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Determinants of the Future International Role of the Euro: A first evaluation

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1. Introduction

This paper studies the phenomenon of international currencies and examines which role the euro, the future common European currency, could play in the international monetary and financial system when competing with the US dollar and the Japanese yen after its introduction, scheduled for January 1999. An international currency is a currency which fulfils one or several of the classical money functions — medium of exchange, store of value and unit of account — for non-nationals or non-residents of the issuing country, be they private or public agents. International currency competition refers to the process determining to which extent various national currencies are employed by non-residents. With respect to the euro the issuing «country» is the sum of all European Union (EU) countries joining European Monetary Union (EMU). Euro internationalization only refers to the acceptance of the common European currency by non-EMU area residents, since there will not be any genuinely competing alternative currency within the EMU zone.

The paper is organised in 8 sections. After this introduction, section 2 describes the different dimensions of an international currency and section 3 discusses why and for what international currency competition is important. The following section examines the latest historical example of a transition from one dominant international currency, the pound sterling, to another, the United States dollar. Since this and earlier transitions appeared to be slower than changes in the economic fundamentals suggest ('hysteresis'), section 5 briefly shows some econometric evidence that network externalities in currency use — the fact that moneys which are already more employed than others have lower transaction costs — can explain this regularity. The next section analyzes the potential future role of the euro in world trade invoicing and shows a first difference between the emergence of the euro and earlier historical experiences, a discontinuous change in the international structure of currency uses. Section 7 analyzes the potential future role of the euro in international investment and discusses a second difference between the emergence of the euro and earlier historical experiences, the capacity of modern financial markets to accelerate transitions from one dominant international money to another. The last section gives a first evaluation of what the most likely pattern of euro internationalization is going to be.

2. International Money

What are the dimensions of international money? A functional definition of international money starting from the traditional money functions, as first worked out systematically by Cohen (1971) and taken up with slight variations by later writers on the topic, has proven to be a good starting point. In Table 1 I present another typology of international money functions

Table 1: International money functions

| Money function | Private use | Official use |
|--------------------|--|-----------------------|
| Medium of exchange | Vehicle currency | |
| | (i) in goods exchange: — foreign trade vehicle — domestic trade vehicle (direct currency substitution) | |
| | (ii) in currency exchange: — foreign exchange vehicle | Intervention currency |
| Unit of account | Quotation currency | Pegging currency |
| Store of value | Investment currency (including indirect currency substitution) | Reserve currency |



The internationalization of a currency begins when an individual agent or institution residing in a country other than that of this currency accepts or uses it as a medium of exchange, unit of account or store of value.¹ The first distinction made in Table 1 refers to the type of the agent using this currency. Column 3 describes actions initiated by institutions forming part of the public sector of a country (official use). These are usually the central bank or sometimes the finance ministry or treasury department. Column 2 concerns uses by private agents.²

Consider first the functions of international money in official use. Most of the expressions in the three cells are self-explaining. Governments try to influence their country's exchange rates by intervening in the foreign exchange market. However, their domestic currency can be traded against many foreign currencies. Hence, they have to decide in which of the bilateral markets to intervene determining the intervention currency (or currencies). Immediately related to intervention currencies are reserve currencies (Polak, 1992). Central banks can only intervene in those currencies in which they hold some reserves. Even if they would intervene in only one foreign currency, in a floating exchange rate environment they would usually hold a portfolio of reserve currencies in order to diversify against exchange rate risk. Finally, pegging currencies are those currencies against which some country's exchange rate has to be maintained at some fixed level (or within some interval) as specified in an exchange rate arrangement (Williamson, 1971).

The delineation of international currency functions in private use is a more complex matter. I start with international media of exchange, which I denote as vehicle currencies.³ There are two types of vehicle currencies — those which serve as media of exchange in goods exchange and those which serve as media of exchange in currency exchange. In goods markets one can make an additional distinction between domestic and foreign trade vehicle transactions (see Grassman (1973) and Magee and Rao (1980) on the latter). The former phenomenon, that residents of the same country use a foreign currency as medium of exchange for their local transactions, is known as direct currency substitution (McKinnon, 1985). In the interbank foreign exchange markets the vehicle exchange enters in a currency exchange very much like a conventional domestic medium of exchange enters in goods exchange (Swoboda, 1969; Hartmann, 1994, 1998).

