp run-up in borrowing from commercial banks in the late 1970s and early 1980s had not occurred. Specifically, we ask whether these countries are better or worse off for having borrowed, and we attempt to gauge the extent to which they would

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1. Division of International Finance, Board of Governors of the Federal Reserve System, Washington D.C. This paper represents the views of the authors and should not be interpreted as reflecting the views of the Board of Governors of the Federal Reserve System or other members of its staff. The authors wish to express their thanks to their colleagues in the International Finance Division for their comments and suggestions. Thomas Connors, Allen Frankel, David Howard, Jaime Marquez, Larry Promisel, Charles Siegman, David Spigelman, and Edwin Truman were especially helpful. We would also like to thank Heidi Lyss and Patricia Ma for excellent research assistance, and Delores Burton for providing secretarial support.

have received greater benefits if policies that improve economic efficiency had been followed.

Based on simulation results from a very simple macroeconomic model, the following preliminary judgments can be made for Argentina, Brazil, Chile and Mexico. First, the higher levels of bank borrowing prevailing prior to the debt crisis allowed the four countries to achieve somewhat higher output levels than would otherwise have been possible. At their pre-debt-crisis peaks, we estimate that actual real GDP per capita exceeded levels that would have prevailed in the absence of heavy bank borrowing by roughly 5 percent in Argentina, 12 percent in Brazil, 16 percent in Chile, and 4 percent in Mexico. To the extent that the higher levels of borrowing prevailing at the end of the 1970s were artificial and unsustainable, so too were the high rates of economic activity and growth enjoyed by the four countries.

Second, the decline in real GDP per capita in the 1980s was exacerbated by the fall-off in bank borrowing from the levels prevailing prior to the debt crisis. In the absence of the extraordinary run-up of debt in the late 1970s and the subsequent sharp fall-off, average growth rates of per capita output in Brazil and Chile would have risen in the 1980s. Average growth rates would have fallen in Mexico and Argentina, but by less than the fall in historic growth rates and for reasons unassociated with the debt crisis. Even with a steadier path of bank borrowing, real growth in the 1980s likely would not have been as robust as in earlier periods. These countries would have had to cope with rising interest rates that raised the interest cost of debt, and declining terms-of-trade. Further, it is important to note that in Argentina and especially in Brazil, investment and growth fell prior to the decline in bank borrowing.

Third, the four countries do not appear to have benefitted on balance from the temporary surge in borrowing from banks that took place at the end of the 1970s. As of 1987, levels of potential output in all countries were about the same as they would have been in the absence of this borrowing. However, in all cases actual output fell from at- or above-capacity levels in the 1970s to below-capacity levels in the 1980s; in the absence of heavy bank borrowing, this is likely not to have occurred in Brazil and Chile and to have occurred to a lesser extent in Mexico and Argentina. Thus, average levels of real per capita GDP in the post-debt-crisis period are lower than the model indicates that they would have been in the absence of heavy borrowing. (In Argentina by about 5 percent, in Brazil by about 12 percent, in Chile by about 5 percent, and in Mexico by about 12 percent.) Moreover, for the four countries, actual net indebtedness in 1987 averaged almost twice as high as it would have been in the absence of heavy borrowing. A large level of net indebtedness leads to higher interest payments that act as a drag on future growth.

Fourth, to the extent that heavy borrowing led to inappropriate economic policy choices, the gains from heavy borrowing were further reduced. Had all debt been channelled into investment projects that were additional (to investments that would otherwise been undertaken) and that were not devastated by the economic environment of the 1980s, there is every reason to believe that the current level of economic activity would be higher than if the debt had not been acquired. Generally, however, much of the net inflow did not find its way into productive investment. (Judged by their performance in raising potential output, Brazil and Chile appear to have achieved the most success in investing borrowed funds productively.) To differing degrees, inappropriate macroeconomic policies

led to the diversion of these borrowed funds into consumption expenditures or into resident asset holdings abroad. Further, much of the investment that did occur during the 1970s turned out to be socially unprofitable: private investment incentives were distorted by economic policies and government spending was often directed at large, inefficient public enterprises. These results support the conclusion that international borrowing is not a substitute for appropriate economic policies as a way of sustaining output growth.

Fifth, had good policies been combined with heavy borrowing, these countries would still have experienced recessions following the onset of the debt crisis, although they would not have been as deep. With better policies, economic capacity would have been higher and these countries would have been better able to adjust to the shocks of the 1980s. However, even had all external borrowings been efficiently invested, the sharp fall-off in lending associated with the debt crisis would have caused comparable declines in investment spending and aggregate demand, forcing current activity below levels of economic capacity. Increased real interest rates, adverse terms-of-trade movements, and slow growth in industrial countries would have exacerbated this downswing.

Section II briefly reviews the debt accumulation and growth experiences of Argentina, Brazil, Chile and Mexico. Section III discusses the main channels through which foreign debt flows influence growth. Section IV develops a simple macroeconomic model which incorporates these channels to analyze quantitatively the impact of bank lending on these countries. The results of these exercises with the model are summarized above.

II. Debt and Growth in the 1970s and 1980s

Chart 1 presents the level of real GDP per capita and annual net borrowing[2] from banks during the 1975-87 period for Argentina, Brazil, Chile, and Mexico. The short vertical lines indicate 1982, the conventional date of the start of the debt crisis. In all four countries, annual borrowing from banks--the dashed lines--rose sharply in the late 1970s, peaked at the close of that decade or in the early 1980s, and fell precipitously thereafter. Similarly, in all four countries real GDP per capita--the solid lines--rose in the late 1970s before contracting sharply in the early 1980s. Notwithstanding the broad correlation over the period between borrowing and growth, they have not moved in lock-step on a year-to-year basis. For example, Chile's adjustment effort contributed to a rebound in activity beginning 1984, without a concomitant increase in bank lending. In Brazil, the level of per capita GDP peaked in 1980 and dropped sharply the following year in response to a balance-of-payments crisis, two years before the net flow of bank lending dropped in 1983; as in the case of Chile, growth resumed temporarily in 1984, continued declines in bank lending notwithstanding.[3]

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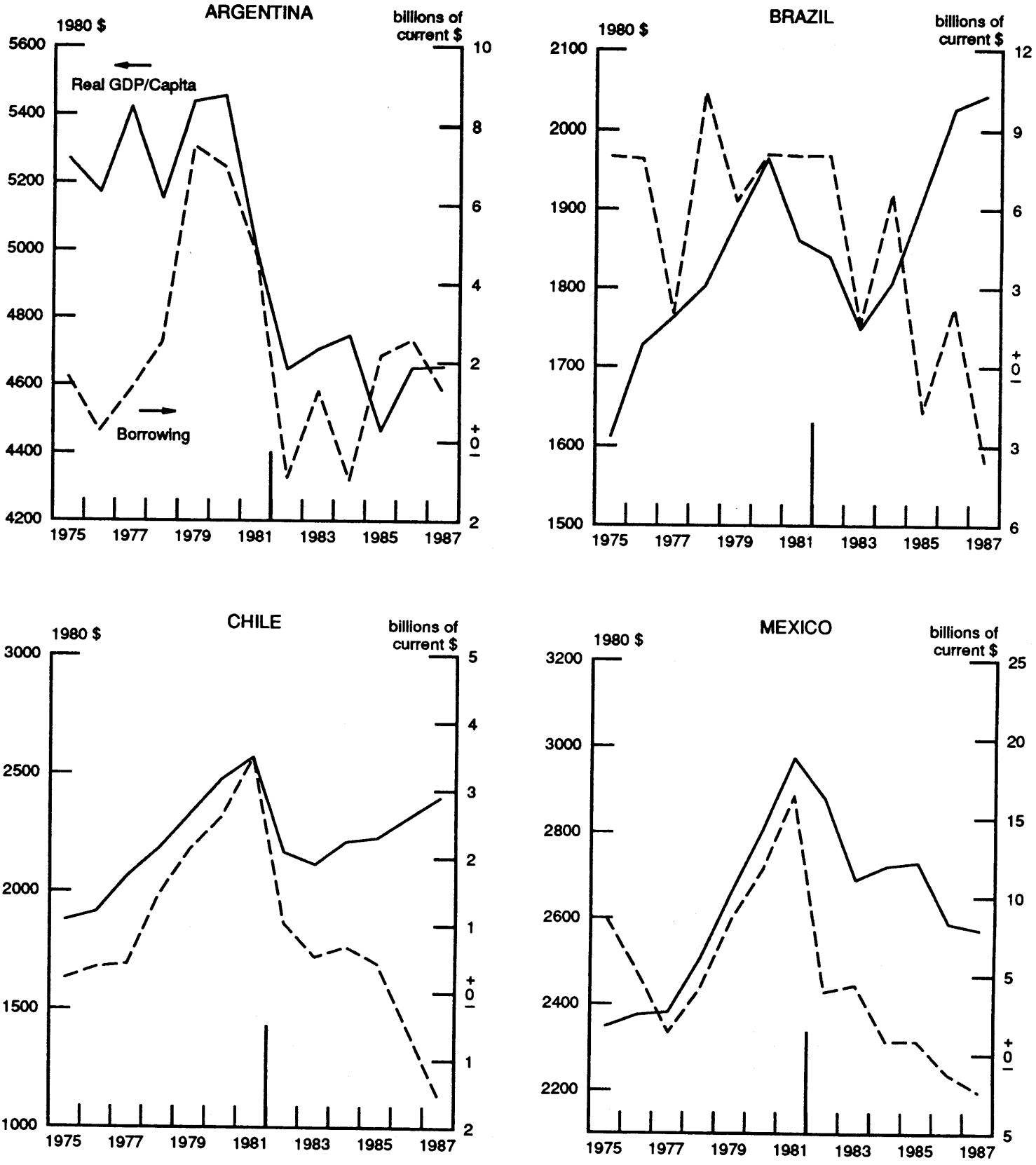
2. Data based on the BIS quarterly series. There was a major break in the series at end-1983, when coverage was expanded. Additional debt included in that revision was allocated proportionately over previous years. Data for 1984-87 are adjusted for the effects of exchange rate movements.

3. The relation between the growth rate of per capita output and the net flow of bank lending is more tenuous. In Argentina, the level of per capita GDP and the flow of bank lending both peaked in 1979. In 1980, however, bank lending still remained high while per capita output growth registered zero compared with 9.4 percent the year before. Section III.b below presents reasons why the flow of bank lending may be more strongly associated with the level of output than its rate of growth in the short run.

