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A NOTE ON "TRANSFERS"

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## **ABSTRACT**

This paper attempts to provide some structure to the analysis and measurement of "net resource transfers." We go about achieving this objective in two steps. First, we use standard measures of portfolio changes and balance of payments statistics to evaluate the real resource transfers associated with financial transactions. Second, we sketch ways in which this analytical framework can be used to address the economic concerns associated with the term "net resource transfers," e.g., questions regarding the "burdens" of international debt obligations and the effects of these obligations on domestic capital formation and debt servicing.

## A Note on "Transfers"

David B. Gordon and Ross Levine<sup>1</sup>

### I. Introduction

Recently, measures of "net resource transfers" from heavily indebted developing countries have been used to quantify the extent to which international debt obligations restrict investment and retard growth.<sup>2</sup> Unfortunately, the lack of a consensus definition of "net transfers" has led to a proliferation of competing measures. Indeed, the range of "net resource transfer" figures is quite large with some measures indicating very large "transfers" out of developing countries, while others indicate "net transfers" into developing countries. It is not clear, however, that one measure is "right" and another "wrong." Each may be the "right" measure of a different concept of "net resource transfers." Indeed, the underlying disagreement maybe over the appropriate level of any given measure.

This paper offers no position on the appropriate level of "transfers," but instead attempts to provide some structure to the analysis and measurement of "net resource transfers." We go about achieving this objective in two steps. First, we use standard measures of portfolio

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1. The authors are economists in the International Finance Division. This paper represents the views of the authors and should not be interpreted as reflecting those of the Board of Governors of the Federal Reserve System or other members of its staff. We would like to thank, without implicating, M. Carkovic, D. Howard, S. Kamin, and J. Marquez for their comments.

2. For example, the World Bank's World Development Report 1988 states that reducing net resource transfers from developing countries to the rest of the world is one of the three key issues which needs to be addressed in order to improve growth prospects in developing and industrialized countries. (p. 13)

changes and balance of payments statistics (BOP) to evaluate the real transfers associated with financial transactions. This analytical framework produces two broad notions of "transfers" that are intimately linked but differentiated by their intertemporal perspective. In particular, our "transactions" measure of portfolio trading equals the opportunity cost in terms of goods this period due to portfolio transactions this period while our "stock value" measure equals the opportunity cost in terms of goods in the future associated with portfolio transactions this period. If we consider all of a country's portfolio transactions, these correspond to common notions of transfers: the trade account is the transactions measure while the current account is the stock value measure.

Second, we sketch ways in which this analytical framework can be used to address the economic concerns associated with the term "net resource transfers." Specifically, we pose and answer a series of questions regarding the "burdens" of international debt obligations, and the effects of these obligations on domestic capital formation and debt servicing.

The questions we pose in linking measures of transfers to underlying economic concerns fall into three groups. The first group involves the "burdens" or opportunity costs of financial transactions. This leads to questions such as: what was forgone in terms of real goods and services this period because of portfolio transactions; or alternatively, what are the implications in terms of future consumption and investment due to financial trades this period? This difference in intertemporal perspective corresponds precisely to the distinction between the transactions and stock value measures of portfolio transactions.

A second perceived implication of "net transfers" from developing countries is that they restrict capital formation. This leads to questions such as: do standard balance of payments statistics provide information about the international flow of capital goods; and are developing country financial obligations constraining them from purchasing foreign capital goods? Perhaps unsurprisingly, no common measure of "transfers" provides much insight into domestic capital formation or growth since they are based on BOP statistics which themselves provide little information about real investment activities.

In constructing an accounting framework and examining the extent to which various notions of "transfers" illuminate the "burdens" of international financial transactions and the effect of these transactions on domestic capital creation, we found much of the analysis closely related to the question of whether and to what degree debt is being serviced. Thus, the paper ends with a short discussion of debt servicing by addressing questions such as: can we measure the degree to which debt obligations are being satisfied; and/or quantify the probability of default from standard BOP statistics? Interestingly, even if countries are currently satisfying their intertemporal budget constraints, the probability of default may be growing. Thus, debtors and creditors may have very different notions of when debt is being "serviced."