In order to complete the description of Table 1 I finally turn to the unit of account and store of value functions. Quotation currencies, are those currencies in whose units prices of goods or assets are expressed when they are different from the currency of the respective supplier of the goods or issuer of the asset. Investment currencies are those currencies in which asset contracts are settled.⁴ As in the case of foreign trade invoicing, the decision by real investors in which currencies to issue equity or debt and the decision by savers in which currencies to put their money is distinct, but not independent, of the vehicle phenomenon in foreign exchange markets, in which those agents may have to convert the related cash flows into their home currency. Of course investment currencies also include currencies used for international short-term asset substitution, or indirect currency substitution (McKinnon, 1985).

1 Some might argue that this definition of currency internationalization is too broad. Consider a world with three countries, each one issuing a domestic currency. Assume that all exports of all countries are invoiced in the exporter's currency ('symmetry' in trade denomination). Then international currency use (for foreign trade) is completely analogous to the international trade flows and differences in international currency use reflect nothing else than differences in international trade activities of countries. If these would be symmetric as well, then the definition of internationalization becomes in fact void, because every currency is as international as any other. Notice however that there are huge differences in the foreign trade activities of various countries and that symmetry in trade invoicing is far from being complete and also varies between pairs of countries (the currency of invoice is a matter of negotiation between the exporter and the importer). On this basis I consider that the alternative definition of internationalization, restricting the term to the use of third currencies alone (currencies of countries not involved in the respective trade transaction, «asymmetric» trade denomination), is definitely too narrow.

2 The distinction between private and official uses of international currencies goes back at least to Klopstock (1957), who applied it to the store of value function of international money, and Aliber (1966).

3 I traced back the term vehicle currency to Roosa (1965).

4 See Solnik (1974) and Dumas (1994) for international portfolio choice, the demand side.



Generally speaking, there are, as in the domestic money case, synergetic forces at work implying some tendency towards keeping the different functions together in one currency. However, because of the multiplicity of currencies competing on the international level this tendency is much weaker. One reason is that under currency competition a friction between the medium of exchange and the store of value function may emerge. Media of exchange show a tendency towards concentration due to thick-market (or network) externalities (section 5), while stores of value show a tendency towards multiplicity due to risk-reducing diversification (section 6). In the international sphere the scope for a separation of the unit of account and the other money functions is also enhanced.

Regarding the typology of international money exposed above, it appears that nowadays — in a world with relatively integrated international goods and capital markets — most industrial countries' currencies are to some extent internationalized. However, there is a hierarchy among those currencies. Only a few perform many of the functions to a non-negligible extent. These might be named key currencies. And there might be a single currency performing most of the functions to a much larger extent than even the (other) key currencies — the dominant international currency (Fratianne, 1992), like the US dollar for most of the time after World War II.

3. The Importance of Currency Internationalization and European Monetary Union

The extent with which national currencies in general and the euro (after 1999) in particular are used in the international sphere is of major importance, both for the global community as well as for the specific issuing country. The more important a national currency is for cross-border or completely foreign transactions the stronger the impact of exogenous domestic shocks as well as monetary and exchange rate policies of this country on other countries. Therefore, the issuer of a large international currency will have to be a major player in international policy coordination. In other words, a large international currency gives a country a lot of political power in international monetary relations with substantial geopolitical consequences. In modern history a dominant international currency has often been the expression of, or even one of the driving forces behind, political and/or economic world leadership, as has been the case for the British pound during the 19th century and for the US dollar after World War II.

Beyond the political sphere the internationalization of a currency has substantial consequences for internationally active businesses, which are the transmitters of this internationalization. For example, transnational corporations may find it more cost-effective to base their internal accounting on the dominant international currency instead of their home currency at headquarters. Banks and non-bank financial institutions offering financial services internationally will face increased demand for products in internationalized currencies, requiring them to develop expertise and operations in the respective financial markets (be they domestic or off-shore ['euro'] markets). Of course, this increased demand will also feed back into domestic financial markets of the country issuing an international currency, enhancing their size and liquidity. In case of a virtual regime shift, say, from one dominant international currency to another or from a one-currency to a two-currency system, private payments and settlements systems will have to be adjusted to the new monetary order. Similarly, the pricing practices and hedging needs of international traders of homogenous primary goods, which are usually priced and settled in the dominant international currency, can change substantially.

