The Contribution of the Ecu to Exchange-Rate Stability: A Further Reply

According to the Delors Committee a single currency would be a desirable feature of a monetary union. Then, it is highly desirable to study the potential effects of a well-developed and generally accessible market for such a single currency role — an obvious candidate being the Ecu. From this point of view, we welcome Fornari's contribution to the discussion of the Ecu's potential effects on exchange-rate stability. Since he applies the same procedure as we did in our article, our comment will be restricted to (a) explaining some aspects of our study, which in our view are misunderstood by Fornari, and to (b) defending the role of arbitrage and coverage of exchange-rate risk by banks, something which Fornari criticises but which occupies a prominent place in our article.

First, the *main conclusion* of our study is not that "the three situations of increased [exchange-rate] instability..., have been strong enough ... to make the Ecu's global effect one of increased currency instability" (Fornari, 1989, p. 469). Just as Sarcinelli, Fornari mistakenly interprets our analysis as a search for an increase in either stability or instability of the exchange rates. However, we had a more modest objective in mind, namely to question the strong hypothesis that the Ecu will boost exchange-rate stability in all circumstances. Then, refutation requires one counter-example only. In the analysis from the global perspective we have found three counter-examples. From the European perspective all cases appeared to reject the hypothesis. From these results we conclude that "it proves to be possible that the addition of the Ecu to the investment currencies results in increased exchange-rate instability" (Jager and de Jong, 1988a, p. 56). As the Ecu may lead to exchange-rate instability, we recommend measures to minimise the possibility that this "higher fluctuation case" will occur (see Jager and de Jong, 1988b, p. 334).

Although Fornari applies more or less the same *method* as we did in our study, the mean-variance analysis, his analysis differs from ours in many details. He uses different sets of investment opportunities, *numéraires* and periods. A well-known problem in applying the method is how to choose the preferred portfolio from the total number of efficient composi-

tions. A recommendable approach is to utilise the point that is characterised by tangency between the efficient frontier and the capital-market line. This is a good approximation of the market's behaviour. This is the approach that we applied. If the corresponding portfolio cannot be determined, or if this approach is not used, one may opt for the minimum-variance portfolio on the efficient frontier. Examples are Masera (1987) and Jager and de Jong (1987). In fact, this choice brings out extremely risk averse behaviour. This extremity can be reduced substantially by using empirical information about the probability distribution of the investment yields involved. This variant is described in Jager and de Jong (1987). Fornari, however, applies the extreme variant. This choice increases the optimal share of the Ecu (see Masera, 1987).

With respect to the choices of investments in our global variant, Fornari doubts the relevance of our choice of the currencies. We selected the four quantitatively most important national currencies in the world, which is obvious. Fornari's critique that the Ecu does not appear in the portfolios of German and non-European investors is not relevant. We determine the *optimal* international investment portfolio. Practice may widely differ from this outcome. What matters is that the investors concerned — and these are in our calculations also investors in 11 other (European) countries — are *allowed* to invest in Ecus. In our hypothetical — and at the same time desired — case of a fully fledged Ecu market this assumption holds.

With regard to the periods distinguished, Fornari suggests that the periods used in our article are periods during which "the private Ecu and its market were not yet developed" (Fornari, 1989, p. 474). Two comments are in place. First, dollar movements are among the main sources of exchange-rate instability within the European Monetary System. Therefore, we have divided the period 1979-1985 in subperiods, namely a period with a weak dollar, a period with a strong dollar and a transition period. Distinguishing these three periods has an additional advantage. Within each period the assumption of constant variances and covariances of the rates of return becomes more realistic. This enhances the applicability of the Capital Asset Pricing Model. Second, during each period we introduce the desirable situation that the private Ecu is traded on a parallel market alongside the markets in domestic currencies and that the Ecu market is well-developed and generally accessible. Some additional assumptions are made to guarantee that the existence of the Ecu market might only alter exchange-rate stability by affecting the geographical pattern of international capital flows (see Jager and de Jong, 1989a, p. 39). Conditional on these assumptions, the actual position of the Ecu in the periods investigated is irrelevant for the outcome. It is true that the data we use are influenced by the actual events in the period concerned. One could object that in the period used in our study (1979 - 1984), the relatively frequent EMS realignments have undermined

the stability of the Ecu's yield. This would diminish the share of the Ecu in optimally composed portfolios. However, the results in Jager and de Jong (1987) point to the opposite direction.

