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International Money Transfers; Paradoxes and the Balance-of-Payments

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Abstract

The literature on international transfers has studied the possibility of transfer paradoxes; the donor gains and the recipient loses from a transfer. This can occur in a wide range of circumstances, including perfect competition and the absence of distortions. The literature, however, largely ignores the fact that most transfers are given in the form of money and not in real (consumption) terms. Money holdings reflect postponed consumption and requires that a time dimension enters the analysis. This aspect is ignored in the literature. We focus on money transfers in an otherwise standard set-up of a Walrasian perfect competition model. We determine whether transfer paradoxes are likely. We also study the welfare consequences of financial transfers for the donor and the recipient, and their impact on the Balance-of-Payments. We find that under normal circumstances transfer paradoxes do not occur, the donor's current account deteriorates and the recipient's current account improves.

JEL-Codes: F320, F350.

Keywords: money, transfers, international trade.

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1 Introduction

International transfers have been studied throughout the history of economic thought; from the bullion controversy after the Napoleonic wars in 1815 to the debate between Keynes and Ohlin after World War I. War reparations are common in peace settlements, and can also be expected when recent international conflicts come to an end. An early example are the reparations of Rome imposed on Carthage, following the First Punic War in 241 BC, but many more examples exist (Hinrichsen, 2024). The most famous discussion on the effects of such payments is no-doubt that between Keynes and Ohlin. The intention of Keynes was to show that the reparations imposed on Germany were too high a burden on the German economy. He turned out to be correct in practice, as the burden paved the way for Hitler, but wrong in theory as transfers do not result in Balance-of-Payment deficits as Keynes thought to be important (Brakman and Van Marrewijk, 2007).

The debate between Keynes and Ohlin focused on Balance-of-Payments and terms-of-trade consequences of the reparations. The subsequent literature, however, shifted towards a welfare analysis, for donor and recipient, see for example Samuelson (1947, p. 29), Gale (1974), Chichilnisky (1980), Bhagwati, Brecher and Hatta (1983), and Kemp and Kojima (1985). The common framework in these analyses is based on duality theory that enables welfare analyses, see in particular Dixit (1983) and Kemp (1995).² A key topic in this literature is the possibility of transfer paradoxes; the donor gains from a transfer, while the recipient loses. The terms-of-trade effects are crucial in these types of analyses.³

The possibility of transfer paradoxes are studied in a wide range of circumstances. Special cases include the presence of: public goods, non-tradable goods, unemployment, multi-lateral transfers, endogenous transfers (utility of the donor depends on that of the recipient, and vice versa), overlapping generations, transaction costs, rent-seeking, trade policies, and so on (see, for example, Cremers and Sen, 2021, Kemp and Shimomura, 2003, Hinrichsen, 2024, and Brakman and Van Marrewijk 2009 for a survey). In general, it turns out that transfer paradoxes are possible in the presence of distortions, or in a multi-country setting without distortions with a by-stander (a third-country).⁴

A common characteristic of the modern literature of international transfers is that it assumes that transfers are given by means of commodities or factors of production. Monetary aspects are not investigated. A money transfer, however, is different from a real transfer. Money holdings reflect postponed consumption and countries can forego current consumption in exchange for consumption tomorrow. So, in the presence of money, a time dimension enters the analysis. The trade-off between current and future

² See Brakman, and Van Marrewijk (2009), for a survey.

³ Note that transfer paradoxes are not only possible in international settings. For example, Sen (2023) shows that transfer paradoxes might exist for transfers between pensioners and working generations.

⁴ Note, that in Cremers and Sen (2021) terms-of-trade effects that lead to paradoxes are caused by world capital accumulation that benefits the donor (through terms-of-trade-effects), and not by distortions or the presence of by-standers.

consumption is mostly absent in the standard transfer literature. This is the focus of the current analysis.

The neglect of money in the literature is remarkable in view of the frequent use of financial transfers in order to relieve foreign exchange shortages in developing countries. In fact, the aim of the International Monetary Fund is to give financial assistance combined with policy advice to restore sustainable economic development and overcome Balance-of-Payments crises.

We analyze the consequences of financial transfers in a simple, two-country, monetary economy, clarifying not only aspects that are traditionally investigated in the literature (paradoxes, welfare effects, and the Balance-of-Payments), but also the link between them. We find that under normal circumstances transfer paradoxes do not occur, the donor's current account deteriorates and the recipient's current account improves.

The set-up of this paper is as follows. Section 2 introduces the model and the analysis, and highlights under what circumstances paradoxes are possible, Section 3 concludes.