In sum, the broad range of available measures of transfers and the apparent disagreement over the appropriate level of transfers reflect underlying differences as to the relevant political and economic criteria. We have no position on the appropriate criteria. Instead, by imposing some standard structure on questions regarding the measurement and perceived implications of "net resource transfers," we hope that the

current debate will shift from focusing on the "right" measure to focusing on the underlying questions.

## II. Trading, Definitions, and Accounting

In order to evaluate the real transfers associated with financial transactions, we examine the financial and goods market interactions between a hypothetical developing country (DC) and the rest-of-the world (ROW). Each country begins a period with a portfolio of assets and liabilities. Trade in goods, new assets, and net interest and dividend payments determine the end-of-period portfolio. This along with the realization of the interest rate determine scheduled interest payments in the next period. We assume the ROW always pays interest as scheduled. The DC, however, sometimes fails to meet scheduled interest and amortization payments. Interest or amortization payments not made on time are "re-financed" at the current interest rate and remain in the ROW's stock of claims against the DC.

There are two types of assets: debt and equity. It is important to emphasize that equity investment is a purchase of an ownership share in some activity. Thus equities are claims on real assets within a country, but not liabilities of residents.<sup>3</sup> Debt, on the other hand, is a pure "IOU," not a purchase of ownership. The term "IOU" refers to both the interest and principal portion of the debt because both quantities are pre-specified and owed at particular dates. International reserves held by the DC government are considered IOUs issued by the ROW government.

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3. Capital gains are ignored throughout. Their inclusion complicates the accounting but does not change the basic thrust of the analysis.

Capital inflows to the DC take the form of new loans,  $L^*$ , and equity inflows,  $I^*$ . For simplicity, we aggregate DC capital outflows into one term,  $P$ . Thus, the budget constraint for the DC with the ROW is:

$$x + I^* + L^* + A_a + i_a + d^* + i^* - m + P + A_s + d + i_s + R$$

where:

- $x$  and  $m$  are exports and imports of goods and non-capital services;
- $I^*$  and  $L^*$  are equity investment and new loans made by the ROW (inflows to the DC).
- $P$  is the increase in the DC's portfolio of ROW assets ("I+L");
- $d$  and  $i$  ( $= i_s - i_a$ ) are dividend and interest payments made to the ROW; subscripts "s" and "a" indicate scheduled and arrears respectively;
- $d^*$  and  $i^*$  are corresponding dividend and interest payments received by the DC from the ROW;
- $A$  ( $= A_s - A_a$ ) represents actual amortization payments made by the DC on pre-existing loans DC;
- $R$  is the increase in DC holdings of international reserves.

Obviously, the DC budget constraint is closely related to its balance of payments (BOP). In order to facilitate discussion, the BOP of this simple economy is given in Table 1.<sup>4</sup> It should be noted, however, that we have separated the world into financial transactions on the one hand and goods transactions on the other. This delineation differs from the distinction in the BOP between current and capital account transactions.

### III. Evaluating Portfolio Changes

This section defines two standard measures of portfolio transactions and the implied real resource transfers associated with those transactions. We then use these measures to evaluate the portfolio transactions of the DC using common BOP statistics. In Section IV, this framework is used to consider the burden of external financial obligations, the degree to which these obligations are being satisfied, and any constraints on consumption, investment, and growth due to these obligations.

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4. There are a number of discrepancies that must be recognized when these "numbers" are collected.  $i$  and  $A$  correspond to actual interest and amortization payments and not to scheduled payments. Published balance of payments statistics, however, report scheduled interest and

amortization transactions ( $i_s$  and  $A_s$ ). Also,  $L^*$  indicates actual new loans made by the ROW to the DC and does not include interest arrears that are balanced in the BOP by a capital inflow.  $P$  includes purchases of ROW treasury bonds that are actually loans, but balance of payments report this as portfolio investment. Investment figures ignore capital gains until these gains are realized and reported. Therefore, investment figures must be disaggregated in order to obtain a "correct"  $I^*$ .



A. Two Measures of Portfolio Transactions

The first measure is called the transactions measure, and it refers to the net supply (positive or negative) of financial assets within a period. We can define the transactions measure in period  $t$  as  $c_t$ , which represents the difference between the value of the beginning-of-period portfolio and the end-of-period portfolio due to transactions during that period. This is the real resource flow associated with portfolio transactions during a period.

