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Special drawing rights and inflation

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SPECIAL DRAWING RIGHTS
AND INFLATION

Manfred J. M. Neumann

1972
I. Introduction

In a recent paper on "The Desirable Rate of Creation of an International Money" 1) Pasquale Salin advances among others some interesting propositions about the effects of allocation of Special Drawing Rights (SDRs) on inflation. From an analysis of the workings of SDR allocation in a two-country (America versus Europa) model with fixed exchange rates Salin comes to the following conclusions: (i) "In the long run neither the rate of inflation (in Europa) nor the rate of growth of seigniorage paid (by Europa) are modified by the creation of SDRs." "As soon as asset equilibrium is reached, SDR allocation at the same growth rate as dollar creation does not have any additional constant inflationary effect... But there exists a once-for all inflationary effect due to the introduction of SDRs..." 2) (ii) "In the short run, SDR creation is inflationary (in Europa) and must be inflationary, and a constant rate of growth of SDRs (higher than the rate of growth of other reserve components) induces a variable rate of inflation (in Europa)." 3) The purpose of this paper is twofold. Firstly, we want to demonstrate that Salin's conclusions about inflationary consequences of SDR allocation do not hold and do not follow from his analysis. The allocation of SDRs, sharply to be differentiated from the use of SDRs, is not inflationary, neither in the long run nor in the short run,
never mind what the rate of growth of SDR creation is. Secondly, we want to carry the analysis further ahead by taking into account the use of SDRs, that is the exchange of SDRs for key-currency or for foreign resources. The use of SDRs, indeed, may have inflationary consequences.

It will be convenient to organize our presentation as follows: We will start with a brief outline of Salin's model and his results (section II). Next, we will give an analysis of SDR allocation within a reformulated version of Salin's model (section III). It will be followed by a section on the effects of an home-made inflation (section IV) because this will permit to demonstrate what the essence of Salin's analysis really is. Thereafter we will trace the effects of the use of SDRs on the system (section V). The final section summarizes our main results.
II. Outline of Salin's Analysis

Salin bases his analysis on a two-country world in which exchange rates are fixed and prices are fully flexible. It is assumed that the national currency of one country, called America, is the key-currency and the only international liquid asset. So the world lives with a pure dollar standard. It is further assumed as a starting point that in long-run equilibrium America has a balance of payments deficit of constant real value. The rest of the world is the second country, called Europa.

For Europa a constant relationship between the quantity of money \( M \) and the monetary base \( B \) is assumed

\[
(1) \quad M = k B
\]

\[
(2) \quad \frac{dN}{dt} \frac{1}{M} = \frac{dB}{dt} \frac{1}{B}
\]

In the long run, the income velocity of money can be assumed to be constant; so we have

\[
(3) \quad \frac{dN}{dt} \frac{1}{M} = \frac{dP}{dt} \frac{1}{P} + \frac{dy}{dt} \frac{1}{y} = \Pi^E + \phi^E
\]

where \( y \) is real income, \( P \) the general level of prices, \( \Pi^E \) the rate of inflation (in Europa), and \( \phi^E \) the real rate of growth (in Europa).

From (2) and (3) follows

\[
(4) \quad \frac{dB}{dt} \frac{1}{B} = \Pi^E + \phi^E
\]
Equation (4) shows that in the long run for given $\rho^E$ the European rate of inflation depends on the growth rate of the monetary base. Assuming that the base is not expanded via acquiring domestic assets and disregarding net capital flows between Europa and America, the growth of the monetary base is determined by Europa's trade surplus

$$\frac{dB}{dt} = x p^A(t) y^A(t) - m P(t) y(t)$$

where $x$ is the American marginal propensity to import, $m$ the European marginal propensity to import, $p^A$ a the American price level, and $y^A$ the American real income; $x$ and $m$ are assumed to be constant in the long run.

From (4) and (5) we find

$$\pi^E + \rho^E = p^A + \pi^A$$

This equation gives us the equilibrium rate of inflation in Europa for given values of $\rho^E$, $p^A$ and $\pi^A$.

