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**Working Paper — Digitized Version**

## Some Effects of exchange rate changes

Kiel Working Paper, No. 82

**Provided in Cooperation with:**

Kiel Institute for the World Economy – Leibniz Center for Research on Global Economic Challenges

*Suggested Citation:* Fuerstenberg, R. (1979) : Some Effects of exchange rate changes, Kiel Working Paper, No. 82, Kiel Institute of World Economics (IfW), Kiel

This Version is available at:

<https://hdl.handle.net/10419/47091>

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# Kieler Arbeitspapiere Kiel Working Papers

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Arbeitspapier Nr. 82

Some Effects of Exchange Rate Changes

von

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Januar 1979

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ISSN 0342 - 0787

As 341 79  
Weltwirtschaft  
Kiel

## Some Effects of Exchange Rate Changes

When the DM price for one US dollar was quoted at less than two in late February of 1978 this event was reported in the radio news. An extraordinary attention was devoted to this price of a foreign currency at a time when it was changing somewhat more rapidly than it normally does and when it was crossing levels which "wise" men in Germany thought it would "never" attain.

This particular interest may partly be due to a certain uneasiness about the forces which determine an exchange rate. Since the break down of the Bretton Woods system of fixed exchange rates in 1973 speculation in foreign exchange has become a much harder job than it used to be. There is an enormous demand for reliable forecasts. Many laymen as well as economists hold the view that some version of the purchasing power parity principle determines exchange rates: the relative price of two currencies moves in such a way as to equilibrate the changes in domestic price levels. There is widespread astonishment if this theoretical background - though possibly true in the long run of correctly modified and interpreted - "never" provides correct forecasts.

If exchange rates have changed for some reason or other there is probably an even more serious interest in the consequences that have to be expected from these changes. For if it is not possible to anticipate correctly what the exchange rates are going to be there is much less time for international traders, central bankers and policy makers to adjust to the new situation and take actions to minimize (expected) losses and exploit additional profit opportunities<sup>1</sup>.

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<sup>1</sup> Clearly, the expected effects may not materialize due to faulty guessing on the reason(s) which caused the exchange rate change. New actions may prove to have worsened the situation (a better reaction then would have been to stick to the old plan).

Decisions at short notice are costly. It cannot be expected<sup>1</sup> that the predictions of exchange rate changes will improve substantially in the medium run. It is therefore important to develop some understanding of what one has to expect from a change in the exchange rate<sup>2</sup> in order not to be totally caught by surprise and follow what may prove to be ill advice. The evaluation of the effects of exchange rate changes is thus seen as a contribution to smoothing the process of becoming familiar with the regime of floating exchange rates in general.

In order to discuss the effects of exchange rate changes it is important to stress that a proper analysis cannot be obtained unless the source of the disturbance is known. Therefore a short classification of exchange rate changes is outlined in the following paragraph.

#### 1. ppp exchange rate changes

Consider two countries 1 and 2. If in country 1 the consumer price index<sup>3</sup> does not move like in country 2 then the purchasing power parity principle demands that the exchange rate changes in order to remove the divergence from an equality of the purchasing power of the two currencies. This principle can be expected to hold in the long run provided that this divergence of the rates of change in the consumer price indices was caused by monetary phenomena. To the extent that a move of the exchange rate can be explained by the purchasing power parity principle (ppp) this change of the exchange rate is called a ppp exchange rate change. Such an exchange rate change is

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<sup>1</sup> Two reasons for this assumption are  
a) policies of central banks continue to change in an unpredictable fashion,  
b) discretionary large scale stock shifts of currency holders are unpredictable.

<sup>2</sup> The exchange rate of currency j and currency i in country i is defined to be the number of units of currency i which have to be paid for one unit of currency j.

<sup>3</sup> We abstract here from the discussion on the most suitable price index.

always observable as a change in the quotation of the price of one currency in terms of another currency, i. e. there is a nominal exchange rate change.

## 2. Real exchange rate changes

Real exchange rate changes are defined to be non-ppp exchange rate changes. Real exchange rate changes are not necessarily observable as a change in the price of a currency in terms of another currency. The current theory on exchange rate determination suggests that the real exchange rate changes enumerated below constitute a classification which comprises the most important of such changes - because all the exogenous variables used there find their proper consideration below.

