Patterns of Financial Change in the OECD Area *

HENK VAN GEMERT and NOUD GRUIJTERS

1. Introduction

During the last two decades the international financial environment has changed dramatically. The gradual removal of capital controls, the deregulation of financial markets and the advanced information technology have strongly improved the conditions for international borrowing and lending in industrial countries. As a result financial markets have become increasingly integrated and capital mobility reached unprecedented levels. This paper measures the degree of financial change over this period by studying interest rate differentials across OECD countries. Since interest rates and exchange rates are strongly interconnected, we divide the OECD-area into two regions. In the 'FixWorld' the authorities participate in a currency arrangement, whereas in the 'FlexWorld' exchange rates are left free.

The analytical framework of our analysis is presented in Section 2. A portfolio approach is followed to cluster the various determinants of capital mobility into yield variables, risk premiums and regulatory barriers. This approach is elaborated for three different regimes, representing three 'states of the world' with respect to the nature and degree of financial change. Each regime is translated into

□ Tilburg University, Economics Department, Tilburg (The Netherlands).

* We are grateful to Jacques Sijben and Sjak Smulders and to an anonymous referee of this *Review* for helpful comments on an earlier version of the paper. Of course the usual disclaimer applies.

a specific hypothesis about the interdependence of national interest rates. In Section 3 the paper proceeds with an empirical analysis of these hypotheses, both for the FixWorld and the FlexWorld. The results are discussed against the background of some institutional changes in the countries concerned. Section 4 examines the policy implication of our analysis and Section 5 concludes.

2. Theoretical framework

Global financial change can manifest itself in different shapes. This section illuminates the conceptual distinction between three related but different patterns: financial integration, asset substitution and monetary integration. A portfolio approach can clarify the nature and the characteristics of each. Here we will restrict ourselves to a verbal description of the model; a more formal exposition is presented in the Appendix.

In the model a representative investor can diversify his financial wealth between two instruments. One asset is issued at home and denominated in the domestic currency. The other is issued abroad and expressed in a foreign currency. Other asset characteristics such as liquidity, term to maturity and default risk are assumed equal. Hence, the assets differ only in two aspects: the currency denomination and the national jurisdiction in which they are issued. One may think here of government bonds or money market funds.

In general, portfolio decisions are guided by expected returns, risk perception and environmental factors like legislation, communication systems and market structure. It is useful to elaborate on this by separating the investment decision into two analytical steps. In the first step the *preferred* portfolio is determined. This preferred portfolio is an expression of the investors' *willingness* to hold foreign and domestic assets in a certain proportion. In the second step the investor tries to bring his *actual* portfolio in line with the preferred one. Hence, the actual portfolio also reflects the *ability* of the investor to realize his preferences.[1]

[1] *Cf.* Kenen (1976), Akthar and Weiller (1987) or Bovenberg and Goulder (1991).

The first step is a theoretical device. Here, the investor is assumed to determine his optimal – *i.e.* return/risk maximizing – portfolio *as if* there are no imperfections in the asset markets. In such a smoothly operating world the investor sets the desired portfolio-shares in response to the expected returns on foreign and domestic assets given the degree of substitutability between them. The latter is a function of the investor's subjective risk aversion on the one hand, and the assets' objective risk characteristics on the other. Since the two financial instruments are issued in different currencies and under different legal jurisdictions we discern two risk characteristics. A currency risk results from the fact that the *expected* future course of the exchange rate, and thus the return on foreign assets, is subject to uncertainty. Next, a political risk is involved because the investor might lose control over his investment abroad if *future* exchange restrictions will limit the repatriation of funds.

Whenever the perceived risks on foreign assets increase the degree of substitutability declines. In such a situation, the preferred portfolio-share of foreign assets will diminish unless a rise of the expected relative return compensates for the deteriorated risk exposure. In equilibrium this rise reflects an increase in the required risk premiums.

The second step of our approach includes the adjustment of the actual to the preferred portfolio. In principal all kinds of real world market-imperfections hampering portfolio decisions could be built into the model. Here we focus on financial obstacles, especially exchange controls on international capital flows.

Broadly speaking, countries can resort to direct or to indirect regimes of capital control. *Indirect* controls discourage foreign investment by official price regulations. One example is that the authorities apply a cash deposit requirement to capital outflows; another is that interest payments from abroad are subjected to an interest rate ceiling or to a withholding tax. These measures are cost-based and influence the *net* relative yield on foreign assets. The impact of *direct* controls is quite different. In a world with direct regulations investors are not able to bring the actual portfolio in line with the preferred one immediately. In essence, quantitative restrictions delay or in the extreme case even preclude capital movements. If the controls are effective investors are temporary forced to settle with a suboptimal portfolio carrying an undesired return/risk profile.

Aggregating the actual demand of all investors and assuming that the supply of assets is exogenous, the model generates a semi-reduced form for the difference between the foreign and the domestic interest rate. This differential ($i_f - i_d$) turns out to be determined by:

– the expected depreciation rate of the foreign against the domestic currency (EDEP),

– the required premiums for the perceived currency risk (CUR) and the perceived political risk (POR), and

– a regulatory (REG) differential which is due to indirect and direct capital controls.

For the purpose of exposition we denote

$$i_f - i_d = \text{EDEP} + \text{CUR-premium} + \text{POR-premium} + \text{REG-differential.}$$

This *basic equation* summarizes the model; it will be used to deduce three parity conditions, describing three different regimes of the international economy: financial integration, asset substitution and monetary integration. The regimes differ as to the attached values of right-hand side determinants.

Regime 1: financial integration

We define financial integration as a process by which all environmental obstacles to asset trade disappear. This includes the abolition of both direct and indirect capital controls. In a world of *perfect* financial integration the return on foreign assets is not affected by price regulations and the actual portfolio is allowed to adjust instantaneously to any desired change. Under such circumstances the regulatory differential in the basic equation has lost its role.

If the authorities' action of lifting capital controls is credible, the political risk of holding foreign assets will undoubtedly diminish. As financial integration proceeds we might expect the POR-premium to disappear. It is important to note, however, that the decision to diversify internationally can still be hampered by a perceived currency risk.

