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FINLAND'S EXCHANGE RATE REGIME AND EUROPEAN INTEGRATION***

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ABSTRACT: Finland's participation in the deepening European integration means a considerable change in her economic policy setting. Liberalization of capital movements and financial services will increase interest and exchange rate sensitivity. To maintain stability, tighter coordination of economic policies is required. The integration of Finland's foreign trade and the markets of the factors of production with the EC will cause pressures to adjust Finland's exchange rate regime to the changing conditions. Of the available alternatives participation in the European Monetary System (EMS) would seem to be excluded for political reasons. In practice, the alternatives to be considered are the pegging of the markka to the ECU basket of the EC countries, or the increase of the weight of the EC countries' currencies in the present basket. At the moment there is no need for changing the weights. The need for change would, however, increase if other EFTA countries joined the EMS or pegged their currencies to the ECU, or if the importance of the US dollar for the Finnish economy substantially decreased.

KEY WORDS: Finland, exchange rate regimes, European integration.

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TIIVISTELMÄ: Suomen osallistuminen tiivistyvään Euroopan integraatioon merkitsee tuntuvaa muutosta talouspolitiikan toimintaympäristössä. Pääomanliikkeiden ja rahoituspalvelujen vapauttaminen lisää korko- ja valuuttakurssiherkkyyttä. Vakauden säilyttäminen vaatii talouspoliittisen koordinaation tiivistämistä yleisesti. Suomen ulkomaankaupan ja tuotannontekijämarkkinoiden integroituminen Euroopan yhteisöön aiheuttaa paineita Suomen valuuttakurssijärjestelmän sopeuttamiseksi muuttuvaan ympäristöön. Periaatteessa käytettävissä olevista vaihtoehdoista osallistuminen Euroopan valuuttajärjestelmään EMS:iin ei poliittisista syistä voine tulla kysymykseen. Käytännössä harkittavaksi jäävät vaihtoehdot ovat tällöin markan sitominen EY-maiden ECU-valuuttakoriin tai nykyisen korin muuttaminen niin, että EY-maiden valuutoilla on siinä nykyistä suurempi paino. Tällä hetkellä painojen muuttamiseen ei ole tarvetta. Muutoksen tarve kuitenkin lisääntyisi, jos muut EFTA-maat liittyisivät EMS:iin tai sitoisivat valuuttansa ECU:un tai jos USA:n dollarin merkitys Suomen kansantaloudelle vähenisi oleellisesti.

ASIASANAT: Suomi, valuuttakurssijärjestelmät, Euroopan integraatio

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1. INTRODUCTION

Following the breakdown of the Bretton Woods system in the early 1970s, individual countries had to choose their own foreign exchange systems. These ranged from pure floating to different kinds of fixed rate regimes. As of March 31, 1988, of the 150 member countries of the IMF, 94 countries had their currencies pegged to a single currency or a currency composite, 12 countries had their currencies' flexibility limited in terms of a single currency or group of currencies and 44 countries followed more flexible exchange rate practices (see appendix 1). In the first group, 39 countries had pegged their currency to the US dollar, 7 countries to the SDR and 29 countries to various baskets of currencies. In the third group, 18 countries could be classified as independent floaters, including, e.g., the United States, Japan and the United Kingdom.

After the collapse of the Bretton Woods system Finland implemented various institutional arrangements to enable it to continue a fixed exchange rate policy. With the suspension of convertibility of the US dollar into gold in 1971, Finland pegged the markka to the dollar. In mid-1973, this arrangement became unsatisfactory because of marked fluctuations in international exchange rates. Accordingly, the Bank of Finland started to calculate different kinds of currency baskets, which were used for the guidance of foreign exchange policy.[1] In 1977, the basket concept was formally and legally adopted. Thus, Finland has, during more than a decade, had an exchange rate regime which institutionally is rather similar to the system of fixed exchange rates in force during the Bretton

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[1] Of Finland's exchange rate practice and its developments see PURO (1978 and 1984) and ÅKERHOLM (1987).

Woods era, with the difference that a currency basket has replaced the US dollar as the target for the peg. Of the Nordic countries, Norway and Sweden apply the same kind of trade-weighted baskets as Finland, while Denmark is a member of the European Monetary System (EMS).

The economic environment has changed substantially since the adoption of the present system, and is still changing. Finnish financial markets have undergone fundamental change in the past few years as a result of deregulation, internationalization and integration. Domestic financial markets have been deregulated with the transition from strict interest rate regulation to largely market-determined interest rates. Foreign exchange controls have been gradually liberalized along with the developments in many other industrial countries. As a result, capital flows have become more flexible and volatile and sensitive to the differential between domestic and foreign interest rates. Opportunities for conducting an independent monetary policy in a fixed exchange rate regime with relative freedom of capital movements have clearly diminished.

Further challenges lie ahead. The Commission of the European Communities (EC) has set a target to create a single, internal market by liberalizing goods, services, capital and labour movements by 1992. Also, the EFTA countries and the EC have agreed on the development of cooperation between the two parties with the aim of deepening European economic integration. The liberalization process requires concessions on behalf of the EFTA countries, too. The most marked changes are to be expected in the trade of services and in capital movements. This calls for coordination and cooperation of economic policies in the EC and EFTA countries. The relevance of present exchange rate practices must be taken into consideration, too, and forthcoming

pressures for changing the regime have to be analyzed.

In this paper we deal with theoretical and empirical considerations affecting the choice of the exchange rate regime for a small open economy. In particular, we are interested in the case of Finland in the face of European integration. In chapter 2, we start by reviewing the theories relevant for the choice of an exchange rate regime. From Mundell's and Fleming's fundamental foundations we proceed into the theory of optimum currency areas, and delve further into the exchange rate criteria based on the dominance of various shocks facing the economy. In chapter 3 we survey the choice of an optimum currency basket. In chapter 4 we consider the European integration process and its likely implications for the monetary and exchange rate setting. Finally, in chapter 5, we review the present Finnish exchange rate regime and assess what kinds of changes in it might become necessary, if European integration proceeds according to plan.

2. THEORETICAL ANALYSES OF EXCHANGE RATE REGIMES

2.1. Early arguments for flexible exchange rates

Modern discussion on the choice of an exchange rate regime goes back to FRIEDMAN's (1953) critique of the fixed rate regime. Friedman argued for flexible rates, mainly because he thought that the world economic situation then prevailing was ill-suited to fixed rates. According to Friedman the existing trade barriers and other direct controls could have been abolished by the use of flexible rates. He also argued that the use of flexible exchange rates would release monetary policy from external targets to maintaining internal balance. Other proponents of flexible exchange rates were, for instance, SOHMEN (1961) and Harry Johnson

in his various writings (see JOHNSON, 1972).

These early analyses were very general in nature and paid little attention to differences between countries. They left the impression that an identical case for flexibility could be made for any country, even if countries vary in, for instance, size, openness to foreign trade, mobility of factors of production and policy attitude.

They also underestimated the problems connected with flexible exchange rates. They argued that speculation would stabilize the exchange rate around the level suggested by economic fundamentals, mainly the purchasing power parity. The history of floating rates since 1973 has, however, shown a high volatility and misalignments of exchange rates, which, in turn, have had negative effects on the economies, for instance in the form of misallocations of resources. New theories of exchange rate determination, evolved since the mid-1970s, state theoretical arguments for the observed volatility of exchange rates.[2]

2.2. Policy effectiveness and the impacts of domestic disturbances

Important contributions to the choice of an exchange rate regime were the articles of Mundell and Fleming in the early 1960's. (See FLEMING, 1962 and MUNDELL, 1963.) One of the main characteristics of these analyses was an explicit consideration of the impacts of capital mobility. The so-called Mundell-Fleming model is still an important source of inspiration in theoretical literature and economic policy discussions.

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[2] The "new" theories of exchange rate determination are not dealt with explicitly in this article, see, for instance, KRUEGER (1983).

Mundell and Fleming examined the effects of stabilization policies under fixed and flexible exchange rate assumptions. Moreover, their analysis can be transformed into statements about the effects of domestic monetary and aggregate demand disturbances.[3]

The conclusions of the Mundell-Fleming analysis are as follows:

1. Under the regime of fixed exchange rates monetary policy is ineffective in influencing output, whereas fiscal policy is effective. Under the regime of floating rates it is the other way round.

2. Fixed rates are preferable to flexible rates, if domestic monetary disturbances are important, since such disturbances have no impact on output under fixed rates. They only result in a change in foreign exchange reserves. On the other hand, if domestic aggregate demand disturbances are important, flexible rates are preferable, because they eliminate the effects on output.

These results are strong and dependent on the assumptions used: (1) a small country, (2) assets are perfect substitutes, (3) perfect capital mobility, (4) exchange rate expectations are static, (5) nominal wage and price levels are fixed, (6) there are unemployed resources, and (7) an exchange rate depreciation (appreciation) improves (worsens) the balance of trade (the Marshall-Lerner condition). (See for instance EDISON, 1987.)