### 2.1. Monetary real changes

In particular in the short to intermediate run changing monetary parameters may have a strong influence on the exchange rate. On the supply side of a currency

- changes in the money supply

carry the dominant influence. Changes in the money supply have been observed to be very large also over short periods of time<sup>1</sup>.

Consider again two countries 1 and 2 who have adopted a system of freely floating exchange rates. Assume that both countries (representing the entire world) are in a situation of long run equilibrium<sup>2</sup>, i. e. all variables are changing in a way which is known and therefore expected. Let country 1 expand its money supply over night<sup>3</sup> by more than was expected. Then both

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<sup>1</sup> Such changes occur with a true regularity when a central bank switches priority from domestic stability to relative exchange rate stability.

<sup>2</sup> For a definition see below.

<sup>3</sup> The following argument owes its substance to an article by Jürg Niehans, "Exchange Rate Dynamics with Stock / Flow Interaction", Journal of Political Economy, Vol. 85, No. 6, Dec. 1977.

the prices of country 1 and the exchange rate will show equiproportionate changes once the adjustment process to this "shock" is over.

The first reaction is an instantaneous depreciation of the currency of country 1. Foreign money is acquired in order to protect the purchasing power now stored in domestic money. The trade account in this model initially shows surpluses which in the later stages are reversed into deficits as the holdings of foreign money are reduced to the level before the shock occurred. In terms of the domestic price rise the exchange rate initially depreciates faster (overshoots), followed by a less rapid depreciation (undershoots)<sup>1</sup>. During the entire adjustment process - with the possible exception of countably many points in time - the shock produces monetary real exchange rate changes.

On the demand side rather important variables<sup>2</sup> are

- changes in the velocity of circulation
- changes in the area where the currency is used
- changes in the size of gross national product.

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<sup>1</sup> It is convenient to use the relative magnitudes of the first derivative of prices and the exchange rate with respect to time for a definition of overshooting (undershooting) of the exchange rate according to whether the former is smaller (bigger) than the latter. Assume the economy to be in equilibrium. A sudden monetary expansion (in the sense of Dornbusch, Expectations and Exchange Rate Dynamics, JPE no 84 vol 6) will lead domestic prices and the exchange rate to move to equiproportionately higher levels once the adjustment process is over and the economy is in a new equilibrium. It is assumed that capital markets react much faster than goods markets. Therefore the economy will hardly ever travel on a straight line connecting the old and the new equilibrium in domestic prices - exchange rate space. It is much more likely that the exchange rate reacts faster. If output does not change in the short run the exchange rate possibly even moves beyond the new equilibrium level instantaneously. This is the phenomenon of overshooting in the Dornbusch sense. In a model by Niehans (Exchange Rate Dynamics) this type of behaviour of the exchange rate is excluded. He writes on page 1250: "There is nothing in the model, however, to prevent overshooting in the sense that the instantaneous depreciation is immediately followed by a temporary appreciation before further depreciation sets in." Here overshooting is understood in a yet less restrictive sense.

<sup>2</sup> Differences in portfolio mix between countries, e. g., were disregarded although situations can be constructed where this variable may have some influence via different currency preferences in different countries.

Both the currency area<sup>1</sup> and the growth of the gross national product can be expected to change relatively slowly. Also, both these variables in general have a rather large trend component in their growth rates. Minor deviations of these variables from their trend values will have only mild influences on the general direction and the tendency of the exchange rate to change<sup>2</sup> (which itself is given by the trend of these two variables). Changes of the velocity of circulation may occur most rapidly<sup>3</sup> in particular in connection with speculative purchases of foreign currency (e. g. out of fear of changes in monetary policy or judicial conditions). Such changes can be expected to have strong influences on the fluctuations of the exchange rate.

All these variables lead to monetary real exchange rate changes only in the short to intermediate run. With this time horizon<sup>4</sup> they are relevant for the explanation of the observed fluctuations. In the long run their influence diminishes gradually with the establishment of a new price level and therefore ceases to produce non-ppp exchange rate changes.

