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# How Lending to Eastern Nations Affects the Developing World

Donald Putnam Henry

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Donald Putnam Henry

November 1983

35<sup>th</sup>  
Year



## **PREFACE**

This study was sponsored by The Rand Corporation, using its own funds, under Rand's International Economic Policy Program. The report analyzes the relationship between lending to the Eastern bloc countries and lending to the developing nations of the world. It should be of interest to those concerned with East-West economic relations, global economic development, and international finance.

## SUMMARY

This report examines the relationship between capital flows to the Eastern bloc and capital flows to the developing nations of the world.<sup>1</sup> When residents of a nation or region spend more than they produce, they must import resources from abroad to cover the shortfall in production. The region must pay for these resources by importing capital, which is simply borrowing abroad. Residents of other regions produce more than their current spending; they export resources and lend or invest abroad.

Over the years, but particularly during the last decade, the Eastern bloc countries and the non-oil developing countries have imported large amounts of capital. These flows have been covered by exports of capital from the industrialized West and the oil exporting countries. Flows for the past decade are summarized in Table S.1.

In the past, Western governments have generally not impeded capital flows to either the East or the South. In fact, flows to both regions are frequently encouraged through a variety of explicit and implicit subsidies. Few qualitative distinctions are made between borrowers in the East and borrowers in the South. The strategic impact of capital flows to the East, however, differs greatly from the impact of capital flows to the South.

Capital flows to the East increase the economic potential of the Warsaw Pact. If economic gains are transformed into greater military expenditures, the West must either counter these expenditures at some cost or accept a lower level of military security. The nations of the East are a fairly well coordinated political unit. As such, the nations could credibly threaten, as a group, to renounce their debts to the West in order to extort political or economic concessions. Finally, loans to the East might be used, in turn, to finance credit sales of Eastern bloc goods, especially arms, to the South. The West might be financing Eastern mischief in the third world, presumably with effects that are not congenial to the West.

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<sup>1</sup>This report rather artificially divides the world into three parts: the industrialized market democracies referred to as the West, the communist countries referred to as the East, and the developing world referred to as the South or the third world. The third world is further divided into oil exporting countries and non-oil developing countries. A listing of the countries in each bloc is provided in Appendix A. An analysis of the effects of various actions on large blocs of countries of necessity ignores the differences among nations within a bloc. Results derived for blocs as a whole might be just the opposite of results derived for individual members.

Table S.1

ESTIMATED NET CAPITAL FLOWS: 1973-1982  
(Billions of dollars)

Region	Lending (Borrowing)
West	50.3
United States	115.8
Other	(65.5)
South	45.1
Oil exporting	397.5
Other	(352.4)
East	(95.5)
Soviet Union	(11.8)
Other	(83.8)
World total	0.0

SOURCES: International Monetary Fund,  
Central Intelligence Agency (see Appen-  
dix B).

Capital flows to the South are not burdened with such drawbacks. Lending to the South generally supports economic development which is widely viewed as a positive result in the West. The Southern nations pose a much smaller military threat to the West. Also, the developing nations are a diverse group with very different ideologies, economies, and loyalties. There is little chance that the third world could agree on a coordinated debt renunciation scheme for either political or economic reasons. Lastly, direct Western lending to the South enhances Western influence in the developing world.

Not only do capital flows to the East adversely affect Western interests, but they also displace capital flows to the South. Resources sent East might otherwise end up in the South. If capital flows to the East are reduced by \$11 billion (roughly one tenth of outstanding Eastern indebtedness), capital flows to the South would increase by an estimated \$2.2 billion. Interest rates would fall slightly (by about two hundredths of a percent), spurring investment both in the West and the South. New investment will eventually increase production in both

areas. Declining interest rates will reduce the interest burden on debtor nations, largely non-oil producing developing countries. Although lower interest rates will reduce earnings in the net creditor West, the greatest burden will fall on the oil producing countries.

These estimates of the effects of a capital flow diversion rest heavily on assumptions made about the sensitivity of investment to changes in interest rates. The figures above assume that the interest elasticity of investment is  $-1$  in both the West and the South. This assumption can be violated in two ways. First, the interest elasticity of investment might differ across regions. The share of new investment will then be greater in the region that is more sensitive to interest rate changes, and the results might change significantly. Second, the interest elasticity might be the same in both regions, but this common elasticity might not be  $-1$ . If investment is less sensitive to interest rates in both regions, interest rates will have to fall more to "absorb" the resources denied to the East. As the South is a net debtor, its interest burden will be lower at reduced interest rates, allowing greater consumption. As the North is a net creditor (by more than the South's net debt), consumption will fall in the North as interest earnings decline. Since the consumption decline in the North will exceed the consumption rise in the South, the difference must be "absorbed" by increased investment in both regions. This second violation of the elasticity assumption will not change the results significantly. Overall, the South will gain the most if interest elasticities are small everywhere but comparatively large in the South. These effects can be seen in the various scenarios developed in Sec. IV.

As a whole, the West would lose in purely economic terms from a reduction of unsubsidized capital flows to the East. Interest income generally falls by more than production increases so Western consumption is reduced at some point. If *subsidized flows* are curtailed, however, the loss in interest income is offset by lower subsidy payments. Both the West and South might gain if such a strategy were effected.

Although a reduction in capital flows to the East might be beneficial to both the West and the South, several problems are encountered if Western governments attempt to implement such a reduction. A key problem is obtaining and maintaining a consensus in the West. The West might gain from a reduction in capital flows to the East, but individual countries might have more to gain by undermining such policies. Subsidized flows might be the easiest to reduce, but governments often feel great pressures to promote certain exports by subsidizing credit. The influence of those interest groups that benefit from these subsidies should not be underestimated. Subsidies, however, are provided by

Western governments rather than by individuals, so a subsidy reduction is a *comparatively* easy policy to implement for a government so inclined. A subsidy reduction can certainly be implemented by the Western countries as a whole and perhaps by one country unilaterally.

A reduction in commercially justified<sup>2</sup> flows to the East is a much more difficult policy to effect. Even if all governments in the West could agree on such a reduction (which is improbable), enforcement of a capital flow reduction would be almost impossible. Such an imposed reduction would in effect be a financial embargo on the East. As in any embargo, arbitrage profits reward those who can evade the embargo. Tight control would be needed over all Western banks, their offshore subsidiaries, and other financial conduits. Even the tightest financial controls in the West are insufficient to assure a reduction in genuinely unsubsidized lending to the East. The oil producing countries might lend directly to the East, bypassing Western banks.<sup>3</sup> Although it might be desirable to encourage the oil producing developing countries to bear some of the political risk in Eastern lending, such a policy could drive the oil exporting countries economically and politically closer to the Eastern bloc. Without the active cooperation of the oil producing states, a capital flow embargo would certainly fail. The economic power of the oil producing countries might wane with lower surpluses over the next decade. Nonetheless, even if the oil producing nations import small amounts of capital, most such nations will have large investment portfolios that might be shifted into direct lending to the East if the returns are high enough. Even with cooperation from oil producing states, a capital flow embargo could be circumvented by countries in the South borrowing from the West, or from the oil producing states, and relending to the East. For capital flow restrictions to succeed, every nation outside of the East must either abide by the embargo or be isolated from world financial markets.

Although direct attempts to reduce unsubsidized lending to the East will probably fail, other policies adopted throughout the West or by a few Western countries might succeed. *Future lenders* to the East might be denied the assistance of Western governments or courts in collecting Eastern debts. If Western lenders are not allowed to attach Eastern assets in the West, loans might be cut back or at least made at higher interest rates to cover the increased risk of default. Such a

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<sup>2</sup>"Commercially justified" is used here to mean flows that provide a competitive rate of return after risk premia. This return includes only financial rewards to the individual lender and does not consider side effects for the West as a whole from added lending to the East.

<sup>3</sup>To some extent, this is already happening.

scheme would also transfer to the individual lender many of the risks and costs of lending to the East.

A program to encourage lending to the South might also be effective in shifting funds from the East. Bank lending to governments is the primary vehicle for capital flows to the South. Other financial institutions prominent in the West are less developed in the South. If novel methods of financing development in the South could be devised, increased Southern borrowing might drive the East from the credit markets through higher interest rates.

A final consideration in developing a capital flow policy toward the East is the reaction of the East and other parts of the world to the policy. A bellicose reaction in the East could instantly erase any benefits to the West of a capital flow diversion to the South. A capital embargo on the East might be construed as a hostile act and could be used by the East as a justification for a debt renunciation. A reduction of capital flow subsidies would be less of a challenge to the East—it is merely an adverse change in commercial policy. Denying creditors recourse in the courts against the East could be packaged as a friendly act—protecting our socialist friends from frivolous suits by misguided citizens. Actively promoting capital flows to the South might be the ideal policy for it makes the East hear the economic music without plucking the usual chords of East-West relations.