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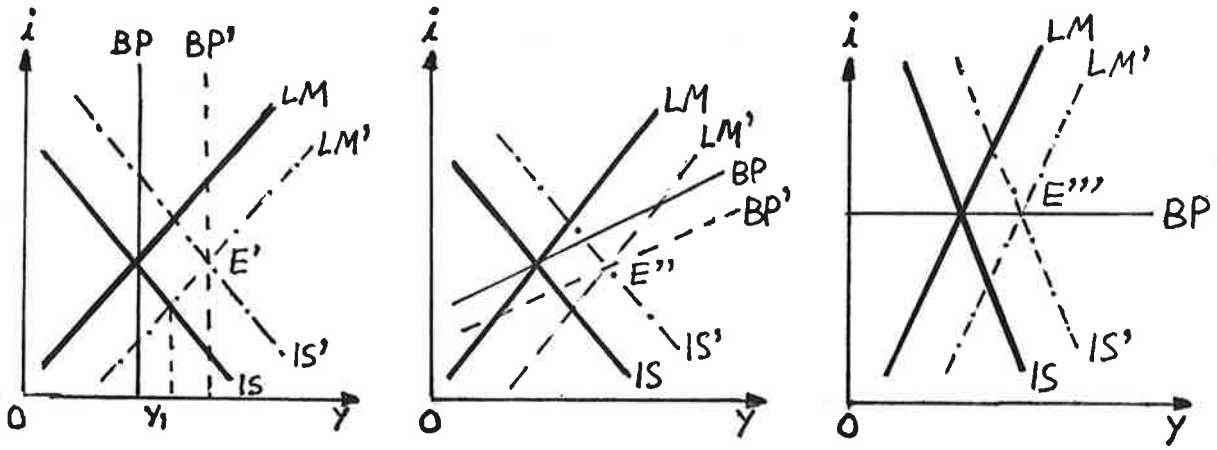
[3] About the development of the Mundell-Fleming model see, for instance, MARSTON, 1983 and FRENKEL & RAZIN, 1987.

To see the importance of different assumptions concerning capital mobility, we consider, following WILLIAMSON (1983), short-run impacts of an expansive monetary policy under zero capital mobility, finite capital mobility and perfect capital mobility.

In figure 1 the standard IS-LM framework is presented, with the BP line illustrating the external balance (zero change in reserves). In the case of zero capital mobility (1A), the BP curve is vertical, because a change in the interest rate has no direct effect on the external balance, assuming a given output. In the case of perfect capital mobility (1C) the BP curve is horizontal: the domestic interest rate is determined by the international interest rate. The case of finite capital mobility (1B) is between these extremes.

Figure 1. Monetary policy in the Mundell-Fleming model



A. zero capital mobility

B. finite capital mobility

C. perfect capital mobility

With zero capital mobility an expansionary monetary policy will push the LM curve to the right. With fixed exchange rates, income would expand by y1 and the external balance would run a deficit (in the short run).[4] With floating rates, however, the exchange rate will depreciate quickly pushing the IS and the BP curves to the right until external balance is reached. The new equilibrium is in point E', where output is higher than it would be under fixed rates.

In the case of finite capital mobility monetary expansion shifts the LM curve to the right. The short-run equilibrium (with an unaltered exchange rate) is the same as in the case of capital immobility. Under flexible exchange rates the current account deficit leads again to a depreciation. The new equilibrium occurs at E'', where income expansion is larger than with fixed rates.

Under perfect capital mobility and fixed exchange rates a monetary expansion leads immediately to a capital outflow and has no effect on output. In the case of flexible exchange rates an expansionary monetary policy is more powerful in affecting output, because it leads to a depreciation and to an increase in income until the demand for money has risen to match the rise in supply. The new equilibrium is at E''', where output is increased and the current account is in balance.

A similar analysis can be presented for fiscal policy (and real disturbances). In the case of perfect capital mobility fiscal policy is very effective under fixed rates but impotent under flexible rates. If less than perfect capital

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[4] In the long run money supply effects of the current account deficit would lead, in the absence of sterilization, to a shift in the LM curve back to its initial position.

mobility is assumed, the positive effects of fiscal policy will be dampened under fixed exchange rates. In the case of flexible rates fiscal policy has some effects.

MARSTON (1983) has shown that assumptions concerning the wage setting process are also crucial for the results of the Mundell-Fleming analysis. If full wage indexation is introduced, the exchange rate ceases to have any effect on real variables. For that reason there is no difference in the response of output to monetary disturbances under fixed and flexible rates.[5]

2.3. Impacts of foreign disturbances

Early proponents of flexible exchange rates argued that flexible rates would insulate an economy from foreign disturbances (FRIEDMAN, 1953; SOHMEN, 1969). To analyse this MARSTON (1983) following FLOOD (1979) develops a model for the foreign economy, and analyses first the impacts of the disturbance inside that country. After that he considers, how the disturbances are transmitted to the domestic economy. Marston's analysis shows that a purely monetary foreign disturbance becomes both a real and monetary disturbance from the domestic country's point of view. The real disturbance originates as a change in foreign output, which in turn affects the domestic economy as would a domestic aggregate demand disturbance. Marston shows that flexible exchange rates insulate the domestic economy only in special cases, and that, in general, flexible exchange rates do not even insulate the economy from foreign monetary disturbances. The insulation property

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[5] The line of research represented by Marston is already rather distanced from the original Mundell-Fleming framework. Marston's model can be called "a model of stochastic disturbances" as EDISON (1987) calls it.

holds only in models without capital mobility.

Marston stresses that foreign disturbances affect the domestic economy through various channels. A foreign monetary disturbance, for instance, may raise the foreign price, lower the foreign interest rate and raise foreign output with the combined effects being very different from the individual effects.

2.4. The theory of optimum currency areas

An "optimum currency area" is a geographic area inside which exchange rates ought to be fixed. The concept can be widened to concern the criteria for joining a monetary union. The term "optimum currency area" was coined by MUNDELL (1961). The traditional approach tries to single out crucial economic characteristics, where the lines should be drawn. In addition to Mundell other important contributions to this line of research are McKINNON (1963), KENEN (1969) and VAUBEL (1978). Another approach, represented by ISHIYAMA (1975) starts with national economies, taking each nation and national currency as indivisible and trying to evaluate costs and benefits of fixing exchange rates in relation to some area (and of joining a monetary union). (For a survey of literature on optimum currency areas see ISHIYAMA, 1975).

According to the traditional approach the following characteristics are thought to increase the need for exchange rate fixity within an area: (1) high mobility of factors of production (MUNDELL, 1961), (2) high share of tradeables in production (income and price stabilization by fixing) (McKINNON, 1963), (3) a high degree of product diversification (KENEN, 1969), (4) a high degree of financial integration within an area (especially concerning

long-term securities) (INGRAM, 1969), (5) similarity in rates of inflation (HABERLER, 1970; FLEMING, 1971), (6) no need for real exchange rate changes (VAUBEL, 1978) and (7) a high degree of policy integration (for instance TOWER & WILLETT, 1970).

ISHIYAMA (1975) evaluates and criticizes the above mentioned criteria. For instance, a high mobility of factors of production is shown to be an insufficient condition for fixing an exchange rate. FLEMING (1971) has pointed out that internationally mobile capital as a precondition for countries forming an optimum currency area depends on the nature of the disequilibrium, the sensitivity of investment to economic activity and the allowed time period for adjustment. CORDEN (1973), in turn, criticizes the view that labour movements could be relied upon as a substitute for payments adjustments, both because such a high degree of mobility is not attainable and because migration creates substantial adjustment costs.

Concerning criteria (2) and (3) ISHIYAMA (1975, p. 351-354) points out that they are very sensitive to the type of disturbances facing a country. The product diversification criterion leads easily to a conclusion that is the exact opposite to the conclusion drawn through the openness criterion. The more diversified an economy is, the larger it would be and the smaller the foreign trade sector would be.

Criterion (4) means mainly a high degree of asset substitutability. It has been argued that under such circumstances the need for exchange rate changes would be eliminated, because only fractional changes in interest rates would evoke sufficient equilibrating capital flows between countries. TOWER & WILLETT (1970) criticize the

mechanism presented by criterion (4) of being primarily financing than correcting, or adjusting payments imbalances. The critique presented against the capital mobility criterion is partly valid in the case of criterion (4), too. It can also be asked whether a high enough degree of asset substitutability can be achieved and whether residents of payments surplus countries are willing to lend to deficit countries at reasonable interest rates.

The "similarity in rates of inflation" criterion can be criticized for being insufficient, because balance of payments problems can arise for microeconomic reasons, too. Changes in demand and supply conditions can lead to changes in equilibrium exchange rates and worsen real competitiveness even if inflation is in line with that of other countries.