In short, perfect financial integration means that the basic equation can be reduced to hypothesis (1):

$$(1) \qquad i_f - i_d = \text{EDEP} + \text{CUR-premium.}$$

Regime 2: asset substitution

In a financially integrated world domestic and foreign assets remain imperfect substitutes, notably because the exchange rate cannot be predicted with certainty. To proceed to a world of perfect substitutability, it is necessary that investors lose their risk aversion. Only if this condition is met the substitution parameter becomes infinite and the CUR-premium drops out of the model. Hence, perfect asset substitution means that the international interest rate differential only reflects *expected* exchange rate changes, or

$$(2) \qquad i_f - i_d = \text{EDEP.}$$

The interpretation of hypothesis (2) is based on arbitrage. With investors both able and eager to exploit all investment opportunities the actual portfolio is completely elastic to the *expected* return differential. The slightest deviation provokes a demand surplus in the market for the higher-yielding asset and a supply surplus in the market for the low-yielding asset. In equilibrium the expected returns on foreign and domestic assets will be equalized and the arbitrage process results in uncovered interest rate parity.

Many textbooks use the condition of uncovered interest rate parity to typify perfect capital mobility.[2] This implies that instantaneous adjustment and asset substitution are not interpreted as different phenomena. Indeed, in a theoretical world with perfect foresight or without uncertainty, both regime definitions are identical. In our more *empirical* approach however, we prefer to draw a distinction between the concepts of mobility and substitution, reflecting respectively the ability and the willingness of investors to diversify their portfolios internationally.[3]

---

[2] See *e.g.* Dornbusch (1980, p. 176).

[3] For other ways to distinguish between financial integration and asset substitution see Kenen (1976, p. 20) or Golub (1990, p. 425).

Regime 3: monetary integration

The third regime we would like to present refers to the process of monetary integration which we define as the combination of financial integration *and* the gradual disappearance of exchange rate changes. Clearly, this regime refers to western Europe, where a zone of monetary stability has been a high priority ever since the foundation of the European Community in 1958.

We will call monetary integration perfect if capital controls have been abolished and market participants no longer expect the bilateral exchange rates to change at all. The sustainability of such an arrangement requires a high degree of policy convergence. With free capital movements one might even argue that a permanent locking of exchange rates with no margin of fluctuations requires monetary policy to be completely centralized and fiscal policy to be strongly harmonized.[4] If such a situation has been reached, both EDEP and CUR have lost their role and the basic equation can be reduced further to:

$$(3) \qquad i_f - i_d = 0.$$

Hypothesis (3) claims that perfect monetary integration results in an equalization of nominal returns. Neither capital controls, nor exchange rate expectations and exchange rate uncertainty can drive a wedge between the nominal interest rates of the countries concerned.[5]

3. Empirical implementation and results

We now turn to the issue of quantifying the historical pattern of financial change in the OECD area. To this end the parity conditions (1), (2) and (3) will be translated into a set of *aggregate dispersion*

[4] See for instance EC (1990).

[5] Regime 3 might be interpreted as a special case of regime 2: perfect substitutability with EDEP = 0 as an additional requirement. However, there is a subtle difference. As perfect substitutability relies on the assumption that the currency risk premium is zero because investors are neutral or indifferent towards currency risks, perfect monetary integration means that the currency risk premium is zero because the exchange rate uncertainty *itself* has disappeared.

measures. Each measure captures the mean absolute deviation from interest rate parity for a group of countries against a common reference rate.[6] In general:

$$ADM_t = \frac{1}{n} \sum_{j=1}^{n} |i_{j,t} - (i_{ref,t} - COR_t)|$$

with ADM_t = aggregate dispersion measure at moment t

n = number of countries

$i_{j,t}$ = domestic interest rate of country j at moment t

$i_{ref,t}$ = reference rate at moment t

COR_t = regime correction term.

Depending on the regime under consideration the reference rate has to be adjusted for exchange rate expectations and/or risk premiums. The derived parity conditions prescribe which elements should be included in the regime correction term (COR). Subsequently some additional assumptions are necessary to make the dispersion measure operational. In Table 1 the empirical implementation of each regime has been summarized. Basically, financial integration is measured by *covered* interest rate parity, asset substitution by *uncovered* interest rate parity and monetary integration by *nominal* interest rate parity.

Under the hypothesis of perfect financial integration (case 1) a bilateral interest rate differential can only be attributed to currency factors. The correction term should therefore include these elements, but the problem is that neither is directly observable. A common solution confines the analysis to *short term* yields and assumes that the investor hedges the currency risk in the forward market.[7] This way of reasoning enables us to replace the currency factors by the forward discount on foreign currency. In the case of perfect asset substitution (case 2) the reference rate only has to be adjusted for the expected depreciation rate. Using rational expectations as the operational assumption, the hypothesis of perfect substitutability comes down to the *ex post* equalization of returns across countries except for a random error term which reflects the *unexpected* change of the

[6] *Cf.* Kasman and Pigott (1988) for a comparable statistic.

[7] See *e.g.* Frankel (1989).

exchange rate.[8] Finally in case 3, the calculation of the dispersion measure does not rely on any operational assumption since no correction of the reference rate is needed.

TABLE 1

AGGREGATE DISPERSION MEASURES FOR THREE REGIMES OF FINANCIAL CHANGE

Case 1:	Financial Integration
COR:	EDEP + CUR-premium
OA:	EDEP and CUR-premium replaced by the forward discount (FD) of the reference currency against the domestic currency
ADM:	$\frac{1}{n}\sum_{j=1}^{n} \lvert i_j - (i_{ref} - FD_{ref,j}) \rvert$
Case 2:	Asset Substitution
COR:	EDEP
OA:	EDEP replaced by the actual depreciation (DEP) of the reference currency against the domestic currency during the investment period
ADM:	$\frac{1}{n}\sum_{j=1}^{n} \lvert i_j - (i_{ref} - DEP_{ref,j}) \rvert$
Case 3:	Monetary Integration
COR:	–
OA:	–
ADM:	$\frac{1}{n}\sum_{j=1}^{n} \lvert i_j - i_{ref} \rvert$

Note: COR = regime correction term, OA = operational assumption, ADM = aggregate dispersion measure. To simplify the notation time indices have been suppressed.