Subsequently, we comment on what Fornari regards as his main contribution to the discussion of exchange-rate stability, *viz.* the role of *arbitrage*. Contrary to what Fornari suggests, we did not introduce arbitrage in order to shed light on other functions of a reserve currency than the investment, or store-of-value, function. Arbitrage has nothing to do with the two other functions of a reserve currency as usually distinguished: the unit-of-account and the transaction, or vehicle, functions. These functions are unimportant for our purpose, since exchange-rate variations are fed by changes in the foreign-exchange markets. These are effected by international capital flows, arising from relative changes in the attractiveness of currencies for investment purposes, but not at all by the two other functions of reserve currencies. Taking into account the Ecu's investment function only, the possibility of arbitrage is introduced since the Ecu is a basket of currencies. Its supply and demand need not be balanced. A disequilibrium in the Ecu market may cause an incipient change in the Ecu price. Such a development will create arbitrage profits, which can be realised through shifts between the Ecu and its composing national currencies. Of course, in that event profit-maximising arbitrageurs, *viz.* banks, will bring about the desired arbitrage flows. Alternatively, banks create open Ecu positions, induced by shifts in demand of the non-banking sector. But it is usual that these positions are covered as soon as possible, usually during the same day. "Banks are able to cover an open position in Ecus in several ways. All these ways have the feature that a net demand for, or supply of, Ecus is spread over the currencies which are components of the Ecu basket" (Jager and de Jong, 1988a, p. 37).

According to Fornari, the effects of arbitrage could be more or less delayed in time "owing to the inefficient working of the markets or giving rise to speculative forces in view of exchange-rate realignments within the EMS" (Fornari, 1989, p. 475). We do not understand his point. Generally, financial markets are considered to be highly efficient. In these markets news is immediately incorporated into prices. This holds with certainty in our hypothetical case, desired by the Delors Committee, of a fully developed Ecu market and of liberalised capital flows in the EMS area. Speculation possibilities do not hinder the materialisation of arbitrage profits in any way. Portfolio adjustments in response to expected exchange rate changes are, by definition, speculative capital flows. The results are incipient market imbalances and price changes. As we argued, these are in fact the source of arbitrage profits. Therefore, it is improbable that inefficiencies and impossible that speculation will disrupt our propositions based on arbitrage effects. Even if we assume that Fornari's reasoning is right presently, it should be noted that in the near future the validity of his

arguments will diminish. Carrying out the proposals for liberalising capital movements within the EMS, will enhance the efficient functioning of financial markets. Aiming for a monetary union by coordinating economic policies will reduce the frequency with which strains within the EMS will give rise to speculative capital flows due to expected exchange-rate realignments.

It is remarkable that Fornari's quantitative *results* show a substantial similarity to ours, despite the afore-mentioned differences in the materialisation of the mean-variance approach. In fact, the similarity in results gives support to the robustness of our propositions concerning the Ecu's effect on exchange-rate stability. Indeed, Fornari's calculations allow for destabilising effects of the Ecu on exchange rates too. Restricting ourselves to the transition of the period 1985-87 to 1987-89 and to the case that all countries are taken together, his Tables 4 and 5 show that only the variation of the value of the Deutsche Mark *vis-à-vis* the SDR increases through the inclusion of the Ecu. However, the two tables contain only a small selection of all the exchange rates embodied in Fornari's basic Tables 2 and 3. These other rates and the Ecu's impact on their variability can easily be determined. From this additional material it appears, for example, that the variability of the Dutch guilder rate against five (out of a total of nine) other national currencies rises due to the introduction of the Ecu. It concerns the guilder *vis-à-vis* the Deutsche Mark, the French franc, the U.S. dollar, the Japanese yen and the Danish krone. When arbitrage is allowed, as mentioned the only relevant situation, even Fornari's Tables 4 and 5 produce ample instability owing to the Ecu: then four of the nine exchange rates considered display a greater variability in response to the Ecu's inclusion in the investment possibility set. In our investigation we found a similar effect of arbitrage on the relation between the Ecu and exchange-rate stability.

A seemingly conflicting outcome of the two studies concerns the impact of the U.S. dollar's strength on the position of the Deutsche Mark in the EMS exchange-rate mechanism. Fornari states that, unlike our findings, the often accepted tendency that when the dollar is strong the Deutsche Mark tends to grow weaker relative to the other EMS currencies, and *vice versa*, is supported by his results. In the passage from 1985-87 to 1987-89 the mark's share decreases in his Table 1 but not to the advantage of the dollar! Indeed, in the second period the dollar almost disappears from the optimal portfolios. It is, therefore, not a substitution of dollars for marks — as is the root idea behind the pretended dollar/mark relation — but a shift out of the mark into other EMS currencies. A possible explanation of the substitution observed could be the announcement effect of the German withholding tax of 10% on investments in Germany. This has induced a capital outflow from Germany, a subsequent lower mark, and, consequentially, a detrimental development of the yield on investments in Deutsche Mark in the period 1987-89. This will have lowered the mark's share in the

optimally composed investment portfolio, irrespective of the *numéraire* currency.

Concluding, notwithstanding our critical comments on Fornari's analysis, we consider it a valuable contribution to the important subject of the Ecu's potential influence on exchange-rate stability. Despite differences in investment opportunities, *numéraires* used, periods examined, and the choice of the preferred efficient portfolio, Fornari obtains results which are similar to ours. His analysis, therefore, gives some support to the robustness of our propositions that (1) the opposite movements in the values of the U.S. dollar and the Deutsche Mark cannot be explained by mutual substitutions of these currencies and that (2) there is a possibility that the introduction of the Ecu will enhance exchange-rate instability.

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