The second measure is called the stock value measure (SV), and it equals the value of the end-of-period portfolio in period  $t$  minus the value of the end-of-period portfolio in period  $t-1$ . This stock value measure is the change in the present value of future real resource flows resulting from portfolio transactions during period  $t$ .

More formally, at the end of period  $t-1$ , the net portfolio between the DC and ROW implies a series of portfolio transactions from period  $t$  on:  $\{c_i\}_t^\infty$ . At the end of period  $t$  trading, the resulting portfolio implies a series of portfolio transactions from period  $t+1$  on:  $\{c_i\}_{t+1}^\infty$ . The stock value measure simply subtracts the implied period  $t-1$  present value of the end-of-period  $t-1$  portfolio from the implied period  $t$  present value of the end-of-period  $t$  portfolio, or

$$SV_t = \left[ \sum_{i=t+1}^{\infty} \beta^{i-t} c_i \right] - \left[ \sum_{i=t+1}^{\infty} \beta^{i-t} c_{i-1} \right],$$

where  $\beta$  is assumed to be a constant discount factor.<sup>5</sup>

### B. The Evaluation of Three Portfolios

We now turn to evaluating the real resource transfers associated with three portfolios. In terms of the questions discussed in the introduction there are three portfolios of particular interest:

- (1) The DC's portfolio of claims on the ROW;
- (2) The ROW's portfolio of claims on the DC; and
- (3) The ROW's portfolio of IOUs against the DC.

The last is of independent interest because of the limitations of the ROW's ability to appropriate DC assets to satisfy these obligations and the associated default risk.

Changes in each of these portfolios may be evaluated using either the transactions measure or the stock value measure:

#### The Transactions Measure:

By construction, the transactions measure evaluates the real resource transfers in period  $t$  associated with changes in a specific portfolio. The DC increases its claims against the ROW by purchasing foreign equities or bonds,  $P$ , and by acquiring reserves,  $R$ . Each of these lowers  $c_t$ . Similarly, the ROW increases the present value of its claims

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5. Of course, if we know the relevant discount rate and the net stock of claims at the end-of-period  $t-1$ , the measures are informationally equivalent. The formal relationship between these measures is presented in the appendix.

against the DC (increases  $c_t$ ) by purchasing DC equities ( $I^*$ ), and loaning money to the DC ( $L^*$ ).

Note interest, dividend, and amortization payments are financial transactions, and thus are included in the transactions measure. These payments by the DC to the ROW during period  $t$  lower  $c_t$ , and corresponding payments by the ROW to the DC increase the transactions measure of real resource transfers associated with portfolio transactions.

These portfolio changes along with the "other side" of the DC budget constraint are collected in Table 2. Line 3 represents the value of the net change in claims of the DC with the ROW, i.e., line 1 minus line 2.a. This is equal to the trade account surplus, which is  $-c_t$ . Line 2.b. gives the corresponding change in the ROW's portfolio of IOUs against the DC.

The Stock Value Measure:

Alternatively, the stock value measure evaluates changes in future real resource flows resulting from portfolio transactions this period. The DC increases its net stock of claims against the ROW by purchasing foreign equities, bonds, international reserves, or amortizing past loans, and the net stock of claims is reduced when the ROW purchases DC equities, loans the DC money, or re-finances current DC obligations.

The net stock of claims is unaltered by dividends or interest payments on assets purchased in the past. Dividend payments leave the value of equity (the discounted value of future dividends) unchanged from

one period to the next,<sup>6</sup> and the stock of debt is unchanged by interest payments. This leaves the implied stream of future portfolio transactions unaltered; thus, the implied stream of real resource flows is unaltered.<sup>7</sup>

Table 3 presents changes in the stock value of portfolios resulting from portfolio transactions in period  $t$ . In particular, line 1 lists the change in the stock value of the DC's portfolio of ROW assets. Line 2.a gives the change in the stock value of the ROW's portfolio of DC debts and equities, while line 2.b represents the change in the value of ROW loans. Line 3 is the net change in the stock value of debts and equities, i.e., line 1 minus line 2.a, and equals the current account surplus, or equivalently, the capital account deficit plus the increase in international reserves.