[8] An alternative would be the use of survey-data. However, even if a consistent data set of exchange rate expectations of market participants would be available, this approach is not without problems. The *average* expectation of the survey might not contain useful information when the spot rate is driven by agents with *extreme* expectations. Moreover, market participants do not have an incentive to reveal their true expectation. See *e.g.* Hodrick (1987).

The ADM's presented in Table 1, are calculated for two regions, labeled *FixWorld* and *FlexWorld*. The countries of the FixWorld have participated in the exchange rate mechanism of the EMS and its predecessor for a prolonged period of time. The FlexWorld-countries are not tied by official obligations neither to intervene in the foreign exchange markets, nor to adapt domestic interest rates in response to exchange market pressures. Although they may have pursued a policy of managed floating their commitment is rather weak. Given this *ex ante* subdivision of our sample the availability of data limits the number of countries to six for the FlexWorld and six for the FixWorld. Germany is included in both subsamples as this country is assumed to represent the floating of the FixWorld-block within the FlexWorld.

Fixworld: Belgium, Denmark, France, Germany, Italy and the Netherlands.

Flexworld: Australia, Canada, Germany, Japan, United Kingdom and United States.

All ADMs are calculated on a monthly basis and the observation period is 1973/3-1993/11. Data are taken from the DATASTREAM International Database. The *domestic* interest rates (i_j) are predominantly three month (interbank) deposit rates; the *reference* rate (i_{ref}) is a three month Euro$rate for the FlexWorld and a three month EuroDMrate for the FixWorld.

The patterns of financial change, condensed in six ADMs, are plotted in Graphs 1, 2 and 3 and will be discussed successively. Bars on the horizontal axis refer to mid year estimates unless indicated otherwise.

Case 1: financial integration

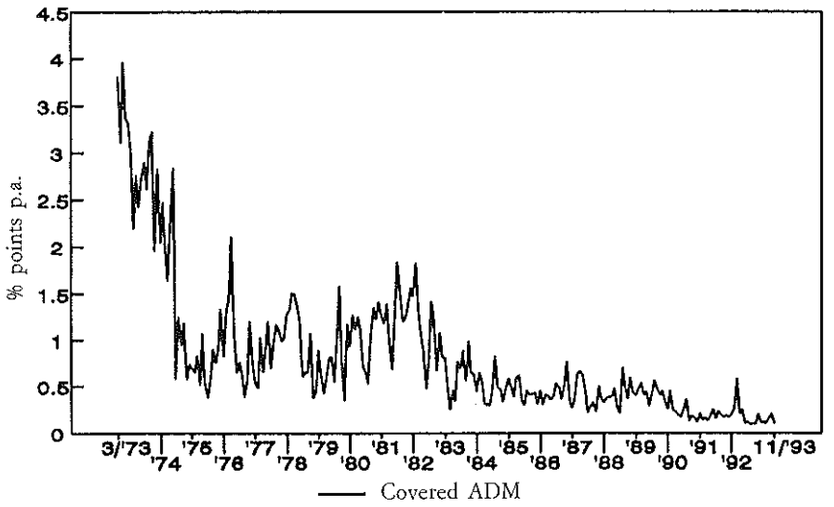
The ADMs of Graph 1 show the mean absolute deviation from covered interest rate parity within the FlexWorld and the FixWorld. Remaining yield differentials reflect regulatory obstacles to arbitrage, especially capital controls and political risk premiums.[9] If in other

[9] Since Eurocurrency markets are virtually free from reserve requirements, witholding taxes and other regulations, the differential between a country's domestic and external rate (the latter measured as the currency adjusted reference rate: see Table 1) isolates as much as possible the effect of capital controls in the country concerned.

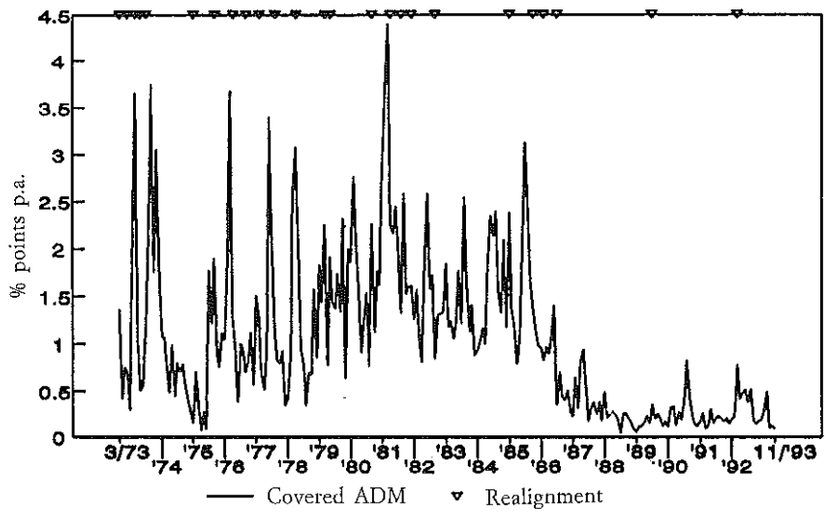
GRAPH 1

FINANCIAL INTEGRATION

FlexWorld
Aus, Can, Ger, Jap, UK, US



FixWorld
Bel, Den, Fra, Ger, Ita, Neth



words the covered ADM is high, there is little reason to accept the hypothesis of perfect financial integration.

In the *FlexWorld* the ADM drops quickly after the transition to floating exchange rates in the beginning of the 1970s. In 1974 the United States and Canada liberalized capital outflows while Germany, Japan and Australia relaxed the restrictions on capital inflows.[10] There were several driving forces behind this development. As the stabilization of the exchange rate became a less binding policy objective, the need for capital controls as an additional instrument to maintain control over the domestic monetary situation diminished. For some countries another motive for liberalizing capital inflows was the weakened balance of payments position after the first oil crisis.