Chart 1

Real GDP Per Capita and Annual Net Borrowing from Banks, 1975 - 1987



Looking over a longer time horizon, table 1 shows that the growth of real GDP per capita during 1965-74 averaged 2.9 percent in Argentina, 7 percent in Brazil, 1.3 percent in Chile and 4.3 percent in Mexico.[4] These rates considerably exceed those that prevailed both from 1975 to the onset of the debt crisis, and from the onset of the crisis to the present, shown on lines 2 and 3 of chart 2, respectively. Assuming that growth rates had remained at their 1965-74 averages from 1975 to the present, crude estimates, shown on line 6, illustrate that by 1987 real GDP per capita would have been substantially higher than actually occurred in Argentina, Brazil, and Mexico. Chile is an exception because its growth rate from 1965 to 1974 was relatively low.

The difference between this back-of-the-envelope projection and actual output paths cannot be attributed exclusively to the reduction in borrowing associated with the debt crisis, however. For one thing, growth rates declined, except for Chile, in advance of the crisis. Another important explanation for the lower growth in both the 1970s and 1980s is that it reflected the world macroeconomic disturbances of the period. By comparison, real per capita growth in industrial countries averaged about 3-3/4 percent during 1965-73, but fell to about 1-3/4 percent per year during 1973-83. Moreover, other factors, including oil price shocks and other changes in terms of trade, variations in real interest rates, and macroeconomic policies were also important determinants of economic activity in these countries in the last 15 years.

4. World Bank, World Development Report, various issues.

Table 1

Real GDP Per Capita

	ARGENTINA	BRAZIL	CHILE	MEXICO
GROWTH IN REAL GDP PER CAPITA (percent per annum)				
1. 1965–74	2.9	7.0	1.3	4.3
2. 1975–Pre–Debt Crisis (1975–1981)*	–.0	2.5	2.2	3.7
3. Post–Debt Crisis (1982–1987)*	–2.2	1.6	–1.1	–2.4
1987 REAL GDP PER CAPITA (1980 dollars)				
4. Actual	4650	2050	2400	2550
5. Counterfactual, with 1965–74 growth rates from 1975 to 1987	7950	3800	2600	3950
6. Percent difference, between counterfactual and actual	71	85	8	55

* For Argentina the post–debt crisis period extends from 1981–87.

Thus, any comprehensive explanation of the experience of the 1970s and 1980s must attempt to separate the impact of world macroeconomic shocks from the impact of borrowing.

III. Links between External Lending and Growth

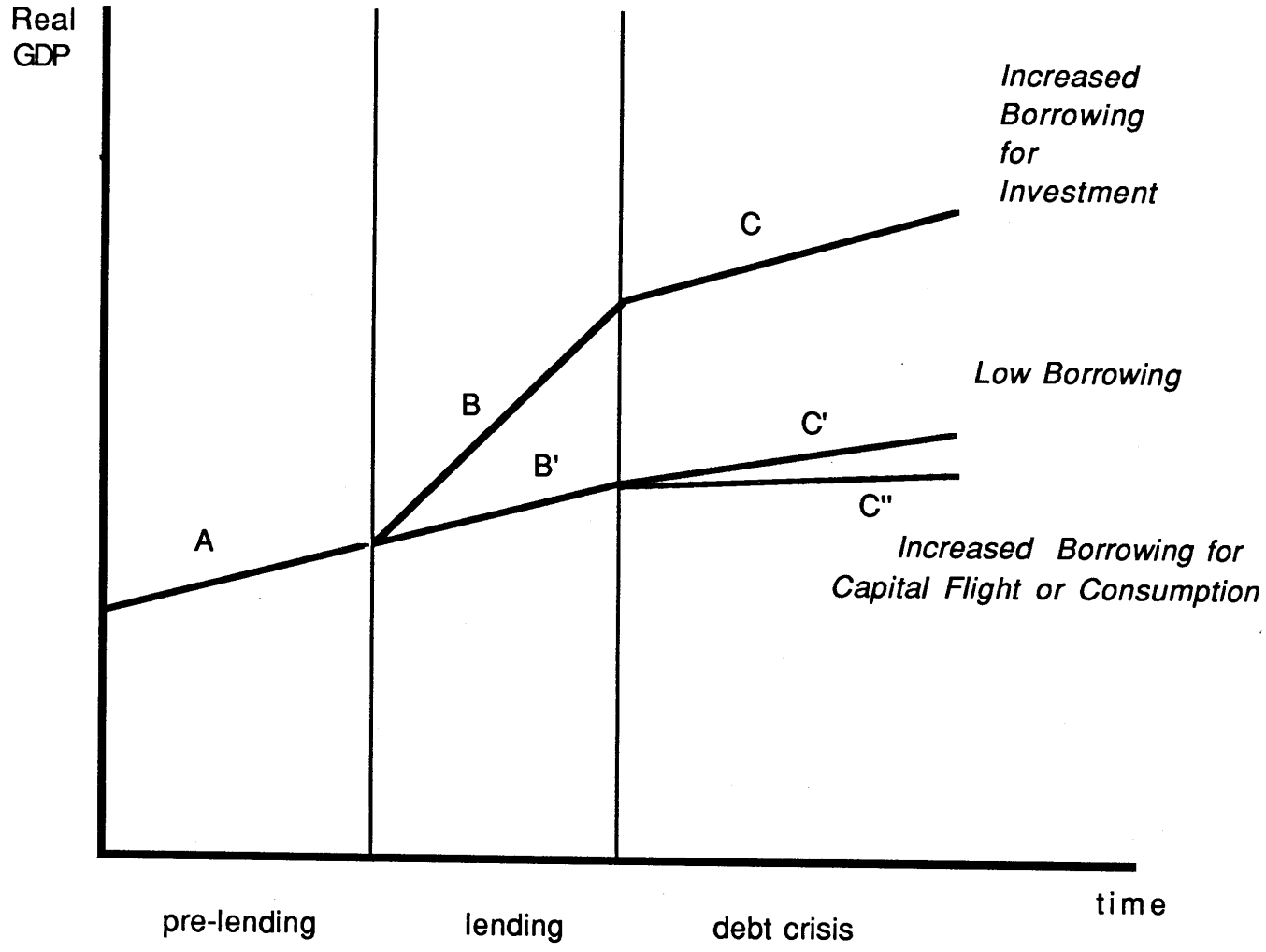
This section traces out three channels through which foreign borrowing affects growth. The first channel is through the effect of foreign borrowing on investment, which increases the capital stock and future growth prospects. The second channel is through its effect on current spending, which has an impact on the current level of economic activity. The third channel is that increased debt raises future interest payment obligations.

A. The investment-capacity link

In a capital-scarce economy that has gained access to international capital markets, one might expect capital inflows to augment investment almost exclusively. Further, if all borrowing was invested efficiently, the path of potential and actual real GDP would increase, as shown in the stylized example depicted in chart 2. Segment A represents the path of potential output prior to the initiation of extensive bank lending, while segment B represents its path during the high lending period. This increase in output would be characterized by higher rates of capital accumulation as the capital stock and output increase to a new long-run optimal level. In the early 1980s, with real interest rates high, terms of trade deteriorating, and countries effectively shut-off from foreign credit markets, we would expect national investment to have fallen both because of the decline in available resources for investment and because the macroeconomic environment was less profitable and more

Chart 2

How Borrowing Affects Growth:
The Investment-Capacity Channel



uncertain. Further, private agents might have anticipated either higher taxes or other injurious policies that would affect real returns on investment since the governments had to finance their international debt obligations. (The so-called "debt-overhang" problem.) The decline in investment would lead to slower growth in capacity. For this reason the output profile depicted in segment C is flatter than the output path in the high lending period represented by segment B.[5]

If the country had not borrowed in the 1970s, we assume that output would have grown at its former rate along the segment B'. When real interest rates rose and the terms of trade fell in the early 1980s, however, growth would still have tended to slow. It is unclear whether the effects of the adverse economic environment would be smaller in the case with higher initial borrowing. On the one hand, the absence of a large public debt interest payments in the early 1980s implies that investment would not be further curtailed by agents' anticipations of higher taxes or other economic dislocations. On the other hand, a country that had invested to diversify its export base might find itself better protected from certain risks.[6] Thus, one would expect that the segment C' would have a smaller slope than B', but the slope could be either steeper or flatter than C.

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5. This decline in investment is mitigated to the extent that the economy adjusts by shifting resources into newly profitable sectors.

6. For example, Korea acquired large amounts of external debt and appears to have faced macroeconomic shocks as severe as those facing Latin American countries in the late 1970s and early 1980s. However, Korea weathered these shocks with little impact on growth. One popular argument is that it was in fact Korea's investment in a diversified export base that allowed it, through an export drive, to adjust more easily than if the investment had not occurred.

Real consumption, investment, and net bank lending as a percent of real GDP in the four countries are shown in table 2. The data indicate a less uniform pattern of lending and investment than that indicated in chart 2 above. Only in Chile and Argentina did real bank lending (bank loans deflated by the price index for imports) peak at the end of the 1970s, as we would expect. Mexico also experienced a surge of lending at that time, but enjoyed high real borrowing from banks in 1975-76. In Brazil, real bank lending as a percent of GDP peaked in 1975-76 as well; subsequent increases in nominal bank flows were more than offset by the rise in import prices. Notwithstanding the diversity of their pre-1982 experience, however, all four countries experienced substantial reductions in real bank lending as a percent of GDP thereafter.

Prior to 1982, real investment and lending trends were only loosely correlated. In Chile and Mexico, the simultaneous surge of bank lending and investment was marked. Brazil's share of investment in GDP declined steadily from 1975 to 1982 as the share of bank loans as a percent of domestic output also declined, albeit less regularly, during this period. In Argentina, investment and lending exhibited little relation to each other prior to the debt crisis. By contrast, in all four countries the drop-off in bank lending in the 1980s was associated with substantial reductions in investment ratios as well.