VAUBEL (1978) criticizes the "traditional" optimum currency area literature for being too "eclectic" and difficult to operationalize and weight various criteria. He suggests deviations from relative purchasing power parity (real exchange rate changes) as a comprehensive and operational criterion for the desirability of currency unification. According to him this criterion measures the implications, which all the heterogenous and partly contradictory criteria developed in the previous optimum currency area literature have for currency union. Vaubel argues that real exchange-rate changes indicate the economic cost of currency union. In this framework a group of countries form an optimum currency area if real exchange rate changes are not needed between them.[6]

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[6] The problems related to criteria (5), (6) and (7) are extensively discussed in the literature concerning the European Monetary System, see also ISHIYAMA, 1975, p. 356.

ISHIYAMA (1975) uses the cost-benefit analysis approach to optimum currency areas for analysing the pros and cons of joining a monetary union. These arguments can be applied to the problem of fixing the exchange rate in relation to an area, too. The benefits of joining a monetary union are: (1) elimination of costs of forward cover, (2) speculative capital flows are completely eliminated, (3) saving on exchange reserves and (4) acceleration of fiscal integration.

The most obvious costs are the following: (1) loss of autonomy in monetary policy, (2) some loss of autonomy in fiscal policy, (3) assuming that each country has its own particular Phillips curve, a common currency (or a fixed exchange rate) may imply worsening of the unemployment-inflation relationship as countries have to deviate from the nationally desired positions on their Phillips curves, and (4) possible deterioration of regional economies.

2.5. Models of optimal intervention

Since both fixed and flexible rates stabilize output only in special cases, it has been asked whether some intermediate arrangement could be better than these extremes. The models of optimal intervention follow this line of research. A simple intervention rule can be presented as follows: $m_t - \bar{m} = k(x_t - \bar{x})$, whereby the money supply (m) is varied in response to current changes in the exchange rates (x), with $\bar{m}$ and $\bar{x}$ denoting the equilibrium values of the variables. The intervention parameter k is infinite in the case of fixed rates and zero in the case of totally flexible rates (MARSTON, 1983).

A classic article in the field of optimal intervention is BOYER (1978). Boyer uses a simple IS-LM model, where he

assumes that intervention can take place in goods and/or asset markets. He shows that if both monetary and aggregate demand disturbances affect the economy, a limited degree of foreign exchange intervention is called for. The optimal degree of intervention depends on the relative importance of the two disturbances. If monetary disturbances alone affect the economy, a fixed rate is optimal, but if aggregate demand disturbances alone affect the economy, a flexible rate is optimal. (About other studies in this line of research see, for instance, EDISON, 1987 and MARSTON, 1983.)[7]

3. THE CHOICE OF AN OPTIMUM CURRENCY PEG

A country can choose to peg its currency based on many of the arguments dealt with in the previous chapter. The costs connected with exchange rate volatility and misalignments are one line of argumentation. A country can also peg its currency based on the theory of optimum currency areas. If it is estimated that domestic monetary disturbances are more important than real disturbances, some kind of pegging can be preferable on the grounds of the Mundell-Fleming analysis, too. Under less than perfect capital mobility this argument loses some of its strength and the choice of an exchange rate regime is no longer clear-cut. If both monetary and real disturbances are existent, the theory suggests some intermediate arrangement (BOYER, 1978). Wide bands and crawling pegs are, however, often rejected because of the danger of speculative crises connected with them.

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[7] The literature on wide bands, the crawling peg and target zones represents this kind of intermediate view on a more practical level. The theories of speculative attacks, in turn, are connected to the problems of maintaining the targets set for exchange rates.

After choosing to peg, a country has to find the optimal way to do that. A peg to a single currency can be chosen if economic ties to that country are close, or if foreign trade of a country is mainly priced in that particular currency. Other existing forms of pegging are to tie the currency to the SDR or to some currency composite (appendix 1). The EMS is a form of basket pegging, too: the currencies of the participating countries are tied to currencies of the most important trading partners. The EMS currencies, however, float against major outside currencies, mainly the dollar and the yen.

In this chapter we consider the determination of the optimal composition of the currency basket, when the aim is to minimize the effects of various disturbances on the economy. Following PIKKARAINEN (1986) we divide the existing literature into three categories: (1) real economy models, (2) models emphasizing monetary aspects, and (3) general equilibrium macroeconomic models.

3.1. The real economy models

The Multilateral Exchange Rate Model of the IMF is one type of real economy model. It is an econometric general equilibrium goods market model for 18 industrial countries, with oil producing countries and the rest of the world dealt with as aggregates. (See ARTUS & RHOMBERG, 1973 and ARTUS & McGUIRK, 1981.) The model and its parameter estimates have been constructed so that it describes the medium run (2-3 years) impacts of exogenous exchange rate movements on the balance of trade. In addition to foreign trade shares, the weights of the MERM basket take into account price elasticities of demand and supply.

LIPSCHITZ and SUNDARARAJAN (1980) study a small open economy, where the objective of the decision makers is to minimize the variance of the real exchange rate around its equilibrium level over some reference period. The authors derive optimal baskets on these grounds. They notice that the optimal weight of a currency differs from a MERM-like weight, because the variances and covariances of exchange rates and relative prices have an important effect on the real exchange rate, and weights in the optimal basket are chosen to maximize the contribution to stability.

FLANDERS and HELPMAN (1979) derive two kinds of optimal currency weights: (1) weights which minimize variation of the trade account due to exchange rate changes, and (2) weights which minimize the variance of the real domestic income, with the constraint that the expected real domestic income grows by a certain amount. In both cases the optimal weights depend in a complicated manner on the expected values of exchange rate changes, on the variance-covariance structure of exchange rate changes, on consumption and import elasticities, on price elasticities of imports, and on the values set for target variables. Weights of some countries can be negative, too.

BRANSON and KATSELI-PAPAEFSTRATIOU (1981) examine the choice for currency basket weights in a foreign trade model where a country can have market power both in export markets and in imports. The authors' objective is to minimize the effects of a third country's exchange rate changes on the following variables: (1) the terms of trade of the country, (2) the relative price of tradeable and non-tradeable goods, and (3) the trade balance. In all cases optimal weights are dependent on the market power in exports and imports and on the bilateral foreign trade shares. In minimizing variations of the trade balance the optimal

weights are similar to MERM weights, where price elasticities of foreign trade have importance, too.

NYBERG (1982) has used the same kind of model as Branson and Katseli-Papaefstratiou. A difference is that Nyberg takes into account the time horizon of the decision makers and the problems related to invoicing currency shares. Nyberg derives optimal currency basket shares by stabilizing the terms of trade. The weights depend mainly on bilateral foreign trade shares and on invoicing currency shares.

3.2. Models emphasizing monetary aspects

CONNOLLY (1982) considers a model where there are, in addition to the home country, two foreign countries. The home country is a small open economy. The domestic price level is a geometric average of import prices weighted by import shares. Changes in exchange rates reflect inflation differentials between countries according to the purchasing power parity. In both of the foreign countries the growth rate of the money supply determines the inflation rate. The output level is given.

Connolly derives optimal currency basket weights by minimizing the variance of the inflation rate. On the one hand, the weight of a currency should be the higher the larger is the import share of that country. On the other hand, the share should be the smaller the greater is the expected variance of the inflation rate. This means that a country where monetary conditions are unstable should have a rather small weight in the optimal currency basket.

3.3. General equilibrium macroeconomic models

General equilibrium macro models differ from the two above presented types of models by dealing with both real and monetary aspects. The first of this type of models is TURNOVSKY (1982), which considers a case of a small open economy with perfect capital mobility. Turnovsky's objective in deriving optimal weights is the stabilization of domestic real income. In his model the exchange rates of the small country vis-à-vis the rest of the world are determined endogenously, whereby international capital flows and exchange rate expectations (assumed to be rational) have a central role.

Turnovsky's small open economy trades with goods and bonds with two foreign countries, which together make up the rest of the world. Each country produces a single commodity, with the domestic good being an imperfect substitute for the two goods produced abroad. By contrast, the bond is assumed to be perfectly tradeable internationally, so that interest rate parity holds throughout the world. Only the domestic economy is described with structural equations. Foreign variables which affect the domestic economic development are dealt with as stochastic processes.

The optimal currency basket weights derived depend on the following influences: (1) the variance of the differential in foreign nominal interest rates, (2) the covariance between the foreign interest differential and the disturbances in the demand for domestic output, (3) parameters, which measure the effects of unit increases in foreign exchange rates on the real demand for domestic output. The last effects can be divided into two components: (a) the relative price effect, which depends on the price elasticities of demand for different

commodities, and (b) the effect that operates through the real interest rate.