Now let us introduce SDRs. The SDRs to be analyzed here are a fiat international money created and allocated gratis; they are held by central banks and cannot be sold on the private market. Note that the SDRs here are not identical in every respect with the SDRs of the present world 4). "The main assumption is that SDRs and dollars are perfect substitutes in official reserves as liquidity means and (source) components of the monetary base." 5)
Salin assumes that SDRs are allocated to Europe only. If $B_1$ denotes dollar reserves, $B_3$ SDRs allocated and $B_2$ all other components, the European monetary base is

$$B = B_1 + B_2 + B_3 \tag{7}$$

Assume with Salin that $B_2 = 0$, "in order to make the equations simpler", then one has

$$B_2 = 0 \tag{8}$$

$$B = B_1 + B_3 \tag{7a}$$

Next define a ratio $q_1$ of $B_3$ to $B_1$ and differentiate

$$q_1 = \frac{B_3}{B_1} \tag{9}$$

$$\frac{dq_1}{dt} = \frac{1}{q_1} \frac{dB_3}{dt} \frac{1}{B_3} - \frac{dB_1}{B_1} \frac{1}{1} = T_3 - T_1 \tag{10}$$

$T_3$ and $T_1$ are the growth rates of $B_3$ and $B_1$ respectively.

Then, from equations (1), (7a) and (9) one gets

$$M = k (1 + q_1) B_1 \tag{11}$$

Differentiating and using (3) gives

$$\pi^E + \rho^E = \frac{dn}{dt} \frac{1}{m} = T_1 + \frac{dq_1}{dt} \frac{1}{q_1} \frac{q_1}{1+q_1} \tag{12}$$

This is the basic equation from which Salin derives his conclusions about the long-run and the short-run effects of SDR allocation on the European inflation rate as follows:
In the long run, when a desired ratio of SDRs to dollar reserves is reached, \( q_1 \) is constant and hence \( (dq_1/dt) \) is zero. Then it follows from equation (10) that \( T_3 = T_1 \), from equation (12) that \( \Pi^E + \rho^E = T_1 \), and from equation (6) that \( \Pi^A + \rho^A = T_1 \). Hence, "for \( \rho^E, \Pi^A \) and \( \rho^A \) given, the long-run inflation rate of Europa is not modified by its allowance of SDRs." 6)

In the short run, that is during the transitory period from the situation before the first SDR allocation until the situation where the long-run desired \( q_1 \) is reached, the consequences appear to be different. During the transitory period Europa has to build up stocks of allocated SDRs such that \( q_1 \) increases. Thus, Salin concludes from equations (10) and (12): "If SDRs grow at a constant rate, higher than \( T_1 \), in this transitory stage, \( q_1 \) is increasing and \( dq_1/dt \) is positive, and \( (dq_1/dt)(1/q_1) \) is positive and constant..." Thus, the inflation rate in Europa is higher, the higher the \( q_1 \) is. A constant rate of change in the \( q_1 \)-ratio is inflationary and at an increasing rate". 7) "It may... be stressed that, in the transitory period, SDRs are necessarily inflationary. The higher \( T_3 \) is, the higher \( \Pi^E \) will be, but the quicker the attainment of the desired \( q_1 \) will be." 8)

Finally, it should be noted that Salin's analysis is based on the remarkable assumption that the international agency responsible for SDR creation creates SDRs during the transitory period "at a higher rate than the long-run equilibrium one".
III. Analysis of SDR Allocation

In this section we present an analysis the results of which contradict Salin's conclusions. Later we will explain why Salin did not arrive at our results. Let us start with a discussion of the techniques of SDR allocation.

1. SDR Allocation and Monetary Base

How do the SDRs allocated to a country like Europa enter its monetary system? Consider the following simplified balance-sheet of a European central bank before any SDR allocation:

<table>
<thead>
<tr>
<th>Balance-Sheet I</th>
</tr>
</thead>
<tbody>
<tr>
<td>$B_1$</td>
</tr>
<tr>
<td>Dollar-Reserves</td>
</tr>
<tr>
<td>$B$</td>
</tr>
<tr>
<td>Base Money</td>
</tr>
</tbody>
</table>

Assuming that the central bank does not hold any domestic assets and liabilities, the monetary base consists on the sources side solely of $B_1$, that is of dollar reserves gained from past trade surpluses with the rest of the world. On the uses side the monetary base consists of European currency held by banks and the public.