#### IV. Burdens, Constraints, and Default

We now return to the basic questions outlined in the Introduction. In posing and answering questions concerning forgone consumption and investment resulting from financial transactions, we focus on the portfolios and measures of "transfers" discussed in III.

The questions we pose fall into two broad categories. The first set of questions focuses on the opportunity cost of financial transactions.

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6. Recall our assumption of no capital gains, i.e., all profits are distributed as dividends, and there is no uncertainty about the future value of the firm, only about this period's dividend payments.

7. For example, if the DC is \$1 in debt after period  $t-1$  and the interest rate is 10% and the DC pays \$0.10 in interest during period  $t$ , the net stock of debt at the end of period  $t$  is, ceteris paribus, still \$1. Interest or amortization payments not made on time are re-financed and added to the stock of ROW IOUs against the DC.

For example, what is the opportunity cost in terms of real goods of portfolio transactions this period; or, what is the implication of portfolio transactions for future consumption and investment? In addition, we distinguish the DC as a geographical entity from DC citizens. This distinction is empirically important to the degree that ROW citizens own a substantial percentage of the DC's means of production and to the degree that DC residents hold a substantial percentage of their wealth abroad.

The second set of questions focuses on the potential effects of asset transactions on investment behavior. For example, does meeting financial obligations constrain investment and growth; or, do balance of payments statistics permit us to make inferences about the flows of real capital or changes in real investment opportunities?

We finish this section with a short examination of the relationship between measures of portfolio transactions and debt servicing. In particular, we ask: what information can we obtain from measured portfolio transactions in the BOP about the degree to which debt is being serviced, contracts satisfied, intertemporal budget constraints satisfied?

A. "Burdens:" The DC Perspective

The most direct question regarding the transfer of real resources resulting from financial exchanges is:

Q1: What has the DC forgone in terms of consumption and real investment this period in conducting all of its international portfolio transactions during the period?

By construction, this question leads to a transactions measure of real resource transfers. The answer can be obtained directly from Table 2. Line 3 collects all portfolio transactions on the left-hand-side of the country's budget constraint. The right-hand-side simply represents the DC's opportunity cost in real goods and services of those transactions. Thus, the trade surplus (TS) represents forgone consumption and domestic capital formation this period resulting from financial transactions.

The above question was posed and answered viewing the DC as a geographical entity, i.e., from a "border" perspective. Another way of posing the question is to focus on DC residents. This perspective leads to the question:

Q2:       What have DC residents forgone in terms of consumption and investment this period due to financial transactions with the ROW?

In order to answer this question, it is important to remember that ROW-residents own the dividends they collect on DC investments. A ROW investor repatriating his dividends from a DC equity share does not alter the opportunities of DC residents, but repatriation does alter the opportunity set of the DC as a geographical entity since these dividends cannot be used to purchase goods or financial assets from within the DC. An easy way to see this is to consider a DC whose citizens conduct no portfolio transactions with the ROW, and thus forgone consumption and investment due to financial transactions with the ROW must be zero. Suppose a ROW investor owns and operates a firm in the DC. Furthermore, suppose that he exports all of his output to the ROW and repatriates all of his earnings. The DC trade surplus will be positive and equal to ROW dividends from the

DC country (d). The opportunity cost of DC resident portfolio transactions with the ROW must be zero because residents did not trade with the ROW. Therefore, in answering the question, "what have DC residents forgone in terms of consumption and investment due to financial transactions with the ROW," one must subtract dividend payments to the ROW from the DC trade surplus:  $TS - d$ .

The net debt position of many developing countries has been of particular interest in recent years because much of the debt is sovereign debt and not collateralized by the DC's portfolio of claims against the ROW. Therefore, in examining the financial burdens of the DC, the DC's debt obligations are of independent interest. One may ask:

Q3: What is the ex post cost of receiving and servicing foreign debt obligations to the DC this period in terms of forgone consumption and investment?

This question is obviously posed in such a way as to be directly answered using the transactions measure of portfolio transactions. The answer - holding the demand for other assets constant - is straightforward: interest and amortization payments actually made minus new loans received by the DC:  $i + A - L^*$ .