Even when bank lending is used to finance investment, it may not lead to substantial additional growth. The link between the level of investment and potential output is weakened if investment choices are distorted by policy, or if ex-ante efficient projects turn out to be ex-post unprofitable. For example, some argue that a significant portion of

TABLE 2: REAL CONSUMPTION, REAL INVESTMENT, AND REAL NET BANK LENDING AS A PERCENT OF REAL GDP

	1974	1975	1976	1977	1978	1979	1980
Argentina							
Consumption/GDP (%)	68.4	68.4	64.1	61.4	62.6	64.9	66.8
Investment/GDP (%)	18.6	19.0	20.4	23.1	20.1	20.7	22.2
Net Bank Lending/GDP (%)	0.3	2.1	0.3	1.4	2.5	5.8	4.5
Brazil							
Consumption/GDP (%)	72.4	68.3	70.0	70.9	70.5	71.8	70.3
Investment/GDP (%)	26.3	27.5	25.3	24.1	23.8	22.2	22.9
Net Bank Lending/GDP (%)	1.2	8.9	8.0	1.8	8.3	3.7	3.4
Chile							
Consumption/GDP (%)	70.7	71.3	69.1	72.6	72.2	71.1	70.7
Investment/GDP (%)	22.6	12.3	11.9	12.7	14.5	17.2	21.0
Net Bank Lending/GDP (%)	0.6	1.9	3.1	3.1	8.9	10.1	9.5
Mexico							
Consumption (%)	67.0	67.2	67.2	66.2	66.0	65.7	65.1
Investment/GDP (%)	24.1	23.9	22.4	21.7	22.4	24.1	27.2
Net Bank Lending/GDP (%)	0.9	9.9	5.7	1.3	3.3	5.3	6.0

	1981	1982	1983	1984	1985	1986	1987
Argentina							
Consumption/GDP (%)	68.4	67.2	68.4	70.7	70.2	70.9	69.0
Investment/GDP (%)	18.2	15.5	13.5	11.7	9.8	10.9	12.5
Net Bank Lending/GDP (%)	3.3	-0.7	1.0	-0.7	1.7	1.9	0.9
Brazil							
Consumption/GDP (%)	69.4	70.5	72.2	69.9	67.6	68.4	71.4
Investment/GDP (%)	20.3	18.5	14.6	15.7	16.2	18.1	15.9
Net Bank Lending/GDP (%)	3.3	3.5	0.8	3.0	-0.7	1.0	-1.4
Chile							
Consumption/GDP (%)	74.2	75.0	73.1	70.1	67.5	65.4	64.2
Investment/GDP (%)	24.3	9.8	8.1	13.4	12.2	13.2	15.7
Net Bank Lending/GDP (%)	11.8	4.3	2.3	2.8	1.8	-2.1	-5.2
Mexico							
Consumption (%)	64.2	63.0	62.3	62.1	62.5	63.2	61.5
Investment/GDP (%)	28.6	21.8	16.6	17.0	18.6	15.4	15.9
Net Bank Lending/GDP (%)	7.8	1.9	2.3	0.4	0.4	-0.6	-1.0

the borrowing by some countries funded "white elephants," large scale government projects with low ex-post economic returns. Second, even where the project generates acceptable returns, it can be questioned whether the investment was truly additional. (That is, whether the project would not have otherwise been undertaken but financed through additional domestic savings.) Finally, the large terms-of-trade shocks of the late 1970s and early 1980s may have undermined the returns on funds that had been efficiently employed. All these factors would cause investment efficiency to decline.

From gross fixed investment and GDP data, the marginal capital "cost" of an additional unit of output can be calculated to obtain a rough index of the productivity of investment in these countries. Table 3 presents estimates of incremental capital-output ratios (ICORs) for the four countries. (A low number signifies high productivity.) It is interesting to note that in all cases the efficiency of investment declined during the period of heavy borrowing. One explanation for this may be that these countries could not absorb the large inflows of capital efficiently. It is also possible that the decline in the efficiency of investment reflects the slowdown in productivity growth experienced throughout the world in the 1970s; in the 1973-79 period, productivity growth slowed to 0.7 percent on average in the industrial countries compared to 2.9 percent in the 1960s and early 1970s.[7]

It is likely, however, that the increase in ICORs among the four countries considered here was mainly attributable to poor policies and

7. Total factor productivity from OECD, Economic Outlook, December 1987.

country-specific factors. Brazil and Mexico, which were the most efficient users of capital in the 1960s and which supported the most stable political and economic environments in the 1970s, suffered the smallest decline in productivity. Argentina and Chile both experienced severe political disruptions and marked shifts in economic policy during the 1970s; they suffered more substantial increases in their ICORs.

Table 3: Incremental Capital-Output Ratios[8]

	1961-63 to 1971-73	1971-73 to 1979-81
Argentina	4.4	11.1
Brazil	2.9	3.3
Chile	3.8	5.0
Mexico	2.5	3.1

The failure of some countries to turn bank lending into higher output growth may reflect not only the low efficiency of their investment, but the diversion of bank lending to non-investment purposes. Two other alternatives considered in this paper are capital flight and consumption binges. In the case of capital flight, distortionary policies induce private residents to invest abroad. Table 4 presents an imperfect but often cited measure of capital outflows.[9] In Argentina and Mexico,

8. Source: Diaz-Alejandro, Carlos, "Latin American Debt: I Don't Think We Are In Kansas Anymore." Brookings Papers on Economic Activity, 2:1984. Calculation used three-year averages and investment lagged one year.

9. This table includes a staff adjustment for valuation affects on the stock of debt resulting from fluctuations in the value of the dollar against other major currencies.

TABLE 4
IMPLICIT CAPITAL OUTFLOWS OF SELECTED DEVELOPING COUNTRIES 1/
(billions of U.S. dollars)

	Annual Average 1975-80	1981	1982	1983	1984	1985	1986	1987	1988e	1975-87 billions of dollars	1975-87 percentage of net bank borrowing
Argentina	8.0	9.8	6.1	1.7	-0.4	0.5	-1.2	1.6	-2.9	23.0	75.0
Brazil	8.6	-3.0	7.7	-0.4	4.8	0.7	0.5	5.3	-4.6	22.0	30.0
Chile	-1.7	1.5	2.8	0.7	1.4	-3.1	-5.2	-5.2	-0.9	-1.0	-5.0
Mexico	13.5	9.6	6.4	9.3	6.2	3.3	1.6	-0.4	2.0	55.0	85.0
Total of Above	28.5	17.9	23.0	11.3	11.9	1.4	-4.3	1.3	-6.4	99.0	185.0

1/ Broad measure of capital flight. Equals change in gross external debt plus the inflow of net foreign direct investment minus the current account deficit minus the change in foreign exchange holdings of the government and domestic commercial banks. Adjusted for valuation effects resulting from changes in exchange rates.

capital flight was high relative to foreign borrowing throughout most of the period, peaking in 1981-82. (In fact, in Argentina, foreign asset accumulation by residents may have exceeded the accumulation of bank debt during 1975-82.) In Brazil, capital flight on average was low until the 1980s, and, in Chile, measured capital flight was low throughout.

This broad measure can be criticized as misleading for a number of reasons,[10] but it represents additional evidence of policy-induced capital outflows that weakened the link between foreign borrowing and growth. For example, in Argentina we interpret these data as indicating capital flight because exchange rates were highly overvalued, tariffs were high, future macroeconomic policy was uncertain, and the capital account was relatively free. These policies induced Argentines to purchase "cheap" foreign currency from the central bank and invest these funds abroad rather than in projects at home. Notwithstanding the low share of bank lending which went to finance investment in Argentina during the 1970s, investment levels dropped considerably with the onset of the debt crisis for a number of reasons. First, heavy capital flight continued through at least the first year of reduced lending, considerably reducing the supply of resources available for investment. Second, Argentina's failure to turn bank lending into growth meant its debt-to-GDP ratio and corresponding debt-service burden were very high by the early 1980s. As suggested above, the implications of this situation for future taxes, inflation, or macroeconomic stability posed strong disincentives to private investment.

10. For a discussion of these issues, see Gordon, David B. and Ross Levine, "The Capital Flight 'Problem'," forthcoming in The World Economy, June 1989.

We would expect this slowing in investment, in turn, to have led to slower output growth following the onset of the debt crisis.

The use of external bank borrowing to finance increased consumption is another way in which capital inflows could be diverted from investment spending. In Chile, for example, while the authorities borrowed extensively from abroad, they also temporarily liberalized trade, maintained strict capital controls and permitted their exchange rate to become highly overvalued. These policies encouraged residents to purchase "cheap" foreign currency from the central bank which they then used in this case to purchase consumption goods from abroad. Table 2 shows the high level of Chilean consumption as a percent of GDP by 1981-82. In consequence, with the cut-off in bank lending in the 1980s, Chile found itself, like Argentina, with a high debt-to-GDP ratio and substantial debt-service obligations. Even though not all bank lending found its way into investment during the 1970s, investments dropped in the 1980s due to tighter monetary and fiscal policies, investor concerns regarding future government policies and the uncertain macroeconomic environment. To generalize, the drop-off in output growth after the crisis will tend to be more severe in countries that used foreign borrowing for "consumption" than in countries that used it for "investment".

As a way of putting the problems of Argentina and Chile in stark relief, line segments A, B′ and C′′ in chart 2 represent the stylized path of potential domestic output when capital inflows are diverted completely into either capital flight or consumption imports. Investment activity during the lending period is assumed to be the same as in the low borrowing scenario. Investment and, hence, output growth in the post-borrowing

period falls below the low borrowing country's path for incentive reasons related to the debt-overhang discussed above. Consequently, it is reasonable to suppose that countries in which the government borrowed, in effect, to subsidize private capital flight or private consumption may be worse-off today than if they had not borrowed in the late 1970s.

B. The aggregate demand link

For the most part, the discussion in the preceding pages has been predicated on a simple model where current investment leads to future increases in capacity and, hence, output. Such a model can explain declines in growth in terms of reduced investment, but has difficulty explaining the precipitous declines in the level of GDP per capita observed in chart 1. Another channel through which foreign borrowing affects growth is through its effects on current income. By increasing the country's pool of funds, access to debt-creating flows raises public and private spending. Increased private sector demand combined with stimulative fiscal policy would, at least temporarily, increase aggregate demand and domestic output.

Indeed, these links between foreign borrowing and current output may be stronger in developing than in industrial countries because of the existence of distortionary policies that create foreign exchange constraints. In many countries, consumption imports are closely linked to income, and production depends heavily on imports of intermediate goods. In such countries, governments with high external payment obligations may be forced to take measures to contract the economy to improve the balance of payments; alternatively, improvements in the balance of payments may allow government stimulation of the economy. In these instances, variations in bank lending, as evidenced by chart 1, may lead to

corresponding variations in current output levels. The extent to which this aggregate demand effect is reflected in increased capacity is a function of the degree to which private investors see the boom as permanent and expand productive capabilities or see it as temporary and increase utilization of current capacity.