It can also be argued that banks and other financial institutions have an advantage in dealing with products denominated in their home currency, be it through more experience with domestic macroeconomic policies, the legal and regulatory environment, through better knowledge of the functioning and organisation of the local securities and banking markets, through long-standing relationships with an important domestic end-investor base, or through easier access to the domestic payments and settlements systems. In this sense, banks from a country issuing a dominant international currency start with an advantage vis-à-vis their foreign competitors. While it might be objected that these competitive advantages should not play an important role among



the truly global players operating in practically all important financial centers, the evidence is in favour of home currency advantage.⁵

Since World War II the US dollar has been the dominant international currency, more ratified by the Bretton Woods system of fixed exchange rates, built around it, rather than caused. A gradual diversification out of dollar into mainly Deutsche mark and Japanese yen since the unravelling of the post-war monetary order in the early 1970s has come to a halt in the last couple of years and, in any case, has never seriously questioned the dollar's dominance. European Economic and Monetary Union (EMU) is certainly the most important event in the international monetary and financial system since the end of the Bretton Woods system in the early 1970s (Bergsten, 1997). Depending on the number of countries qualifying for the European currency union the size of the domestic monetary habitat of the new common European currency, the euro, will become comparable to that of the dollar and larger than that of the yen or that of the mark, the most important European currency at present (Hartmann, 1996b, 1998).

Will this «shock» to the international monetary system cause further diversification out of the dollar? Will the euro become as important as the size of Europe in the world economy suggests and challenge the current dollar dominance, may be even replace the US currency as the world leader? Any of these scenarios would have important implications for world monetary and financial affairs, both for the European common policy institutions as well as for the distribution of powers on the global level.

With respect to the European level a quick and far-reaching internationalization of the euro has implications for the domestic monetary policy approach chosen. For example, large foreign short-term euro holdings are likely to render European money aggregates more unstable and therefore a pure monetary targeting strategy (as opposed to, say, an inflation targeting strategy) more difficult.⁶ Moreover, strong euro internationalization will reinforce the case for a structure of EU-internal monetary institutions which allows Europe to speak with one voice to the outside for the purposes of world monetary policy and exchange rate coordination.

On the world level, US influence on international monetary affairs would decline and European Union (EU) influence increase, further strengthening the case for tightening of EMU-internal institutions. At the latest when a common EMU-external policy of the European monetary institutions is fully accomplished, the composition of cooperative bodies, such as the G 7 (currently comprising the USA, Canada and Japan on the one hand, and Germany, France, Italy and the UK on the other, and the refinancing and governance structures of the major international organisations, in particular that of the International Monetary Fund (IMF), would have to be reformed in order to meet the new balance of power.⁷ Other open issues concerning the impact of EMU and euro internationalization on the international monetary system, relate to reforms of IMF macroeconomic policy surveillance (EMU-wide surveillance versus single country surveillance), to potential access of EMU-countries to IMF liquidity assistance and to the redefinition of currency weights for the Special Drawing Right (SDR), the IMF's artificial basket currency.⁸

5 For example, McCauley and White (1997) show that bookrunners in the primary eurobond markets have dominant market shares in issues denominated in their home currency.

6 Internationalization is not the only factor which can make monetary aggregates less reliable intermediate targets for monetary policy. Another major factor which plays a role is financial market development and, in particular, financial innovations resulting in more volatile money demand behavior. Of course, the two factors are not independent: Deep, broad and sophisticated financial markets make a currency more attractive for international traders and investors and internationalization itself will produce competitive pressures and incentives accelerating domestic financial market development (section 6).

7 See Alogoskoufis and Portes (1991), Bergsten and Henning (1996) on these issues. The present share of the United States in total IMF quotas is about 18 percent, while the cumulative share of all 15 EU countries amounts to about 30 percent (Henning, 1997).