This quantity represents resources that are not going to DC consumption or savings anywhere in the world. This measure is line 2.b. of Table 2, i.e., the transactions measure of the change in the ROW's

portfolio of IOUs against the DC. It is also the (negative of) World Bank's measure of "net transfers."<sup>8</sup>

Although this measure is the answer to a specific question, it is only a net measure of flows between banks in the ROW and the DC. It is not a measure of changes in the net position of the DC relative to the ROW. It does not include changes in the DC's portfolio of claims against the ROW and this measure ignores substitutions between debt and equity. For example, a complete debt for equity swap would be indicated in the World Bank measure as an enormous transfer of resources from the DC to the ROW. The net claims of the ROW against the DC, however, would be unchanged. Furthermore, the World Bank measure ignores the magnitude of the original capital inflows to the DC. If the DC borrowed substantial sums from the ROW, then requisite transfers to satisfy existing obligations will be large.<sup>9</sup>

Each of the questions above is carefully posed in terms of the current opportunity cost of portfolio transactions and thus can be answered directly in terms of a transactions measure (as in table 2). Instead of focusing on consumption and investment forgone this period, one may be concerned with the impact of portfolio transactions this period on the future flow of consumption and investment. In particular, how do the flows

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8. See: the World Development Report 1988, p.30, where net resource transfers are defined as "disbursements of medium- and long-term external loans minus interest and amortization payments on medium- and long-term external debt."

9. Notice that the border/citizen distinction does not arise if foreign debt is a liability of private DC citizens. If the debt is public and the tax base includes all economic activities within the DC country (including those owned by foreigners) the answer to Q3 is a "border" measure and not a resident measure.



generated by a given portfolio from period  $t$  on differ from those generated from period  $t+1$  on?

Thus, a slight re-wording of Q1 and Q3 yields:

Q1': How have the flows of future consumption and investment, represented by the DC's net portfolio changed due to portfolio transactions this period?

and;

Q3': How have the flows of future consumption and investment, represented by the DC's net stock of debt changed due to portfolio transactions this period?

The differences between this set of questions and the questions posed above highlights the distinction between the transactions measure and stock value measure of financial transactions.

The stock of IOUs, equities, and reserves at the end of period  $t-1$  is the present value of the flow of real goods it can generate from  $t$  on. Consequently, the net change in the stock of the DC's portfolio with the ROW due to portfolio transactions during period  $t$  represents the difference between the flow of real goods implied by the end-of-period  $t-1$  portfolio and that implied by the end-of-period  $t$  portfolio.<sup>10</sup> Thus the answer to Q1', which focuses on all financial transactions during period  $t$ , is line 3 of Table 3, the DC's current account surplus.

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10. This assumes that future interest and amortization obligations are met (in present value terms).

Question Q3' focuses on changes in the net debt position.

Although payment of scheduled interest alters consumption and investment this period, it leaves the stock of liabilities at the end-of-period  $t$  the same as it was at the end-of-period  $t-1$ . On the other hand, borrowing money this period increases the DC's stock of liabilities and increases the flow of future consumption and investment that must be forgone (from  $t+1$  on) in order to finance the portfolio. Thus, the answer to Q3'

is:  $A - i_a - L^*$

In conclusion, it is worth emphasizing the relationship between the transaction measure and stock value measure of the DC's total portfolio transactions. The transactions measure (the trade account surplus) reflects the degree to which the DC has forgone current goods in order to engage in financial transactions, while the stock value measure (the current account surplus) represents changes in future resource claims on the economy and thus indicates whether net obligations are rising or falling.<sup>11</sup> Given information on initial portfolio positions and the relevant interest rate(s), there is a simple and direct relationship between the two measures: the stock value measure equals the relevant interest rate times the stock of claims at the end of last period minus the

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11. All of the questions above could be stated in terms of the ROW's portfolio transactions with the DC. As long as all scheduled payments on debt are made, the opportunity cost to the ROW of a given set of financial transactions is equal to that of the DC but of opposite sign. Thus, the answers to the same questions posed in terms of the ROW would simply be the negative of the given answers.