The early liberalization trend did not persist very long. The behaviour of the ADM during the second half of the 1970s fits in with the reintroduction of capital controls by Germany, Switzerland and Australia. In Japan the application of restrictions responded in a consistent way to the position of the current account. With a growing surplus in 1977 net capital inflows were discouraged, but after a deterioration of the current account in 1979, the Japanese policymakers reversed the controls and stimulated net inflows.[11]

A second, more comprehensive and lasting wave of financial integration in the FlexWorld started in 1979. In the United Kingdom the free market philosophy of the Thatcher administration gave new impetus to the liberalization process. Within a few months all British capital controls were abolished. Thereupon the second oil crisis induced the abolition of the remaining restrictions on capital inflows in Germany. In 1980 new legislation in Japan changed the system of capital regulations fundamentally, but it took severe political pressure, exerted by the United States in 1984, before the Japanese government made serious commitments to liberalise capital flows and to facilitate the access of non-residents to the domestic financial markets. In December 1983 Australia abolished almost all restrictions on capital flows. This liberalisation was the result of a policy switch to free floating, after a decade of pegging the Australian dollar to a currency basket. Finally, during 1984 the United States, Germany and Japan repealed their withholding taxes on interest payments to non-residents.

---

[10] Due to the limited availability of data Japan and Australia enter the analysis not before respectively February 1977 and March 1977.

[11] See Ito (1986).

These regulatory changes are accompanied by a sharp decrease in both the level and the volatility of the aggregate dispersion measure during the first half of the 1980s. This behaviour indicates that the speed of financial integration was high. By now the mean covered interest rate differential has been less than 0.5%-point for a decade or so.[12] Hence we conclude that the process of financial integration in the FlexWorld was completed in the mid 1980s.

The pattern of the *FixWorld* is quite different. First of all, interest rate differentials have lasted for a rather long period; in fact they continued unabated until 1989/90. Second, the ADM of the FixWorld fluctuates at a relatively high level and also exhibits a relatively high volatility. Those observations indicate a weak degree of financial integration for much of the observation period. We consider this result quite comprehensive as it represents the extensive and discretionary use of capital controls by countries with an explicit exchange rate objective.

The early decrease in the ADM of the FixWorld corresponds to the relaxation of capital restrictions by Germany, the Netherlands and France in 1974/75.[13] This drop, however, was only incidental. France and Italy reversed their control systems: these countries liberalised inflows but regulated outflows in response to the deterioration of the external position. Other countries, too, maintained or re-introduced

[12] At first glance, 50 basis points might seem high for integrated financial markets. One should realize however that this deviation does not imply automatically an unexploited *net* profit opportunity for two reasons. First, the arbitrager faces transaction costs in the spot exchange market, the forward market, and in the deposit markets. Estimates of the transaction costs differ. Keynes (1924, p. 128) suggested for example: "... such amount (say 1/2 per cent) will yield the arbitragers sufficient profit for their trouble". Frenkel and Levich (1981) come up with estimates ranging between 48 and 59 basis points for transaction costs in the $/£ currency market. Their method is criticized for overestimating the actual costs, see *e.g.* McCormick (1979). As there are no capital controls nor differences in political risk in *one* financial centre, we consider covered interest rate disparities *within* Eurocurrency markets as an indicator of the *minimum* transaction costs for a round trip. In our data set, the mean absolute deviation for the Euro$/DM currency market is 22 basis points in the period 1973-1993. The second reason for remaining deviations are imperfections in the data-set. Ideally, the monthly observations for the spot rate, the forward rate and the interest rates should be made at the very same moment, because all transactions involved in arbitrage can be made within seconds. To our knowledge there are no data-sources that can guarantee for a sample of eleven countries over a period of twenty years, such a high level of accuracy. Therefore, another part of the remaining differential is due to observation lags.

[13] At the same time, Denmark and Italy liberalized capital inflows, but they are not included in the ADM until respectively January 1976 and January 1977, because of the limited availability of data.

parts of the control system during both the Snake-period and the turbulent starting period of the EMS.

In the early stages of the EMS there was a discrepancy in the use of controls. Germany and the Netherlands liberalised capital inflows in 1981, while the 'weak currency' countries, *viz.* France, Italy, Belgium and Denmark, continued to regulate capital outflows. This discrepancy is often interpreted as a consequence of the asymmetric functioning of the EMS.[14] In this view the 'anchor' country Germany determines the monetary policy stance of the entire system, while the 'periphery' countries align their policy to defend the exchange rate. However, most countries did not wish to refrain completely from domestic policy objectives and tried to stabilize the exchange rate with capital controls.

The controls were unable to prevent realignments. But neither did the devaluations of the 'weak currency' countries help to improve the current account balance. On the contrary, the frequency of the parity adjustments together with the use of controls harmed the reputation of the policymakers and sparked inflationary expectations. Therefore the authorities gradually decided to abandon discretionary domestic policies and to give priority to stabilizing the exchange rate according to the asymmetric functioning of the EMS.

In the second half of the eighties, the relatively favourable economic developments and the internal market program of the European Commission carried the liberalization process even further. After the removal of the most important capital controls by the Chirac administration in 1986/87, France complied with the European directives concerning the liberalization of capital movements. Italy followed the French example at short distance; the new foreign exchange law of January 1988 changed the Italian control system fundamentally, although some rules for short-term transactions remained in force.

At the end of the decade capital movements were hardly impeded as reflected by the low level of the ADM. We conclude that next to the FlexWorld also the FixWorld can nowadays be characterized as a region of perfect financial integration.

[14] This interpretation is developed in Giavazzi and Pagano (1988) and Giovannini (1989); for a review of the literature on this topic see Gros and Thygesen (1992, pp. 136-150).

Case 2: asset substitution

Financial integration does not automatically imply perfect substitutability. As elaborated above, the hypothesis of perfect substitution presupposes both the absence of regulatory barriers and a general indifference of the representative investor in his choice to hold foreign or domestic assets. Only under these conditions will interest arbitrage ensure *ex ante* uncovered interest rate parity.