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<sup>1</sup> In the longer run changes of currency domains occur slowly. An exception is the pound sterling in the second half of 1974 and 1975 when value guarantees came to an end.

<sup>2</sup> Effects of such changes of the exchange rate are not dealt with explicitly in the sequel.

<sup>3</sup> If the velocity of circulation remains on its new level prices will also fall (rise) or not rise (fall) as fast as they would have without the purchases (sales) of domestic currency by foreigners. This observation is sometimes overlooked but may contribute in a small way towards the explanation of rather stable prices in Germany during recent months and possibly also for some time to come in the presence of high rates of growth for money aggregates.

<sup>4</sup> For policy implications and applications this is the level most frequently talked about.



## 2.2. Non-monetary real changes

This type of exchange rate change does not melt away with time in any predictable or regular way. Non-monetary real exchange rate changes are mainly responsible for causing deviations of exchange rates from the path which would be expected from the purchasing power parity principle.

The influences can be grouped under demand and supply shifts for the domestic currency.

So far as the demand side is concerned one should note

- changes in international demand for domestic products
- changes in domestic demand for foreign products.

On the supply side:

- changes in productivity
- changes in factor endowment

have an influence on the exchange rate<sup>1</sup> . .

The variables which are discussed so far influence the exchange rate because market participants observe the past and current values and react upon them. In addition expectations are formed on future values of these variables using autoregressive schemes or some other kind of extrapolation. It appears highly likely that the expected values may have a stronger impact on current behavior than the current values<sup>2</sup>.

For the following analysis, the concept of equilibrium for one currency in terms of another must be introduced. An equilibrium for a currency is defined for the short run and for the long run.

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<sup>1</sup> For a detailed discussion see Harry G. Johnson, *Increasing Productivity, Income-Price Trends, and the Trade Balance*: EJ 1954 p. 463 ff.

<sup>2</sup> In particular there may be changes of exchange rates with no change in the "underlying" variables because expectations did not materialize but had already been reacted upon.

The notion of equilibrium is widely used. The terms equilibrium prices and equilibrium exchange rates are found in the literature as well as in public discussion. Unfortunately normative issues and judgements<sup>1</sup> are associated with equilibrium. There is the impression that many associate smooth or small movements if any with their idea of equilibrium.

The equilibrium is defined to be an operator EQ that relates a differentiable function  $f_t$  from an interval  $[t_0, \infty) \subset \mathbb{Q}^+$  into the positive rational numbers with the property  $f(t) < \infty$  for all  $t \in [t_0, \infty)$  with every status quo of a given economy, i.e.

$$\text{EQ: } \text{SQ} \rightarrow \{ f_{t_0} / f_t : [t_0, \infty) \rightarrow \mathbb{Q}^+, f_{t_0}(t) < \infty \\ \text{for all } t \in [t_0, \infty), f_t \text{ differentiable} \}$$

The set SQ contains the status quo of the economy under observation, together with the economies it is related to by trade or otherwise<sup>2</sup>. The concept of status quo needs some elaboration. Assume that the present time is  $t_0$ . Prior to  $t_0$  there may have been various shocks changing the variables mentioned above in an unforeseen way. But from  $t_0$  on for all future time it is assumed that no disturbance occurs in any economy. That means that all variables change at a rate that is known to everybody at  $t_0$ . This rate of change need not be constant. Furthermore, in a status quo it is required that there be no interventions by any central bank. The absence of purchases and sales of foreign currency by central banks is part of the

<sup>1</sup> Compare the discussion by F. Machlup, Equilibrium and Disequilibrium: Misplaced Concreteness and Disguised Politics, EJ no 269, vol LXVIII, March 1958.

<sup>2</sup> A truly complete analysis would have to consider the entire rest of world. The number of countries included largely depends on the type of relations that the country under observation has with other countries.

definition although central banks often are engaged in foreign currency dealings with private parties. Sometimes the motive is to prevent or retard the exchange rate from climbing further, sometimes the contrary is desired. Interventions are excluded here because they are believed to have distorting effects on markets for foreign currency. They are different from private transactions in three respects:

1. central banks believe to have better foresight than other participants of the market (if the contrary would hold they had no operational basis whatsoever). 2. central bankers are not sued after they have inflicted damage to society. 3. central bankers are speculating with money that others have to pay for (give up consumption which would otherwise have been possible). The absence of interventions after some time  $t_0$  - the system being in a status quo then - does not imply that there is no impact on the exchange rate for some time after  $t_0^1$ .