8 Many of these issues are discussed in Polak (1997) and Thygesen (1997). The future of the SDR has even been the focus of a separate book, see Mussa *et al.* (1996).



The international competitive edge which the European banking industry could gain through euro internationalization and EMU-internal consolidation is likely to lead to more truly global financial players and fiercer international competition raising the question how the related potential systemic risks could be matched by financial regulators and supervisors. Although a large part of regulation is likely to remain fundamentally national for the foreseeable future, even within Europe, more pressure would build up to improve international coordination in banking supervision and crisis management.⁹

4. A Historical Example: The Transition from Sterling to Dollar

One way of approaching the future international role of the euro is through historical analogy. This section, therefore, considers the replacement of the pound sterling as the dominant international currency by the US dollar earlier this century. This episode is the first for which some quantitative data — although still very crude — are available.¹⁰ The limits of this historical analogy are addressed in sections 5 and 6.

The era of the pound sterling began somewhere at the turn between the 18th and the 19th century, when Britain was ahead of other countries in industrialization, its foreign trade expanded rapidly and London took over as the leading financial centre, and was confirmed with Britain's return to gold convertibility 1819/1844 after the Napoleonic wars (Cohen, 1971). However, the little hard evidence on currency use available indicates that the dominance of sterling — while very clear — was not absolute, i.e. there were several other key currencies. For the period from 1900 through 1913, for example, Lindert (1969) shows that private and official currency holdings outside Europe were in fact predominantly in sterling, but among continental European and Scandinavian countries the shares of Deutsche marks or French francs holdings were more important.

After the rise of the US industrial power at the beginning of the 20th century the dollar emerged for the first time as an important international currency after the end of World War I, which impaired the financial flows through London. Sterling loses its strictly dominant role with the war, but it continues to be an important international currency until the early 1970s (Roosa, 1965; Cohen, 1971; Klump, 1986; Eichengreen, 1997), well illustrating the scope for hysteresis in the use of international currencies (see next section).

It is instructive to look at the few numbers about the decline of the UK currency available more closely, for example as presented by Cohen (1971: 71f.) for foreign trade vehicle use. According to his sources, notably Williams (1968) and others, sterling peaked in the decades before World War I at a share of «at least 60 percent of world trade» and declined rather gently until shortly after World War II to about «half of all trade». ¹¹ For the 1950s the estimates become more numerous, but also more variable; a share between 30 and 40 percent of world trade invoiced in sterling might be considered a conservative estimate. During the 1960s contemporaneous observers estimated a decline from 27 to 23 percent. (By 1980 sterling's share is down to 6 percent of world trade (ECU Institute, 1995).)

It is reassuring that this rather slow dethronement of sterling as the dominant international currency is also visible from other money functions. For example, Lindert (1969) finds that the share of sterling balances in the total official foreign exchange reserve holdings of 35 major central banks was 43 percent in 1899 (French franc 11 percent, Reichsmark 10 percent, US dollar below 4 percent) and 38 percent in 1913 (franc 24 percent, mark 12 percent, dollar below 5 percent). From the data provided by Eichengreen (1997), quoting Triffin (1964), one can deduce

⁹ This also raises the question whether European regulators will increasingly come to the Basle Committee on Banking Supervision, the G-10 coordinating body for banking regulatory affairs, speaking with a single voice (McCauley and White, 1997).

¹⁰ Earlier cases of dominant international currencies are surveyed in Hartmann (1998, chapter I).

¹¹ This number might be slightly too high, but it nevertheless shows that clear dollar dominance was not yet established right after the second war.



that by 1928 official reserves in sterling have probably not been much lower than 40 percent of the total (dollar 19 percent).¹² Further quoting Triffin (1964), Eichengreen then reports sterling shares in reserves of 55 percent for 1949 (dollar 27 percent),¹³ 36 percent for 1957 (dollar 49 percent) and 28 percent for 1962 (dollar 57 percent).¹⁴ From Polak (1992) one sees that sterling's decline is continued thereafter reaching 10 percent in 1970 (dollar 77 percent) and 3 percent in 1980 (dollar 69 percent). Overall, it turns out that sterling did not become less important than the dollar as an official reserve currency before the 1950s, which is compatible with the foreign trade invoicing figures reported above.