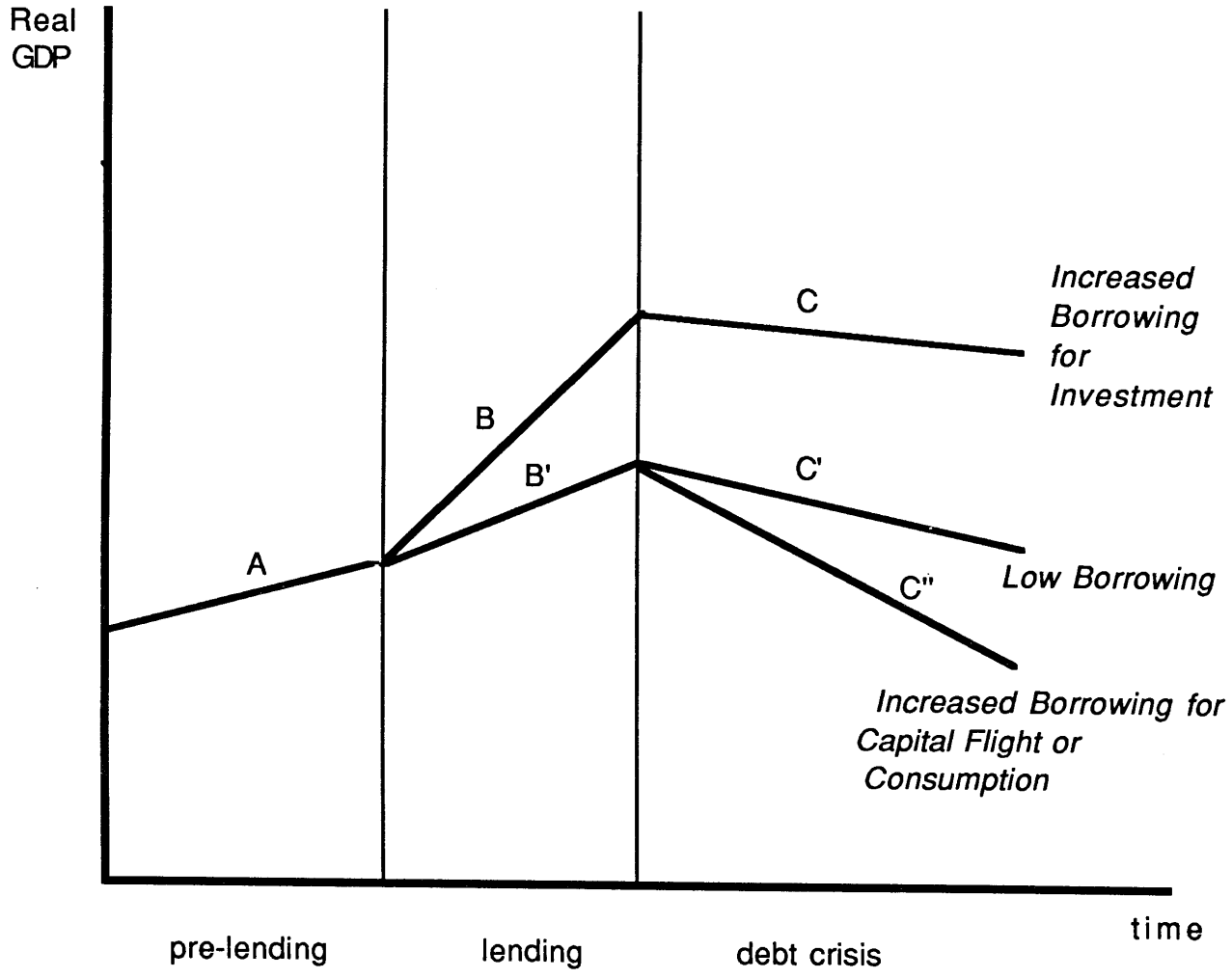
Chart 3 indicates the growth paths of various stylized economies when links between bank lending and the current level of output are also taken into account. As we can see, the level of output per capita falls in all three scenarios with the cut-off in bank lending, but the drop-off is most moderate for the high-investment case and most marked for the capital flight/consumption binge case. Countries that used foreign bank loans to finance domestic capital formation would tend to be more resilient to external shocks than countries in which much of the public debt was used to subsidize private asset holdings abroad, or to subsidize private purchases of foreign consumer goods.

C. The interest payments-income link

A third channel through which foreign borrowing affects growth is through the effect on interest payments resulting from a higher stock of outstanding debt. Increased foreign borrowing raises future debt service, which means that the foreign exchange constraint is tightened in the future. Of course, if the borrowed funds were used efficiently, growth would be enhanced through the investment link described above. However, for a given level of exports, higher levels of debt reduce imports, investment, and aggregate demand. In 1988, for example, the four countries had scheduled interest payments of $26.4 billion on a debt of about $290 billion. These interest payments represent approximately 5 percent of GDP,

Chart 3

How Borrowing Affects Growth: Investment-Capacity and Aggregate Demand Channels



compared with less than less than 1 percent of GDP in 1975. In our counterfactual scenarios discussed below, this channel contributes further to the fall in output after the debt crisis when there has been extensive borrowing, as in segments C and C" of chart 3.

IV. A Quantitative Appraisal of the Impact of Bank Lending During the Past Decade on Output Growth

In this section we attempt to quantify the channels linking bank lending to output that were discussed above in order to make a rough estimate of the path output would have taken in Argentina, Mexico, Brazil, and Chile in the absence of the run-up and subsequent plunge in bank lending that actually occurred. We then examine how growth paths in those countries would have changed in response to improvements in economic policies. The estimates are based on a simple macroeconomic simulation model that incorporates all three of the basic linkages described earlier:

1) the relation between lending, investment, and the growth of potential output;

2) the dependence of the current level of economic activity on current imports and hence bank lending; and

3) the role of bank lending in raising levels of net indebtedness and, hence, increasing interest payments abroad.

We first describe the structure of the simulation model in greater detail. This is followed by a more specific discussion of the assumptions underlying our counterfactual simulations, and finally by a description of the simulation results themselves. We should stress at the outset that the model is not intended to be a thorough description of the various economies

considered here; the simulation results should, therefore, be regarded as no more than the crudest back-of-the-envelope calculations.

A. The simulation model.

The most important relationships in the model, which is applied separately to each of the four countries, are listed on the next page. An apostrophe indicates the variable is treated as exogenous, while numbered variables in lower-case letters indicate parameters. All variables are expressed in domestic currency units at 1980 prices.

For a given year, interest payments are essentially pre-determined in equation (6) by the level of net indebtedness. The level of exports XNIA is pre-determined by the growth in potential output PY (equation (3)), which is itself calculated as average investment in the preceding three years multiplied by the country's inverted incremental capital-output ratio, icori0.[11] (See equation (8)). Since all other elements of the balance of payments are taken to be exogenous--bank lending, non-bank lending, direct foreign investment, reserve changes, and capital flight--the level of imports MNIA is determined by the balance-of-payments equation (5). The assumption that the amount of financing obtained determines the level of imports reflects our view that during the post-debt crisis years, the economies in question were actively constrained by the amount of available foreign exchange. We assume that these economies would have been similarly constrained in the absence of the surge in bank lending which took place during the 1970s.

11. We use the incremental capital-output ratio's that are presented in Table 3. In particular, we use those calculated for the later period spanning the 1970s.

The Model: Important Relationships:

National Income Accounts identity:	Y = CP + I + CG' + XNIA - MNIA	(1)
Consumption function:	CP = b0 + b1*Y	(2)
Exports-potential output link:	XNIA = XNIA(-1)*(PY/PY(-1))*xicori0	(3)
Imports as a function of output:	log(MNIA) = b2 + b3*log(Y) + b4*TIME'	(4)
Balance of payments constraint:	MNIA = XNIA + NBANKL' + NOTHERL' + DFI' - NINT - KFLIGHT'- BOP'	(5)
Net interest payments:	NINT = LIBOR'*NDEBT	(6)
Net debt accumulation:	NDEBT = NDEBT(-1) + NBANKL' + NOTHERL'	(7)
Potential output determination:	PY = PY(-1) + icori0*(I(-1) + I(-2) + I(-3))/3	(8)

Definitions:

Y	- real GDP
CP	- private consumption
CG'	- government consumption
I	- investment
XNIA	- exports, national accounts basis
MNIA	- imports, national accounts basis
PY	- potential GDP
TIME'	- time trend variable
NBANKL'	- net bank lending
NOTHERL'	- net lending from all other institutions
DFI'	- direct foreign investment
NINT	- net interest payments abroad
KFLIGHT'	- capital flight abroad
BOP'	- balance of payments (= change in reserve levels)
LIBOR'	- international dollar interest rate
NDEBT	- bank and non-bank debt, net of external assets
icori0	- inverse of incremental capital-output ratio
xicori0	- parameter linking exports to potential output.

With the level of imports determined, equation (4) exploits the historical relationship between imports and output prevailing in the country being modeled to determine the level of output Y; its parameters were estimated using OLS over the 1975-1987 period. The consumption function in equation (2), also estimated using OLS over 1975-87, then determines private consumption spending CP. (These estimates are discussed in greater detail in the Appendix.) Since government consumption CG is exogenous, this allows the national accounting identity in equation (1), which may also be thought of as the savings-equals-investment constraint, to determine investment I. Thus, investment is determined by the amount of resources remaining after private and public consumption levels have been determined. This differs from the simplest Keynesian model where investment is pre-determined and output and the trade balance, also known as "foreign savings", adjust to equate savings and investment.

The level of investment in any year contributes to the determination of potential output in subsequent years, and thus to the determination of future exports and hence future actual output as well. Exports provide foreign exchange needed to fuel current activity, and their dependence on potential output provides the link between current activity and past investment which simpler Keynesian models generally fail to provide. In simulating the model for the four countries in question, we found that exports generally grew faster than calculated changes in potential output. Accordingly, we introduced an adjustment factor, xicori0, to incorporate this observation; the parameter ranges from 1.02 to 1.04.

B. Counterfactual assumptions

Scenario 1: In scenario 1, we assumed that annual net commercial bank lending was frozen, from 1975 onwards, at the real levels (in terms of the U.S. consumer price index) prevailing during the 1970-1975 period. As indicated in table 5a through 5d following the main text, the effect of this assumption is to reduce considerably the amount of bank lending extended to these economies during the pre-debt-crisis period. The discrepancy between actual and counterfactual bank lending is much smaller in the post-debt-crisis years, however, and in all countries except Argentina, counterfactual lending actually exceeds historic lending during the post-debt-crisis years.