## **ACKNOWLEDGMENTS**

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# I. INTRODUCTION

This report examines the consequences of reducing capital flows from the industrialized nations of the West to the communist states in the East. It has been argued that capital flows to the Eastern bloc harm the West in several ways: increased economic and military potential of the Warsaw Pact, the possibility of the East threatening debt default to extort concessions from the West, and increased exports of both goods and influence from the East. Here it will be argued that capital flows to the East also harm the developing nations of the world by crowding them out of international capital markets and driving up interest rates on the borrowing that they are able to undertake. Potential problems in diverting capital flows from the East to other areas will also be discussed.

It is somewhat artificial to divide the world into a few blocs or groups of countries.<sup>1</sup> This is particularly true when the effects of a policy are calculated for an entire bloc. Countries within a bloc differ in their resources, concerns, and preferences. Some nations within a bloc might benefit from an action while others will lose. The divisions offered here are neither precise nor consistent, yet they attempt to split the world along multiple cleavages: economics, politics, and culture.

The West includes the world's industrialized market economies. Belying the geographical implications, Japan, Australia, and New Zealand are considered to be part of the West. These nations share similar economic and political systems with Western Europe, the United States, and Canada. Many of these nations are joined in explicit or implicit military alliances generally in opposition to the East.

The East is comprised of the communist nations. Some of the nations of the East are highly industrialized whereas others are largely agrarian. All have tightly controlled economies that discourage private ownership and stress central planning. Every nation in the East is controlled by a party espousing Marxist ideology. The Warsaw Pact links many of these nations in an alliance against much of the West.

The South is made up of the rest of the world and is a varied lot. With some important exceptions, these nations are not militarily allied with either the West or the East. The South is less industrialized than the West, and, with the exception of the oil exporting countries, is poorer than the West and most of the East.

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<sup>1</sup>For a listing of countries and the blocs to which they are assigned, see Appendix A.

Over the past decade, the West and the oil exporting nations have exported vast amounts of capital to both the East and the non-oil developing countries. Western governments have not tried to systematically regulate these capital flows. In fact, subsidization schemes often encourage lending to both regions. Past policies have not distinguished between lending to the East and lending to the South, although the strategic effects of lending to these two areas differ greatly.

The East, unlike the South, is a military and political rival of the West. Lending to the Eastern bloc increases the economic potential of the Warsaw Pact and other Marxist countries. This economic potential might be transformed into greater military expenditures or into support for external mischief. The West must either counter these expenditures at some cost or accept a lower level of military security. This threat is twofold: military forces in the East might grow, and these forces might be used in a concerted way. The South does not pose such a great military threat to the West. Not only are the armed forces of the South weak compared with those of the East, but also it is unlikely that these forces will be used in unison against the West or anyone else. Capital flows to the South will generally support economic development, but even if Southern military potential rises, this potential is as likely to be directed against other nations in the South as against the West.

Although debt renunciation and default are risks in lending to both regions, the cohesiveness of the East makes a *coordinated* debt renunciation more likely. Usually defaults on loans to an individual nation will not greatly harm the West. To be sure, the lending countries and the banks might lose large sums, but the international financial system will emerge intact. The defaulting nation, however, might suffer dire economic consequences. Further international borrowing will be difficult or impossible, and the country might have its assets seized in creditor countries. A default by a large number of countries, however, might greatly harm the West. Widespread bank failures and monetary collapse, although highly unlikely, are not unthinkable. A large group of defaulting nations can continue trading among themselves. The fairly cohesive East might exert great pressure on the West by threatening massive defaults. At worst, the East might have to return to more traditional patterns of trade—largely intrabloc or barter. It is improbable that more than a few nations in the South could agree on a coordinated debt renunciation scheme. Consequently, lending to the East is much more risky than lending to the South. This would be true even if defaults on individual loans were more likely in the South

than in the East, for the real damage to the Western economies lies in *coordinated* default. Even if Argentina, Brazil, and Mexico, which have a combined net indebtedness of approximately \$130 billion, were to simultaneously repudiate parts of their debt, it is unlikely that all of these funds would be lost. Some part of this total would be repaid in any realistic scenario. A complete repudiation of Eastern debt is much more likely.

Also, loans to the East might finance, in turn, Eastern exports to the third world. The exports might displace some Western goods from the market. Further, if the East exports arms to the South on credit, Western influence in the developing world might decline. It is clearly not in the interests of the West to finance such ventures.

Lending to the East might be a poor practice in itself; it would be even worse if, as argued here, it displaces lending to the South. Might not both the West and the South gain by a capital flow diversion from the East to the South? The tradeoff between East and South might be particularly important during the next decade. Over the past ten years, lending has been primarily demand constrained. OPEC produced huge capital surpluses that had to be loaned out. Easy money was available for most borrowers with little regard for risk. The next decade promises to be different. Smaller oil surpluses will reduce the pool of readily available funds while recent bank troubles will highlight the risks of international lending. In such an atmosphere, lending to the East might be much more detrimental to the South.

## II. THE ECONOMIC THEORY OF CAPITAL FLOWS

Capital flows are net international borrowings and lendings. If a country wishes to spend more than it produces during a period,<sup>1</sup> it must import this excess from abroad. Imports can be paid for either with exports or by borrowing abroad.<sup>2</sup> Since a country spending more than it produces must be a *net* importer, it must also be a *net* international borrower. Such a country is importing capital. Equivalently, a country producing more than it currently spends exports capital. The net flow of goods and services is known as a resource flow, and the corresponding financial transaction is known as a capital flow. These two flows will be the same. Resource flows are reported by nations in their *current accounts*, and the capital flows are reported by nations in either their *capital account* or their *reserve account*.<sup>3</sup> Although the concepts behind the accounts will be equal in value (the balance of the current account should be equal in magnitude and opposite in sign to the balances of the capital account and the reserve account), the reported values are seldom identical. The difference is reported as a statistical discrepancy and might have many causes such as accounting errors, smuggling, and intentional omission for national security or other reasons.

In a sense, all capital flows are temporary. They are supposed to be paid back with interest in the future. Thus a capital importing country does not gain these funds but merely the use of them. Similarly, a capital exporting country postpones using its surplus funds and is rewarded by interest payments. There are many reasons why a country or region might want to import or export capital during a period. A developing country, because of its low wage rates, might be able to generate so high a return on capital that it can profitably import capital and produce more of a surplus than the interest charges it must pay for the use of the capital. An agricultural country might have wide swings in the value of its crops. It might be able to stabilize its consumption

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<sup>1</sup>This ignores changes in domestic inventories.

<sup>2</sup>Borrowing is used throughout this report in the broad sense of receiving current resources in exchange for claims on future resources. Thus, a country allowing direct foreign investment or other equity investments by foreigners within its borders is "borrowing."

<sup>3</sup>Capital flows by the monetary authorities of a country.

by exporting capital during good years and importing during bad years. A nation at war might face high expenses in the short run. Loan repayments in the future might be seen as a small sacrifice compared with military defeat. Similar in motivation is the desire of many oil exporting countries to lend abroad. They have huge surpluses now which might disappear in the future. Exporting capital allows them to enjoy their oil revenues over a greater period of time.

Whatever the motivations of individual countries for importing or exporting capital, the total of these flows for the entire world will be zero: for every borrower, there is a lender; for every loan, a corresponding asset. Because these flows add to zero during every period, they will also add to zero over time. For an individual country or region, this sum over time is its net international claims—its international wealth. Total international claims or wealth will also sum to zero for the world as a whole.

Because capital flows for the entire world must sum to zero, a reduction in capital flows to the East will result in an identical increase in capital flows to other areas.<sup>4</sup> Not all the flows diverted from the East will end up in the South. Some will be put to other uses in the West. There are four possible destinations for funds diverted from the East:<sup>5</sup>

1. Increased consumption (both public and private) in the West.
2. Increased consumption in the South.
3. Increased investment in the West.
4. Increased investment in the South.

If Eastern borrowings are reduced in the credit markets of the West and South, loan demand and interest rates will fall. A fall in interest rates will lead to increased investment in both the West and the South. Changes in consumption are harder to predict. Income rises in the West from increased investment might be more than offset by drops in interest income at lower interest rates. This is because the West is a net creditor. This ambiguous change in income leads to a similarly ambiguous change in consumption in the West. The net debtor South will almost assuredly increase its consumption because increased investment and lower interest payments work in unison to increase consumption. There are two substitutions taking place here. Investment in the West and South replace lending to the East so future domestic production is substituted for future Eastern production. Both the West and the South might also substitute future consumption for

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<sup>4</sup>A country reducing its exports of capital is increasing its net imports of capital in this context.