The operator EQ must be thought of as being completely independent of time. For any particular application of it to a certain status quo the economist simply associates  $t_0$  with the present time. A distinction is made between the short run and the long run.

The short run equilibrium is an operator EQS

$$EQS: SQ \rightarrow \{s_{t_0} | s_{t_0} : [t_0, t_0+x] \rightarrow Q^+, s_{t_0} = f_{t_0}([t_0, t_0+x])\}$$

where  $x \in Q$  depends on the economy under observation and corresponds to

<sup>1</sup> Apart from the change in the money supply which very often accompanies interventions there are direct impacts of interventions on the exchange rate also. Here are two examples:  
 1. official interventions just prior to  $t_0$  may have been the single cause for a speculator to sell foreign currency spot to the central bank. He will buy it back some time after  $t_0$ .  
 2. if in the absence of interventions the money supply would have been expanded likewise just prior to  $t_0$  by open market purchases of government securities from the public the demand for foreign government debt would have increased.

the time that is necessary for shocks to work through the system. It will be at most of the magnitude of 4-5 years<sup>1</sup>.

Similarly the long run equilibrium is defined<sup>2</sup>:

$$\text{EQL: } \{ \text{SQ} \cap \{ t_0 \mid l_{t_0} : (t_0 + x, \infty) \rightarrow Q^+, l_{t_0} = f_{t_0} \mid (t_0 + x, \infty) \} \}.$$

It cannot be excluded that for a given economy there is no subinterval  $U$  of  $[t_0, \infty)$  of positive length for which it is true that the exchange rate quoted in the market is equal to the rate  $f_{t_0}(t)$  for all  $t$  in  $U$ . Nevertheless the construction of equilibrium is indispensable for reference purposes.

Without a proper reference system it is impossible to tackle questions or statements concerning undervaluation, overvaluation, the need for intervention, excessive fluctuations of exchange rates and so on<sup>3</sup>.

<sup>1</sup> In a statement on January 30, 1978, to the Committee on Banking, Finance and Urban Affairs Carl F. Christ said that an increase in the growth rate of the money stock and the maintenance of the higher rate thereafter will have real effects lasting for perhaps 2 or 3 or 4 years.

<sup>2</sup> It is highly likely that the subset of  $\text{SQ}$  which is defined by the property: there is  $y > x$ , and  $l_{t_0}(t_0 + y, \infty)$  constant is empty.

<sup>3</sup> An example of a rather unprecise usage of similar terms is picked up by the Economist, issue of March 4, 1978, surveys 32 and 35: 'The Rambouillet summit agreement encouraged central bank cooperation to keep currencies within loosely defined target zones and it also tried to distinguish between (1) "erratic and wild" movements in exchange rates, which warrant intervention, and (2) those resulting from "underlying economic and financial factors" which should not be meddled with'. It is interesting to note in this context that the vice-president of the Bundesbank, Karl-Otto-Pöhl, believes his institution to be in a position to identify erratic movements of exchange rates: Auch in Zukunft können Interventionen an den Devisenmärkten notwendig werden, wenn es zu erratischen Kursschwankungen kommt. Wirtschaftswoche no. 9, February 24, 1978, page 89.

### 3. Effects of Exchange Rate Changes

In the sequel the effects that can be expected from the above mentioned exchange rate changes are discussed. The concentration is on the following items:

- trade
- capital movements
- employment
- prices
- structure of the economy
- activities of government and other official institutions.

A change in one of the variables which are causing exchange rate changes is to be understood as a relative change with respect to the same variable in those countries who via this variable affect West Germany in an important way (be it by trade or otherwise).