The emerging picture is also matched very well by Klopstock's (1957) account of the evolution of (private and official) foreign short-term asset holdings in the United States between 1921 and 1956. From this perspective the use of the dollar as a short-term investment and reserve currency increased substantially during the 1920s but then declines sharply back to former levels in the early 1930s, mainly as a consequence of the unravelling of the Gold Standard and of the Great Depression. Only from 1934 onwards a strong and continuous recovery of dollar investments sets in, which by-passes the levels of the late 1920s in 1939 on a continuing trend. However, «as late as 1940, the level of foreign-owned liquid sterling assets was still double the level of foreign-owned liquid dollar assets» (Frankel, 1992: 699). On the basis of all this evidence claims that the dollar has quickly overtaken sterling during the 1930s, as have sometimes been voiced recently, must be characterized as a pure myth. The transition from sterling dominance to dollar dominance has taken, at the minimum, 30 years (starting around 1918 and being fully accomplished somewhere in the late 1950s).

One important factor in the UK currency's long endurance was the creation of the sterling area before World War II (Cohen, 1992; Eichengreen, 1997). On the one hand, the intense regional use of sterling within this area for private trade, currency pegging and official reserves even after the war ensured the coexistence of two leading international currencies for an extended period, even though the dollar became slowly more important than sterling on the overall global level. On the other hand, Britain used to pay substantial war-time purchases with pounds. These expenditures had considerably increased the so-called «sterling balances» held in sterling-area countries but also in the US and other war ally countries (Harrod, 1952). Outside the sterling area there was some convertibility of these balances for current account transactions, but inside the area the use of most of these assets was strongly restricted for at least a decade after the end of the war. It is quite plausible that these provisions have delayed the decline of sterling in official reserve holdings until de facto convertibility was established in 1955.

The main events which produced sterling's earlier decline were, of course, Britain's own decline as an economic and political world power, World War I and the unravelling of the Gold Standard. World War II and the Bretton Woods conference of 1944 sealed the fate of Britain's currency. The United States' production capacity had not been negatively affected by the war, unlike that of

12 Notice that during the Gold Standard and the Gold Exchange Standard the figures on the currency distribution of pure foreign exchange reserve holdings may be distorted by shifts in and out of gold as an alternative reserve medium. After the 1922 Genoa Conference, which recommended the increased use of foreign exchange reserves, the role of sterling was strengthened by related shifts of central banks out of gold (Harrod, 1952).

13 Eichengreen (1997: 11) cautions that while the 1949 figures give «the appearance of impressive reliance on sterling reserves», (...) «the reality was different, since these balances were to a considerable extent blocked and inconvertible», as a consequence of special arrangements for Britain' war-time purchases of inputs paid in sterling (see below).

14 Alternative estimates have been provided by Klump (1986: 314), who quotes IMF sources. He reckons that as late as 1951 the reserve share of sterling was still up to about 60 percent of world forex reserves, with the US dollar at only 31 percent and that this picture is only reversed by 1960 (sterling 36 percent, dollar 63 percent). Although there are some non-negligible differences between these numbers and those provided by Eichengreen (1997), at least for 1949/1951, they can certainly not put any doubt on the overall picture of the dollar by-passing sterling not earlier than the 1950s.

many European countries, and it became the leading country in national production, international trade, war finance and postwar reconstruction, such that governments attached to it a quasi pivotal function in the Bretton Woods system of fixed exchange rates. All countries participating in the system effectively pegged their currencies to the dollar, whose convertibility remained unrestricted (in contrast to many other currencies, notably sterling), such that by 1960 it had clearly also become the leading reserve and intervention currency (see above).¹⁵ The important official role of the dollar should not disguise the fact that this rather accompanied or confirmed its emerging dominance in non-official transactions, as the most important vehicle and investment currency (Klopstock, 1957; Aliber, 1966; McKinnon, 1969; Krugman, 1984). Some decline during the 1970s and 1980s notwithstanding, the dollar maintained its dominant position in virtually all functions of international money until the present day.