<sup>5</sup>A model predicting the division among these categories is developed in Sec. III.

current consumption as a decline in interest rates lowers the cost of current consumption relative to future consumption.

A capital flow diversion will also affect the *economic* well-being of each region. The East will lose from this cutback because it is denied the opportunity to borrow from the West. If it could gain from the capital flow restrictions, individual countries in the East could gain as easily from unilaterally reducing their borrowings. The South will gain from increased consumption and investment. The effect on the West is again ambiguous. Investment and production will increase, but if well-being depends only on consumption, the West might end up worse off after the diversion.

So far, the capital flows being considered are all unsubsidized flows at market interest rates. Many of the loans to the East are made with explicit or implicit subsidies. If subsidized capital flows from the West to the East are reduced, the West has a better chance of improving its economic well-being. Reductions in income from lower interest rates will be offset by reduced subsidy payment. A cutback in subsidized flows to the East might be to the economic advantage of both the West and the South.

### III. A MATHEMATICAL FRAMEWORK FOR ANALYZING CAPITAL FLOWS

#### SCOPE OF THE MODEL

The model developed in this section attempts to reduce the interactions among the numerous influences on capital flows to a few comprehensible variables. For the sake of simplicity, many important variables are neglected or ignored. The model is designed to compare capital flows under alternative abstract conditions; it is not meant to be predictive, historical, or complete.

The model tries to describe the changes that occur after market rate or subsidized capital flows to a region are reduced or curtailed. It is important to remember that a country being cut off from capital flows does not "lose" these funds, nor does the country implementing the embargo "gain" these funds. Rather, the country being denied capital flows today is relieved of the burden of repayments later. Similarly, the country that cuts off capital flows does gain funds in the short run but will not receive repayment with interest from the embargoed country in the future.<sup>1</sup> The tools developed here concentrate on the effects in the capital exporting countries and in capital importing countries other than the targets of the reduction. The analysis, however, should be equally valid in the embargoed country.

#### THE SIMPLE MODEL

In this model, the important components of national income are consumption, production, investment, and income from wealth. Consumption includes all final uses of production, both public and private. Production is a country's net economic output. Investment is considered an intermediate good used in the production process, and as such it is included in neither consumption nor production. The impact

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<sup>1</sup>This model does not explicitly address the possibility that a borrower will default on a loan rather than repay it. In such a case, credit denial is more attractive: the lender can choose between keeping his money with certainty or lending his money with a *possibility* of repayment. One would expect that lenders would demand some sort of compensation (in the form of higher interest rates) for this possibility. Unfortunately, international credit markets are often distorted by government subsidies and guarantees that mask the true risks involved.

of investment on production will be considered later. Wealth is the current value of a country's *net* international claims—its rights to current or future production in other regions or countries. It is assumed that wealth can be evaluated in terms of current production invariant of the interest rate.<sup>2</sup>

A country is bound by its intertemporal budget constraint so that discounted consumption exceeds discounted production by the value of wealth. Thus,

$$D(C) = D(P) + W ,$$

where  $D(C)$  and  $D(P)$  are the present discounted value of all future consumption and production, and  $W$  is wealth. Discounting all future consumption and production converts these figures to stock variables. Wealth is already a stock variable. If consumption and production are initially the same in every year, then the discounted consumption and production streams can be rewritten as

$$D(C) = C / r$$

$$D(P) = P / r ,$$

where  $C$  and  $P$  are annual consumption, the traditional flow variables, and  $r$  is the interest rate. Therefore,

$$C / r = P / r + W ,$$

or, alternatively,

$$C = P + rW .$$

In other words, sustained consumption can exceed production by interest income in every year.

As long-term interest rates change, however, production can be expected to change as well. In particular, falling interest rates will increase investment, which will raise future productive capacity. The amounts of these increases depend upon the sensitivity of investment

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<sup>2</sup>This condition is extremely restrictive in an economy with a multitude of goods. The value of claims on capital assets usually changes greatly with swings in interest rates. In a very simple "corn economy," however, the consumption good, corn, is also the investment good. A person's wealth is his stock of corn and will not change in value relative to consumption corn as the interest rate changes. Of course, the value of corn wealth in terms of *future* corn consumption will change.

to changes in the interest rate. The increase in investment can be expressed as

$$(\partial D(I)/\partial r)\Delta r ,$$

where  $D(I)$  is the discounted stream of future investment, a stock variable;  $\partial D(I)/\partial r$  is the derivative of investment with respect to interest rates (the slope of the marginal efficiency of investment (MEI) schedule); and  $\Delta r$  is the change in interest rates. The MEI schedule will have a negative slope so  $\partial D(I)/\partial r$  is less than zero. For simplicity, it will be assumed that  $\partial D(I)/\partial r$  is a constant—that the MEI schedule is linear. Since investment in capital in the long run is an intermediate good in final production, its discounted value should be subtracted from production:

$$D_r(P(r)) = D_r(P(r_0)) - (\partial D(I)/\partial r)\Delta r + \dots .$$

If new investments are undertaken, then, as a minimum their costs must be recovered through increased production:

$$D_r(P(r)) = D_r(P(r_0)) - (\partial D(I)/\partial r)\Delta r + (\partial D(I)/\partial r)\Delta r + \dots .$$

But production will increase by still more. If interest rates fall, projects that are marginally profitable at the old, high interest rates will be much more profitable at the new, low interest rates.<sup>3</sup> In fact, every investment that becomes profitable between the old and new rates will yield a greater increase in output than its cost.<sup>4</sup> This “surplus” can be estimated from the MEI schedule. This added production is the area of the shaded triangle in the figure on p. 10, which is equal to

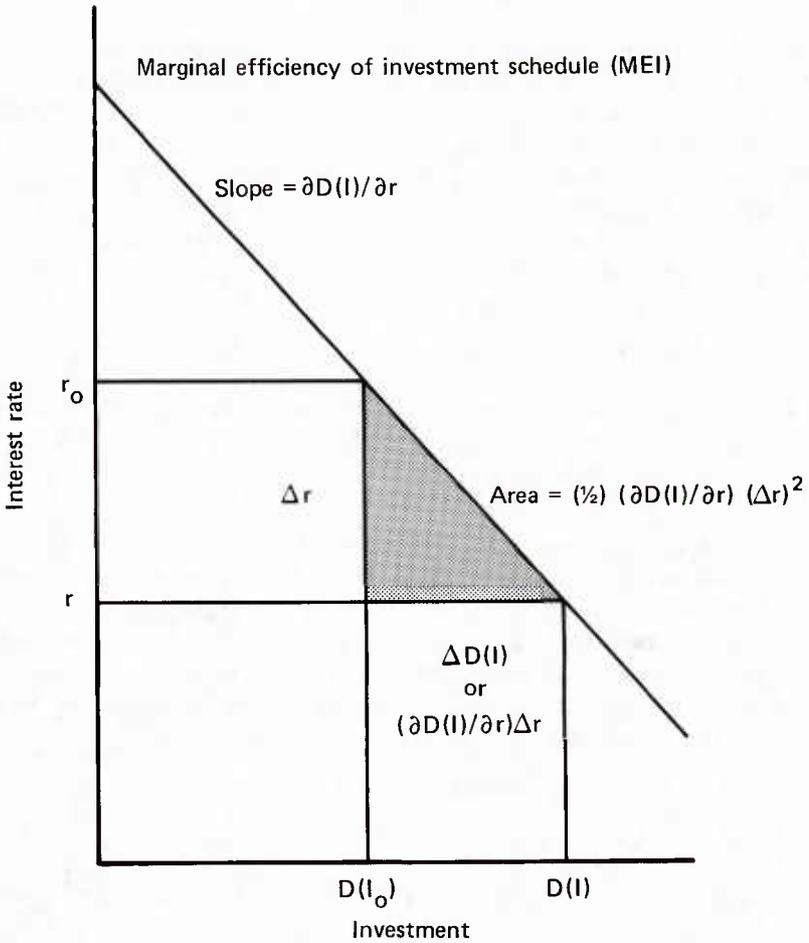
$$(1/2)(\partial D(I)/\partial r)\Delta r \mid \Delta r \mid .$$

Thus, new production is

$$D_r(P(r)) = D_r(P(r_0)) - (\partial D(I)/\partial r)\Delta r + (\partial D(I)/\partial r)\Delta r \\ + (1/2)(\partial D(I)/\partial r)\Delta r \mid \Delta r \mid ,$$

<sup>3</sup>Conversely, if interest rates rise, projects formerly profitable might be unable to cover their costs.

<sup>4</sup>Some of this increased production will be the result of higher productivity in factors other than capital so the entire increase cannot normally be captured by owners of capital. Such distributional aspects are ignored in this model.