It would be unrealistic to reduce bank lending in our counterfactual scenario while leaving other capital flows unchanged. We assumed that capital flight represented the same share of bank lending under the counterfactual scenario that it did historically.[12] The "net inflows" lines in tables 5a through 5d indicate the combined impact of our assumptions about bank lending and capital flight on net flows (bank lending less capital flight) under scenario 1. In all four countries, net inflows decline from pre- to post-debt-crisis historically but rise under the counterfactual scenario; moreover, in all four countries the average levels of net inflows after the onset of the debt crises are higher under the counterfactual scenario than they were historically.

In addition, our measure of non-bank lending (NOTHERL'), reserve changes (BOP'), and a statistical discrepancy term used to balance the

12. Our estimates of historical capital flight flows are presented in table 4 above.

import equation were smoothed so that their volatility did not cause excessive volatility in the simulation paths of counterfactual output.

Scenario 2: there is reason to believe that had the four countries considered here not had such easy access to international borrowing during the 1970s, they would have had stronger incentives to implement more prudent policies that would have tended to reduce incentives for capital flight and raise the efficiency of investment. To allow for this possibility, we performed a second simulation, which retains the same reduced flow of bank lending as in scenario 1, but in addition set capital flight equal to zero and assumes that investment in new capacity was implemented at the higher level of efficiency (that is, lower incremental capital-output ratio) that prevailed in each country during the earlier 1961-73 period.

Scenario 3: we also wished to examine how the economies considered here would have performed had they received the flow of lending which actually occurred, but implemented more appropriate economic policies. In this third scenario, we assume the flow of net commercial bank loans which prevailed historically, but set capital flight to zero and assume a high level of investment efficiency as in scenario 2.

C. Counterfactual simulation results

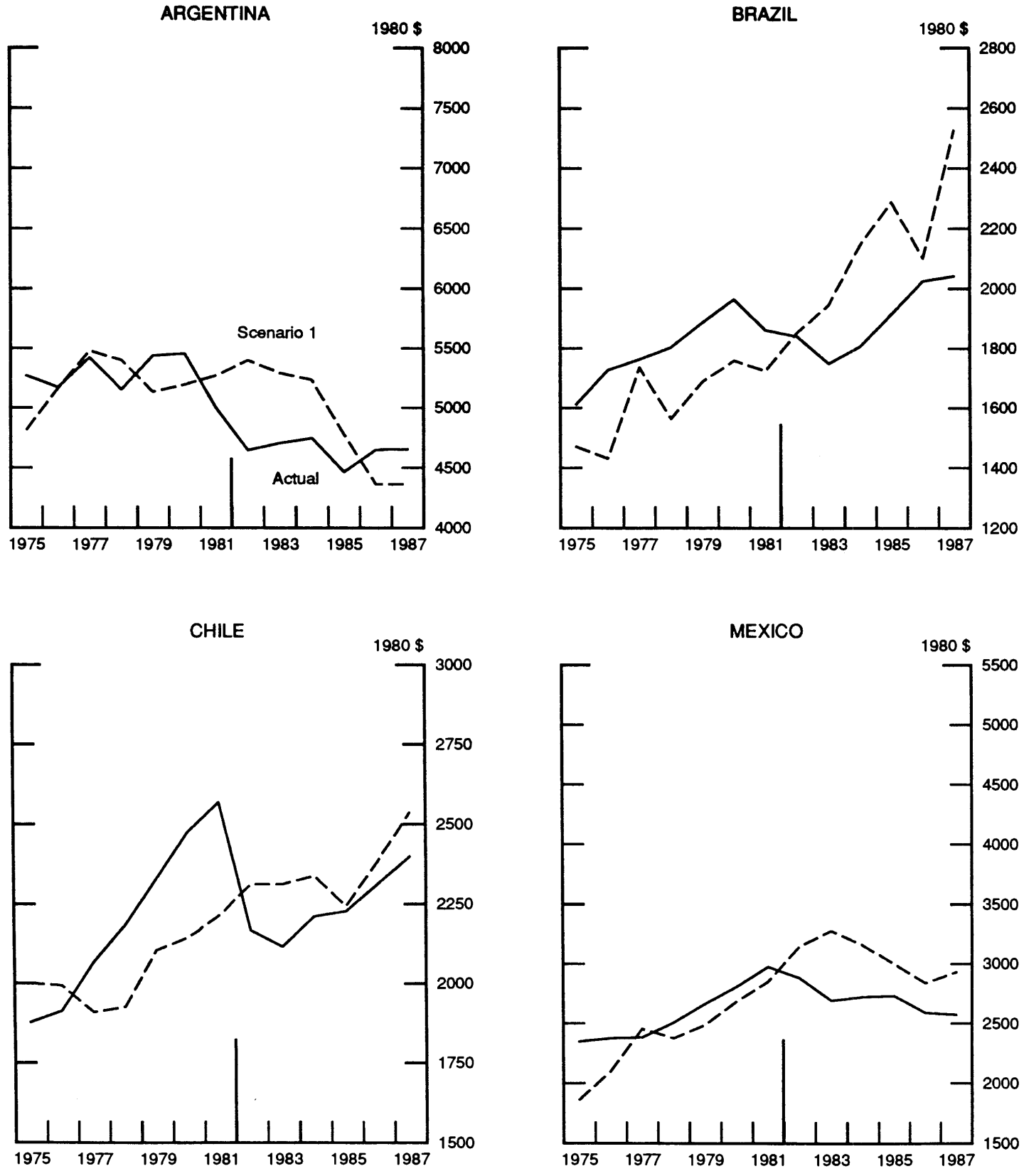
The results of our counterfactual simulations are presented in charts 4 - 9 in the text, as well as tables 5a - 5d at the end of the text.

Scenario 1: three key findings emerge from this simulation experiment.

First, the higher levels of bank lending prevailing prior to the debt crisis allowed Argentina, Brazil, Chile, and Mexico to achieve

Chart 4

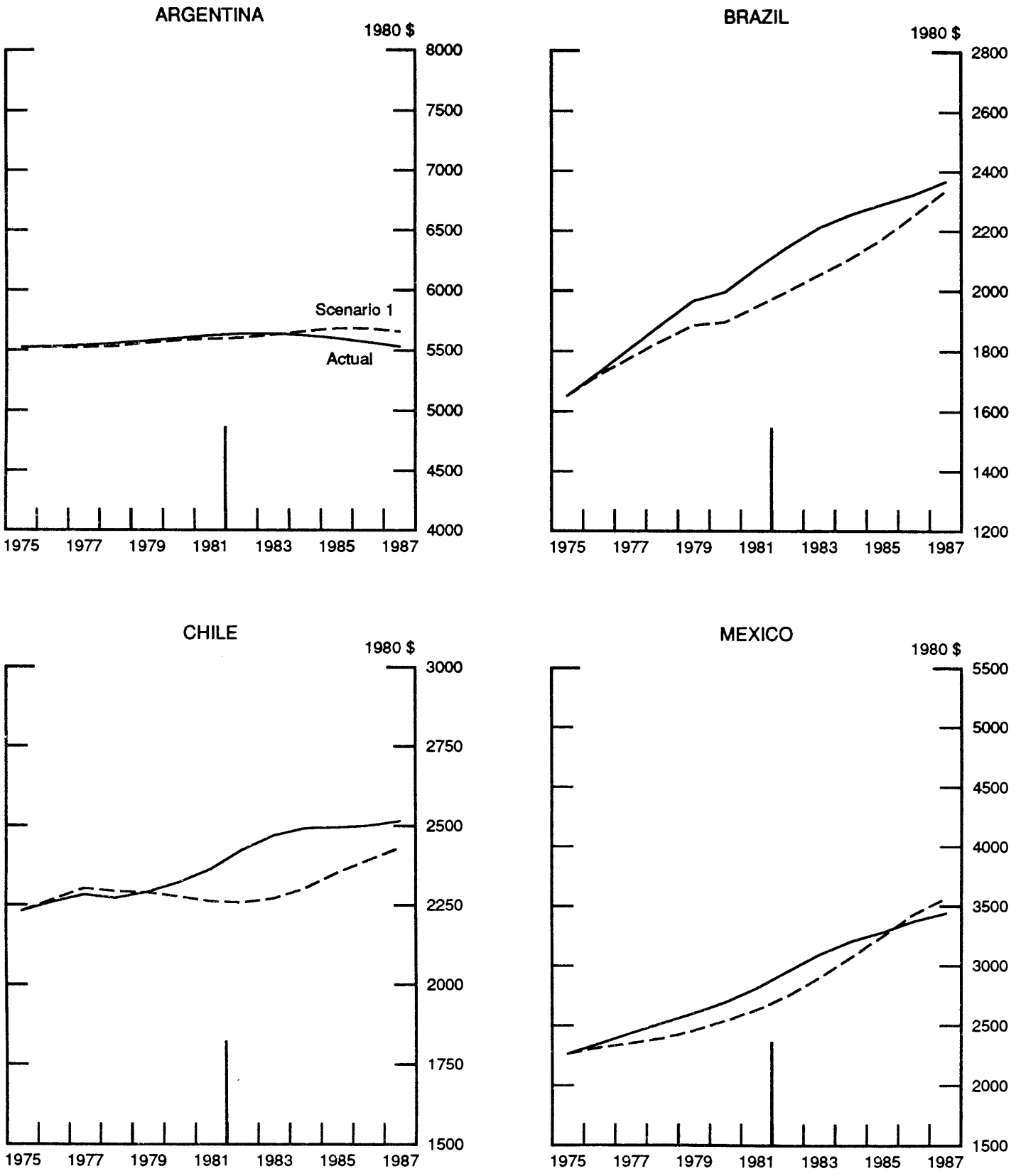
Real GDP Per Capita : Actual and Scenario 1



Scenario 1 : Bank borrowing fixed at 1970-75 real levels ; capital flight reduced to maintain actual share of bank lending .