Now, assume SDRs are created and allocated to Europa. These SDRs, intended to supplement the dollar reserves as international liquid assets, clearly are assets for the European central bank and therefore appear on the asset's side of its balance-sheet, $B_2$, (see balance-sheet II).
Despite these SDRs are not allocated on a credit base, that is, despite Europa receives the SDRs as a donation without taking any liability of repayment, simple bookkeeping rules require the central bank to put a contra-entry of equal amount on the liabilities' side of the balance-sheet. If we derive the monetary base from the balance-sheet, we get

\[ B = B_1 + B_2 - B_3 \]

We find that the introduction of SDRs into the system does not affect the monetary base of Europa because the resulting positive source component \( B_3 \) will automatically be matched by the negative source component \( B_2 \), the contra-entry to SDRs allocated. In this respect, SDRs allocated really are "dead" assets. In addition we find that the sum of remaining source components, \( B_2 \), (besides \( B_1 \) and \( B_3 \)) is not equal to zero due to the necessity of a contra-entry to \( B_3 \). However, we can make \( B_2 \) equal to zero, if we assume that the central
bank purchases domestic assets, $B_2^2$, equal in amount to the contra-entry to SDRs allocated. Then we have $B_1^1 = B_2^2$ and hence $B_2 = 0$. But note that under these circumstances the base will be increased by an amount equal to the domestic assets purchased.

From a comparison of the three different situations described by the above balance-sheets we can conclude: Firstly, the allocation of SDRs to a country does not change its existing monetary base in any way. Secondly, correct book-keeping shows that in the case of SDR allocations the sum of remaining source components, represented by $B_2^2$, will only be zero (Salin's assumption), if and only if the central bank acquires a net amount of domestic assets which equalizes the value of the stock of SDRs allocated, measured in European currency.

2. A General Model

The model we are presenting here essentially is Salin's model
but it will be formulated in a more general way so that we will be enabled to derive a correct solution of the SDR-allocation case and to evaluate the specific solution derived by Salin.

In our model we use the equations (1) to (5) stated above with the following modification. In the trade-balance equation (5), dB is replaced by dB, the rate of change of dollar reserves accruing from international trade. This modification is required because in a general formulation we have to take into consideration additional source components of the base besides the dollar reserves accruing from international trade. We introduce a formulation of the base identity which explicitly states all those source components which might be of interest for the purposes of our analysis,

\[
(13) \quad B = B_1 + B_3 - B_2 + B_2^2
\]

where \( B_1 \) are dollar reserves, \( B_3 \) the SDRs allocated, \( B_2^1 \) the contra-entry to SDRs allocated, and \( B_2^2 \) net domestic assets.

Next we define in addition to the ratio \( q_2^1 \) (see equations (9) and (10) above) the following ratios

\[
(14) \quad q_2^1 = \frac{B_2^1}{B_1}
\]

\[
(15) \quad q_2^2 = \frac{B_2^2}{B_1}
\]

Differentiating gives

\[
(16) \quad \frac{d}{dt} \frac{1}{q_2^1} = \frac{dB_2^1}{B_1} \frac{1}{dB_1^1} - \frac{dB_1^1}{B_1} = T_2^1 - T_1
\]
where \( T_1 \) and \( T_2 \) are the growth rates of \( B_2 \) and \( B_2^1 \) respectively.

From (1), (15), (9), (14) and (15) we get the following equation for the money stock:

\[
(18) \quad M = k (1 + \frac{q_1}{q_2} - \frac{q_1}{q_2} + q_2^2) B_2^1
\]

Differentiating and using (3) gives

\[
(19) \quad \frac{\Pi^E}{\rho^E} = \frac{dM}{dt} \frac{1}{N} = T_1 + \frac{dq_1}{dt} \frac{1}{q_1} \frac{q_1}{1 + q_1 - q_1^2 + q_2^2} - \frac{dq_2}{dt} \frac{1}{q_2} \frac{q_1}{1 + q_1 - q_1^2 + q_2^2} + \frac{dq_2}{dt} \frac{1}{q_2} \frac{q_2}{1 + q_1 - q_1^2 + q_2^2}
\]

Equation (19) is a more general formulation of Salin's equation (12) and will serve us as the basic equation in our following discussions.