NOTE: The size of the production surplus can be calculated from the marginal efficiency of investment schedule. The surplus is equal to the area of the shaded triangle.

Production surplus from a fall in interest rates

or

$$D_r(P(r)) = D_r(P(r_0)) + (1/2)(\partial D(I)/\partial r)\Delta r \mid \Delta r \mid .$$

The effect of an interest rate change on consumption can now be determined. The intertemporal budget constraint still holds albeit at a different interest rate:

$$\begin{aligned} D_r(C(r)) &= D_r(P(r)) + W \\ &= D_r(P(r_0)) + (1/2)(\partial D(I)/\partial r)\Delta r \mid \Delta r \mid + W , \end{aligned}$$

which can be transformed into

$$C(r) = P(r_0) + (1/2)(\partial D(I)/\partial r)\Delta r \mid \Delta r \mid + rW .$$

If investment increases by the same amount in every year, then

$$(\partial D(I)/\partial r)r = \partial I/\partial r ,$$

where  $\partial I/\partial r$  is the annual change in investment for a change in the interest rate. So consumption becomes

$$C(r) = P(r_0) + (1/2)(\partial I/\partial r)\Delta r \mid \Delta r \mid + rW .$$

The change in consumption for a given change in the interest rate<sup>5</sup> can be expressed as

$$\begin{aligned} \frac{\Delta C}{\Delta r} &= \frac{P(r_0) + (1/2)(\partial I/\partial r)\Delta r \mid \Delta r \mid + rW - (P(r_0) - r_0W)}{r - r_0} \\ &= (1/2)(\partial I/\partial r)\Delta r + W . \end{aligned}$$

The changes in production and interest income can be written in a similar manner:

$$\begin{aligned} \frac{\Delta P}{\Delta r} &= (1/2)(\partial I/\partial r)\Delta r \\ \frac{\Delta rW}{\Delta r} &= W . \end{aligned}$$

---

<sup>5</sup>This is not an instantaneous derivative but rather the total change in consumption for the entire change in interest rates.

Capital flows are the difference between consumption and production:

$$F = C - P - rW ,$$

where  $F$  is capital flows. In the *very long run*, capital flows are unchanged by a change in the interest rates:

$$\begin{aligned} \Delta F &= \Delta C - \Delta P - \Delta rW \\ &= (1/2)(\partial I / \partial r)\Delta r \mid \Delta r \mid + \Delta rW \\ &\quad - (1/2)(\partial I / \partial r)\Delta r \mid \Delta r \mid - \Delta rW \\ &= 0 . \end{aligned}$$

This is not surprising because capital flows must be repaid in the long run. The effects of a capital flow embargo and the resultant interest rate decline are *short run*. Lower interest rates cause a substitution of current consumption for future consumption and a substitution of future domestic production for probably more efficient future foreign production. The timing of these effects is by no means certain. Altered consumption, investment, and production might surface at almost any point. Because the investment must precede increased production, it is assumed that investment changes now whereas production changes at some future date. Since consumption changes might occur at any time, a fairly neutral assumption will be made: consumption will increase immediately and remain at the same level indefinitely.

A change in capital flow is offset by changes in consumption and investment. In the case of primary interest to this report, capital flows to the Eastern bloc are curtailed with no restrictions on flows between the West and the South. These regions will replace the hypothetical countries in the remainder of this section. The reduction in Eastern flows must be absorbed by Western and Southern consumption and investment:

$$-\Delta F_e = \Delta C_w + \Delta I_w + \Delta C_s + \Delta I_s ,$$

or

$$\begin{aligned} -\Delta F_e &= (1/2)(\partial I_w / \partial r)\Delta r \mid \Delta r \mid + W_w \Delta r + (\partial I_w / \partial r)\Delta r \\ &\quad + (1/2)(\partial I_s / \partial r)\Delta r \mid \Delta r \mid + W_s \Delta r + (\partial I_s / \partial r)\Delta r . \end{aligned}$$

For a given one-time capital flow change, the long-term interest rate change and the components of absorption can be calculated from just four pieces of information:

1. The interest sensitivity of investment in the West.
2. The interest sensitivity of investment in the South.
3. Wealth in the West.
4. Wealth in the South.

An interest rate equilibrium is assured<sup>6</sup> because the “wealth effect” which *might* cause a decrease in consumption is proportional to the change in interest rates. The “income effect,” which will cause an increase in consumption, is proportional to the square of the change in the interest rate. Thus the “income effect” will eventually overwhelm the “wealth effect.”<sup>7</sup>

This model predicts that a cutoff in capital flows to the East will be absorbed by increased investment in both the West and the South. Consumption will always increase in the net debtor South. Small declines in the interest rate lead to declines in consumption in the net creditor West. The instantaneous derivative of consumption with respect to interest rates is

$$\partial C / \partial r = (\partial I / \partial r)(r - r_o) + W .$$

Because wealth is positive in the West and  $(r - r_o)$  is zero at  $r_o$ , the derivative is positive very near the old interest rate. Thus a decline in interest rates will lead to a reduction in Western consumption unless interest rates change a great deal. If sustained consumption is a good measure of economic welfare, then a capital flow reduction to the East will unambiguously make the South better off. The West will probably end up worse off.

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<sup>6</sup>This equilibrium might be at a negative interest rate because of the way that this simple model is structured.

<sup>7</sup>Because the interest rate is solved for in a quadratic equation, the possibility of multiple equilibria must be addressed. The presence of the absolute value signs allows for up to three solutions. It can be shown that there will always be a unique equilibrium for the “correct” direction of interest rate movements—a reduction in interest rates when lending abroad is reduced, an increase in rates with an increase in lending. If there are two equilibria, then one will be in the “wrong” direction and it will be unstable. If there are three equilibria, then two will be in the “wrong” direction. The solution closest to the old interest rate will be unstable whereas the solution further from the real interest rate will be stable. Although this second stable equilibrium is a mathematical possibility, the natural tendency from the old interest rate is toward the stable equilibrium in the “correct” direction.

## A MODEL WITH SUBSIDIZED FLOWS

So far this model has been developed on the assumption that curtailed capital flows to the East are commercial flows at market rates. The flows most likely to be reduced are official subsidized flows. These flows can easily be incorporated into this model. When subsidized flows are curtailed, interest rates will generally fall to restore equilibrium, but the value of the removed subsidy is added to the previous donor's wealth. If the West removes subsidies on capital flows, consumption in the West will be greater than the case of a pure capital flow curtailment:

$$C_w(r) = P_w(r_0) + (1/2)(\partial I_w / \partial r)\Delta r \mid \Delta r \mid + r(W_w + \Delta S),$$

where  $\Delta S$  is the value of the subsidy removed. The change in consumption in the West resulting from this policy will be

$$\Delta C_w = (1/2)(\partial I_w / \partial r)\Delta r \mid \Delta r \mid + \Delta r W_w + r\Delta S$$

or

$$\Delta C_w = (1/2)(\partial I_w / \partial r)\Delta r \mid \Delta r \mid + \Delta r W_w + \Delta r \Delta S + r_0 \Delta S.$$

The functions expressing Western investment and Southern investment and consumption will remain unchanged. The flows still must be absorbed by changes in consumption and investment:

$$-\Delta F_e = \Delta C_w + \Delta I_w + \Delta C_s + \Delta I_s.$$

The interest rate change can still be calculated; an equilibrium is still guaranteed.

If welfare is again measured by sustainable consumption, then the West fares better under this scheme. The drop in interest rates earned on wealth is offset, in part, by the increase in wealth. Depending on the relative sizes of the capital flow and subsidy changes, Western consumption might either rise or fall even for small interest rate changes. The South will probably be better off after a reduction in subsidized flows. Because the change in interest rates will be smaller than with a pure case of capital flow reductions, the South gains less in this case.

## AREAS FOR IMPROVEMENT

Numerous extensions and improvements could be made to this model. More complicated consumption and production paths would allow the model to incorporate real economic growth and other factors.

Certainly the current values of wealth and subsidies do change with interest rates. A more realistic investment and payoff schedule could be adopted. The distinction between investment starting "now" and increased production starting "later" seems a bit artificial. Of course, these improvements would greatly add to the complexity of the model.

## IV. QUANTITATIVE FINDINGS

The effect on the South of lending to the East is largely a quantitative issue. To be sure, the South should gain, if only to a limited extent, from any reduction in lending to the East, but nothing can be said about the impact of such a reduction in the West. This section uses the model developed in Sec. III to quantify the consequences of such a capital flow diversion to both the West and the South.