#### 3.1. Effects of ppp Exchange Rate Changes

A ppp exchange rate change goes along with a price change of domestic prices relative to prices abroad. The direction of causality is not important here because a ppp change is defined to occur parallel in time to the relative price change. Relative prices in the home country all remain constant. Therefore no other variable will be affected in an important way. Such changes of exchange rates will occur only very rarely in this pure form. Often it will be the case that there are small deviations even in the absence of explicit shocks. Be it that price indices taken as a basis of comparison for the purchasing power parity principle are constant while subindices pertaining to traded goods e. g. are not. One might then expect some change in trade flows. Incipient capital flows may be observed from a more inflationary to a less inflationary country although the exchange rate has moved in accordance with the purchasing power parity principle.

The reason is a preference of investors for less inflationary currencies<sup>1, 2</sup>.

### 3.2. Effects of Monetary Real Exchange Rate Changes

Monetary real changes of exchange rates are probably most widely discussed because changes in the money supply lead to wide fluctuations of exchange rates<sup>3</sup>. Together with an unexpected change in the rate of expansion of the money supply the expectation for further such expansions outside the preannounced interval may trigger further movements of the exchange rate<sup>4</sup>. The short run equilibrium operator has related the status quo to a function  $s_{t_1}$  which probably differs substantially from  $s_{t_0}$ . ( $t_0$  is some time prior to the last shock,  $t_1$  after it.) If there would be no further shock until such time that  $t_1 + x$  is reached it may well be that the exchange rate nevertheless moves up and down until the long run equilibrium takes over. Also thereafter fluctuations cannot be excluded but it can probably be assumed that in a situation where the expected future rate always materializes and new shocks do not occur with certainty they would be much milder. Since it is highly likely - recent research in the theory of exchange rate determination leads to these estimates - that an overshooting of the exchange rate is followed by an undershooting (relative to consumer

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<sup>1</sup> This preference to some extent ignores the covered interest arbitrage parities and possibly finds an explanation in different (relative) taxation of interest income and capital gains in different countries or the investor associates a relatively higher risk of expropriation with highly inflated currencies.

<sup>2</sup> This is an example that homogeneity assumptions should be made cautiously.

<sup>3</sup> For an estimate of the effect of an unexpected 1 % expansion of the money supply on the exchange rate (in the order of 10 (ten!) percent) see Jeffrey A. Frankel, On the Mark: A Theory of Floating Exchange Rates Based on Real Interest Differentials; MIT, October 1977.

<sup>4</sup> To a large extent the movements of the exchange rate may be caused by stock adjustments. A simplistic comparison of rates of growth of the money supply, prices and exchange rates then certainly leads away from the empyrean of increased prognostic power.

price changes that occurred in the meantime) any lasting effects on trade flows, employment, or the structure of the economy may not occur.

Intermediate changes in trade flows may be met with during the adjustment process. These changes most likely do not result in changes in employment because employment and structural changes react with substantial lags.

Also an exchange rate change must have occurred and lasted for a relatively long period of time before a change in some real variables occurs. At any rate, if trade flows or employment do have changed as a reaction to the monetary real change they will have <sup>to</sup> change back to initial levels after the shock that caused the real change has worked itself through the system.

Then the exchange rate will be left at a new level - the ppp change - with all real variables on the level of the status quo ante.

Capital flows react more quickly partly because they are much more easily reversed. For the same reason they are very responsive to changes in expectations.

Activities of institutions like governments or central banks may accompany a monetary real change of the exchange rate. Almost always very short term perspectives lead to an activism which on average leaves the private parties with a feeling of increased insecurity about the future course of these institutions. This is almost a necessary condition to trigger further capital flows.

So far the analysis has drawn inferences from what is labelled exchange rate dynamics in the literature. This analysis, however, is comparative static in nature because it starts from an "equilibrium" and finishes with a new "equilibrium".

The dynamics about it lie in the description of the path of relevant variables between the equilibrium positions. In reality, however, the situation is more complicated and therefore much more difficult to handle. Contrary to the situation usually depicted in the literature two facts are to be observed:

- the system is NOT in "equilibrium"<sup>1</sup> when the first shock occurs
- the next shock rocks the boat BEFORE the last one has ceased to have an important influence<sup>2</sup>.