In addition to the general model, Turnovsky analyses the optimum currency composition under some specific assumptions. An interesting case from the point of view of the previous analyses is a case where all goods' prices are given exogenously in the world market and where the foreign price levels are non-stochastic. If the objective is now to stabilize the domestic CPI, the optimal weight is the trade weight. However, as soon as the domestic economy is able to influence the price of the commodity, this result does not hold, and demand conditions in the market for that good become relevant.

Another important contribution to the general equilibrium approach is BHANDARI (1985). Bhandari's model differs from Turnovsky's mainly in that he constructs an explicit rest-of-the world submodel and solves it. The relevant solutions are then inserted into the domestic economy. In this kind of model the role of world economic parameters and structural variances in the determination of the domestic currency composite can be explored.

Bhandari uses four alternative optimality criteria: (1) stabilization of domestic output around its expected value, (2) stabilization of domestic output around its full information value (equivalent to minimization of the variance of domestic prices), (3) stabilization of domestic reserve (money) stock levels, and (4) stabilization of a domestic competitiveness index.

One of Bhandari's key concerns in his article is to compare the optimal currency shares derived under the above criteria with the simple trade weights commonly used in practice.

In this comparison Bhandari gets the following results: (1) except in a single razor edge case involving perfect symmetry worldwide, simple trade weights are never coincident with optimal weights derived under any optimizing criterion, (2) if foreign monetary disturbances dominate, the first three optimality criteria suggest a low weight for close trading partners, and (3) the simple trade weight criterion is insensitive to the relative size of foreign countries and to relative structural variances.

3.4. Conclusions from the optimal basket literature

One conclusion of the research surveyed above is that every country has its own optimal basket. The optimal weights depend on the size and on the structure of the economy, and thus on the way different disturbances are transmitted into the country and on what kinds of effects they have inside the economy. The mix of international disturbances facing an economy is country specific, too. Choice of a currency basket depends also on the objectives of the policy makers, which in turn differ between countries. Pegging to their own currency basket, as is the case in Finland, thus gets support from the research done.

Pegging by many countries to a single basket, for example to the SDR or the ECU, does not get support from the research surveyed. It is not, however, excluded that pegging to these kinds of composites could be optimal for an area consisting of many rather similar countries. A single country would then benefit from the externalities generated for the whole area. The net gain or loss compared to pegging to a country's own basket depends on the magnitude of the externalities and on how much the common basket differs from the optimal one. Sharing of the externalities would be an additional problem, because some countries would

obviously benefit more than others.

The second conclusion is that optimal baskets are sensitive to the objective functions of policy makers, with different criteria suggesting different weights.[8] The task of policy makers is then to choose between objectives, and perhaps to form a weight-structure which takes into account various objectives. A trade-weighted basket can, for instance, be interpreted to be a synthesis of weights minimizing variations in the competitiveness of the open sector (export shares) and of weights minimizing variations in domestic prices (import shares). In addition to the stabilizing effects realized through the structure of the basket, the policy makers have the option of limited flexibility inside the band, which can be used to neutralize short-term monetary disturbances originating from the international capital markets.

The third conclusion is that some weight-structures are difficult to operationalize. Weights that cannot be calculated exploiting the latest economic developments because of lack of data are problematic. An additional difficulty arises if weights are based on econometric estimations of historical data, because certain estimates are not necessarily stable in time. These kinds of difficulties have partly contributed to the use of foreign trade shares, which can readily be calculated.

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[8] About various weights calculated for Finland see PIKKARAINEN, 1986; see also appendix 2.

4. EUROPEAN INTEGRATION AND ITS FINANCIAL IMPLICATIONS

4.1 Creation of the European Internal Market

In 1985, the Commission of the European Communities (EC) launched its plan, the so-called White Paper, to create a single, internal market by 1992.[9] The plan calls for liberalization in the areas of goods, services, capital and labour. Liberalization is a continuation of the process towards economic and monetary union in Europe, as set out by the Treaty of Rome in 1957, when the European Economic Community (EEC) was created.

The liberalization began with the removal of quotas and tariffs in the trade of goods, leading to a rapid increase in intra-Community trade. In the 1970s, currency instability and oil shocks, among other events, delayed the integration process, but in the 1980s, it has revived again. Through the elimination of barriers in the trade of goods and services and through the liberalization of labour and capital movements, the aim is to create one of the world's largest single markets, comprising about one-third of world GNP. Likewise, the aim is to improve Europe's competitiveness vis-à-vis Japan and the United States. All this will be accomplished through directives based on the principle of deregulation, an enhanced role for competition and the concept of mutual recognition. Even if the enthusiastic aim could not be completed by 1992, the process will undoubtedly continue.

The financial sector is the one where the most radical changes of the 1992 plan may take place. There are three

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[9] The internal market plan and its financial implications have been dealt with in Economic Commission of Europe: European Economy 35 and 36, 1988.

key segments for deregulation of the financial industry: 1) the right to sell financial services across borders, 2) the right of financial firms to set up business in other member countries, and 3) the complete freedom of capital movement.

The EC Commission's programme laid down two phases for completing the liberalization of capital movements. The aim in the first phase is to achieve effective liberalization throughout the Community of the capital transactions most directly necessary for the proper functioning of the common market and for the linkage of financial markets. The second phase is aimed at achieving complete liberalization of all capital movements including all short-term or long-term banking and financial transactions, even those of a purely monetary or quasi-monetary nature not linked to commercial transactions (European Economy No 36, 1988, p. 9).

The EFTA countries have expressed their willingness to take part in the liberalization process to avoid the emergence of new hindrances between the EC and the EFTA countries and to benefit from and contribute to the dynamic integration process. Political considerations, however, prevent the EFTA countries from taking full part in the integration. The challanges of the economic cooperation between the two parties have got their expression in the creation of the concept "European Economic Space". Accordingly, the ongoing liberalization and integration process in Europe concerns directly all the 18 countries of the EC and EFTA.

4.2 Implications of the liberalization of capital movements

The Commission of the EC regards complete liberalization of the capital movements necessary for the proper functioning of the large internal market and an important step towards monetary unification. It will open a new phase in the development of the EMS and will be essential to strengthening monetary cooperation.

The removal of all restrictions on capital flows will undoubtedly increase the mobility of capital which, in turn, may lead to more sensitive interest and exchange rates. The impact on exchange rates will differ according to whether liberalization leads to a concentration of portfolios in one currency, or to a diversification between different currencies. The former will generally have a destabilizing and the latter a stabilizing effect. The impact of liberalization on exchange rates will also depend on the degree of asset substitutability. In theory, perfect substitutability between financial assets denominated in different currencies deprives monetary policy of all autonomy while imperfect substitutability leaves the authorities some margin of autonomy.

According to the theory of optimum currency areas the fixity of exchange rates is a crucial element for financial integration. The mobility of the factors of production- labour and capital - is one of the criteria used to define the optimum currency area. According to that theory, greater capital mobility within the EC countries thus increases the optimality of the European monetary area.

In principle, the EMS is a fixed but adjustable exchange rate system. The EMS countries, however, operate in a flexible exchange rate system vis-à-vis the world major

currencies such as the US dollar, the yen and the pound sterling. Until now, the EMS has functioned with imperfect capital mobility and limited economic policy coordination. In the future, the stability may require tighter coordination of economic policies, and particularly of monetary policy. That may be necessary to counter potential increased tensions within the EMS, resulting from the full liberalization of capital movements. Tightening coordination is likely to mean a tendency for nominal interest rates to equalize.

According to the Mundell - Fleming model, in a system of fixed exchange rates, monetary policy has very little independence. Consequently, participation in the EMS exchange rate system involves a restriction on the management of monetary policy, which varies in severity according to the country's economic power and size. Empirical experience confirms that membership of the EMS involves an almost total loss of monetary policy autonomy in the smaller EC countries. At present one central bank (Deutsche Bundesbank) establishes the common reference for the conduct of monetary policies in the EC and takes on the responsibility of managing relations between the system and major third countries. Full liberalization of capital movements will therefore mean a relative loss of national autonomy as far as economic policy is concerned.

5. IMPLICATIONS FOR FINLAND'S EXCHANGE RATE REGIME

5.1. Finland's present currency index

As indicated in chapter 3, there seems to be no clear-cut and objective theoretical grounds in the choice of the currency basket for favouring one particular weighting

structure to the exclusion of all others. After all, the weighting structure adopted has to coincide with the objectives of economic policy.

In Finland, as in Norway and Sweden, the international competitive position of the economy has been the chief consideration when choosing the currency composition of the official currency basket (PURO, 1978, ÅKERHOLM, 1987, EDISON and VÅRDAL, 1987). The rationale behind this has been that by maintaining, on average, a stable foreign exchange relationship vis-à-vis the most important trading partners, the competitive environment would remain as stable as possible. Besides the official index, several types of currency indices, i.e. MERM- and payments-weighted indices, have been constructed over the years. (For various indices, see charts in the appendix).