A central problem in predicting the results of capital flow policies is finding adequate measures of debt levels. Several existing measures perform poorly in this task. The World Bank, for instance, keeps very close track of the public debt of developing countries. Coverage of private debt is confined to publicized bond offerings and bank loans. Trade credits are largely ignored. The World Bank figures concentrate on "debt" in the traditional financial sense—loans without equity components. Direct and portfolio investments also need to be considered when calculating net international claims. Similar problems plague other measures, including figures compiled by the Bank for International Settlements and commercial banks such as Morgan Stanley & Co. To make matters worse, many of these figures show only the gross indebtedness of a country and not deposits and other offsetting assets abroad.

This study takes a different tack. Over time, the current account balances of a country will add up to its net international claims. The capital account balances will add to the mirror image of net international liabilities. These accounts might include large errors, but they at least measure the correct concept. It is hard to predict what systematic bias, if any, the accounts will have. Balance of payments figures were acquired for every nation that reports them to the International Monetary Fund (IMF) for as many years (up to thirty) as they are available. Because these are monetary accounts, there is no conceptual problem in aggregating the figures over time into a net claims measure: one simply adds them. For countries not reporting balance of payments figures to the IMF, various other measures were used to approximate the balance of payments concept. The derivation of all these figures is explained in Appendix B.

Net international claims and capital flows are shown for each region in Table 1. As expected, the West and the oil exporting South are net creditors whereas the East and the rest of the South are net debtors. The largest capital flows were out of the oil exporting South and into

Table 1  
WEALTH AND CAPITAL FLOWS FOR VARIOUS REGIONS  
(Millions of dollars)

Region	Capital Flows for 1973 to 1982	Net Claims in 1982
West	50,280	157,604
United States	115,819	144,326
Other	-65,539	13,278
South	45,070	-47,610
Oil exporting	397,510	406,007
Non-oil	-352,440	-453,617
East	-95,536	-109,995
Soviet Union	-11,760	-12,934
Other	-83,776	-97,061
World total	0	0

the East and the non-oil South. The West, a net provider of credit over the past decade, is perhaps most important as an intermediary between these regions.

The economic effects of three capital flow diversions are provided in Table 2. These figures all assume that the interest elasticity of investment is  $-1$  for all countries.<sup>1</sup> The first case shows a diversion of \$11 billion from the East (about one-tenth of outstanding Eastern indebtedness). The second case shows a similar diversion but assumes that subsidies equal to ten percent of the diversion are also removed. The final case shows the effect of all the indebtedness of the East being returned to the West and South. In all these examples, about a quarter of the flows that are diverted from the East end up in the South. Over time, the South will be able to increase its consumption by about two percent of the total diversion. The non-oil nations gain a great deal more, and the oil exporters actually lose. The non-oil nations of

<sup>1</sup>The interest elasticity of investment assumed in the base cases,  $-1$ , was chosen because the interest elasticity of the ideal capital stock is  $-1$  with a Cobb-Douglas production function. Investment should be roughly proportional to the ideal capital stock for a given depreciation rate or labor force growth rate. Consequently, one might assume that  $-1$  is a reasonable guess for the interest elasticity of investment.

Table 2  
EFFECTS OF A CAPITAL FLOW DIVERSION  
(Millions of U.S. dollars unless otherwise noted)

	Case I	Case II	Case III
<b>Assumptions</b>			
Flow reduction to East	\$10,990	\$10,990	\$109,900
Subsidies rescinded	0	1,099	0
<b>Results</b>			
N-S interest rate change	-0.0239	-0.0237%	-0.228%
Eastern interest rate change	0.0928	0.0923%	0.715%
Consumption change in West	-\$35	\$20	-\$259
Consumption change in South	11	11	134
Oil exporting	-93	-92	-920
Non-oil	104	103	1054
Consumption change in East	-462	-513	-28,771
Investment change in West	8,793	8,749	87,838
Investment change in South	2,221	2,210	22,188
Oil exporting	631	628	6,300
Non-oil	1,590	1,582	15,888
Investment change in East	-10,528	-10,477	-81,129
<b>Discounted Changes in Consumption</b>			
West	-700	400	-5180
South	220	220	2,805
Oil exporting	-1860	-1840	-19,258
Non-oil	2,080	2,060	22,063
East	-9,072	-10,074	-503,394

NOTE: Other assumptions in this table are listed in Appendix C.

the South will receive about twenty percent of the diversion in increased consumption over time. The annual amounts of increased consumption are much smaller. The South as a whole will increase its consumption by 11 million dollars per year—less than a penny per person in the South. The impact on the West depends greatly on the cost of rescinded subsidies. For the \$11 billion flow reductions, the West loses \$700 million over time (\$35 million per year) if no subsidies are removed; it gains \$400 million (\$20 million per year) when about a billion in subsidies are rescinded. The effects on interest rates are small.

Even if all Eastern loans are returned, interest rates will fall by less than one quarter of a percent.

The figures presented in Table 2 are particularly sensitive to the interest elasticity of investment assumption. Table 3 shows how the results would differ in Case I if (Case I.A) the interest elasticity of investment were  $-2$  in all countries, (Case I.B) the elasticity were  $-1.5$  in all countries, (Case I.C) the elasticity were  $-1.5$  for the West and East but  $-1$  for the South, and (Case I.D) the elasticity were  $-1$  for the West and East but  $-1.5$  for the South.

Table 3  
EFFECTS OF A CAPITAL FLOW DIVERSION UNDER  
ALTERNATIVE ASSUMPTIONS  
(Millions of U.S. dollars unless otherwise noted)

	Case I.A	Case I.B	Case I.C	Case I.D
<b>Assumptions</b>				
Interest elasticity in W-E	-2.0	-0.5	-0.5	-0.1
Interest elasticity in South	-2.0	-0.5	-1.0	-0.5
Flow reduction to East	\$10,990	\$10,990	\$10,990	\$10,990
<b>Results</b>				
N-S interest rate change	-0.0114%	-0.0458%	-0.038%	-0.128%
Eastern interest rate change	0.0474%	0.1787%	0.179%	0.721%
Consumption change in West	-\$17	-\$70	-\$59	-\$198
Consumption change in South	6	22	19	65
Oil exporting	-46	-186	-154	-518
Non-oil	52	208	173	582
Consumption change in East	-242	-856	-862	-2,810
Investment change in West	8,783	8,812	7,328	4,915
Investment change in South	2,219	2,226	3,702	6,208
Oil exporting	630	632	1,051	1,763
Non-oil	1,589	1,594	2,651	4,445
Investment change in East	-10,748	-10,134	-10,128	-8,180
<b>Discounted Changes in Consumption</b>				
West	-340	-1,400	-1,180	-3,960
South	120	440	380	1,300
Oil exporting	-920	-3,720	-3,080	-10,360
Non-oil	1,040	4,160	3,460	11,640
East	-4,795	-16,529	-16,654	-49,107

NOTE: Other assumptions in this table are listed in Appendix C.

## V. PROBLEMS IN IMPLEMENTING A CAPITAL FLOW DIVERSION

There are several problems confronting a policy of capital flow diversions. Perhaps the hardest problem to overcome is obtaining and maintaining a consensus in the West to impose such a policy. A distinction should be drawn between reductions in subsidized capital flows and reductions in commercially justified capital flows. Since the West as well as the South will gain from a reduction in subsidized flows, such a reduction is in the purely economic interests of the West. Reductions in market rate flows will probably harm the West economically, so a consensus on diverting these flows must be reached on other grounds such as security. The former diversions are potentially more feasible than the latter ones.

A diversion in subsidized capital flows is also a *comparatively* easy policy to implement for countries so inclined. The governments of these countries are offering these subsidies themselves, so no control must be exercised over their citizens. The interest groups in the West that benefit from these subsidies must still be reckoned with. This is also a policy that one country in the West might be able to undertake unilaterally.

A reduction in commercially justified flows is much more difficult. The Western governments are often involved only tangentially with these transactions, so a system of controls must be implemented. There are no profitable ways for a person in the West to circumvent a reduction in subsidized flows. A reduction in market rate flows, however, will drive a wedge between interest rates in the West and interest rates in the East. Anyone who can evade the capital flow regulations can profit from this spread. Controls must be more pervasive to prevent market rate flows. Strict regulations need to be put in place for every country in the West or citizens of a country without regulations could borrow abroad and lend to the East.

Elaborate capital controls in every nation in the West would still not assure the success of restrictions on lending to the East. To a large extent, the West acts as an intermediary between the oil exporting nations and the East. If the West refuses to lend to the East, there is nothing to prevent oil exporters from lending directly. In fact, this is already occurring to some extent. Of total bank credits granted to the East and reported in the World Bank's *Borrowing in International*

*Capital Markets* for the first half of 1981, 64 percent of the transactions involved at least one Arab bank. An attempt to reduce capital flows to the East might drive the oil exporting nations closer to the Soviet Union in economic and political terms.