The empirical implementation of this condition runs up against a serious problem. As we have to assume rational exchange rate expectations, the analysis of this regime is hampered by the inescapability of a *joint* hypothesis: *ex post* uncovered interest rate differentials can be the result of risk-premiums (imperfect substitution) and/or the release of new information (expectational errors).[15]

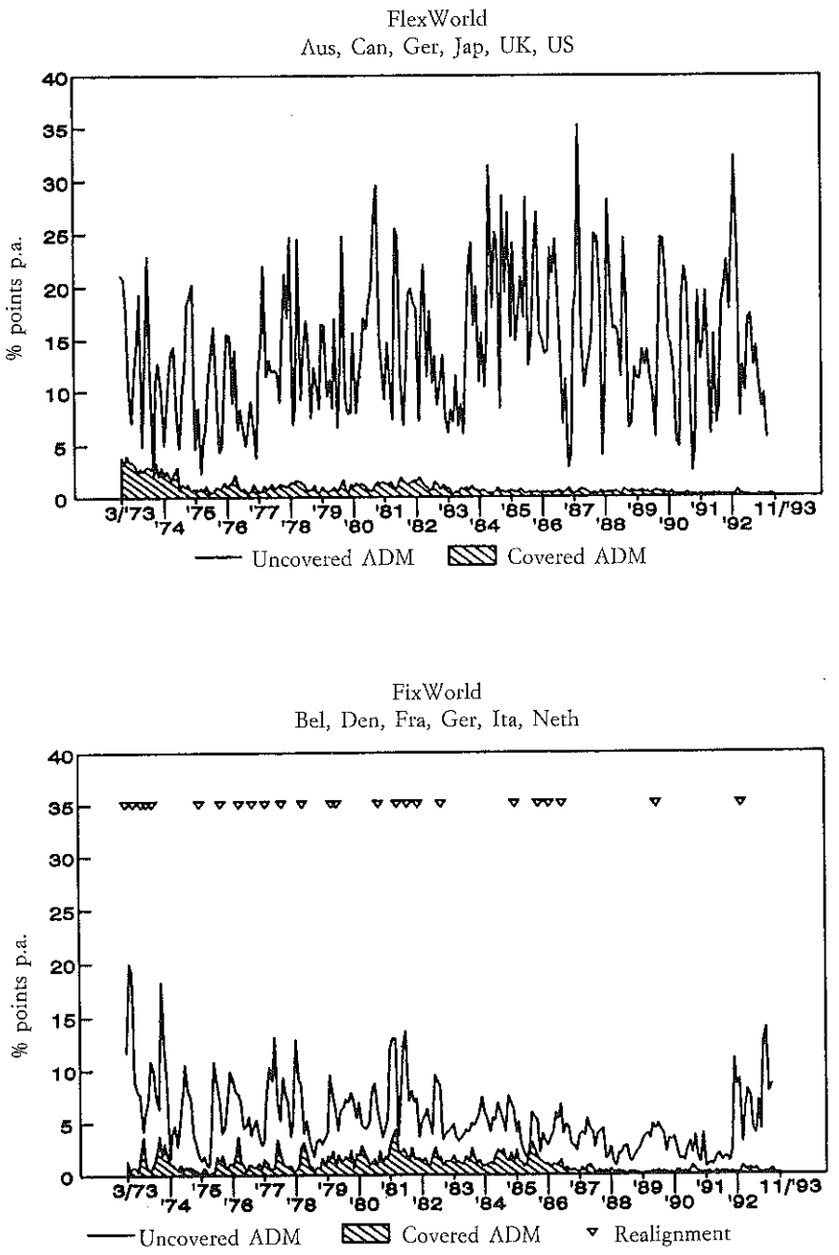
Graph 2 presents the mean absolute deviation from uncovered interest rate parity within the FlexWorld and the FixWorld. The covered dispersion measure is included too: the distance between the uncovered ADM and the covered ADM can be due to imperfect asset substitution and/or to expectational errors. Both ADMs display a remarkably different pattern. In the *FlexWorld*, the uncovered return differential fluctuates strongly around a high mean throughout the whole sample period. It seems reasonable to attribute this to the uncertainty about the future course of the bilateral exchange rates against the US$. Undoubtedly this uncertainty gives rise to both substantial risk premiums and to non-negligible errors in the prediction of exchange rates. In the *FixWorld* both the level and the volatility of the aggregate dispersion measure is far below its counterpart in the FlexWorld.[16] The proclaimed efforts of the authorities

[15] In the literature, considerable effort has been dedicated to modeling and estimating the exchange risk premium. The results are mixed. Although there are empirical indications for the existence of a time-varying risk premium, it turns out impossible to obtain estimates that can explain the magnitude of the uncovered interest rate differentials. Other empirical studies using survey-data on exchange rate expectations point to the presence of large and systematic expectational errors. Explanations for this apparent irrational behavior of economic agents within the paradigm of rationality range from the peso-problem to speculative bubbles. For an overview see Boothe and Longworth (1986).

[16] This conclusion corresponds to the results of Ayuso and Restoy (1992, pp. 24-25): "Evaluation of the risk premia highlights the notable difference between the risk run on investing in ERM currencies and in those of non-ERM members ... Deposits in dollars and yen thus incorporate substantial risk premia, while those associated with the D-mark, French franc, the lira, the peseta and, to a lesser extent (owing to its later membership of the ERM), sterling are on a much more moderate scale ...".

GRAPH 2

ASSET SUBSTITUTION



to achieve stable exchange rates are likely to be responsible for this result. Moreover, this region seems to have experienced an increasing substitutability of assets during the 1980s, but this process was abruptly reversed in the eve of the EMS-crisis of September 1992.

We conclude that, not only conceptually but also empirically, financial integration and asset substitution are very different phenomena. On the other hand the analysis strongly suggests that asset substitutability should be seen in relation to the prevailing exchange rate system. We therefore consider this regime as an intermediate case and precede quickly to the regime of monetary integration.