3. The Pure SDR-Allocation Case

In order to bring out the fundamental properties of SDR allocation let us assume that the European central bank does not hold any domestic assets or domestic liabilities; then

\[
(20) \quad B_2^2 = 0
\]

There are SDRs allocated to Europa which enter the balance-sheet of the central bank on the assets' side, \( B_3 \), and which
require an identical contra-entry on the liabilities' side, $B_2^1$. Hence, we have

(21) $B_2 = B_2^1$

(20) and (21) imply

(22) $q_2^2 = 0$ and

(23) $q_1 = q_2^1$

It follows that in the pure SDR-Allocation case the money stock equation (18) is reduced to

(18.1) $M = k B_1$

Thus equation (19) takes the form

(19.1) $\pi^E + \rho = \frac{dM}{dt} \frac{1}{M} = T_1$

What can we conclude from this solution? Our major conclusion is that the allocation of SDRs to Europa by itself does not have any effect at all on the European inflation rate, $\pi^E$, because the European monetary base and the money stock in no way are affected by SDR allocation.

This conclusion is valid, irrespective whether one is concerned with the long run or the short run; therefore, it clearly conflicts with Salin's conclusion that "SDRs are necessarily inflationary" during the transitory period between two long-run equilibrium situations. Why Salin arrived at this wrong conclusion we will explain in the next section. But before moving on we wish to emphasize not only that SDR allocation by itself is not inflationary but, moreover, that also the rate of growth of SDR allocation
is of no relevance in this respect. It may take any value without changing our result. Any rate of growth of SDR allocation is consistent with solution (19.1), for the simple reason that any increase in SDR allocation to Europa automatically will be matched by a corresponding increase of the contra-entry in the balance-sheet of the European central bank. And what is true for Europa, by the way, is equally true for any other country including America. As long as SDRs are allocated but not used, that is sold in exchange for foreign currency or foreign goods, they are "dead" assets.

Therefore, in the pure SDR-allocation case we necessarily are driven to the same conclusion as in the case of a pure dollar-standard regime: Given $\rho^E$ and $\rho^A$ the European inflation rate depends in equilibrium on the American inflation rate (equation 6), and this equilibrium will not be disturbed by SDR allocation.

IV. Analysis of Home-Made Inflation

1. The General Case

We drop now the assumption that the European central bank does not acquire domestic assets in excess of domestic liabilities [equation (20)] , hence, $B^2_2$ and $q^2_2$ are different from zero and positive. However, we continue to assume that SDRs are allocated to Europa and are not used, so equations (21) and (23) hold.

In this case equation (18) takes the form

$$(18.2.1) \quad M = k \left( 1 + q^2_2 \right) B_1$$
and consequently (19) becomes

\[(19.2.1) \quad \ddot{M}^E + \ddot{P}^E = \frac{dN}{dt} \frac{1}{M} = T_1 + \frac{dq_2^2}{dt} \frac{1}{q_2} \frac{q_2^2}{q_2 + q_2^2} \]

What we find is that the growth rate of the European money supply and - for given \( p^E \) - the European inflation rate depend as before on the growth rate of dollar reserves, \( T_1 \), but in addition on the growth rate of the ratio of net domestic assets to dollar reserves, \( q_2 \), weighted with a factor \( q_2^2 / (1 + q_2^2) \). Given \( T_1 \) any increase in \( q_2^2 \) via \( T_2 \) will raise the growth rate of the European money supply and the European rate of inflation. This is the classic case of an home-made inflation.

In the long run such an home-made inflation could not be maintained by Europa. The system would turn to a new equilibrium, when \( q_2^2 \) reaches a desired level, so that \((dq_2^2 / dt)(1/q_2^2) = 0\). This implies that the European central bank cuts back the growth of net domestic assets acquired to its former level. Both source components, the dollar reserves and net domestic assets, would again grow at the same rate, \((T_2^2 = T_1)\). Consequently, in the new long-run equilibrium again equation (6) would hold, stating that in the last analysis the American rate of inflation determines the European rate of inflation.