Given the estimated size of  $x$  it is almost certain that a new shock will follow the most recent one (dating from time  $t_0$ ) before  $t_0 + x$ . The impact of this new shock very much depends on how far the adjustment process to the earlier disturbance has come to work itself through the system. The fluctuations of the exchange rate may be less sharp because it just so happens that the new impact neutralizes what was set in motion before. It is also possible that the fluctuations are accentuated. The influences may cumulate in such a way as to keep the exchange rate rather stable but away from a purely ppp change determined path. A myriad of combinations is possible<sup>3</sup>.

Summing up, a sequence of shocks generating monetary real exchange rate changes may lead the exchange rate to remain at a level substantially different from what is explainable with ppp changes for an extended period of time<sup>4</sup>.

<sup>1</sup> If the reader so wishes he may perhaps associate the "equilibrium" as it is mostly employed in the literature with a state of the economy and in particular the exchange rate which is described in our model by the long run equilibrium operator.

<sup>2</sup> The real world will thus never be in a state that might be associated with a state of the model system under the regime of the long run equilibrium operator.

<sup>3</sup> It becomes quite clear that an "intuitive" estimate of the response of any exchange rate to a shock in some economy is almost doomed to failure.

<sup>4</sup> During this time the model system would nevertheless be fully controlled by the short run equilibrium operator. It should be stressed again that it is fallacious to associate small or smooth movements of a variable with an idea of equilibrium for this variable.



It is thus possible that a sequence of monetary real exchange rate changes leads the observer to attribute a relatively permanent character to the deviation of the exchange rate from purchasing power parity levels. These changes of exchange rates may be the result of a shift in the demand for money by foreigners. Be it that investors feel they should have different currency proportions in their portfolios now wanting more domestic currency, be it that corporate treasurers want domestic currency for transactions purposes inside or outside the home country. As a result the velocity of circulation will fall and bring the rate of inflation to a new lower level. This may be a partial explanation for the situation in Germany. To the extent that this move was not expected it will lead to less nominal demand, less room for price increases and thus higher real wages than were anticipated by employers. As a result the employment will shrink. The downward movement of the DM exchange rate also triggers capital movements which result in demand for foreign currencies. Stock adjustments of German investors can be expected for the following reason. An average investor will hold purchasing power in more than one currency. This is done in order to minimise the risk of devaluation. Closely related are "political" risks such as the introduction of quota. Another motive is to hold money for transaction purposes or consumption in a foreign country which is expected to occur at a later (probably not yet precisely determined) time.

The outcome of these considerations is a set of proportions defining the currency shares of total (money) wealth. (It may include negative values.) Now if these shares are fixed in real terms a devaluation of one of the participating currencies - though leading to a smaller purchasing power of the total claims calculated in domestic currency - leads to an extra demand for this currency in order to restore the desired ratios.

To the extent that these real exchange rate changes are persistent they may have the effects of non-monetary real exchange rate changes in particular with respect to employment, prices and capital movements. These effects are discussed in the following paragraphs.

### 3.3. Effects of Non-Monetary Real Exchange Rate Changes

Non-monetary real exchange rate changes on the average occur rather slowly in comparison with monetary real changes and can also be expected to last longer. For 1959 to 1976 Roland Vaubel<sup>1</sup> calculated a compound annual rate for the real upward movement of the value of the DM with respect to the other EC countries' currencies of 0.7 per cent. During 1971-1976 the rate was approximately 1 per cent. These changes to a large extent can be expected to be non-monetary real changes.

The fall of the exchange rate of the DM was accompanied by a shift in international demand away from some of Germany's traditional export goods. The reason is found in more competitive supply<sup>2</sup> from other countries, especially developing countries or changes in taste. This leads to a reduction in German sales in both the competing countries and on third markets. To the extent that real wages paid in the branches that are concerned here are not reduced employment in these branches must shrink.

At the same time that German exports became more expensive to foreigners German imports do not rise in price as much as they otherwise could have

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<sup>1</sup> Roland Vaubel, Real Exchange Rate Changes in the European Community. Journal of International Economics, May 1978; Table 6.