If the DC fails to make scheduled payments, the ROW records arrears in its BOP accounts. To the extent that these are involuntary transactions for the ROW, they do not represent an opportunity cost. If current arrears reflect an inability or unwillingness to meet obligations (in present value terms), the ROW incurs a capital loss that is not reflected in the stock or transactions measures of portfolio changes.

transactions measure.<sup>12</sup> Thus, either can be used in addressing questions concerning the burdens of international debt, the constraints on domestic capital formation resulting from portfolio transactions, and the degree to which countries are satisfying their portfolio obligations. Absent complete information on initial portfolio positions and relevant discount rates, they differ in the specific questions they address.

#### B. Constraints

Much of the importance surrounding the term "transfers" is associated with presumed restrictions on capital formation in developing countries created by large debt obligations. We would like to use the measures of transfers discussed above to evaluate the degree to which international financial transactions constrain the level of domestic investment. Unfortunately, evaluating these constraints on the basis of BOP statistics requires making important simplifying assumptions and loosening our ties to the transactions and stock value measures of portfolio transactions.

One may ask:

Q4: What is the impact of financial transactions on the flow of real capital goods between the DC and the ROW?

Unfortunately, even the level of this flow cannot be measured using standard BOP statistics. The only way to answer this question is to stand at the border and count the flow of machines, i.e., examine the composition

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12. This is shown in the appendix.

of the trade balance. The trade account in the BOP provides little information in this regard and the capital account provides no information concerning the flow of capital goods. Indeed, neither the BOP statistics nor our measures of changes in portfolios can provide us with direct information about real investment activities.

We can, however, rephrase Q4 and make some additional assumptions in order to derive a set of BOP criteria regarding the degree to which DC financial obligations are constraining the acquisition of capital goods. In order to accomplish this, we assume that DC consumption, DC exports ( $x$ ), ROW direct investment in the DC ( $I^*$ ), ROW loans to the DC ( $L^*$ ), and dividends ( $d$  &  $d^*$ ) are fixed. Then, given various assumptions about scheduled and actual interest and amortization payments by the DC to the ROW, we use the DC budget constraint to examine whether the DC could have rearranged its portfolio to acquire an additional unit of capital. It is important to recognize that even if the DC could have rearranged its portfolio and self-financed an additional unit of capital, the purchase would have altered the risk characteristics of the DC-portfolio. This risk change alone may have kept the DC from purchasing the marginal capital good. Thus, we make the important (and incorrect) simplifying assumption that the risk characteristics of the DC portfolio are unaltered by a marginal purchase of capital.

The first question assumes that all scheduled interest and amortization payments are made:

Q6: can the DC purchase a marginal unit of physical capital assuming that all scheduled interest and amortization payments are made?

Thus, even if the DC failed to meet scheduled interest or amortization payments, this question assumes that arrears will be paid before considering a further hypothetical rearrangement of the DC's portfolio to purchase more capital goods. In other words, could the DC have lowered its acquisition of foreign assets (P+R) enough to pay "arrears" and acquire an additional unit of capital, i.e., is:

$$\text{criterion 1: } P + R - i_a - A_a > 0 \text{ ?}^{13}$$

If this criterion is positive, then even if the DC had met all scheduled financial obligations, the DC could have purchased a marginal unit of physical capital simply by (further) rearranging its portfolio and lowering its purchases of claims against the ROW (P+R), e.g., P could be reduced to increase the capital goods component of m. Moreover, if this measure is positive and the DC is accruing arrears, then the DC can clearly "afford" to both satisfy a higher percentage of its scheduled debt obligations (lower  $A_a$  and/or  $i_a$ ) and increase the domestic capital base.<sup>14</sup>

The second question assumes that interest and amortization payments are held constant at their realized values:

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13. Note, the "other" side of the DC's budget constraint is:

$$(x-m) + I^* + L^* + d + d^* + i^* - i_s - A_s.$$

14. This is true only to the extent that one views the DC as a homogeneous geographical entity. For example, if the country has no reserves and P is all private assets, there maybe no simple way for the DC to rearrange "its" portfolio.

Q7: can the DC purchase a marginal unit of physical capital given realized interest and amortization payments?

This is an ex post measure in that it incorporates the country's choice of interest and amortization payments. Could the DC by altering its acquisition of claims against the ROW (P+R) purchase an additional unit of capital without lowering consumption, borrowing more from abroad, or accruing more arrears, i.e., is

critterion 2:  $P + R > 0$  ?