2 Financial Transfers and the Balance-of-Payments

Our model builds on Dixit and Norman (1980, chapter 7), by investigating the Balance-of-Payments in the context of Hicksian temporary equilibria. Agents have access to markets for spot commodities today and a financial asset called money. The financial asset is held for buying commodities on the spot market tomorrow, and thus the demand for money is influenced by expectations about future commodity prices. These expectations may be inconsistent across consumers and may turn out to be wrong as the future unravels. If there is perfect foresight, a sequence of Hicksian temporary equilibria coincides with the equilibrium which would obtain with perfect forward markets.

We introduce money holdings, in a two-period model. Residents in a country acquire claims on each other, but only in their own country's money. The authorities supply this money in exchange for foreign money. There is an inflow of money supply at a rate equal to a country's trade surplus, which leads to an adjustment process like Hume's specie-flow mechanism. There is a spot commodity with price p^J , relative to money as the numéraire, in country J . There is no storage or money-holding by producers, so they have the usual revenue function $R^J(p^J)$ with supply $R_p^J(p^J)$ of the spot commodity, where a subindex denotes a derivative. Consumers demand spot commodities and money, labelled 0, which is held for buying commodities in the future. We assume that the expected future price ${}_e p^J$ reflects current spot prices in a linearly homogeneous way to avoid money illusion, see equation (4) where ψ^J is homogeneous of degree one. Thus the expenditure function is $E^J({}_e p^J, p^J, u^J)$, with E_p^J the demand for spot commodities and $E_0^J \equiv E_{{}_e p^J}^J$ the demand for real cash balances. If we let l^J denote the initial money holdings and T^J the value of the transfer, both denominated in country J 's currency, then this gives budget constraints (1) and (2) for donor and recipient, respectively. The market clearing condition

for spot commodities is given in (3). Finally, to link the money supplies in the two countries we introduce the fixed exchange rate ϵ in equation (5). An increase in ϵ is a devaluation of the recipient's currency. Equations (1)-(5) can then be thought of as describing a short-run equilibrium with a fixed exchange rate⁵

$$\begin{aligned}
(1) \quad & E^A(\epsilon p^A, p^A, u^A) = R^A(p^A) + (l^A - T^A) \\
(2) \quad & E^B(\epsilon p^B, p^B, u^B) = R^B(p^B) + (l^B + T^B) \\
(3) \quad & m^A(\epsilon p^A, p^A, u^A) + m^B(\epsilon p^B, p^B, u^B) = 0 \\
(4) \quad & \epsilon p^J = \psi^J(p^J) \text{ for } J = A, B \\
(5) \quad & p^B = \epsilon p^A
\end{aligned}$$

Multiplying (first) the donor's budget constraint, equation (1), by the exchange rate ϵ , using (second) linear homogeneity of the expenditure and revenue functions in prices and (third) linear homogeneity of ψ^A and (fourth) $p^B = \epsilon p^A$ and $T^B = \epsilon T^A$ gives:

$$\begin{aligned}
& \epsilon E^A(\psi^A(p^A), p^A, u^A) = \epsilon R^A(p^A) + \epsilon(l^A - T^A) \\
& E^A(\epsilon \psi^A(p^A), \epsilon p^A, u^A) = R^A(\epsilon p^A) + (\epsilon l^A - \epsilon T^A) \\
& E^A(\psi^A(\epsilon p^A), \epsilon p^A, u^A) = R^A(\epsilon p^A) + (\epsilon l^A - \epsilon T^A) \\
& E^A(\psi^A(p^B), p^B, u^A) = R^A(p^B) + (\epsilon l^A - T^B)
\end{aligned}$$

If we now, for convenience, define $p \equiv p^B$ and $T \equiv T^B$ we can simplify (1)-(5) to:

$$\begin{aligned}
(6) \quad & E^A(\psi^A(p), p, u^A) = R^A(p) + (\epsilon l^A - T) \\
(7) \quad & E^B(\psi^B(p), p, u^B) = R^B(p) + (l^B + T) \\
(8) \quad & m^A(\psi^A(p), p, u^A) + m^B(\psi^B(p), p, u^B) = 0
\end{aligned}$$

Let \bar{l} denote the world supply of money at the beginning of the period, that is $\bar{l} = \epsilon l^A + l^B$, and normalize such that $E_u^J = 1$ for $J = A, B$. Then differentiating (6)-(8) gives equation (9).⁶ Solving (9) gives (10)-(13), where the inequality in (10) represents stability.

$$\begin{aligned}
(9) \quad & \begin{bmatrix} (\epsilon l^A - T)/p & 1 & 0 \\ (l^B + T)/p & 0 & 1 \\ 0 & m_u^A & m_u^B \end{bmatrix} \begin{bmatrix} dp \\ du^A \\ du^B \end{bmatrix} = \begin{bmatrix} -1 \\ 1 \\ 0 \end{bmatrix} dT \\
(10) \quad & \det = -\frac{[(\epsilon l^A - T)m_u^A + (l^B + T)m_u^B]}{p} \equiv -\frac{1}{\Delta} < 0 \\
(11) \quad & \frac{dp}{dT} = (m_u^B - m_u^A)\Delta > 0 \text{ if, and only if } m_u^B > m_u^A
\end{aligned}$$

⁵ Note, that the introduction of a third country C is straightforward by adding; $E^C(\epsilon p^C, p^C, u^C) = R^C(p^C)$. This results in standard conditions for transfer paradoxes, as shown in Brakman and Van Marrewijk (2009, p. 106).