The weights in the official currency basket are determined on the basis of the structure of Finland's merchandise trade in convertible currencies. A prerequisite for a country to be included in the index is that its trade share has been not less than one per cent during each of the preceding three full calender years. The weights are calculated on the basis of two-year moving averages and, in practice, they are altered every time new quarterly trade figures become available.

At the time of writing, in October, 1988, the official currency basket contains 12 currencies (see appendix 2), in 1977 the corresponding figure was 18. The countries whose currencies are included in the index account for about 85 per cent of Finland's western trade. The Swedish krona has the largest individual weight, making 20.6 per cent of the basket. The share of the Deutschemark is almost as large, 19.9 per cent. The currencies participating in

the European Monetary System (EMS) account for 44.6 per cent of the currencies. If allowance is made for the fact that the Swiss franc has, in practice, closely followed the EMS currencies, the effective weight of the EMS currency area is 47.3 per cent. The weight of the British pound is currently 13.4 per cent, the weight of the US dollar 7.8 per cent and the weight of the Japanese yen 6.0 per cent.

Norway and Sweden apply the same kind of trade-weighted currency baskets as Finland. Given the fixed exchange rate target in these three countries, SEK and NOK can be eliminated from the FIM-basket and the basket calculated on the basis of the outside currencies included in the basket. Such an exercise raises the weight of the "European currency area" (EMS + Swiss franc) to around 60 per cent in the FIM-basket.

The Finnish currency index has a fluctuation range of 6 per cent (since 30.11.1988). By international standards, the external value of the Finnish markka has been rather stable during the last ten years; the markka has been officially both devalued and revalued (fluctuations limits have been changed) twice (appendix 3). All in all, the markka has weakened by some 12 per cent against the official currency basket since 1977.

5.2 Pressures for changing the regime

As the process of European integration proceeds Finland's economic relations with the EC will grow tighter. The share of the EC countries in Finland's foreign trade, at present 40-45 per cent, can be expected to increase. As a result of liberalization, the importance of the trade of services is likely to increase, too. Also, the markets of

the factors of production will integrate. Liberalization of capital movements and financial services will tighten the financial linkages between the two areas. In these circumstances, coordination and harmonization of economic policies with the EC will become more important than has been the case so far.

Accordingly, there is undergoing a gradual but noticeable change in Finland's economic environment. The existing situation can be characterized as follows: (1) a small economy, (2) openness on par with European average, (3) foreign trade relatively concentrated on European (EC and EFTA) markets, (4) pressure for the liberalization of financial and other services, (5) domestic financial markets largely liberalized, (6) gradually deregulated movements of foreign capital and pressure for removing the remaining obstacles, and (7) fully integrated labour markets between the Nordic countries and pressure for the liberalization of labour movements with the EC. With tightening economic relations - especially, in the field of the factors of production - with the EC, we can ask if any changes in the present exchange rate regime should become necessary.

5.2.1. Fixed or flexible exchange rates

In principle, the first question to be answered in choosing the optimal exchange rate regime for Finland in the new circumstances is whether Finland should continue with a fixed exchange rate regime, however it may be defined, or should she shift to a flexible or floating exchange rate system.

The theoretical analysis surveyed in chapter 2 does not give a clear-cut answer to this problem. On the basis of the simple version of the Mundell-Fleming model, the choice

culminates in the nature of the disturbances facing the economy. If monetary disturbances are more important than real disturbances in the Finnish economy, then fixed exchange rates would be preferable if output is to be stabilized. If real disturbances are predominant, flexible rates are preferable. The nature of the likely disturbances in the new circumstances cannot, however, be assessed reliably ex ante, even if past developments would give some indication.

Some empirical studies lend support to the choice of a fixed rate regime. AURIKKO (1988) concluded that according to his simulation results none of the exchange rate regimes (fixed, flexible, floating) insulates the Finnish economy from all the shocks studied (foreign price, demand and interest rate shocks, and domestic money supply shock), and if real shocks dominate in the short run and monetary shocks in the long run, some support for the present Finnish exchange rate policy was given.

HELLER (1978) studied the exchange rate arrangements of 86 IMF countries to identify the most important characteristics, which will help to predict whether a particular country will be a floater or a pegger. Based on a hypothesis given by the theory of optimum currency areas and using the statistical technique of discriminant analysis he derived the following characteristics for a floater: (1) a large GNP, (2) a low degree of openness, (3) a high inflation differential, (4) a high degree of international financial integration, and (5) a low trade concentration. The characteristics of a pegger are, correspondingly: (1) a small GNP, (2) a high degree of openness, (3) a small inflation differential, (4) a low degree of international financial integration, and (5) a high trade concentration.

Structural characteristics of the Finnish economy and tighter integration with the EC speak in favour of the continuation of the fixed rate regime. Furthermore, as Finland has aimed at fixity in the world of floating rates by pegging to a basket, the rejection of that principle in new, uncertain conditions might have adverse effects on the credibility of economic policy in general.

5.2.2. Alternative ways of pegging

If the fixed rate regime is likely to be continued, the task is to evaluate the optimal basket against which to peg the currency. As in the choice between fixed and flexible rates, various disturbances facing the country, together with the structure of the economy and the objectives of the policy makers, are one guideline for the choice of the optimal currency basket. However, the nature and magnitude of the shocks in the new circumstances- whether domestic or foreign, monetary or real - are not known ex-ante. Therefore, the choice of the optimal basket cannot be reliably based on these criteria. The choice of the basket on the basis of, e.g., monetary shocks would lead to suboptimal exchange rate behaviour in the case of real shocks.

The theory of the optimum currency areas might provide additional criteria. Finland's further integration with the EC will obviously satisfy many of the conditions which are thought to increase the feasibility of exchange rate fixity with a certain area. High factor mobility is an essential element in the theory of optimum currency areas. The choice of the exchange rate regime on the basis of that theory is not, however, clear-cut, as indicated by the critics against this theory in chapter 2.4.

In choosing a basket which would take into account Finland's tightening integration with the EC, there are, in principle, three alternatives:

1. Participation in the exchange rate mechanism of the EMS.

2. Pegging the markka to the ECU currency basket.

3. Increasing the weight of the currencies of the EC countries in the present currency basket.

Each of these alternatives has its pros and cons, which are dealt with in the following.

1. Finland's participation in the exchange rate mechanism of the EMS would be the most ambitious of the three alternatives in the economic policy sense. With exchange rate realignments inside the EMS being delayed and insufficient in correcting weakened competitiveness, it would oblige Finland's macro-economic policies to follow the anti-inflationary policies of the Deutsche Bundesbank. Joining the EMS would thus deprive economic policy, especially monetary policy, of almost all of its autonomy. The change of emphasis in policy targets might be, however, politically unacceptable. Economic policies required by the inflationary discipline of the EMS might, for instance, lead to a deviation from a nationally preferable inflation-employment relationship. Real exchange rate changes, possibly needed for maintaining the so-called equilibrium exchange rate, would also be prohibited or delayed. The advantage of tying one's hands could thus prove less than the immediate costs (see GIAVAZZI & PAGANO, 1988). Especially in the transition period to the new circumstances, economic policy autonomy might be called

for. If membership in the EC is a precondition for joining the EMS, this alternative is excluded for political reasons.

2. Pegging the markka to the ECU currency basket would mean a major change in the composition of the basket, but would leave the Finnish authorities the power to change the value of the markka vis-à-vis the basket, if necessary. Factors which speak in favour of the pegging to the ECU are a) increasing factor mobility (capital and labour), b) higher degree of financial integration, c) economic policy integration is tightened by the creation of the "European Economic Space", d) more exchange rate stability with the EMS countries. On the other hand, there are factors which are against pegging to the ECU: a) the ECU is not an optimal basket for Finland (the optimal basket is unique for each country), b) pegging to the ECU would not contribute to stabilizing competitiveness in non-EC markets, c) the ECU basket differs substantially from a basket stabilizing the balance of trade (measured with a MERM-like index), d) importance of the US dollar as an invoicing currency (with implications for price stability and for the profitability of the exporting and importing firms), e) need for policy coordination with the EMS countries might increase, which in turn would reduce the autonomy of economic policy, f) if the automatic stabilizing properties of the ECU basket would prove inadequate, this could lead to more frequent exchange rate or economic policy adjustments.

3. Increasing the weight of the EC countries in the present index offers one solution to adjust the exchange rate regime to correspond better to changing conditions. The rise of the share of the EC countries in Finland's foreign trade of goods will, in fact, be automatically taken into account in the basket. Supplementing the currency index by the trade of services should be considered, if the

importance of services in Finland's total trade clearly increases as a result of liberalization. Increasing the weight of the EMS currencies by more than what their share is in Finland's foreign trade would, however, be inconsistent with the adopted competitiveness and import and export price stability criteria. The share of the EMS currencies (including indirect effects) is already about 60 per cent. Yet, the problem is, how to take the integration of the factors of production into account in the basket.