Chart 5

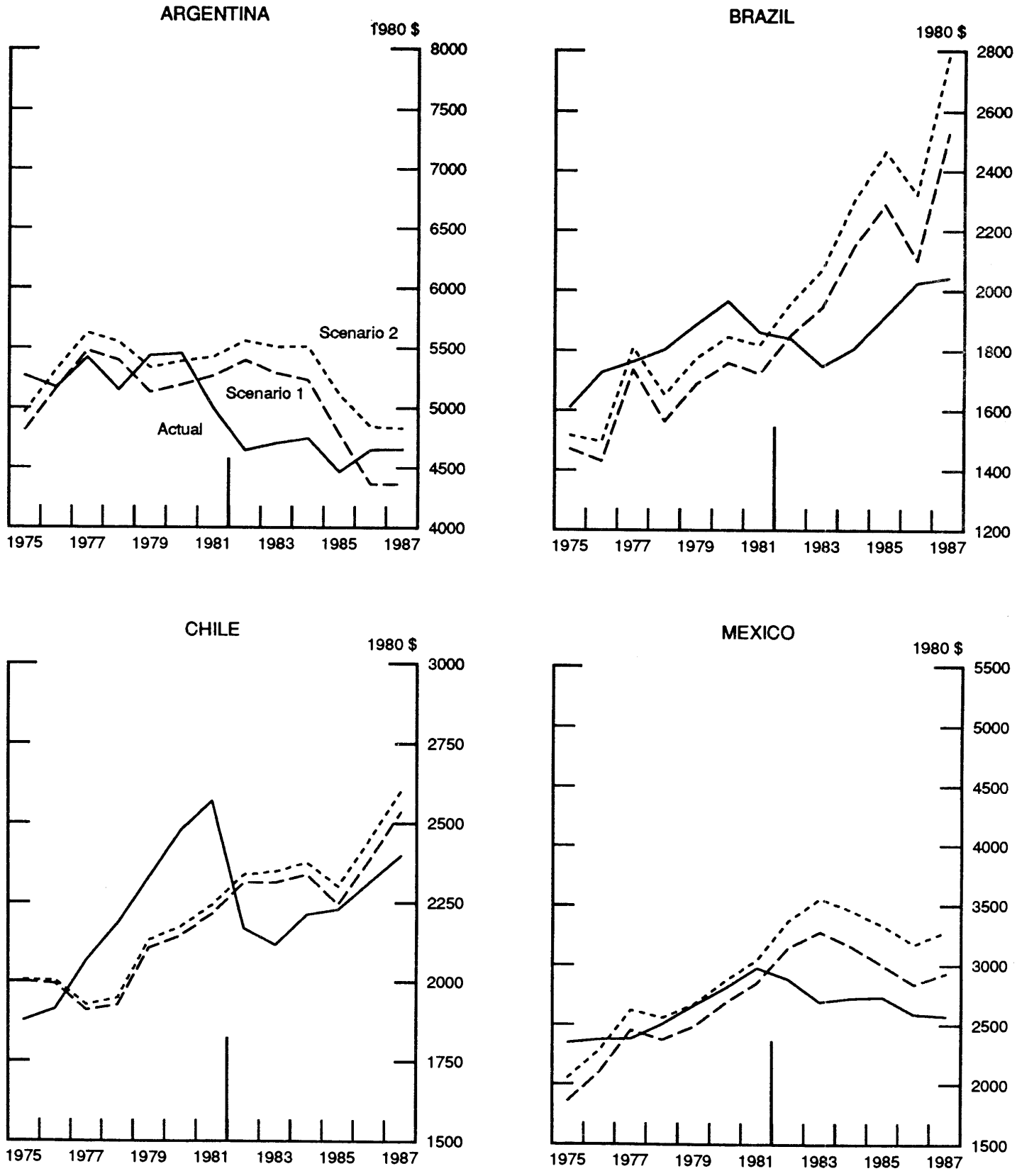
Potential Real GDP Per Capita : Actual and Scenario 1



Scenario 1 : Bank borrowing fixed at 1970-75 real levels ; capital flight reduced to maintain actual share of bank lending .

Chart 6

Real GDP Per Capita : Actual, Scenario 1, and Scenario 2

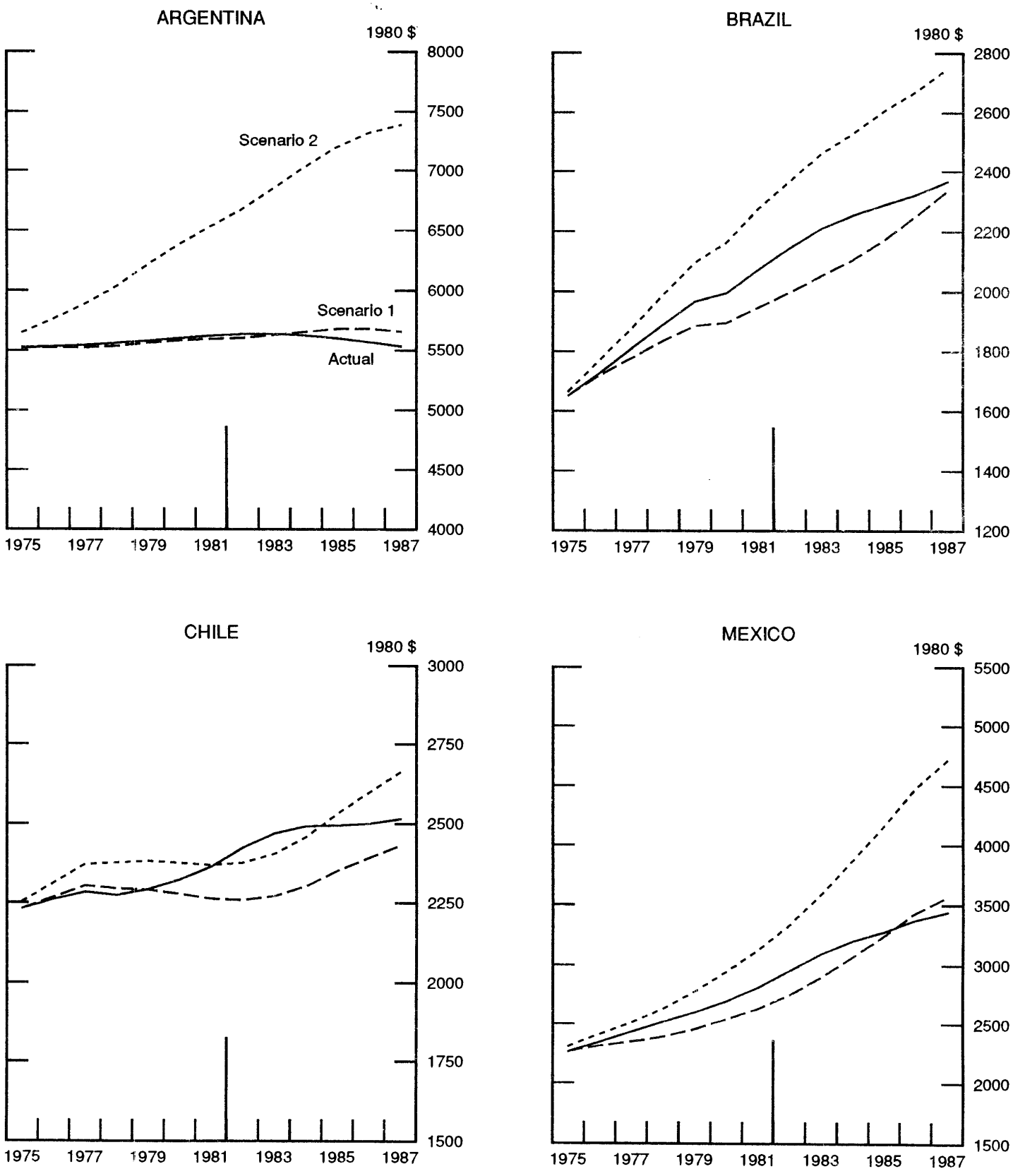


Scenario 1 : Bank borrowing fixed at 1970-75 real levels ; capital flight reduced to maintain actual share of bank lending .

Scenario 2 : Bank borrowing fixed at 1970-75 real levels ; no capital flight ; improved efficiency of capital .

Chart 7

Potential Real GDP Per Capita : Actual, Scenario 1 and Scenario 2

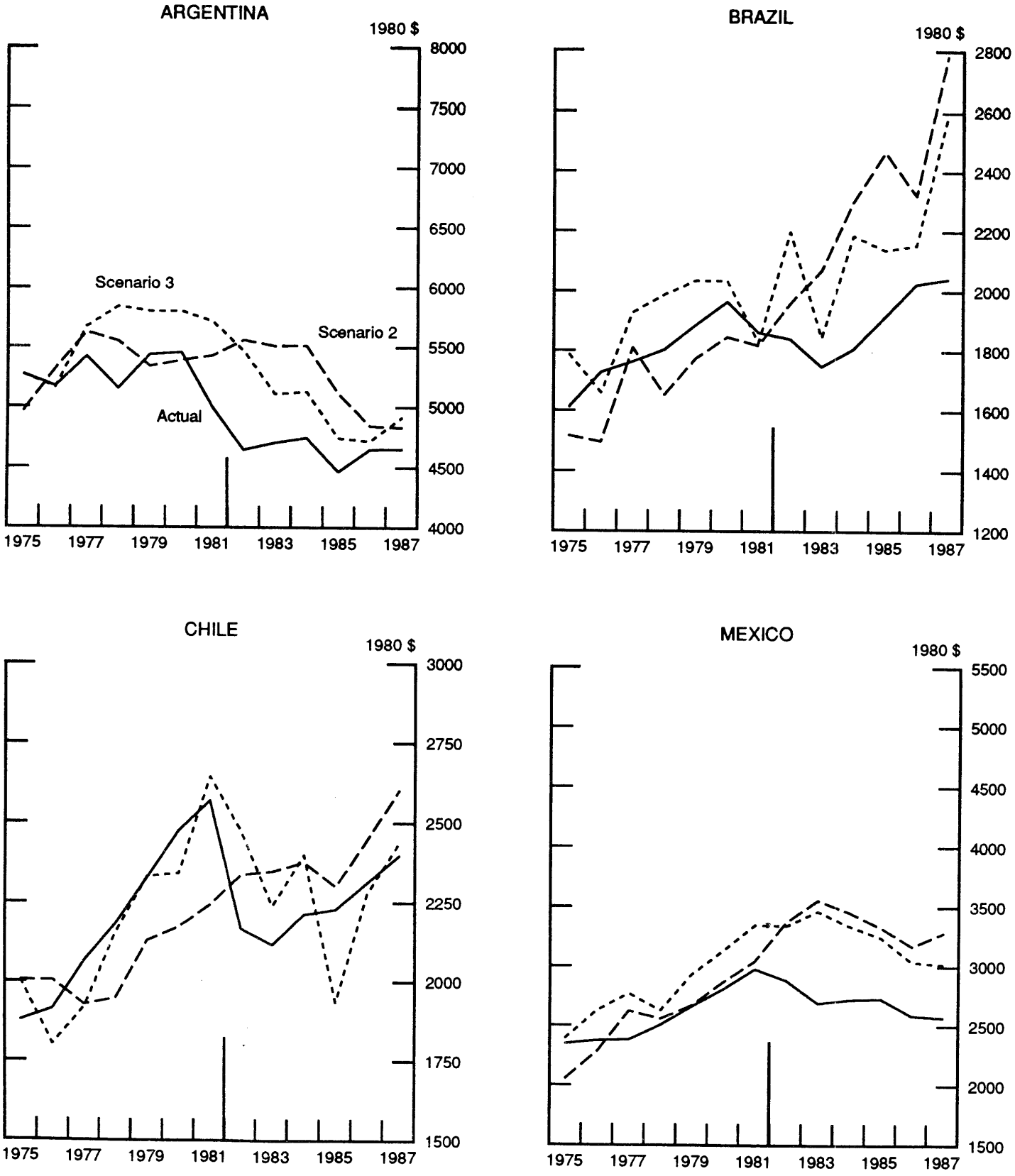


Scenario 1 : Bank borrowing fixed at 1970-75 real levels ; capital flight reduced to maintain actual share of bank lending .