⁶ Differentiating equation (7) with respect to p , for example, gives $E_0^B \psi_p^B + E_p^B - R_p^B$. Using $p \psi_p^B E_0^B + p E_p^B = E$ and $p R_p^B = R^B$ (from homogeneity of E^B and R^B) and (7) gives $E_0^B \psi_p^B + E_p^B - R_p^B = (l^B + T)/p$.

$$(12) \quad \frac{du^A}{dT} = -\frac{\bar{l}}{p} m_u^B \Delta$$

$$(13) \quad \frac{du^B}{dT} = \frac{\bar{l}}{p} m_u^A \Delta$$

Equation (11) translates the familiar conclusion from the literature on the terms-of-trade effect of a transfer to this framework: the price of spot commodities increases if, and only if, the recipient's marginal propensity to consume spot commodities exceeds the donor's marginal propensity to consume spot commodities. Moreover, from equations (12) and (13) it follows that the donor's welfare falls, respectively the recipient's welfare increases, if, and only if, the recipient's, respectively the donor's marginal propensity to consume spot commodities is positive. Not surprisingly, the size of the welfare change is related to the real value of the world money stock.

Proposition 1.

A financial transfer in a stable Hicksian temporary equilibrium increases the price level of spot commodities if, and only if, the recipient's marginal propensity to consume spot commodities is larger than the donor's. This does not give rise to transfer paradoxes if the demand for spot commodities is normal for both countries.

What is the influence of a transfer on the trade balance in this model, or more appropriately on the current account? Country J 's trade surplus, TB^J say, is the value of the net excess supply of commodities, or $TB^J = p^J(R_p^J - E_p^J)$. Using linear homogeneity of the revenue and expenditure functions, that is $R_p^J p^J = R^J$ and $E_0^J e p^J + E_p^J p^J = E^J$, equation (4), the relation between current expenditure and current revenue in equations (1) and (2) and the fact that the transfer is given from country A to country B gives J 's spot current account, CA^J , in equation (14).⁷

$$(14) \quad CA^J = E_0^J(e p^J, p^J, u^J) \psi^J(p^J) - l^J$$

Thus, a country will have a spot current account surplus if its demand for nominal cash holdings exceeds its current nominal cash holdings. Since ψ^J is homogeneous of degree one, E_0^J is homogeneous of degree zero in prices and the sum of the marginal propensities to consume is equal to one, that is $E_{0u}^J \psi^J = 1 - p^J m_u^J$, it follows from (14) that:

$$(15) \quad \frac{dCA^J}{dT^J} = (1 - p^J m_u^J) \frac{du^J}{dT^J}$$

Equation (15) reveals the simple link between changes in the Balance-of-Payments and changes in welfare. Thus, if the demand for spot commodities is normal and we do not have any transfer paradoxes (see Proposition 1), then the donor's spot current account deteriorates and the recipient's spot current account improves. Intuitively, if the demand for spot and future commodities are both normal for the donor, then the donor wishes to spread out the consequences of its transfer over the two periods

⁷ That is $CA^A = TB^A - T^A$ and $CA^B = TB^B + T^B$

involved. Similar reasoning holds, necessary changes being made, for the recipient of the transfer.

Proposition 2.

A financial transfer in a stable Hicksian temporary equilibrium leads to a deterioration of the donor's current account and an improvement in the recipient's current account if the demand for spot commodities is normal for both countries.

3 Conclusion

International transfers are usually studied by assuming that they are given by means of commodities or factors of production. Monetary aspects are ignored. This omission in the literature is remarkable given that most transfers are financial transfers. We study financial transfers in an otherwise standard set-up of a Walrasian, two country model. We arrive at two intuitively appealing conclusions in this simple two-period, two-country monetary framework. If agents hold money to purchase future consumption goods and the demand for spot commodities is normal in both countries, we show that:

- (i) the donor loses and the recipient gains from the transfer, that is transfer paradoxes do not arise, and
- (ii) the donor's current account deteriorates and the recipient's current account improves as a result of the transfer.

The results are in accordance with the generally held belief that a transfer deteriorates the donor's current account and is a simple rationale for financial assistance in case of Balance-of-Payments crises.

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