In the short run, however, during the transitory period before a new long-run equilibrium position of the kind described is reached, we would have an home-made inflation in Europa. The European inflation rate would be higher than
before, and via the deteriorating trade balance it also
would induce a higher inflation rate in America. In order
to reach a new desired long-run value of $q^2_2$, this ratio must
be raised, $(dq^2_2/dt)(1/q^2_2) > 0$. This implies that in the short
run the European central bank acquires net domestic assets
at a growth rate higher than the rate of dollar accruals,
$T^2_2 > T^*_1$. The more $T^2_2$ exceeds $T^*_1$, the more the European in-
flation rate would be pushed up, as can be seen from
equation (15.2.1). The process induces a declining of $T^*_1$
which in turn will contribute to arrive more rapidly at
the long-run $q^2_2$ desired and to shorten the transitory period
before a new equilibrium is reached.

2. A Special Case (The Case of Salin)

In his analysis of the role of SDR allocation Salin assumes
$B^2_2$, the sum of source components of the base other than
dollar reserves and SDRs, to be zero "in order to make
the equations simpler". However, in analyzing the pure SDR-
allocation case we have seen that it is not obvious that $B^2_2$
can be assumed to be zero; in any case there is the necessary
contra-entry to SDR allocation which somehow has to be taken
into account. In fact, it may be this simplifying assumption
which easily induces one to overlook how SDRs enter the
system.

Nevertheless, we also have seen that Salin's assumption
can be justified, if one is prepared to make a very special
assumption of the following kind: The European central bank
for unknown reasons (because she just likes to) increases
the monetary base by acquiring domestic assets exactly in
such an amount that the contra-entry to SDR allocation always is matched (see balance-sheet III above). In this special case the source component $B_2$ is zero and is composed of $B^1_2$, the contra-entry, and $B^2_2$, net domestic assets purchased.

Then we have

\begin{align}
(24) \quad B_2 &= B^2_2 - B^1_2 = 0 \\
(25) \quad B^1_2 &= B^2_2
\end{align}

This implies

\begin{align}
(26) \quad q^1_2 &= q^2_2
\end{align}

In addition, because of SDR allocation, equation (23) holds

\begin{align}
(23) \quad q^1_2 &= q^1_1
\end{align}

It follows that in this special case the ratios $q^1_1$, $q^1_2$ and $q^2_2$ are identical and equal to plus one. This gives us the unusual choice to formulate two differently dressed solutions of our system.

For instance, if we cancel out $q^1_2$ and $q^1_1$ in equation (18), we will get the following solution

\begin{align}
(19.2.2) \quad \Pi^E + \rho^E &= \frac{dM}{dt} \frac{1}{N} = T_1 + \frac{d q_2^2}{dt} \frac{1}{q^2_2} q^2_2 \frac{Q_q^2}{4 + q^2_2}
\end{align}

This solution, indeed, is exactly our equation (19.2.1) derived above which describes the general case of an home-made inflation in Europa. The conclusions derivable are the same as in the general case, except for one modification. This is the condition that the European central bank, because she just likes to, deliberately holds her acquisition of net domestic
assets in line with SDR allocation, $T_2^2 = T_2$. Nevertheless, one cannot escape from the conclusion that it is this acquisition of domestic assets and not the SDR allocation which inflates the base and the economy.

On the other hand, we might cancel out $q_2^2$ and $q_2^1$ in equation (18). This would give us an alternative formulation, namely the one presented by Salin (see equation (12)). If we take this equation by its face we easily are driven to Salin's conclusions concerning the effects of SDR allocation. However, as we now know from our analysis above, the appearance of the ratio $q_1^1$ in this formulation masks the true driving force. The driving force is not SDR allocation but is the policy of purchasing domestic assets, the extent of which is tied to the extent of SDR allocation by the chance of a curious decision of the European central bank.\(^{12}\)

V. Analysis of the Use of SDRs

We have seen that the allocation of SDRs as such is not inflationary. However, the use of SDRs may be. To use SDRs means that the European central bank sells SDRs to the American central bank in exchange for dollars. Now, the dollars received in turn can be used differently. They may either serve as a means simply to increase the level of dollar reserves above the level given by the equilibrium surplus in international trade. Or they may be used to compensate for absolute or relative losses of dollar re-
serves under the regime of an home-made inflation in Europa. Each of these two cases have to be differentiated.