<sup>2</sup> For homogenous products the price is an important determinant of competitiveness and higher prices will lead to lower sales in many cases. For a different view see Gunter Tichy, The German Economic Review, Vol. 14, 1976, page 113: "... and Germany, the producer of irreplaceable goods - irreplaceable either in reality or in the view of the buyers - that are bought at any price (literally)."

been expected to. This leads to smaller price hikes also by German producers of import substitutes. Also for these branches it becomes increasingly difficult to pay their labour at the going rate without reducing employment.

Also during the sixties there were non-monetary real exchange rate changes. But it was easier then to find new lines of production in order to absorb the people who had lost their jobs in declining industries. This has become increasingly difficult. A sure token of this new situation are the new demands of trade unions for wage contracts: it is not so much an increase in pay that is controversial but the guarantee of the employer to pay a given wage also in alternative occupations<sup>1</sup> with lower opportunity costs. Therefore, in order to keep real incomes growing here it is necessary to reconsider the conditions of having an expanding economy. It will then become clear how a changing exchange rate fits into this scenario and what effects can be expected with respect to the structure of the economy in West Germany.

In order to keep the employment in the export industries at a given level it is necessary to change the production mix of the export industries. There is no alternative to a change in the structure of an economy if the economy is to keep on growing. The goods offered for sale abroad should ideally profit continuously from high international income elasticities of demand. Since incomes probably rise in time and tastes change the range of exported goods should change as well.

Investment in new lines of comparative advantage must be undertaken. This is surely a necessity if income is to be kept constant. For resources invested in lines of production that are no longer competitive must be written off. There is no alternative. It appears that the necessity for structural change was not felt in Germany to the extent that would have been desirable in order to have the production mix compatible with high comparative advantage for the location Germany. In the past the retardation of structural

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<sup>1</sup> The large scale introduction of micro processors has its share in the reasons for the new strategy of the trade unions but ultimately this is but one element of the international market becoming more difficult to compete with successfully.

change has partly been due to very particular conditions like the inflow of easily trainable and cheap labour from East Germany and southern Europe as well as an undervalued currency. These factors by now cease to exist. At the same time growth rates abroad are lower now than they were in the fifties and sixties. It has become more difficult to find new profit opportunities. Structural changes have in addition been held back by the payment of ever increasing subsidies to an ever wider circle of industries and entire branches<sup>1</sup>. Resources in the subsidised industries are earning less than they could in other fields. Incomes are thus not rising as fast as they could. The resistance of labour to look for better paying employment in alternative occupations has been reinforced by politicians attempting to "maintain" existing employment. The resistance of capital owners to write off investments has been reinforced by uncertain prospects about the politico-social environment, fruitless discussion on the supply of energy and similar problems affecting the formation of expectations and above all by successfully asking for subsidies<sup>2</sup> from political authorities. It is almost impossible to grow and remain internationally competitive if an increasing number of branches is subsidised.

In this situation the falling quotations for the DM against foreign currencies - if continuing - may be exactly what is necessary to have exports growing in the medium run. In this view the (hopefully) lasting non ppp - changes are interpreted as the deus ex machina to counteract and ultimately lead to reduced payments of subsidies for now misplaced investment of capital<sup>3</sup>.

<sup>1</sup> The "structural policies" deemed necessary for the future are widely believed to consist of a roll back of the policies that were enacted in the past.

<sup>2</sup> Or other forms of exemption from having to adjust to a new macro economic policy or generally a less favorable environment.

<sup>3</sup> Clearly, this is not a necessary development. It is hoped and there is a certain probability that the falling DM quotations in the currency markets accelerate the process of understanding that increasing payment of subsidies, instituting quotas, import and/or export restrictions is a deadend street if the income position of West Germany is to be kept if not in a relative sense at least in absolute figures.

Clearly a fall of the price for foreign currencies is a new datum for every exporter. If lasting it will put marginal German exporters out of business. But on average the now marginal exporter is expected to receive subsidies and therefore to be truly extra-marginal. With a strong DM the politician may have a scape-goat to resist ever increasing demands for subsidies and thus help bring about a process of finding new and higher rewarded occupations for the capital and the labour that is employed in this country.

70. S. Heldt, Die Wirtschaftsplanung Gabuns. Kiel, April 1978, 31 S.
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