Even if the active cooperation of every oil exporting nation could be marshaled in support of capital flow reductions to the East, restrictions might still fail. Any nation in the world could borrow from the West and lend in turn to the East. To assure the success of a capital flow diversion, every nation must either support the diversion or be isolated from the world financial markets. If grain embargoes to the East were ineffective, financial embargoes promise to be almost worthless. Unlike grain, credit can be transshipped at very little cost.

An alternative strategy that might aid the South at the expense of the East is to encourage innovative forms of lending to the South. At present, much of the lending to Southern nations is in the form of debt (in the traditional financial sense). Developing countries are obligated to repay these loans at fixed amounts no matter how their economies perform. This is less than satisfactory for both the Western lenders and Southern borrowers. The South shoulders a great deal of risk in these loans just as the shareholders of a highly leveraged company do. The West stands to lose its investments if Southern projects or nations falter, yet it shares none of the gains when nations in the South do well. If a developing country were a corporation, it could restructure its obligations away from debt and toward equity capital. Developing nations have similar choices: they can encourage direct or portfolio investment. Traditionally, developing nations have not encouraged such investments to any great extent because they end up with less control over their economies. Investors, however, have shied away from schemes that lack investor control in some form because they do not assure a return to the investor for successful projects. Certainly an equity-type investment instrument could be devised for lending to the South which overcomes these difficulties. Perhaps developing countries could retain control of certain enterprises themselves while investors would be protected by accounting and business standards enforced by the World Bank. If such a scheme succeeded, lending rates to the South might fall because risk premiums might fall. Lending to the East would continue at higher interest rates because of the increased capital demands by the South. Such a program would succeed and perhaps prosper during the current crises in the world financial markets for it reduces risks, the largest obstacle to increased lending South.

Another strategy that might aid the South at the expense of the East is to discourage lending to the East through a variety of seemingly innocuous actions. Future lenders to the East might be denied the assistance of Western courts and diplomacy in collecting their debts. Investors lacking even the minimal protection afforded by the right to seize assets might be less likely to lend. As matters stand now, Western governments are helping investors who place their resources in regions that might harm the West. This scheme makes the threat of renunciation more of a problem for individual investors and less of a problem for the West as a whole.

Similarly, deposit insurance limits might be raised for banks making no loans to the East. Such a policy could be justified on the grounds that lending East entails higher risks, and banks with lower risk of failure should get more for their deposit insurance premiums. Such a policy would be particularly effective in discouraging loans by money center banks who have many customers with deposits near or exceeding insurance limits.

In choosing among these various strategies, the reaction of the East to the various policies must be weighed. A bellicose reaction in the East could destroy any gains from the policies for either the West or South. Cutting subsidized capital flows would probably be seen as a mildly unfriendly act, but not as a direct challenge to the East. A financial embargo on commercially justified flows might be interpreted or cast as an act of economic warfare which might be used by the East to justify a massive debt renunciation. A deposit insurance scheme might be seen as a mild irritant in the East, and immunity from debt suits might be sold as a policy to the advantage of the East. A program to encourage capital flows to the South might be ideal because it helps the South, hurts the East, and lies outside the normal theatres of East-West interaction.

## VI. CONCLUSION

It is clear that a diversion of capital flows from the East to the South might be to the strategic advantage of the West and to the economic advantage of the South. This might be more true in the coming decade than in the past decade: capital surpluses from the oil producing nations are likely to shrink or disappear. The competition between the South and the East for capital imports is likely to become more intense. If Western governments can agree, a reduction in subsidized flows to the East is a particularly advantageous policy: both the West and the South might gain economically. A reduction in commercially justified flows, however, is less beneficial to the West and is a nightmare to administer. Alternative policies to promote flows to the South or discourage flows to the East might better serve the dual goals of Western security and Southern prosperity.

## Appendix A

### LIST OF COUNTRIES AND REGIONS

The following tables divide countries into regions. Most of the categories are ad hoc, although the oil exporting developing countries are those so designated by the International Monetary Fund.

Table A.1

#### COUNTRIES BY REGION

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The West	
United States	Ireland
Australia	Italy
Austria	Japan
Belgium	Netherlands
Canada	New Zealand
Denmark	Norway
Finland	Portugal
France	Spain
Germany, Federal Republic of	Sweden
Greece	Switzerland
Iceland	United Kingdom

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The East	
Soviet Union	German Democratic Republic
Bulgaria	Hungary
China, People's Republic of	Laos
Cuba	Poland
Czechoslovakia	Romania
CMEA Banks	Yugoslavia

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The Oil Exporting South	
Algeria	Nigeria
Indonesia	Oman
Iran	Qatar
Iraq	Saudi Arabia
Kuwait	United Arab Emirates
Libya	Venezuela

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Table A.1—continued

The Non-Oil South	
Afghanistan	Grenada
Angola	Guadeloupe
Argentina	Guatemala
Bahamas	Guinea-Bissau
Bahrain	Guyana
Bangladesh	Haiti
Barbados	Honduras
Belize	Hong Kong
Benin	India
Bermuda	Israel
Bolivia	Ivory Coast
Botswana	Jamaica
Brazil	Jordan
Brunei	Kampuchea
Burma	Kenya
Burundi	Korea
Cameroon	Lebanon
Cape Verde Islands	Liberia
Central African Republic	Macao
Chad	Madagascar
Chile	Malawi
Colombia	Malaysia
Comoros	Maldives
Congo	Mali
Costa Rica	Malta
Cyprus	Mauritania
Djibouti	Mauritius
Dominican Republic	Mexico
Ecuador	Morocco
Egypt	Mozambique
El Salvador	Nepal
Ethiopia	Netherlands Antilles
Faeroe Islands	New Caledonia
Fiji	Nicaragua
French Guyana	Niger
French Polynesia	Pakistan
Gabon	Panama
Gambia	Papua-New Guinea
Ghana	Paraguay
Greenland	Peru
Philippines	Tanzania
Reunion	Thailand
Rwanda	Togo
Sao Tome and Principe	Tonga
Senegal	Trinidad and Tobago
Seychelles	Tunisia
Sierra Leone	Turkey

Table A.1--continued

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The Non-Oil South, continued	
Singapore	Uganda
Somalia	Upper Volta
South Africa	Uruguay
Sri Lanka	Western Samoa
Sudan	Yemen Arab Republic
Suriname	Yemen P.D. Republic
Swaziland	Zaire
Syria	Zambia
Taiwan	Zimbabwe

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## Appendix B

### CAPITAL FLOW DATA BY REGION AND COUNTRY

Tables B.1 and B.2 show estimates of wealth and capital flows for almost every country in the world and for the major regions discussed in this report. The wealth figures are net international claims of a nation or region and are all estimated for 1982. The flow figures are averages for the decade ending in 1982 at annual rates. All figures are in U.S. dollars.

There are three major sources for these data. The most detailed data are derived from the balance of payments figures in *International Financial Statistics*. The accounts for each country were examined and every account except the statistical discrepancy was assigned to "current account" or "capital account." The current accounts include imports and exports of goods and services as well as unrequited transfers. The capital accounts include all capital flows including reserve flows, which are capital flows by the monetary authorities of a country. Because these accounts include interest payments and other factor payments for capital, the sum of the current accounts over time should yield net international claims. Similarly, the sum of the capital accounts over time should yield net international indebtedness. Ideally, these two measures should be the same. The estimates of capital flows will err by the error in these flow accounts. The estimates for net international claims will also err by outstanding debt from years before these accounts were available.