Case 3: monetary integration

We see monetary integration as the combination of financial integration and exchange rate stability. Graph 3 depicts the mean absolute deviation from nominal interest rate parity as an aggregate measure for such a situation which could be interpreted as a *de facto* currency union. The covered ADMs of Graph 1 are replotted in order to get a complete picture. We recall that the distance between the nominal and the covered ADM encompasses two elements:

i) the expected exchange rate changes against the US$ (for the FlexWorld countries) or against the DM (for the FixWorld countries), and

ii) the uncertainty surrounding these expectations.[17]

As to the *FlexWorld* it does not come as a surprise that the nominal ADM lacks a clear downward trend. The high volatility of the nominal interest rate differentials in the period 1979/82 coincides with the change in the operating procedures of the Federal Reserve in the US. Since then, the ADM has fluctuated around a level of approximately 3%-points per annum. Although the abolition of capital controls in the 1980s *per se* has caused nominal interest rates to converge, this trend has evidently been offset by divergent economic conditions and policy disparities among the FlexWorld-countries.[18] The low priority given to exchange rate stability and to international policy coordination has given the economic agents little reason to assume constant exchange rates. On the contrary, the dominance of internal objectives made interest rate differentials and

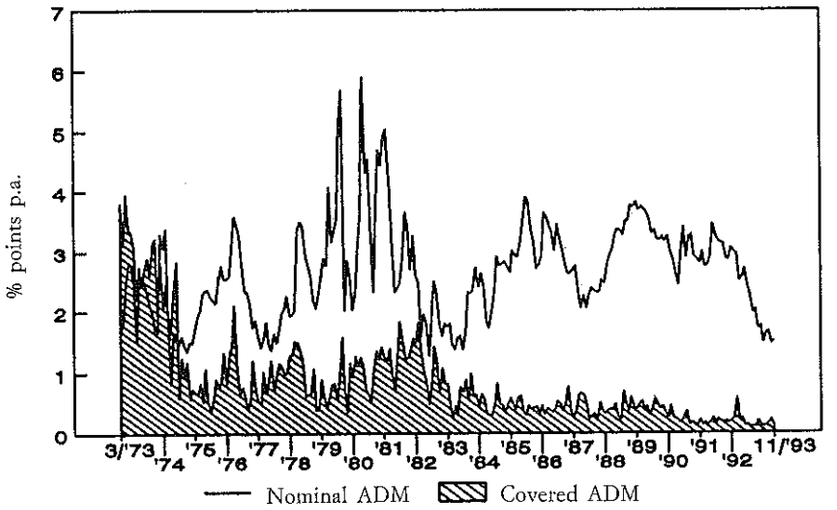
[17] Note however that at times of capital controls part of the impact of these two factors can be surpressed.

[18] A similar observation is made in Kasman and Pigott (1988) and in Pigott (1993/4).

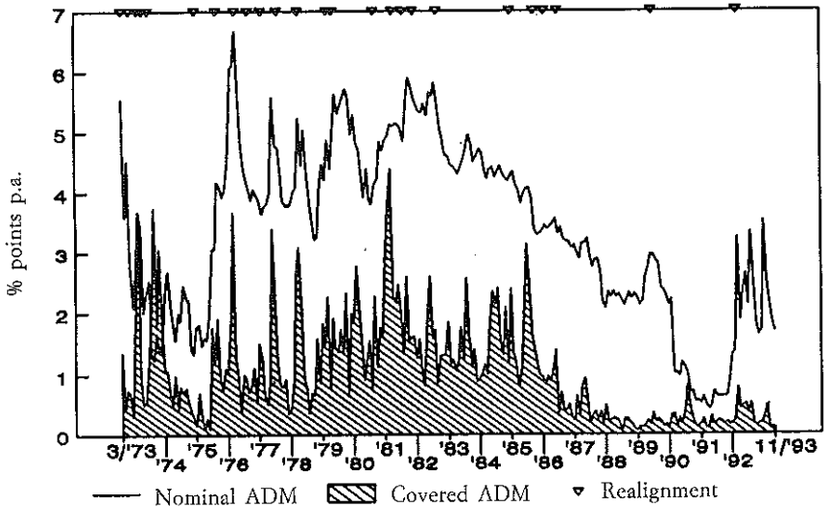
GRAPH 3

MONETARY INTEGRATION

FlexWorld
Aus, Can, Ger, Jap, UK, US



FixWorld
Bel, Den, Fra, Ger, Ita, Neth



bilateral exchange rates rather volatile which in turn destabilized expectations and feeded uncertainty.

Again, the pattern for the *FixWorld* is quite different. During the Snake-period (1972/4-1979/3) the European countries did not live up to their exchange rate commitment very seriously. Several countries abandoned the arrangement and the system experienced five realignments within a period of two years (1976/10-1978/10).[19] In the early 1980s, however, the nominal ADM started to decline and a gradual but consistent decrease could take place. Financial integration went hand in hand with monetary convergence. At the time of the Maastricht Treaty (1991/12) the aggregate dispersion measure was less than 0.5%-point. This reflects that free capital movements were accompanied by a virtually complete stabilization of exchange rate expectations.

The downward trend in the nominal ADM until 1992 is undoubtedly related to the disciplinary effect of the exchange rate mechanism of the EMS. Initially the system mainly survived thanks to capital controls and realignments. Subsequently its main characteristics became liberalization and convergence. Member countries adopted a stability oriented policy and the authorities began to gather reputation. As a consequence the need for realignments virtually disappeared and interest rate differentials could be reduced gradually.

The convergence of monetary policies and inflation rates achieved under the EMS during this period has been remarkable but not complete.[20] By now it is generally accepted that the observed pattern of monetary integration in the FixWorld also originated from a growing confidence of the financial markets in the *prospects* for convergence. The liberalisation of capital flows, the run of success in the stabilization of exchange rates and the perspective of a fully-fledged monetary union made markets euphoric. Institutional investors were tempted to shift their portfolios from hard-currency markets to other markets, including the outer fringe of the EC.[21]

The rise of the ADM in the middle of 1992 reveals that the transition of western Europe to a world of perfect monetary integration was suddenly interrupted. Markets' optimism broke down in

[19] For a chronology see Gros and Thygesen (1992, p. 17).

[20] See de Grauwe (1992), who (before the crisis) pointed out that the convergence of inflation *rates* in the EMS was accompanied by a divergence of price *levels*. He therefore warns that the erosion of competitiveness of countries like Italy and Spain will lead to devaluations and, as a result, to a setback in the European integration process.

[21] See Vliegenthart (1993) and G10 (1993, pp. 24-25 and 76-77).