6. CONCLUDING REMARKS

Finland's participation in deepening European integration will mean a considerable change in her economic policy environment. As a result of the liberalization of capital movements and financial services, sensitivity to interest and exchange rate changes will increase. To maintain stability in financial and foreign exchange markets, closer coordination of economic policies in general is called for.

The integration of Finland's foreign trade and factor markets with the EC will cause pressure to adjust Finland's exchange rate regime to changing conditions. Theoretical considerations do not give a clear-cut answer to the choice of the optimal regime. However, the structure of the Finnish economy, tightening integration of the factor markets and the continuity of the exchange rate policy followed speak in favour of the continuation of the fixed rate regime.

The choice of the optimal peg is not clear-cut either. The dominance of various disturbances facing the economy cannot be reliably assessed ex ante, so that the choice of the optimal basket to peg against cannot be based on this

principle. Some of the criteria of the theory of optimum currency areas suggest pegging the markka to the EC currencies. In principle, there are three alternatives available: participation in the exchange rate mechanism of the EMS, pegging independently to the ECU basket and increasing the share of the EMS currencies in the present basket.

The first alternative would tie Finland closely to European monetary integration and would substantially reduce the autonomy of domestic economic policy. If membership in the EC is a prerequisite for participation in the EMS mechanism, this alternative would obviously be rejected as incompatible with the Finnish neutrality policy, too. Therefore, a more realistic alternative to be considered is pegging the markka to the ECU currency basket. This would not, however, be compatible with the competitiveness and foreign trade price stability criteria adopted so far, leaving, for example, the US dollar outside the currency basket. The ECU basket is a generic basket and as such not optimal for Finland according to any other optimality criteria, either.

The third alternative, increasing the weight of the EMS currencies in the present basket might be the most feasible way to put more emphasis on the European integration process, especially on increasing factor mobility. A problem with this solution is how to measure the appropriate weight of this process. Even if the importance of factor mobility could somehow be measured and weighted, this criterion obviously would not, at the moment, speak in favour of increasing the share of the EMS currencies, but rather in favour of a greater weight for the currencies of the other Nordic countries, with which Finland has an integrated labour market. Enhancing European integration would,

however, increase the importance of the EC ountries' factors of production market for the Finnish economy.

All in all, in the transition period towards more sensitive capital and foreign exchange markets, it might be preferable to maintain a regime which is a continuation to the adopted fixed rate system and which retains some economic policy independence for the authorities. Further increase in flexibility within the fixed rate regime might, however, be necessary for stabilizing disturbances which may appear in the market as a result of liberalization of capital movements.

At the moment there does not seem to be any need for changing the existing currency basket. The need for change might, however, become more urgent, if, for instance, other EFTA countries joined the EMS or pegged to the ECU, or if the importance of the US dollar for the Finnish economy substantially decreased. This would correspondingly mean increased importance for the EMS currencies. Therefore, freedom to change the regime, if necessary, should be retained.

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Exchange Rate Arrangements

(As of March 31, 1988)[1]

Currency pegged to					Flexibility Limited in terms of a Single Currency or Group of Currencies		More Flexible		
US Dollar	French Franc	Other currency	SDR	Other composite[2]	Single currency[3]	Cooperative arrangements[4]	Adjusted according to a set of indicators[5]	Other managed floating	Independently floating
Afghanistan	Benin	Bhutan (Indian Rupee)	Burma	Algeria	Bahrain	Belgium	Brazil	Argentina	Australia
Antigua & Barbuda	Burkina Faso	Kiribati (Australian Dollar)	Burundi	Austria	Qatar	Denmark	Chile	China, P.R.	Bolivia
Bahamas, The	Cameroon	Lesotho (South African Rand)	Iran, I.R. of	Bangladesh	Saudi Arabia	France	Colombia	Costa Rica	Canada
Barbados	C. African Rep.	Swaziland (South African Rand)	Jordan	Botswana	United Arab Emirates	Germany	Madagascar	Dominican Rep.	Gambia, The
Belize	Chad	Tonga (Australian Dollar)	Libya	Cape Verde		Ireland	Portugal	Egypt	Ghana
Djibouti	Comoros		Rwanda	Cyprus		Italy		Greece	Guinea
Dominica	Congo		Seychelles	Fiji		Luxembourg		Guinea-Bissau	Japan
Ecuador	Côte d'Ivoire			Finland		Netherlands		Iceland	Lebanon
El Salvador	Equatorial Guinea			Hungary				India	Maldives
Ethiopia	Gabon			Israel				Indonesia	New Zealand
Grenada	Mali			Kenya				Jamaica	Nigeria
Guatemala	Niger			Kuwait				Korea	Philippines
Guyana	Senegal			Malawi				Mauritania	South Africa
Haiti	Togo			Malaysia				Mexico	Spain
Honduras				Malta				Morocco	United Kingdom
Iraq				Mauritius				Pakistan	United States
Lao P.D. Rep.				Nepal				Singapore	Uruguay
Liberia				Norway				Sri Lanka	Zaire
Mozambique				Papua New Guinea				Tunisia	
Nicaragua				Poland				Turkey	
Oman				Romania				Yugoslavia	
Panama				Sao Tome & Principe					
Paraguay				Solomon Islands					
Peru				Sweden					
St. Kitts & Nevis				Tanzania					
St. Lucia				Thailand					
St. Vincent				Vanuatu					
Sierra Leone				Western Samoa					
Somalia				Zimbabwe					
Sudan									
Suriname									
Syrian Arab Rep.									
Trinidad and Tobago									
Uganda									
Venezuela									
Viet-Nam									
Yemen Arab Rep.									
Yemen, P.D. Rep.									
Zambia									

Classification status[1]	End of Period													
				1985		1986				1987				1988
	1982	1983	1984	QIII	QIV	QI	QII	QIII	QIV	QI	QII	QIII	QIV	QI
Currency pegged to														
US Dollar	38	33	34	31	31	31	31	31	32	33	34	35	38	39
French Franc	13	13	13	14	14	14	14	14	14	14	14	14	14	14
Other Currency	5	5	5	5	5	5	5	5	5	5	5	5	5	5
of which: Pound Sterling	(1)	(1)	(1)	(1)	(1)	(–)	(–)	(–)	(–)	(–)	(–)	(–)	(–)	(–)
SDR	15	12	11	12	12	12	10	10	10	10	10	9	8	7
Other currency composite	23	27	31	33	32	32	33	31	30	27	27	27	27	29
Flexibility limited vis-à-vis a single currency	10	9	7	5	5	5	5	5	5	5	4	4	4	4
Cooperative arrangements	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Adjusted according to a set of indicators	5	5	6	5	5	5	5	6	6	6	5	5	5	5
Managed floating	20	25	20	20	21	21	21	20	21	22	24	24	23	21
Independently floating	8	8	12	15	15	16	18	20	19	20	19	19	18	18
Total[6]	146	146	148	149	149	150	151	151	151	151	151	151	151	151

[1]Excluding the currency of Democratic Kampuchea, for which no current information is available. For members with dual or multiple exchange markets, the arrangement shown is that in the major market.

[2]Comprises currencies which are pegged to various "baskets" of currencies of the members' own choice, as distinct from the SDR basket.

[3]Exchange rates of all currencies have shown limited flexibility in terms of the U.S. dollar.

[4]Refers to the cooperative arrangement maintained under the European Monetary System.

[5]Includes exchange arrangements under which the exchange rate is adjusted at relatively frequent intervals, on the basis of indicators determined by the respective member countries.

[6]Including the currency of Democratic Kampuchea.

Source: International Financial Statistics, July 1988.

APPENDIX 2

WEIGHTS OF EXCHANGE RATE INDICES FOR FINLAND CORRESPONDING TO DIFFERENT TARGETS, %

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Great-Britain	13.4	-1.5	23.1	12.7	3.2	11.4	14.2
Japan	6.0	-4.4	-0.8	9.4	15.9	2.2	-
Switzerland	2.7	12.7	-1.3	2.6	1.4	2.6	-
USA	7.8	-2.5	11.7	8.0	27.9	28.0	-
Norway	4.9	17.3	8.8	3.2	3.6	3.0	-
Sweden	20.6	69.9	31.6	18.2	9.7	16.2	-
The Netherlands	4.9	53.1	1.1	4.0	1.6	3.5	10.5
Belgium	3.2	-	-1.7	2.8	2.0	1.6	8.4
Italy	4.9	-9.4	2.6	6.6	5.2	2.0	9.5
France	6.7	-8.1	4.5	5.1	7.2	4.5	19.0
West-Germany	19.9	-24.1	14.1	22.8	14.0	22.4	33.3
Denmark	5.0	-	6.3	4.6	1.5	2.7	2.7
Austria	-	-	-	-	1.9	-	-
Canada	-	-	-	-	4.9	-	-
Luxembourg	-	-	-	-	-	-	0.3
Ireland	-	-	-	-	-	-	1.2
Greece	-	-	-	-	-	-	0.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(1) Foreign trade shares (official basket), 13.9.1988.