Scenario 2: Bank borrowing fixed at 1970-75 real levels no capital flight; improved efficiency of capital.

Chart 8

Real GDP Per Capita : Actual, Scenario 2, and Scenario 3

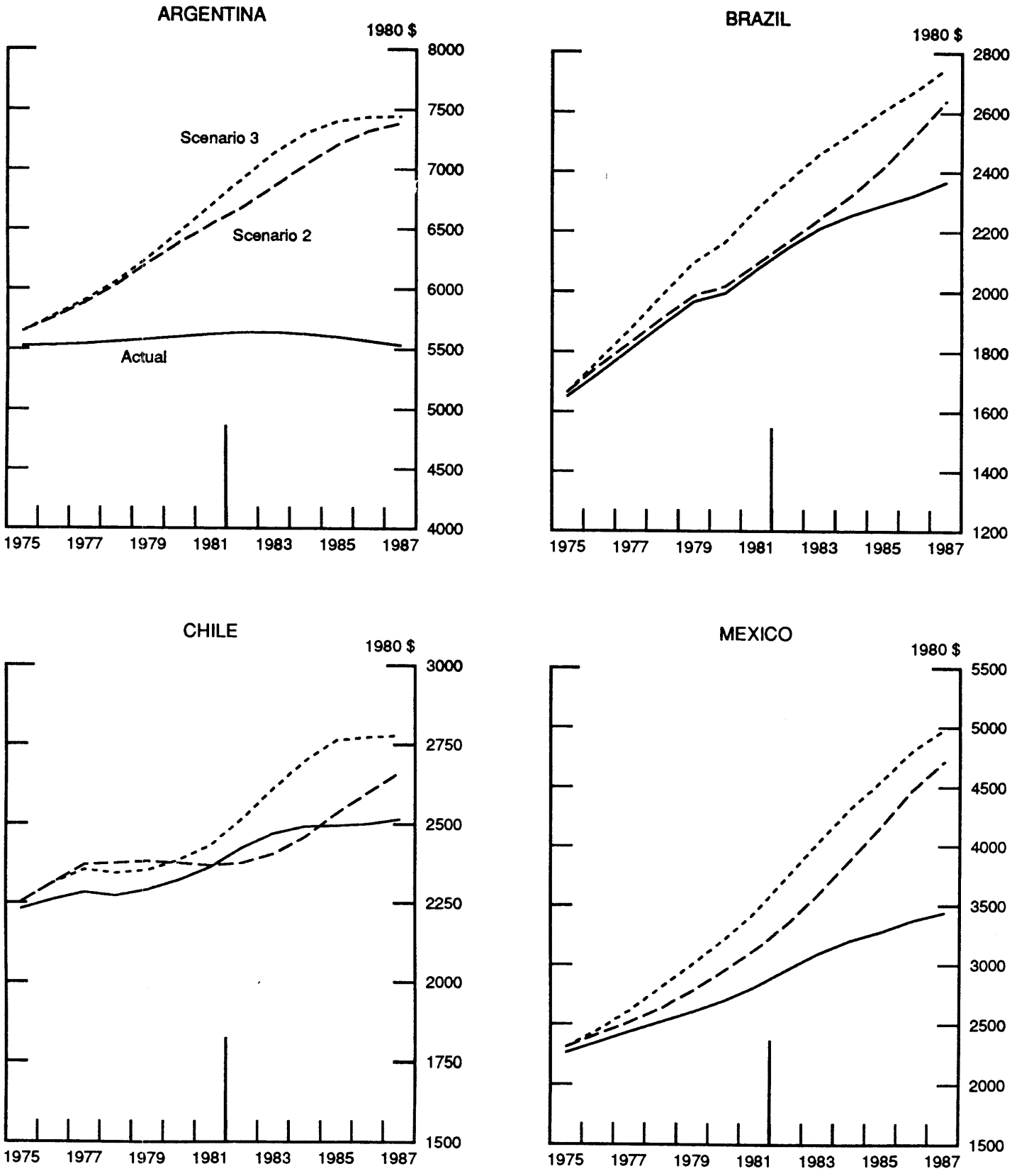


Scenario 2 : Bank borrowing fixed at 1970-75 real levels ; no capital flight ; improved efficiency of capital .

Scenario 3 : Actual bank borrowing ; no capital flight ; improved efficiency of capital .

Chart 9

Potential Real GDP Per Capita : Actual, Scenario 2, and Scenario 3



Scenario 2 : Bank borrowing fixed at 1970-75 real levels ; no capital flight ; improved efficiency of capital .

Scenario 3 : Actual bank borrowing ; no capital flight ; improved efficiency of capital .

higher output levels and growth rates than would otherwise have been possible. At their pre-debt crisis peaks, historical per capita output exceeded counterfactual per capita output by 5 percent in Argentina (1980), 12 percent in Brazil (1980), 16 percent in Chile (1981), and 4 percent in Mexico (1981). In retrospect, the high lending flows to these countries at that time appear to have been excessive and unsustainable. To the extent that a subsequent decline in lending was inevitable, some decline in economic activity and growth was also unavoidable.

Second, the decline in growth rates in the 1980s was exacerbated by the fall-off in bank lending from the levels prevailing prior to the debt crisis. In Brazil and Chile, average growth rates of per capita output fell from before to after the debt crisis while growth rates under the counterfactual scenario rise. Growth rates under the counterfactual scenario fell following the debt crisis in both Mexico and Argentina, but by considerably less than historical growth rates. In all four countries, average levels of real GDP per capita under scenario 1 considerably exceed actual per capita output levels.

Chart 5 shows that the decline in actual real GDP per capita in the early 1980s was not attributable to declines in potential output. Except in the case of Argentina, where investment spending fell markedly and the efficiency of investment was exceptionally low, actual potential output rises during the 1980s and generally exceeds the path of counterfactual potential output. Thus, declines in actual real GDP per capita absolutely, and in relation to potential, appear to have been caused by reductions in aggregate demand brought about by declines in borrowing, weak world demand, high real interest rates, and terms-of-trade movements.

Our third finding is that the four countries considered in this note do not appear to have benefitted appreciably over the long term from the temporary surge in bank lending that took place at the end of the 1970s. As noted above, in all four countries average levels of real per capita GDP in the post-debt crisis period are higher under scenario 1 than they were historically. In addition, 1987 levels of potential output per capita are similar historically and under scenario 1. While the surge of bank lending in the late 1970s led to high rates of investment and build-ups of capacity relative to the counterfactual scenario, this advantage eroded in the 1980s as actual levels of output and investment plunged. Finally, our calculations indicate that levels of net indebtedness in 1987 are about 50 to 80 percent higher historically than they are under the scenario 1. When the additional interest payments associated with this higher indebtedness are taken into account, it appears likely that the four countries were left worse off as a result of their history of heavy borrowing.

The cases of Brazil and Chile conform most closely to what we would have expected. During the pre-debt-crisis period, actual output was generally higher than simulated output since net capital inflows were so much higher as well. After 1982, the decline in bank lending forced actual output levels below those calculated in scenario 1. Neither Brazil nor Chile experienced a prolonged recession under scenario 1. As a result of the legacy of higher output and investment during the pre-debt-crisis period, potential output in 1987 is higher in actuality than under the counterfactual, but by less than 4 percent. On the other hand, debt-to-GDP ratios are considerably lower under the counterfactual scenario.

Unlike in Brazil and Chile, Mexico does experience a prolonged recession under the counterfactual scenario, largely due to the effects of falling oil prices and declines in non-bank lending flows. Nevertheless, under the counterfactual scenario per capita output in 1987 still exceeds that of 1981, and its average exceeds that of historical per capita and output during 1982-87 by 13 percent.

In part because of substantial capital flight, Argentina's output during the 1975-80 period was not much higher historically than under the counterfactual scenario. The drop-off in bank lending and the surge in capital flight in the following years caused output per capita under the counterfactual scenario to exceed historical levels by an average of about 5 percent after 1980. 1987 potential output was about 2 percent higher under the counterfactual scenario than occurred historically. In contrast to the other countries, however, current output in 1987 is higher than under the counterfactual scenario, in large part reflecting an apparent return of flight capital in that and preceding years.

Scenario 2: the paths of real GDP per capita under scenario 2 are presented in chart 6. As noted above, scenario 2 retains the assumptions concerning bank borrowing incorporated into scenario 1, but in addition sets capital flight to zero and assumes a higher efficiency of investment. During the pre-debt-crisis period, the path of output under scenario 2, the dotted line, is closer to actual performance then it was under scenario 1, the dashed line. Thus, when heavy borrowing is used to finance inappropriate policies, the gains from this borrowing are reduced. In the post-debt-crisis period, economic activity under scenario 2 consistently outstrips that of both scenario 1 and the historical record. As shown in chart 7, potential output grows far more quickly under scenario 2 then

historically or under scenario 1. These results support the conclusion that international borrowing is not a substitute for appropriate economic policies as a way of sustaining output growth. To the extent that weaker policies were engendered by the availability of external borrowing, these results also strengthen the conclusion that the four countries considered here were left worse off as a result of their heavy borrowing.

Scenario 3: in this experiment, we attempted to determine the extent to which Argentina, Brazil, Chile, and Mexico would have benefitted from heavy borrowing had they pursued appropriate policies that eliminated capital flight, and maintained a high efficiency of investment.