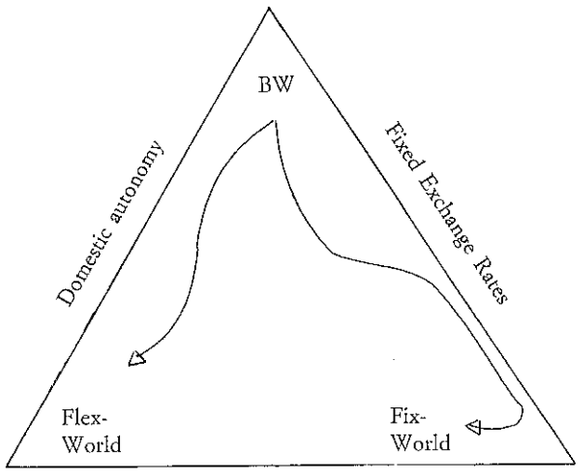
response to the coincidence of a number of events: political problems with the ratification of the Maastricht Treaty, a contractive monetary policy stance in unified Germany and a deteriorating economic outlook in most other member states. With two currency crises and a widening of the fluctuation margins exchange rate uncertainty and instable expectations have resurged. This accounts for the considerable wedge between the bilateral interest rates of the FixWorld countries at the end of the observation period.

4. Financial change and the monetary policy dilemma

The implication of financial change for the scope of monetary policy is depicted in Figure 1.[22] The inconsistency between perfect capital mobility, fixed exchange rates and domestic monetary policy autonomy implies that countries can combine only two of these items. In a world of perfect financial integration this conflicting situation forces countries to choose a position somewhere on the horizontal axis of the triangle.

FIGURE 1

THE CONFLICT TRIANGLE OF MONETARY POLICY



[22] Adapted from EC (1990, p. 43) and Oxelheim (1990, p. 10). *Cf.* also Cooper's triangle in Meier (1982, p. 14) for a country's policy dilemma in coping with the *current account* constraints.

In short the post-Bretton Woods history of financial change in the OECD-area can be seen as a transition process which has pushed countries from the top of the triangle to the bottom line. The *FixWorld* countries, aiming at a zone of monetary stability in western Europe, have chosen to follow a route near to the 'fixed exchange rate' axis. In principle this implies a loss of domestic autonomy. Because of the desire to maintain at least some autonomy, during much of the Snake and EMS-period the distance to both the 'fixed exchange rate' axis and the 'financial integration' axis was considerable. Fluctuation margins, realignments, the option of leaving the system and (until recently) the use of capital controls have always been part of the system.

The Maastricht Treaty was an attempt to proceed to the very right-hand corner of the triangle. In that angle the combination of fully liberalized capital movements and irrevocably fixed exchange rates makes divergent policies of demand management no longer feasible at all: monetary integration has become perfect and monetary policy is completely restricted by the external constraint. The apparent or perceived unwilligness of member countries to accept this consequence has contributed much to the interruption of the monetary integration process in 1992.

For the *FlexWorld* countries the followed route is situated near to the 'domestic autonomy' axis, taking only some distance in *ad hoc* periods when exchange rate management got some importance. Although capital mobility increased and even became perfect the floating exchange rate leaves the authorities much room to base their policies on domestic considerations. Surely, policy induced exchange rate fluctuations can affect internal objectives like inflation, production and employment. This external transmission channel undoubtedly complicates the design of a proper policy. But, since a floating exchange rate accounts for an imperfect substitutability of foreign and domestic assets, there is ample room to use the interest rate as an instrument to target nominal spending.

5. Conclusions

By distinguishing the various determinants of international portfolio diversification, we have been able to define three related but different patterns of financial change. Our main findings are:

i) During the last two decades direct capital controls and indirect price regulations have been used extensively as instruments to isolate the domestic from the foreign market. The gradual disappearence of these institutional barriers is called financial integration. In the FlexWorld perfect financial integration was reached in two steps, one around 1974 and one around 1982. Since then the deviations from covered interest rate parity have been small. In the FixWorld financial integration was only completed in the late 1980s. This relatively slow pace of capital liberalisation is due to the EMS-authorities' initial attempt to preserve some monetary sovereignty.

ii) Instantaneous adjustment does not automatically imply perfect substitution. With free capital movements the investors' willingness to buy foreign assets is conditional on their risk perception. Notably currency risks can prevent expected yields from being equalized completely. The deviations from uncovered interest rate parity suggest that asset substitutability has increased only in the FixWorld. However, our analysis was hampered by the operational assumption of rational exchange rate expectations.

iii) Interest rates are strongly interconnected with exchange rate expectations. In the FlexWorld these expectations and the associated currency risk premiums cause nominal rates to diverge considerably. For the FixWorld the deviations from nominal interest rate parity have diminished significantly in the years 1982/92. The combination of financial integration and (perceived) monetary convergence accounts for this result. Since mid-1992 the turmoil in the EMS has caused a marked reversion of the aggregate dispersion measure.

iv) Financial change has strong implications for the scope of monetary policy. In the FixWorld the combination of free capital movements and fixed exchange rates is incompatible with the desire to maintain domestic monetary policy autonomy. In the FlexWorld the combination of free capital movements and domestic policy autonomy is incompatible with exchange rate stability. Since there is no way back to the reintroduction of capital controls authorities have to live with this dilemma.

APPENDIX

In Section 2 the basic equation for the international interest rate differential ($i_f - i_d$) was introduced by qualitative reasoning. The purpose of this appendix is to present a more formal deduction.

The investor's portfolio choice is about foreign and domestic assets. Let p^* be the *preferred* share of foreign assets, which is independent of the level of financial wealth. With R as the expected net relative return on foreign assets and φ as the substitution parameter we write:[1]

$$(A1) \qquad p^* = p^*(\varphi, R) \qquad \partial p^*/\partial R > 0 \qquad \text{sign } \partial p^*/\partial \varphi = \text{sign } R$$

The substitution parameter captures the risk/return attitude of the representative investor. A subjective risk aversion parameter ρ and two objective risk characteristics, notably the currency risk CUR and the political risk POR, determine the value of φ. In general:

$$(A2) \qquad \varphi = \varphi(\rho, \text{CUR}, \text{POR}) \qquad \partial\varphi/\partial\rho < 0 \qquad \partial\varphi/\partial\text{CUR} < 0 \qquad \partial\varphi/\partial\text{POR} < 0$$

With risk averse investors ($\rho > 0$) and different risk characteristics (CUR, POR $\neq 0$) assets are imperfect substitutes ($\varphi < \infty$), while risk neutrality ($\varphi = 0$) results in perfect substitutability ($\varphi \to \infty$).