The third question assumes that no interest or amortization payments are made.

Q8: can the DC purchase a marginal unit of physical capital by accruing arrears?

Could the DC acquire more machines even if it made no interest or principal payments, i.e., is

critterion 3:  $P + R + i + A > 0$  ?

If critterion three is negative, the DC cannot lower its acquisition of foreign assets in order to finance more capital goods. The DC must reduce consumption, re-structure its economy towards exports,

encourage ROW investment in the DC, and/or borrow more from abroad in order to accumulate capital goods.

Although these three criteria are constructed in order to evaluate the degree to which international financial transactions restrict domestic investment, they require stringent assumptions and do not imply a direct link between transfers and investment. Thus, measures of transfers may provide only suggestive information concerning the extent to which international financial obligations constrain domestic capital formation.

### C. Debt being Serviced?

The current interest in "transfers" centers around the ability and willingness of heavily indebted developing countries to meet past contractual commitments and still grow. In this subsection, we consider the links between measures of transfers and the issue of debt servicing. Unfortunately, the simple question: to what degree is debt being serviced?, does not have a simple answer. This query obviously raises the more fundamental question: what does it mean to service debt? One criterion is whether or not the country is meeting the pre-arranged schedule of payments. This is an easily verifiable and intuitively attractive criterion, but not necessarily an economically significant one.

An alternative criterion is whether or not the country is satisfying an intertemporal budget constraint. A DC is satisfying its debt obligations if the present value of its payments equals the face value of its debt. This requires that the present value of obligations outstanding from  $t+i$  on goes to zero as  $i$  grows. Equivalently, the stock of debt must ultimately grow more slowly than the rate of discount. Thus the intertemporal budget constraint acts as a constraint on the magnitude of

the stock value measure, i.e., the stock value measure must, at some time, register that the growth rate of net debt is growing more slowly than the rate of discount (note: this requires information on the size of the initial portfolio and the relevant interest rate). Similarly, the intertemporal budget constraint can be thought of as a constraint on the sign of future transactions measures, i.e., a heavily indebted country must, at some time, register a negative transaction measure of net resource transfers if it is to satisfy its intertemporal budget constraint.

Of course, even if the growth rate of debt is below the interest rate this period, it may lie above it in future periods. Thus, it is impossible to tell if a country will satisfy its intertemporal budget constraint. It is only possible to determine whether current debt servicing behavior, if continued indefinitely, is consistent with the intertemporal budget constraint: i.e., are current policies "sustainable"?

Whether the present value of debt is currently going to zero, however, is not the only consideration in evaluating the path of debt payments. Even if the stock of debt is rising more slowly than the discount rate, the gains from defaulting are growing. Since the benefit from defaulting in period  $t+i$  is the stock of debt in  $t+i$ , the set of events that would cause the DC to default may expand as the stock of debt increases. Thus, creditors might be concerned about a growing stock of debt (positive stock value measures) even if the DC's current path of payments is consistent with the intertemporal budget constraint. Furthermore, even if the growth rate of debt is negative, if the stock of debt over national wealth is growing, the probability of default may be rising. Creditors observing such a situation would be little comforted by the observation that the DC's stock of debt had been shrinking recently.



## V. Conclusion

There is no single economically relevant measure of "transfers". Each of the conventional measures of "transfers" is in fact a standard measure of the change in a portfolio. The trade balance represents foregone resources this period, while the current account balance represents changes in future resource claims on an economy. Given information on initial portfolio positions and the relevant interest rate(s), there is a simple and direct relationship between the two measures. Thus, either can be used in addressing questions concerning the burdens of international debt, the constraints on domestic capital formation resulting from portfolio transactions, and the degree to which countries are satisfying their portfolio obligations. Absent complete information, they differ in how directly they address any specific question.

By imposing some standard structure on questions regarding the perceived implications of "net transfers," we hope that the current debate will shift from focusing on the "right" measure to focusing on the underlying questions.