As shown in chart 8, the performance of real GDP per capita under scenario 3, shown by the dotted line, is generally superior to the actual performance for all four countries. However, real GDP per capita during the post-debt-crisis period averages higher under scenario 2 than under scenario 3. In part, this reflects the fact that net bank borrowing in scenario 3, which is assumed to be the same as actual borrowing, dropped below the assumed counterfactual path of scenario 2 in the mid-1980s. Moreover, interest payments were higher in scenario 3 than in scenario 2 because higher levels of debt accumulated in the 1970s. This underscores the dependence of current output levels on contemporaneous levels of bank borrowing, as well as the level of debt service payments abroad.

Chart 9, on the other hand, indicates that the level of potential real GDP per capita rises considerably higher under scenario 3 than scenario 2 for all countries. Potential GDP per capita reflects the history of past investments, and more investments are financed under scenario 3 than under scenario 2, regardless of whether that potential can

be realized. Of course, potential real GDP per capita under both scenarios 2 and 3 generally outstrips actual potential output throughout the period.

TABLE 5A: COUNTERFACTUAL SIMULATIONS FOR ARGENTINA
PERIOD AVERAGES

	1975-1980	1981-87
REAL GDP GROWTH (%)		
ACTUAL	1.86	-0.70
SIMULATED		
SCENARIO 1	1.03	-0.93
SCENARIO 2	1.65	0.00
SCENARIO 3	2.90	-0.80
REAL PER CAPITA OUTPUT ($ 1980 MILLIONS)		
ACTUAL	5317.02	4695.13
SIMULATED		
SCENARIO 1	5196.75	4955.92
SCENARIO 2	5363.39	5255.62
SCENARIO 3	5590.23	5113.13
POTENTIAL PER CAPITA OUTPUT ($ 1980 MILLIONS)		
ACTUAL	5555.79	5602.45
SIMULATED		
SCENARIO 1	5540.30	5642.75
SCENARIO 2	5990.35	7001.85
SCENARIO 3	6023.24	7190.35
BANK DEBT INFLOW - NET OF CAPITAL FLIGHT		
NET INFLOWS ($ MILLIONS)		
ACTUAL	1563.75	-361.93
SIMULATED		
SCENARIO 1	20.44	30.21
SCENARIO 2	478.40	707.13
SCENARIO 3	3350.83	1442.86
BANK DEBT INFLOW ($ MILLIONS)		
ACTUAL	3350.83	1442.86
SIMULATED		
SCENARIO 1	478.40	707.13
SCENARIO 2	478.40	707.13
SCENARIO 3	3350.83	1442.86
CAPITAL FLIGHT ($ MILLIONS)		
ACTUAL	1787.08	1804.79
SIMULATED		
SCENARIO 1	457.96	676.92
SCENARIO 2	0.00	0.00
SCENARIO 3	0.00	0.00
NET INTEREST PAYMENTS ($ MILLIONS)		
ACTUAL	996.04	4281.89
SIMULATED		
SCENARIO 1	461.20	1894.78
SCENARIO 2	461.20	1894.78
SCENARIO 3	996.04	4281.89

TABLE 5B: COUNTERFACTUAL SIMULATIONS FOR BRAZIL
PERIOD AVERAGES

	1975-1981	1982-87
REAL GDP GROWTH (%)		
ACTUAL	5.30	3.81
SIMULATED		
SCENARIO 1	4.15	8.93
SCENARIO 2	4.95	9.73
SCENARIO 3	5.03	8.31
REAL PER CAPITA OUTPUT ($ 1980 MILLIONS)		
ACTUAL	1802.19	1896.08
SIMULATED		
SCENARIO 1	1624.34	2142.45
SCENARIO 2	1701.42	2315.92
SCENARIO 3	1893.77	2184.32
POTENTIAL PER CAPITA OUTPUT ($ 1980 MILLIONS)		
ACTUAL	1873.70	2264.98
SIMULATED		
SCENARIO 1	1816.31	2153.50
SCENARIO 2	1894.41	2383.60
SCENARIO 3	1977.58	2564.06
BANK DEBT INFLOW - NET OF CAPITAL FLIGHT		
NET INFLOWS ($ MILLIONS)		
ACTUAL	6419.55	-492.40
SIMULATED		
SCENARIO 1	1072.50	1549.95
SCENARIO 2	1871.37	2704.45
SCENARIO 3	7243.43	2208.33
BANK DEBT INFLOW ($ MILLIONS)		
ACTUAL	7243.43	2208.33
SIMULATED		
SCENARIO 1	1871.37	2704.45
SCENARIO 2	1871.37	2704.45
SCENARIO 3	7243.43	2208.33
CAPITAL FLIGHT ($ MILLIONS)		
ACTUAL	823.87	2700.73
SIMULATED		
SCENARIO 1	798.87	1154.51
SCENARIO 2	0.00	0.00
SCENARIO 3	0.00	0.00
NET INTEREST PAYMENTS ($ MILLIONS)		
ACTUAL	4947.85	8892.31
SIMULATED		
SCENARIO 1	2826.00	5085.99
SCENARIO 2	2826.00	5085.99
SCENARIO 3	4947.85	8892.31

TABLE 5C: COUNTERFACTUAL SIMULATIONS FOR CHILE
PERIOD AVERAGES

	1975-1981	1982-87
REAL GDP GROWTH (%)		
ACTUAL	4.03	0.55
SIMULATED		
SCENARIO 1	1.85	4.03
SCENARIO 2	2.03	4.26
SCENARIO 3	4.46	0.33
REAL PER CAPITA OUTPUT ($ 1980 MILLIONS)		
ACTUAL	2201.51	2239.04
SIMULATED		
SCENARIO 1	2041.23	2354.33
SCENARIO 2	2060.61	2401.58
SCENARIO 3	2170.61	2293.53
POTENTIAL PER CAPITA OUTPUT ($ 1980 MILLIONS)		
ACTUAL	2288.83	2482.54
SIMULATED		
SCENARIO 1	2274.74	2334.04
SCENARIO 2	2347.92	2505.07
SCENARIO 3	2347.46	2689.31
BANK DEBT INFLOW - NET OF CAPITAL FLIGHT		
NET INFLOWS ($ MILLIONS)		
ACTUAL	1741.81	-73.14
SIMULATED		
SCENARIO 1	253.39	366.19
SCENARIO 2	249.52	360.59
SCENARIO 3	1524.86	96.00
BANK DEBT INFLOW ($ MILLIONS)		
ACTUAL	1524.86	96.00
SIMULATED		
SCENARIO 1	249.52	360.59
SCENARIO 2	249.52	360.59
SCENARIO 3	1524.86	96.00
CAPITAL FLIGHT ($ MILLIONS)		
ACTUAL	-216.95	169.14
SIMULATED		
SCENARIO 1	-3.88	-5.60
SCENARIO 2	0.00	0.00
SCENARIO 3	0.00	0.00
NET INTEREST PAYMENTS ($ MILLIONS)		
ACTUAL	778.36	1537.77
SIMULATED		
SCENARIO 1	523.83	666.17
SCENARIO 2	523.83	666.17
SCENARIO 3	778.36	1537.77

TABLE 5D: COUNTERFACTUAL SIMULATIONS FOR MEXICO
PERIOD AVERAGES

	1975-1981	1982-87
REAL GDP GROWTH (%)		
ACTUAL	6.80	-0.24
SIMULATED		
SCENARIO 1	6.15	2.68
SCENARIO 2	7.15	3.51
SCENARIO 3	8.61	0.47
REAL PER CAPITA OUTPUT ($ 1980 MILLIONS)		
ACTUAL	2579.09	2697.00
SIMULATED		
SCENARIO 1	2401.37	3056.70
SCENARIO 2	2585.72	3360.83
SCENARIO 3	2832.02	3241.42
POTENTIAL PER CAPITA OUTPUT ($ 1980 MILLIONS)		
ACTUAL	2525.15	3224.04
SIMULATED		
SCENARIO 1	2421.78	3160.59
SCENARIO 2	2674.62	4026.84
SCENARIO 3	2832.03	4400.86
BANK DEBT INFLOW - NET OF CAPITAL FLIGHT		
NET INFLOWS ($ MILLIONS)		
ACTUAL	3933.47	-3312.32
SIMULATED		
SCENARIO 1	-136.07	-196.65
SCENARIO 2	1559.47	2253.71
SCENARIO 3	8024.57	1082.83
BANK DEBT INFLOW ($ MILLIONS)		
ACTUAL	8024.57	1082.83
SIMULATED		
SCENARIO 1	1559.47	2253.71
SCENARIO 2	1559.47	2253.71
SCENARIO 3	8024.57	1082.83
CAPITAL FLIGHT ($ MILLIONS)		
ACTUAL	4091.10	4395.15
SIMULATED		
SCENARIO 1	1695.54	2450.36
SCENARIO 2	0.00	0.00
SCENARIO 3	0.00	0.00
NET INTEREST PAYMENTS ($ MILLIONS)		
ACTUAL	4580.82	8316.25
SIMULATED		
SCENARIO 1	2305.11	4076.37
SCENARIO 2	2305.11	4076.37
SCENARIO 3	4580.82	8316.25

Appendix: Estimation Results

Both the consumption functions (equation 2) and import functions (equation 4) were estimated econometrically using Ordinary Least Squares (OLS) on annual data over the period 1975-87. The consumption function is estimated as a standard linear relationship between consumption and income:

$$CP = b_o + b_1 Y$$

Estimation results for all four countries are shown below; t-statistics are in parentheses.

Consumption Function

	Argentina	Brazil	Chile	Mexico
b_o	3.0	118.0	93.6	487.8
	(0.5)	(0.3)	(1.3)	(5.6)
b_1	0.6	0.7	0.6	0.5
	(3.2)	(24.3)	(8.2)	(26.3)
Corrected R^2	0.29	0.98	0.85	0.98

In estimating the import functions, we found a logarithmic specification of the relation between imports and output to yield a better fit than the linear specification used in the consumption function. Moreover, the attempts of the four countries to compress imports following the onset of the debt crisis tended to muddy the relationship we would expect between imports and income. We found that by introducing a time trend as an explanatory variable, we were able to estimate plausible (although rather high) elasticities of import demand with respect to output. The final specification of the import function, along with estimation results, is shown below:

$$\log (MNIA) = b_2 + b_3 \log (Y) + b_4 \, TIME'$$

Import Function

	Argentina	Brazil	Chile	Mexico
b_2	-42.7 (-1.3)	197.5 (7.2)	110.4 (6.9)	200.2 (4.1)
b_3	5.4 (3.4)	1.9 (4.9)	3.2 (13.4)	3.3 (4.8)
b_4	0.0 (0.8)	-0.1 (-6.7)	-0.1 (-7.3)	-0.1 (-4.2)
Corrected R^2	0.46	0.86	0.95	0.64

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