The expected relative return on foreign assets R is determined by the foreign interest rate i_f, the domestic interest rate i_d and the expected depreciation rate of the foreign currency during the investment period EDEP. In addition, foreign investment can be discouraged by official price regulations, which affect the *net* relative yield on foreign assets. This kind of *indirect* capital controls is taken account of by the price distortion parameter θ.

$$(A3) \qquad R = \{i_f - \text{EDEP}\}(1 - \theta) - i_d$$

The *actual* portfolio share p is subject to partial adjustment. The adjustment parameter captures the effectiveness of direct capital controls. Hence we denote:

$$(A4) \qquad \Delta p = \alpha.(p^* - p_{-1})$$

With $\alpha = 1$ capital transactions are completely free and a change in p^* will immediatedly be followed by a change of p. For $\alpha < 1$ instantaneous adjustment is not possible: the lower α, the lower the speed of adjustment. In the extreme case of $\alpha = 0$ capital restrictions are prohibitive and p cannot respond to p^* at all.

[1] A specification of this demand function with nice properties would be $p^* = c/(c+e^{-\varphi R})$.

From (A1)-(A4) and given p_{-1}, it follows that

$$(A5) \qquad p = p(i_f - i_d;\ \text{EDEP}, \varphi, \theta, \alpha)$$

Next, if the supply of foreign and domestic assets p^s is assumed exogenous, the equilibrium condition

$$(A6) \qquad p = p^s$$

allows to express (A5) in terms of the international interest rate differential:

$$(A7) \qquad (i_f - i_d) = f(\text{EDEP}, \varphi, \theta, \alpha)$$

Since φ manifests itself in risk premiums and θ and α reflect regulatory barriers, for expositional purposes (A7) can be rewritten as:

$$(A8) \qquad i_f - i_d = \text{EDEP} + \text{CUR-premium} + \text{POR-premium} + \text{REG-differential}$$

In the main text basic equation (A8) is translated into three specific hypotheses of financial change by adding the subsequent regime assumptions. These assumptions have an increasing order of specificity. In case 1 (financial integration) we postulate $\alpha = 1$, $\theta = 0$ and POR = 0. In case 2 (asset substitution) the additional supposition is $\rho = 0$ implying $\varphi \to \infty$. Finally in case 3 (monetary integration) we add CUR = 0 (instead of $\rho = 0$) and EDEP = 0.

REFERENCES

AKHTAR, M. and K. WEILER (1987), "Developments in international capital mobility: a perspective on the underlying forces and the empirical literature", *Research Papers on International Integration of Financial Markets and U.S. Monetary Policy*, Federal Reserve Bank of New York.

AYUSO, J. and F. RESTOY (1992), "Efficiency and risk premia in foreign exchange markets", no. 9225, Banco de España, Servicio de Estudios, Documento de Trabajo.

BOOTHE, P. and D. LONGWORTH (1986), "Foreign exchange market efficiency tests: implications of recent empirical findings", *Journal of International Money and Finance*, vol. 5, pp. 135-152.

BOVENBERG, A. and L. GOULDER (1991), "Introducing intertemporal and open economy features in applied general equilibrium models", *De Economist*, vol. 139, no. 2, pp. 47-64.

DE GRAUWE, P. (1992), "Inflation convergence during the transition to EMU", *CEPR Discussion Paper*, no. 658.

DORNBUSCH, R. (1980), *Open Economy Macroeconomics*, Basic Books, Inc. Publishers, New York.

EC (1990), "One market, one money", *European Economy*, no. 44, Brussels.

FRANKEL, J. (1989), "Quantifying international capital mobility in the 1980s", *NBER Working Papers*, no. 2856.

FRENKEL, J. and R. LEVICH (1981), "Covered interest arbitrage in the 1970s", *Economic Letters*, vol. 8, pp. 267-274.

G10 (1993), *International Capital Movements and Foreign Exchange Markets*, Report to the Ministers and Governors by the Group of Deputies.

GIAVAZZI, F. and M. PAGANO (1988), "Capital controls and the European Monetary System", in Fair, D.E. and C. de Boissieu eds., *International Monetary and Financial Integration - The European Dimension*, Kluwer, Dordrecht, pp. 261-289.

GIOVANNINI, A. (1989), "How do fixed-exchange rate regimes work? Evidence from the Gold Standard, Bretton Woods and the EMS", in M. Miller, B. Eichengreen and R. Portes eds., *Blueprints for Exchange Rate Management*, Academic Press, London, pp. 13-46.

GOLUB, S. (1990), "International capital mobility: net versus gross stocks and flows", *Journal of International Money and Finance*, pp. 424-439.

GROS, D. and N. THYGESEN (1992), *European Monetary Integration. From the European Monetary System to European Monetary Union*, Longman, London.

HODRICK, R. (1987), *The Empirical Evidence on the Efficiency of Forward and Futures Foreign Exchange Markets*, Harwood Academic Publishers, Paris.

ITO, T. (1986), "Capital controls and covered interest parity between the yen and the dollar", *The Economic Studies Quarterly*, vol. 37, no. 3, pp. 223-241.

KASMAN, B. and C. PIGOTT (1988), "Interest rate divergences among the major industrial nations", *Quarterly Review*, Federal Reserve Bank of New York, vol. 13, no. 3, pp. 28-44.

KENEN, P. (1976), "Capital mobility and financial integration: a survey", *Princeton Studies in International Finance*, no. 39.

KEYNES, J. (1924), *A Tract on Monetary Reform*, Macmillan, London.

MCCORMICK, F. (1979), "Covered interest arbitrage: unexploited profits? Comment", *Journal of Political Economy*, vol. 87, pp. 411-417.

MEIER, G. (1982), *Problems of a World Monetary Order*, second edition, Oxford University Press, New York/Oxford.

OXELHEIM, L. (1990), *International Financial Integration*, Springer Verlag, Berlin.

PIGOTT, C. (1993/4), "International interest rate convergence: a survey of the issues and evidence, *Quarterly Review*, Federal Reserve Bank of New York, vol. 18, no. 4, pp. 24-37.

VLIEGENTHART, B. (1993), "EMU and investment funds", in S.C.W. Eijffinger and J.L. Gerards eds., *European Monetary Integration and the Financial Sector*, NIBE, Amsterdam, pp. 145-162.