Four methods are used to estimate flows and wealth for each of these countries: current accounts, capital accounts, a low measure, and a high measure. The low measure uses the lower value of capital exports for every year be it the capital account or the current account. The high measure similarly uses the higher value for every year. Six methods are used to estimate capital flows and wealth for each region: current accounts, capital accounts, the sum of the low measures for each country (the very low measure), the sum of the high measures (the very high measure), a new low measure, and a new high measure. These new low and high measures consistently use the same account for each country. If the capital account shows a lower wealth level for a country, for instance, the new low measure uses the capital account

Table B.1  
WEALTH AND FLOWS BY REGION  
(Billions of dollars)

Method	Estimated Wealth in 1982	Estimated Average Flows for 1973-1982
The World		
Current Account	3.768	-25.548
Capital Account	1.528	-15.449
Low Method	5.007	-37.859
Very Low Method	0.937	-43.015
High Method	0.289	-3.139
Very High Method	5.640	2.016
<i>Used</i>	<i>0.0</i>	<i>0.0</i>
The West		
Current Account	-94.726	-17.142
Capital Account	42.679	-3.365
Low Method	176.988	23.650
Very Low Method	-239.295	26.747
High Method	124.940	3.142
Very High Method	187.249	6.240
<i>Used</i>	<i>157.604</i>	<i>5.028</i>
The East		
Current Account	-110.080	-9.537
Capital Account	-117.475	-10.152
Low Method	-117.475	-10.152
Very Low Method	-117.638	-10.154
High Method	-110.080	-9.537
Very High Method	-109.917	-9.535
<i>Used</i>	<i>-109.995</i>	<i>-9.536</i>
The South		
Current Account	-88.963	1.131
Capital Account	-126.733	-1.932
Low Method	-150.546	-4.055
Very Low Method	-184.004	-6.113
High Method	-65.150	3.256
Very High Method	-31.692	5.311
<i>Used</i>	<i>-47.610</i>	<i>4.507</i>

Table B.1—continued

Method	Estimated Wealth in 1982	Estimated Average Flows for 1973-1982
The Oil Exporting South		
Current Account	391.193	38.249
Capital Account	371.897	36.812
Low Method	362.521	35.739
Very Low Method	352.148	35.044
High Method	400.569	39.328
Very High Method	410.942	40.023
<i>Used</i>	<i>406.007</i>	<i>39.751</i>
The Non-Oil South		
Current Account	-480.156	-37.124
Capital Account	-498.630	-38.744
Low Method	-513.067	-39.763
Very Low Method	-536.152	-41.157
High Method	-465.719	-36.072
Very High Method	-442.634	-34.712
<i>Used</i>	<i>-453.617</i>	<i>-35.244</i>

NOTE: Actual data availability varies by country.

for that country in every period. The current account might be used in every period for another country. The new high measure is calculated similarly.

Balance of payments figures are not available for every country in *International Financial Statistics*. Some countries only list merchandise trade flows. For these countries, it is assumed that the merchandise trade balances represent new international borrowing. It is also assumed that all previous borrowing and interest (calculated at the London Inter-bank Overnight Rate (LIBOR)) are rolled into new loans. The trade balance plus interest is used to measure capital flows. Wealth is merely the sum of the rolled over lending (borrowing) plus interest. Only one set of figures is calculated for these countries. The figures for Cuba are derived in an identical fashion except that the original trade balances are based on Central Intelligence Agency figures in *The Handbook of Economic Statistics*. Wealth and capital flow figures based on trade balances will err because of mistakes in the trade figures and also by the amount that current account balances differ from the merchandise trade and interest flows assumed here.

Table B.2  
WEALTH AND FLOWS BY COUNTRY  
(Millions of dollars)

Country	Data Availability Period		Source <sup>a</sup>	1982 Wealth	1973-1982 Average Flow
	From	To			
Afghanistan	1952	1978	TRD	-2895.018	-160.100
Algeria	1964	1980	BOP	-11840.039	-1111.987
Angola	1952	1974	TRD	2250.050	165.379
Argentina	1953	1981	BOP	-7755.246	-693.723
Australia	1955	1981	BOP	-35178.656	-2825.839
Austria	1956	1981	BOP	-7618.297	-780.462
Bahamas	1973	1981	BOP	-95.757	2.474
Bahrain	1952	1980	TRD	1058.010	40.349
Bangladesh	1973	1981	BOP	-4306.016	-406.641
Barbados	1965	1980	BOP	-321.699	-20.760
Belgium	1956	1980	BOP	-2462.647	-810.898
Belize	1952	1978	TRD	-852.697	-50.387
Benin	1965	1977	BOP	-214.417	-16.364
Bermuda	1952	1979	TRD	-4248.160	-292.129
Bolivia	1952	1980	BOP	-1452.384	-117.010
Botswana	1975	1981	BOP	-314.507	-31.451
Brazil	1952	1981	BOP	-81717.250	-7173.969
Brunei	1952	1979	TRD	16474.395	1417.944
Bulgaria	1971	1979	CIA	-4729.840	-373.284
Burma	1956	1980	BOP	-1581.575	-129.009
Burundi	1962	1981	TRD	-631.950	-52.816
Cameroon	1970	1979	BOP	-1028.287	-88.263
Canada	1965	1981	BOP	-32529.520	-2988.034
Cape Verde Islands	1957	1979	TRD	-1956.736	-126.537
Central African Rep.	1968	1980	BOP	-90.777	-6.615
Chad	1968	1977	BOP	-97.951	-11.951
Chile	1952	1981	BOP	-13140.789	-1078.206
China, P.R.	1977	1981	TRD	-5715.434	-571.543
Colombia	1956	1981	BOP	-2412.629	-26.795
Comoros	1952	1978	TRD	-211.040	-14.429
Congo	1971	1980	BOP	-1413.907	-116.903
Costa Rica	1952	1981	BOP	-3542.374	-290.353
Cuba	1970	1980	HES	-7389.047	-559.437
Cyprus	1957	1980	BOP	-960.562	-88.163
Czechoslovakia	1971	1979	CIA	-3892.925	-361.992

Table B.2—continued

Country	Data Availability Period		Source <sup>a</sup>	1982 Wealth	1973-1982 Average Flow
	From	To			
CMEA banks	1971	1979	CIA	-6110.750	-465.675
Denmark	1956	1981	BOP	-17173.078	-1464.308
Djibouti	1952	1975	TRD	-1738.239	-104.830
Dominican Republic	1952	1980	BOP	-2787.065	-220.661
Ecuador	1952	1981	BOP	-4572.316	-389.733
Egypt	1956	1980	BOP	-9879.684	-717.580
El Salvador	1952	1980	BOP	-600.173	-44.302
Ethiopia	1960	1981	BOP	-998.064	-81.863
Faeroe Islands	1952	1979	TRD	-334.586	-31.068
Fiji	1965	1981	BOP	-457.959	-35.886
Finland	1956	1980	BOP	-7410.375	-586.457
France	1967	1981	BOP	-2048.623	-420.001
French Guyana	1955	1959	TRD	-111.848	-5.474
French Polynesia	1952	1980	TRD	-7733.789	-584.299
Gabon	1968	1979	BOP	494.565	53.093
Gambia	1970	1980	BOP	-102.437	-10.688
German Democratic Rep.	1971	1979	CIA	-10702.367	-882.637
Germany, Federal Rep.	1956	1981	BOP	28325.020	303.139
Ghana	1956	1981	BOP	-1590.294	-47.377
Greece	1956	1980	BOP	-15162.016	-1088.257
Greenland	1952	1980	TRD	-2073.788	-142.083
Grenada	1952	1980	TRD	-646.769	-43.010
Guadeloupe	1952	1981	TRD	-7157.754	-582.723
Guatemala	1952	1981	BOP	-1952.649	-156.736
Guinea-Bissau	1956	1981	TRD	-1140.761	-84.266
Guyana	1963	1980	BOP	-758.754	-57.654
Haiti	1952	1979	BOP	-291.324	-25.589
Honduras	1952	1980	BOP	-1624.332	-133.832
Hong Kong	1952	1981	TRD	-48370.629	-3486.058
Hungary	1971	1979	CIA	-9282.148	-818.615
Iceland	1956	1981	BOP	-853.215	-63.724
India	1956	1979	BOP	-8126.027	417.252
Indonesia	1958	1981	BOP	-3908.965	-41.345
Iran	1956	1977	BOP	37583.328	3987.610
Iraq	1953	1977	BOP	20201.012	1779.343
Ireland	1952	1980	BOP	-6593.855	-517.996
Israel	1956	1981	BOP	-13081.219	-987.550
Italy	1952	1980	BOP	9598.652	-555.998
Ivory Coast	1963	1978	BOP	-3057.177	-252.685
Jamaica	1960	1980	BOP	-2634.875	-142.197