(2) Weights minimizing the variance of foreign reserves. Source: LEHMUSSAARI, O.-P. (1987) Valuuttakurssiepävarmuus ja valuuttavarannon sijoittaminen. Bank of Finland, D:64.

(3) Weights minimizing the variance of production. Source: PIKKARAINEN, P. (1986) valuuttakurssi-indeksin painot ja kokonaistaloudelliset tavoitteet. Bank of Finland, D:62.

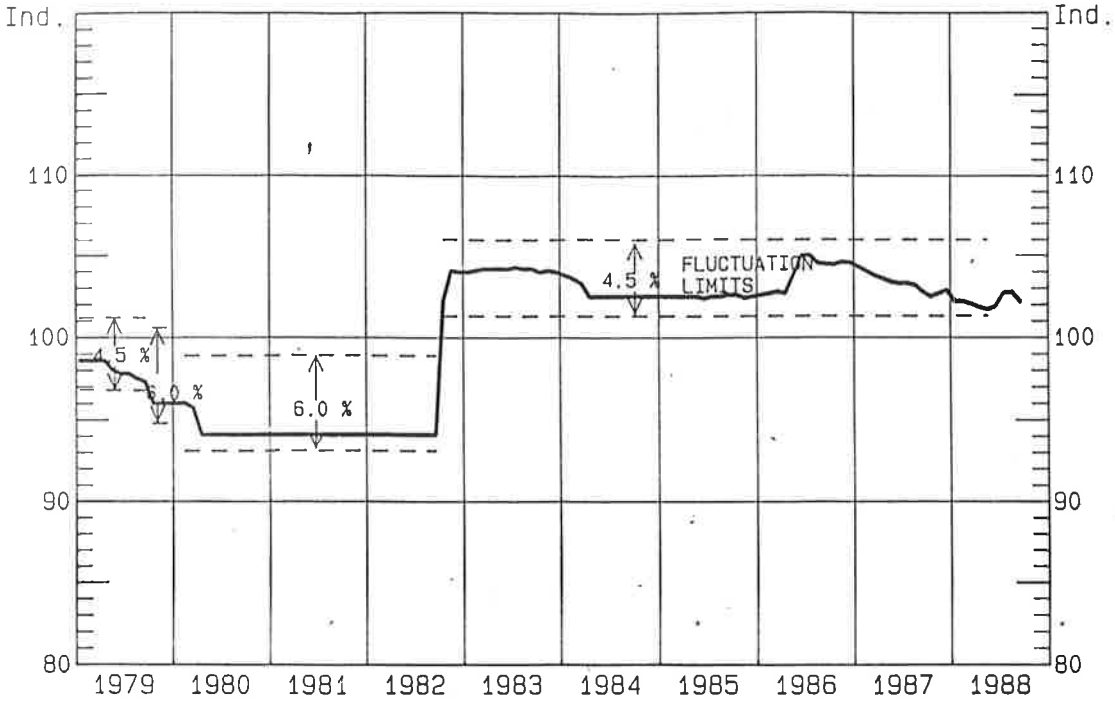
(4) Weights minimizing the variance of domestic prices. Source: see above.

(5) MERM-weights. Source:IMF.

(6) Payments currency -weights, 1.1.1987.

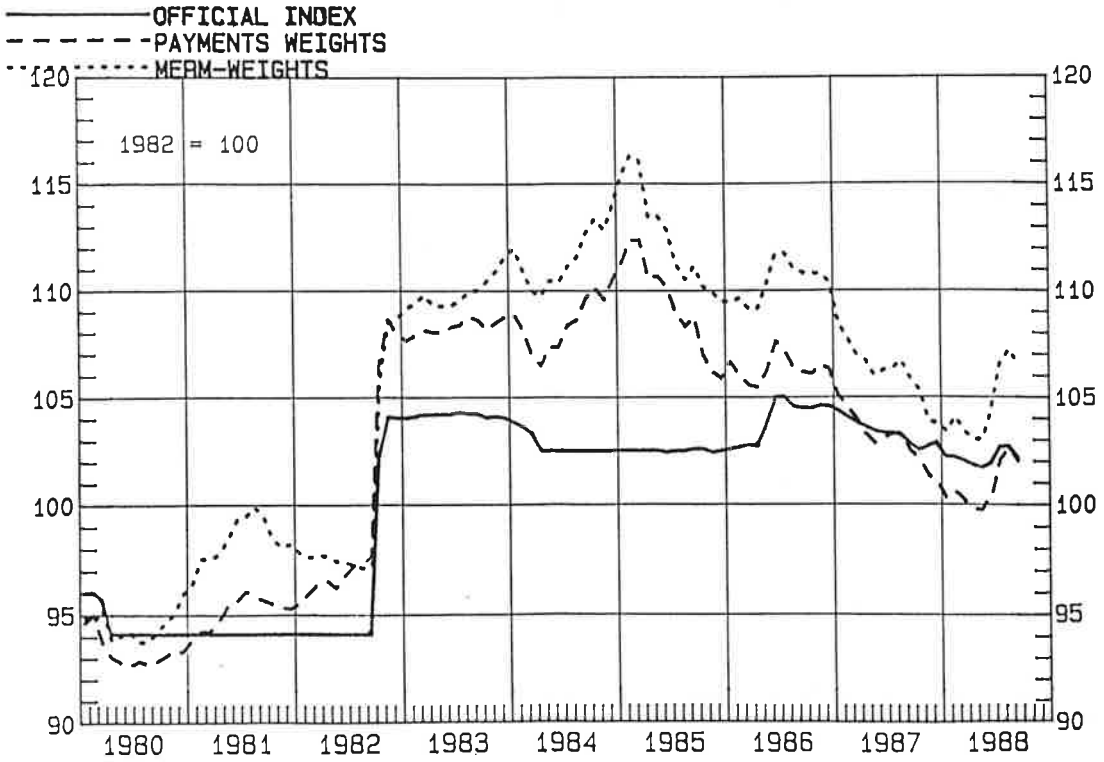
(7) ECU-weights, 7.4.1986.

BANK OF FINLAND CURRENCY INDEX (1)