1. Pure Use of SDRs

Assume the European central bank prefers to possess dollars instead of SDRs, for one or another reason, and the American central bank is ready to accept the SDRs for a fixed price.

Before the exchange of SDRs is carried out, the monetary base of Europa, \( B^E \), is given by equation (13)

\[
(13) \quad B^E = B_1^E + B_3^E - B_2^E + B_2^E
\]

where the dollar reserves accruing from international trade are described by \( B_1^E \). Remember that the SDR holdings, \( B_3^E \), so far are equal to the contra-entry, \( B_2^E \). Now, if a certain amount of SDRs is sold to America, \( B_3^E \) will be reduced while new dollar reserves are gained which we will denote by \( B_2^E \). Then the base is given by

\[
(27) \quad B^E = B_1^E + B_2^E + B_3^E - B_2^E + B_2^E
\]

where \( B_1^E + B_2^E = B_1^E \). The reduction of SDR holdings leads to an equal increase in total dollar reserves. Therefore, while the composition of sources of the European monetary base is changed by the use of SDRs, the total amount of the base is not. If we cancel out the compensating sources of the base, i.e. the SDR holdings, the contra-entry, and the dollars received for SDRs sold, we find

\[
(27a) \quad B^E = B_1^E + B_2^E
\]

that the European base and its rate of change are determined...
by the development of international trade and by the central bank's policy of acquiring domestic assets.

Mutatis mutandis, the same is true for America. Assuming that there is no money creating commercial banking system the monetary base held by the American public is given by

\[ B^A = B^2A - B^1A \]

where \( B^2A \) denotes net domestic assets acquired by the central bank and \( B^1A \) the liabilities to Europa due to international trade. If the American central bank buys SDRs from Europa in exchange for newly created dollars, the base of America is

\[ (28.a) B^A = B^2A - B^1A + B^3A - B^2A \]

where \( B^3A \) are the SDRs received and \( B^2A \) the dollars given to Europa. Note that the monetary base of America is not changed by this operation because \( B^3A \) and \( B^2A \) cancel out.

2. Use of SDRs and Home-Made Inflation

An home-made inflation in Europa leads first to relative and later to absolute losses of dollar reserves and cannot be maintained in the long run, as we have seen in section IV. While the use of SDRs as such is not inflationary because it cannot change the amount of base money available to the European public as well as to the American public, it would on the other hand, permit Europa to prolong an home-made inflation. The dollars received in exchange for SDRs could be used to cover for some time the trade deficit finally emerging. With regard to this the use of SDRs can be viewed to be inflationary despite it is not the driving force of inflation. Then the question is, how long can Europa maintain
its home-made inflation with the help of SDRs exchanged for dollar reserves?

Let us start from an equilibrium situation given by

\[ (6) \ \pi^E + \rho^E = \pi^A + \rho^A \]

which in our model implies

\[ (29) \ \lambda_1^E = \lambda_1^A \]

where \( \lambda_1^E \) and \( \lambda_1^A \) are the rates of growth of the monetary base in Europa and in America respectively. In equilibrium the rates of growth of \( B_2^E, B_2^A, B_1^E, \) and \( B_1^A \) are equal to \( \lambda_1^E \) and \( \lambda_1^A \). When Europa starts an home-made inflation by raising \( \rho^E \), the rate of growth of \( B_2^E \), above its equilibrium level \( \lambda^E \) will increase and so will the rate of inflation in Europa, \( \pi^E \), for given \( \rho^E \). Due to the increase of \( \pi^E \) the growth rate of the European trade surplus and hence \( \lambda_1^E \), the rate of growth of dollar reserves accruing from international trade, will start declining and in the course of the process eventually become negative. Thus, the inflationary policy of Europa will result in increasing losses of dollar reserves and thereby also induce a higher rate of inflation in America for unchanged \( \lambda_2^A \), the growth rate of the acquisition of domestic assets by the American central bank. If SDRs allocated to Europa are not used, Europa will be forced to end her inflationary policy when her dollar reserves are used up, at the latest. On the other hand, if SDRs are used, this will not add to inflation but it will permit to continue the inflation policy 15).
Assume the exogenously given rate of growth of SDR allocation to Europa, \( \lambda^S \), to be equal to the newly chosen European growth rate of acquisition of domestic assets, \( \lambda^{2E}_{2T} \). The value of \( \lambda^S \) determines the longer-run maximum value of the growth rate of dollar reserves attainable by Europa via the use of SDRs, \( \lambda^{2E}_{1T} \). Now, we know that during the whole transitory process for unchanged \( \lambda^{2A}_{2} \) - the monetary growth rate of America, \( \lambda^{A}_{T} \), will be above its initial equilibrium level but below the transitory monetary growth rate of Europa, \( \lambda^{E}_{T} \),