Table B.2—continued

Country	Data Availability Period		Source <sup>a</sup>	1982 Wealth	1973-1982 Average Flow
	From	To			
Japan	1956	1981	BOP	34127.437	1609.488
Jordan	1953	1981	BOP	288.713	28.479
Kampuchea	1955	1972	TRD	-1361.757	-66.642
Kenya	1963	1981	BOP	-3942.539	-355.550
Korea	1952	1981	BOP	-24087.922	-2053.389
Kuwait	1975	1980	BOP	63372.719	6337.270
Laos	1955	1975	TRD	-2724.885	-139.075
Lebanon	1952	1981	TRD	-44222.969	-3187.590
Liberia	1952	1981	TRD	2489.235	167.802
Libya	1967	1979	BOP	26721.691	2436.469
Macao	1952	1980	TRD	-2020.273	-106.225
Madagascar	1969	1979	BOP	-686.999	-66.432
Malawi	1964	1980	BOP	-1014.018	-78.133
Malaysia	1961	1980	BOP	1488.452	158.545
Maldives	1952	1979	TRD	-158.274	-10.812
Mali	1964	1979	BOP	-558.751	-37.469
Malta	1959	1980	BOP	665.281	46.653
Mauritania	1973	1979	BOP	-387.883	-46.488
Mauritius	1964	1980	BOP	-411.906	-41.629
Mexico	1953	1980	BOP	-40998.234	-3262.599
Morocco	1961	1981	BOP	-10619.711	-1014.661
Mozambique	1952	1977	TRD	-6370.199	-370.581
Nepal	1976	1981	BOP	-69.557	-6.956
Netherlands	1953	1981	BOP	10758.230	523.112
Netherlands Antilles	1965	1979	BOP	-447.747	-35.598
New Caledonia	1952	1980	TRD	-331.901	-23.651
New Zealand	1955	1981	BOP	-6365.227	-622.833
Nicaragua	1956	1979	BOP	-1136.158	-74.707
Niger	1968	1976	BOP	-1.424	-4.332
Nigeria	1959	1980	BOP	1704.285	486.909
Norway	1963	1981	BOP	-11433.578	-1000.750
Oman	1974	1980	BOP	2374.795	237.479
Pakistan	1972	1980	BOP	-7257.590	-699.359
Panama	1955	1980	BOP	-2297.025	-158.819
Papua-New Guinea	1972	1981	BOP	-102.540	-28.314
Paraguay	1952	1980	BOP	-1254.852	-100.832
Peru	1956	1981	BOP	-6900.027	-569.555
Philippines	1952	1981	BOP	-10662.535	-1071.990
Poland	1971	1979	CIA	-25361.070	-2314.807
Portugal	1972	1980	BOP	-2879.119	-380.612

Table B.2—continued

Country	Data Availability Period		Source <sup>a</sup>	1982 Wealth	1973-1982 Average Flow
	From	To			
Qatar	1952	1981	TRD	34889.246	3049.841
Reunion	1952	1980	TRD	-8552.254	-680.207
Romania	1971	1979	CIA	-8495.953	-700.095
Rwanda	1967	1980	BOP	6.006	-1.669
Sao Tome et Principe	1952	1977	TRD	169.020	9.115
Saudi Arabia	1967	1980	BOP	134974.687	12940.293
Senegal	1968	1977	BOP	-717.269	-51.924
Seychelles	1976	1980	BOP	-37.016	-3.702
Sierra Leone	1963	1980	BOP	-954.399	-77.100
Singapore	1963	1981	BOP	-5116.934	-497.893
Somalia	1961	1980	BOP	-762.543	-63.121
South Africa	1952	1981	BOP	-3949.731	-51.936
Soviet Union	1971	1979	CIA	-12934.141	-1176.814
Spain	1956	1980	BOP	-17617.023	-1793.037
Sri Lanka	1956	1980	BOP	-1962.717	-125.561
Sudan	1956	1980	BOP	-2298.528	-175.980
Suriname	1965	1981	BOP	210.966	28.777
Swaziland	1974	1980	BOP	-18.499	-1.850
Sweden	1967	1981	BOP	-13652.590	-1543.986
Switzerland	1956	1980	BOP	93987.625	7721.336
Syria	1953	1980	BOP	-1660.312	-172.543
Taiwan	1952	1978	BOP	2949.392	218.449
Tanzania	1961	1980	BOP	-2489.154	-217.371
Thailand	1953	1981	BOP	-11446.328	-1068.527
Togo	1965	1978	BOP	-344.761	-34.851
Tonga	1955	1979	TRD	-213.588	-17.295
Trinidad and Tobago	1960	1979	BOP	407.575	126.320
Tunisia	1958	1980	BOP	-3366.414	-264.418
Turkey	1956	1980	BOP	-13167.785	-1303.754
Uganda	1966	1980	BOP	24.307	6.252
United Arab Emirates	1969	1981	TRD	83000.000	8029.293
United Kingdom	1952	1980	BOP	15475.219	780.892
United States	1953	1981	BOP	144326.500	11581.918
Upper Volta	1968	1978	BOP	-275.423	-28.987
Uruguay	1959	1980	BOP	-1870.888	-183.412

Table B.2—continued

Country	Data Availability Period		Source <sup>a</sup>	1982 Wealth	1973-1982 Average Flow
	From	To			
Venezuela	1956	1980	BOP	16937.309	1595.167
Western Samoa	1965	1976	BOP	-74.462	-4.706
Yemen Arab Republic	1974	1981	BOP	-183.460	-18.346
Yemen P.D. Rep.	1967	1980	BOP	-474.057	-38.539
Yugoslavia	1956	1980	BOP	-12655.949	-1170.897
Zaire	1964	1975	BOP	-2302.806	-173.388
Zambia	1964	1980	BOP	-1636.283	-216.856
Zimbabwe	1964	1981	TRD	1652.891	155.029

<sup>a</sup>Source key:

- BOP *International Financial Statistics*, Balance of Payments
- TRD *International Financial Statistics*, Trade Figures
- CIA *Estimating Soviet and East European Hard Currency Debt*
- HES *Handbook of Economic Statistics*

Other figures are derived from the CIA's *Estimating Soviet and East European Hard Currency Debt*. Hard currency debt is used as an approximation of net international claims, and the differences in debt are used as capital flow estimates. Because these figures include only the hard currency debt of the East, indebtedness to other members of the Eastern bloc is ignored. This discrepancy can distort the wealth and flow figures for an individual Eastern European country, but the errors will cancel out for the sum of all Eastern European countries. Banks run by the Council for Mutual Economic Assistance are included as a separate "country" because they have hard currency obligations independent of the individual Eastern European countries. These estimates will err by the difference between calculated hard currency debt and true net international claims. Again, only one set of figures is calculated for each of these countries.

Data are not available for all countries through the end of 1982. The wealth figures for the last available year are inflated (by the U.S. GNP implicit price deflator) to 1982 levels. Capital flows are adjusted to conform to this inflation.

Net international claims and capital flows must sum to zero for the world as a whole. For every lender, there is a borrower; for every liability, a corresponding asset. Unfortunately, the sum of claims and

flows for all the major countries in the world is decidedly negative. By the current account measure, the world is in debt to no one in particular by almost \$300 billion. This figure drops to about \$200 billion for the capital measure, but this is still a sizable discrepancy. Countries on the average overestimate their liabilities. Two of the measures appear to be more accurate than the others. Both net claims and net flows are close to zero for the high method and the very high method. A weighted average of the two methods is devised so that flows and claims sum to zero. For countries with more than one measure, this average is calculated and listed as "*Used.*"

A complete set of wealth and capital flow figures is provided for each region in this report. These regional figures are the appropriate sums for each category for all countries within each region. Only the final estimates are given for each country. A complete breakdown of all these accounts by country is available from the author.

## Appendix C

### ASSUMPTIONS USED IN CAPITAL FLOW MODEL

The effects of capital flow reductions predicted in Sec. IV are based on the model developed in Sec. III and the following assumptions:

1. Wealth levels are those derived in Appendix B. The West is a net creditor by \$157.6 billion, the South a net debtor by \$47.6 billion, and the East a net debtor by \$109.9 billion. The debt of the South is the sum of \$406.0 billion in net claims of the oil exporting nations and debt of \$453.6 billion in the non-oil South.
2. Investment is \$1,924 billion annually in the West and \$486 billion annually in the South. The investment in the South is comprised of \$138 billion in the oil exporting nations and \$348 billion in the other nations of the South. Investment by the East is \$567 annually. The numbers are drawn largely from the World Bank's *World Development Report 1981*. These figures are mostly for 1979 but have been inflated to 1982 levels by the U.S. Gross National Product implicit price deflator. Figures for some countries not listed by the World Bank were taken from Central Intelligence Agency or United Nations sources.
3. The interest elasticity of investment is  $-1$ . Although this figure is somewhat arbitrary, it does find some support in economic theory. If one combines neoclassical investment theory (Jorgenson, 1971) with a Cobb-Douglas production function, the interest elasticity of the ideal capital stock is  $-1$ . If investment is proportional to the ideal capital stock, it will also have an interest elasticity of  $-1$ . Sensitivity analysis on this assumption is provided in Table 3.
4. Real interest rates are 5 percent.
5. The derivative of investment with respect to the interest rate is  $-384.8$  in the West,  $-97.2$  in the South ( $-27.6$  for oil exporters and  $-69.6$  for the non-oil South), and  $-113.4$  in the East. The units for these derivatives are billions of dollars per percentage point. These derivatives follow directly from assumptions two through four. These derivatives are recalculated for each change in the elasticity assumptions.

6. The interest rate changes calculated for the East are changes in the shadow price of capital. It is assumed that the East will continue to pay world interest rates on its outstanding debt. In effect, this assumes that the East can appropriate all scarcity rents that result from the capital flow restrictions.

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