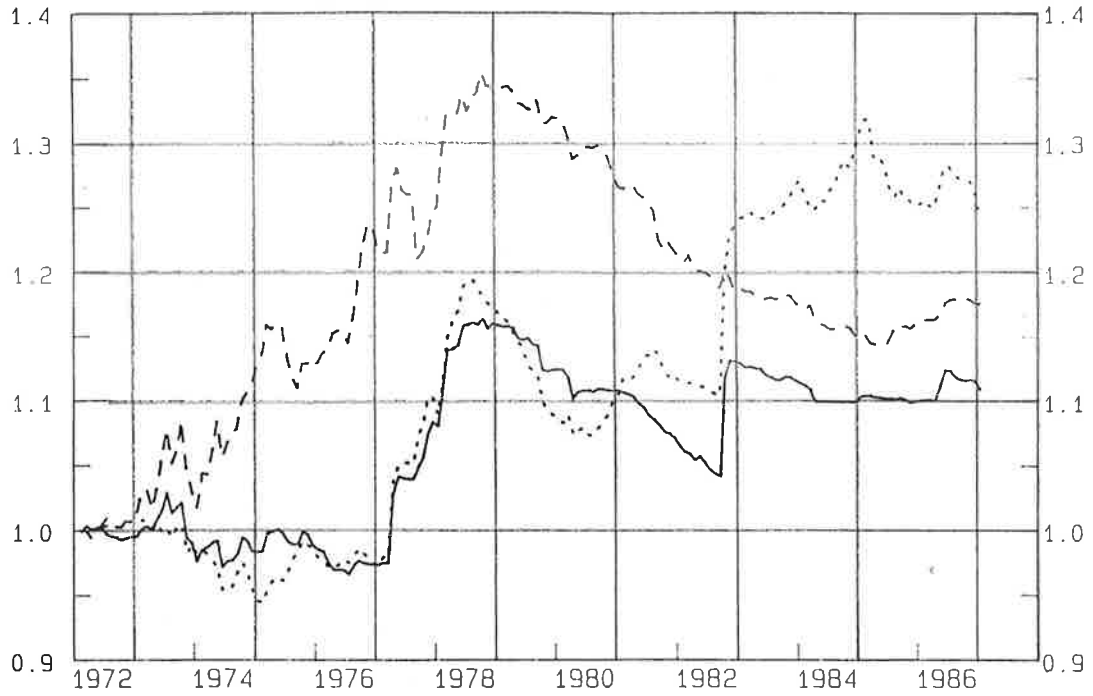


1) MONTHLY AVERAGE

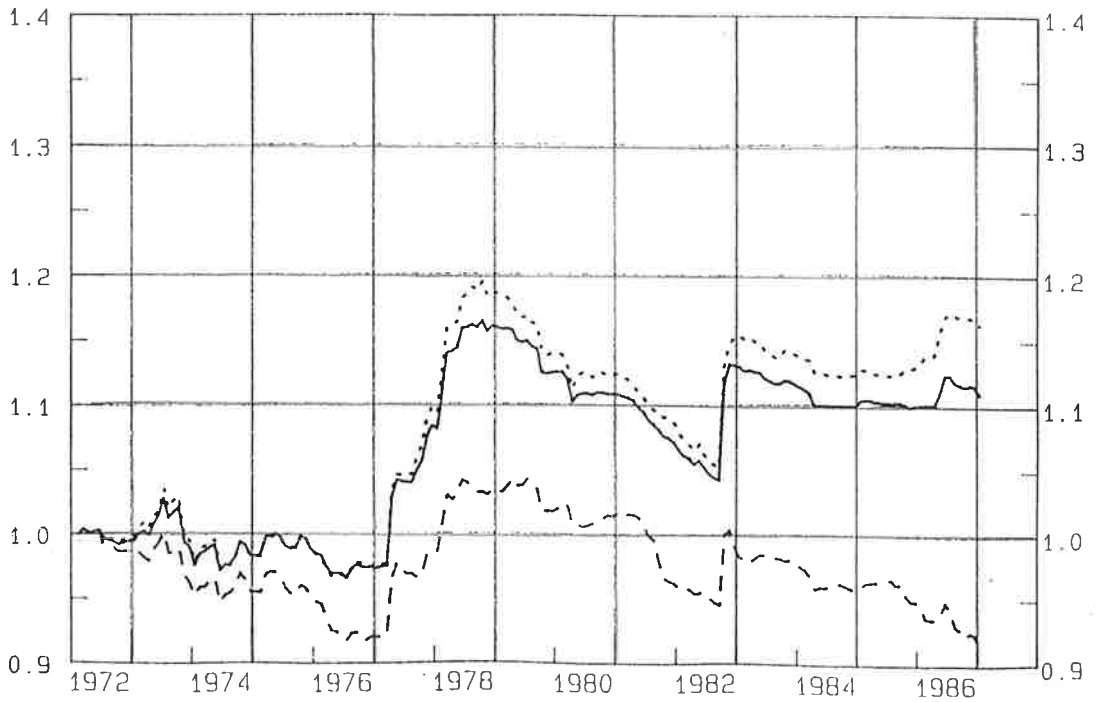
EXTERNAL VALUE OF THE FINNISH MARKKA



NOMINAL EXCHANGE RATE INDICES
———— Foreign trade shares
- - - - - - Weights minimizing the variance of foreign reserves
····· MERM-weights

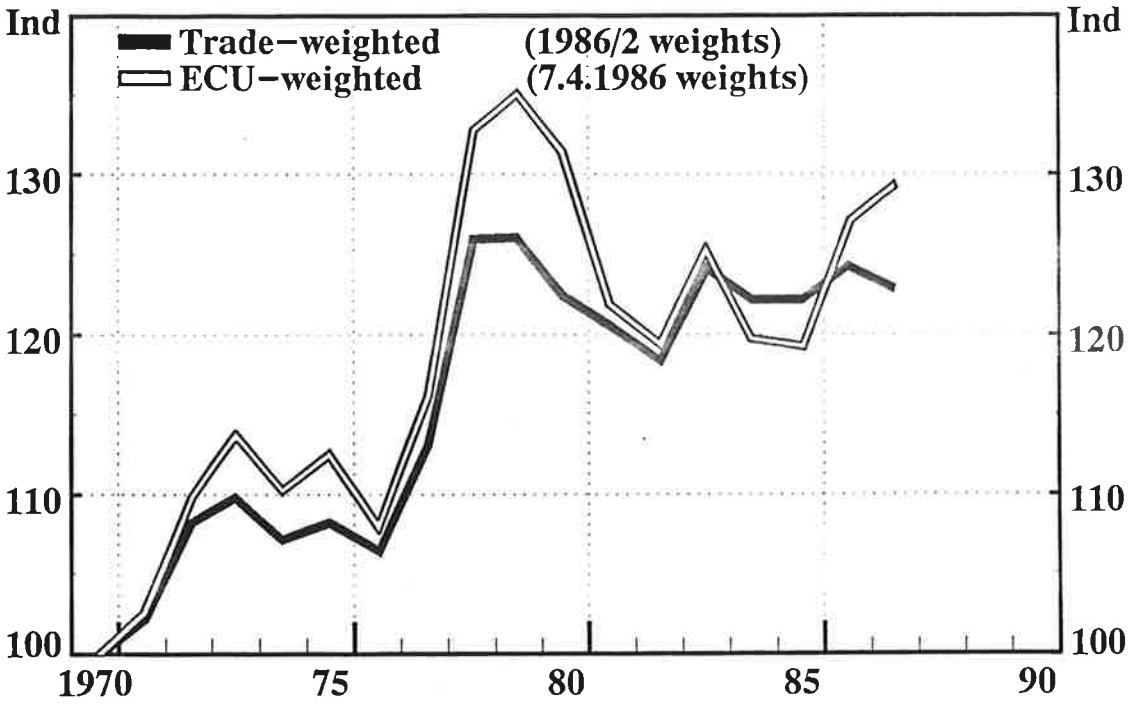


NOMINAL EXCHANGE RATE INDICES
———— Foreign trade shares
- - - - - - Weights minimizing the variance of production
····· Weights minimizing the variance of domestic prices

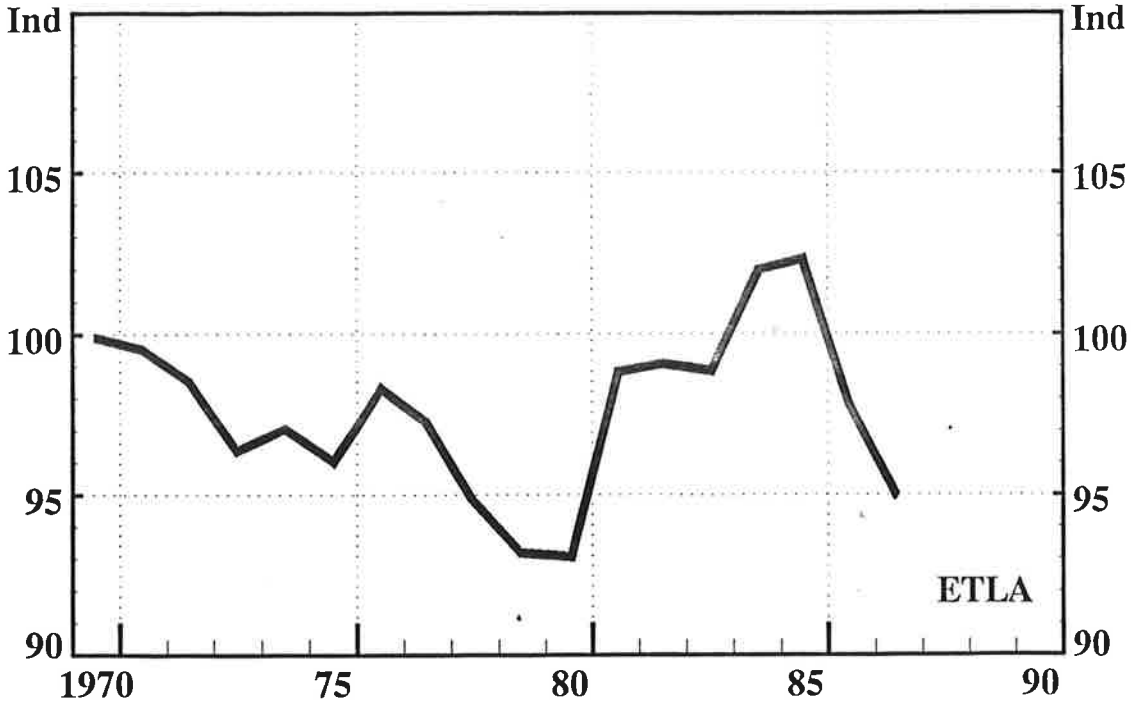


Source of figures (appendices 3 and 4): Bank of Finland.

Trade- and ECU-weighted exchange rate indices for Finland



Relation of the trade-weighted index to the ECU-weighted index 1)



1) When the curve has a negative slope, this means that the ECU index would be devalued more than the trade-weighted index. Thus, if the ECU index were fixed, the trade-weighted index would be revalued more, ceteris paribus, and vice versa.

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