\[
\lambda^{A}_{T} < \lambda^{E}_{T}
\]

Assuming unchanged marginal propensities to import for America as well as for Europa throughout the paper, it follows that the rate of growth of European imports, \( \lambda^{I} \), is determined by \( \lambda^{E}_{T} \) and is higher than the rate of growth of European exports, \( \lambda^{X} \), which is determined by \( \lambda^{A}_{T} \).

Thus, we have

\[
\lambda^{X} < \lambda^{I}
\]

and consequently a rate of growth of the European trade deficit, reflected by \( \lambda^{1A}_{1T} \) and by \( \lambda^{1E}_{1T} \) as well, which is higher than \( \lambda^{E}_{T} \). In addition, we can derive that the more the gap between \( \lambda^{A}_{T} \) and \( \lambda^{E}_{T} \) is narrowing, the more \( \lambda^{1A}_{1T} \) will decline in response. We also know that the longer Europa is able to maintain her inflationary acquisition of domestic assets, \( \lambda^{2E}_{2T} \) (with \( \lambda^{2E}_{2T} > \lambda^{2E}_{2T} \)), the more \( \lambda^{E}_{T} \) will approach \( \lambda^{2E}_{2T} \), and the more the American monetary rate of growth, \( \lambda^{A}_{T} \), - which increasingly becomes dominated by \( \lambda^{1A}_{1T} \) - will approach \( \lambda^{E}_{T} \). In the limit one might expect the growth rates to converge such that \( \lambda^{E}_{T} \) would become equal to \( \lambda^{2E}_{2T} \) and \( \lambda^{1A}_{1T} \).
would become equal to these rates. As a result, one might be led to the conclusion that Europa could maintain her inflationary policy if the longer-run maximum growth rate of dollar reserves attainable through the use of SDRs, determined by $\lambda^S$, is equal to or higher than $\lambda^{2E}_{2T}$, the inflationary growth rate of acquisition of domestic assets as chosen by the European central bank. However, to draw such a conclusion would in addition require to make an assumption about the initial level of SDR allocation of the following kind: The cumulated sum of SDR allocations to Europa over the period from the start of SDR allocation, $t = t_0$, to the final situation, $t = t_n$, where $\lambda^E_T$ reaches $\lambda^{2E}_{2T}$ has to be equal to or higher than the cumulated sum of dollar reserve losses by Europa over the fractional time period from the situation where the original dollar reserves of Europa resulting from former trade surpluses had been used up, $t = t_m$, to the final situation $t = t_n$. So, the required additional assumption would be

$$\int_{t = t_0}^{t = t_n} d SDR \ dt = \int_{t = t_m}^{t = t_n} d B^{1A}_{1T} \ dt$$

which seems to be rather special.

In any case, we find that the existence and use of SDRs will enable Europa to maintain a deliberately chosen inflationary policy for a longer period of time than would be possible without SDRs at hand. The length of the time period gained for such a policy depends on the marginal propensities to import in Europa and in America, on the relative strength
of Europa's inflation policy as measured by the difference
\[ \lambda_{2r}^{2E} - \lambda_{2r}^{2A} \]
on the longer-run maximum rate of growth of dollar reserves attainable by Europa via the exchange of SDRs, \( \lambda_{1T}^{2E} \), which depends on \( \lambda^5 \), and finally on the initial stock of SDRs allocated to Europa. The lower the relative strength of Europa's inflationary policy and the higher \( \lambda^5 \) as well as the initial stock of SDRs allocated, the longer Europa will be able to maintain an home-made inflation for given marginal propensities to import.