Appendix

The formal relationship between the transactions and stock value (SV) measures of portfolio transactions is easily expressed. Let  $c_i$  be the net payment in period  $i$  (positive or negative) generated by a given series of portfolio transactions and let  $C_t = (c_i, t \leq i)$  represent these payments from period  $t$  on. The present value of this sequence of claims is

$$(1) \quad PV_t(C_t) = \sum_{i=t}^{\infty} \beta^{i-t} c_i,$$

where for simplicity the discount factor,  $\beta$ , is assumed to be constant. Thus, the present value in period  $t$  of the portfolio in period  $t+1$  (the sequence of net payments beginning in period  $t+1$ ) is

$$(2) \quad PV_t(C_{t+1}) = \beta^1 PV_{t+1}(C_{t+1}).$$

For a given sequence of portfolio transactions, the transactions measure in period  $t$  is simply  $c_t$ . It is related to the country's portfolio position by

$$(3) \quad c_t = PV_t(C_t) - PV_t(C_{t+1}) = PV_t(C_t) - \beta PV_{t+1}(C_{t+1})$$

Note that  $PV_t(C_{t+1})$  is the value of the end-of-period portfolio: the value of the portfolio in period  $t$  after period  $t$  transactions have taken place. Thus, the transactions measure is the difference between the beginning-of-period portfolio (including current claims) and the end-of-period portfolio.

On the other hand, the stock value (SV) measure is

$$(4) \quad SV_t = PV_t(C_{t+1}) - PV_{t-1}(C_t) - \beta( PV_{t+1}(C_{t+1}) - PV_t(C_t) ),$$

for a given set of portfolio transactions in period  $t$ . The stock value subtracts the net stock of claims at the end of trading in period  $t-1$  from the net stock of claims at the end of period  $t$ . Since the net stock of claims represents a future flow of resources, the stock value measure indicates the change in future resource flows resulting from transactions in period  $t$ .

Using (2)-(4) we can relate these measures:

$$(5) \quad SV_t = \beta( PV_{t+1}(C_{t+1}) - PV_t(C_t) ) - (1-\beta)PV_t(C_t) - c_t$$

or in terms of the interest rate  $r = (1-\beta)/\beta$

$$(6) \quad SV_t = rPV_{t-1}(C_t) - c_t$$

Thus, the stock value measure of the change in a portfolio is greater (less) than zero if and only if the current net payment (the transactions measure) is greater (less) than the interest rate times the stock of claims at the end of the last period.

TABLE 1

The Balance of Payments

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Current Account Surplus (CAS)

1. trade surplus (TS = x - m)
- 2.a. net interest receipts ( $i^* - i$ )
- 2.b. -interest payments in arrears/re-financed  $-i_a = -(i_s - i)$
3. net investment income receipts ( $d^* - d$ )

Capital Account Surplus

- 4.a. -amortization payments (- A)
- 4.b. - amortization in arrears/re-financed  $-A_a = -(A_s - A)$
5. new loans ( $L^*$ )
6. other financing ( $i_a + A_a$ )
7. net investment ( $I^* - P$ )

- Increase in International Reserves (R)

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TABLE 2

Changes in the Value of Portfolios  
Due to Transactions During a Given Period

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<u>Line</u>	<u>Question</u>	<u>Answer</u>
1.	$\Delta$ in the value of DC claims?	$P + R - i^* - d^* =$ $TS + L^* + I^* - d - A - i$
2.a	$\Delta$ in the value of ROW claims?	$L^* + I^* - A - i - d =$ $-TS - d^* - i^* + R + P$
2.b	$\Delta$ in the value of ROW IOUs?	$L^* - i - A =$ $-TS - (d^* - d) - (I^* - P) - i^* + R$
3.	net $\Delta$ in claims?	$(i - i^*) + (d - d^*) + A + (P - I^*) - L^* + R =$ <b>TS</b>

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**TABLE 3**

Changes in the Stock Value of Portfolios  
Between Periods

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<u>Line</u>	<u>Question</u>	<u>Answer</u>
1.	$\Delta$ in the SV of DC claims?	$P + R - CAS + (L^* + i_a + I^* - A)$
2.a	$\Delta$ in the SV of ROW claims?	$L^* + i_a + I^* - A - CAS + R + P$
2.b	$\Delta$ in the SV of ROW IOUs?	$L^* + i_a - A - CAS + R + (P - I^*)$
3.	net $\Delta$ in the SV of claims?	$A + (P - I^*) - L^* - i_a + R - CAS$

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