It is a well known fact that by running an home-made inflation a country can change the terms of trade to its own credit under the regime of a dollar standard. Mutatis mutandis this also is true for a dollar-SDR standard. Europa will be the more able to change the terms of trade to her own credit, the more SDRs are allocated to her. For America it is difficult to escape from this unfavourable consequence of the SDR scheme; there are only two ways for escape. One is that America retracts the scheme by simply refusing acceptance of SDRs; then we were back at the dollar standard. The second way of escape open to America is to avoid the gap \( \lambda_{2T}^{2E} - \lambda_{2T}^{2A} \) by continuously adjusting her growth path of acquisition of domestic assets to that chosen by Europa. However, this would not only mean for America to accept the burden of a higher inflation but also to give up the autonomy of its monetary policy.
VI. Concluding Remarks

The analysis of the role and consequences of SDR creation has to differentiate between the allocation and the use of SDRs. Allocation of SDRs changes the composition of the sources' side of a country's monetary base but it does not change the volume of the base or its growth path. Therefore, pure allocation of SDRs at whatever rate of growth has no inflationary consequences. If SDRs are not used they serve no other purpose than window-dressing in that they permit to display higher stocks of international liquid assets than otherwise possible.

Window-dressing certainly is not the only purpose of the SDR scheme. SDRs can be used to obtain national currency of the key-currency country from other countries. This again has no inflationary consequences because such operations change the composition of the monetary bases of the countries concerned but not volumes and growth paths of the bases. Allocation and use of SDRs as such are cosmetic operations with no relevance for the economies of the countries engaged.

However, this is not the whole SDR story. The availability of SDRs may have a "liberalizing" influence on domestic policies of some countries, especially on their monetary policies. These countries may be induced to use the additional margin, gained by the use of SDRs, to run home-made inflations for a longer time than would be possible under a pure dollar standard. With regard to this the use
of SDRs may have inflationary consequences despite it has to be stressed that even then the use of SDRs is not the driving force of inflation.

Under the regime of a dollar-SDR standard non-key currency countries by using SDRs are put in a position to change the terms of trade to their credit to a greater extent than would be possible under a dollar standard. In order to minimize such shifts of the terms of trade the key-currency country would either have to see to a holding down of the growth rate of SDR allocation or to engage in a competition of inflation. In both cases the autonomy of monetary policy of the key currency country is impaired.
Footnotes


2) and 3) P. Salin, op.cit., p.18

3) Ibid, p.10

4) For a description of the present system see F. Machlup, Remaking the International Monetary System - The Rio Agreement and Beyond, Baltimore 1968.

5) P. Salin, op.cit., p.10

6) Ibid., p.11

7) Ibid., p.15

8) Ibid., p.16

9) The SDR creation reminds one on the Friedmanian helicopter money. However, the Friedmanian helicopter money adds to the existing money supply because it is hastily collected by members of the community; SDRs do not add to the money supply because they can be collected by central banks only.

10) See for instance the official balance-sheets of the Deutsche Bundesbank and the Österreichische Nationalbank in their respective annual reports.

11) The same would result, although in a different equilibrium position, if the European central bank would not care about the ratio $q_2$ but continue her inflationary policy until her dollar reserves are used up due to the growing trade deficit. Europa would have to reduce $T_2$ to the former level, thereby giving way for the settlement of a new equilibrium. On the other hand, it is clear that alter-
natively a new disequilibrium path, this time a deflationary one, could be chosen by reducing $T_2^2$ below the initial equilibrium level. In any case, the home-made inflation could not be maintained in the long run.

12) Note that the European central bank took this decision in order to help Salin in simplifying his equations.

13) For instance, the bank may view dollars to be more secure assets than SDRs.

14) Therefore, neither SDR allocations to America nor the acceptance of SDRs in exchange for dollars require America to start a neutralization policy, as considered by Salin. See Salin, op.cit., p.13.

15) Note that then the signs of $B_1^{1E}$ and $B_1^{1A}$ in equations (27) and (28.a) will change.

16) See equation (5).