5. Sources of Hysteresis in International Currency Use

One reason, may be even the most important one, why dominant international currencies tend to persist for a long time after the issuing country has lost its status as a dominant economic power — as illustrated with the example of the pound sterling in the previous section — has to do with thick-market or network externalities (sometimes also called economies of scale in use) related to media of exchange. The more a currency is used the deeper financial markets, in particular foreign exchange markets, for this currency and the easier for international traders and investors to find counterparties who would also be inclined to accept this currency.¹⁶ In the present section I present a test of this hypothesis based on the relationship between transaction costs and trading activity in the forex market. A negative relationship between these two variables provides evidence in favour of the presence of thick-market externalities, underlying hysteresis in international currency use.

Transaction costs in the spot interbank forex market can be measured by bid-ask spreads, the difference between the purchase and the sales price of a currency against another, as quoted by a forex dealing bank. One way of measuring trading activity or volume is taking the quoting ('tick') frequency of bid and ask prices by trading banks on the Reuters screen.¹⁷ Table 2 shows the results of two regressions of monthly spreads on monthly 'tick' frequencies, both in logarithms. The data are two cross-sections over currency pairs (dollar/mark, dollar/yen, mark/franc etc.) for April 1989 (22 pairs) and April 1992 (33 pairs). The dependent variable is the average of all spreads quoted during the respective month on Reuters for the respective currency pair. The main explanatory variable of interest here is the number of these quotes during the respective month for the respective pair. It is also controlled for the effects of exchange rate volatility and unobservable individual ('one-way' model) and time effects ('two-way' model). The econometric specification is a random effects panel model, which can be estimated with feasible generalized least squares (FGLS).

Table 2: Spread estimations with 'tick' frequency as a measure of trading activity

| Econometric specification (estimator) | 'Ticks' parameter [t statistic] |
|---------------------------------------|---------------------------------|
| One-way random effects model (FGLS) | -0.039 [-1.99]** |
| Two-way random effects model (FGLS) | -0.041 [-2.22]** |

Note: ** means significant at the 95 percent level.

15 The number of IMF members participating in the Bretton Woods system during the 1960s was over a hundred (Klump, 1986).

16 See, for example, Matsuyama *et al.* (1993) or Hartmann (1998, chapter II) for theoretical explanations.

17 Practically all banks trading in the global foreign exchange market have Reuters screens in their trading rooms and many of them do actually feed in their own quotes in the system. When trading is more active and turnovers are high, quotes are updated more quickly than when it is rather calm.



The parameter of interest turns out to have the expected negative sign, which is compatible with thick-market externalities and hysteresis in international currency use. The more active the trading in a market during a certain month, the lower the transaction costs in this market. This result is significant at the 95 percent level and above, whether it is only controlled for individual currency effects (top line in table 2) or both for currency and time effects (bottom line). In a series of tests in different papers I found that this basic result is robust to a variety of different data sets and econometric specifications.¹⁸

It implies that international traders and investors face the lowest transaction costs in those currencies which are already the most used, reinforcing their incentives to continue using them and causing hysteresis. Hence, once a dominant international currency is established, it will usually not lose its role quickly, even if the issuing country has lost its leading status in international trade and investment. In order to dislocate it finally, one or several large economic shocks will be necessary.

6. The Euro and International Trade

In a first step to determine the future role of the single European currency in trade invoicing one can compute potential euro use on the basis of historical data on invoicing practices and international trade flows. A useful data set of invoicing practices in 7 industrial countries and OPEC has been recently collected by the European Commission and published by a study group of the ECU Institute (1995). Although estimations of invoicing practices outside these 7 countries rely on some drastic simplifications, this source together with statistics specifying regional breakdowns of international trade flows (United Nations, 1995) can be used to make some predictions about approximate invoicing currency use at the start of EMU. The results and how they were got are summarised in table 3.

The left-hand side of the table shows the importance of the major currencies in export invoicing in 1992, as reported by the ECU Institute (1995).¹⁹ The dollar (USD) remains the clearly dominant currency in international trade, whose share in global invoicing in 1992 still exceeded the US' share in international trade (12.3 percent) by almost a factor of 4. The second most important currency in international trade is the Deutsche mark (DEM). Its share in trade denomination was only 4 percentage points higher than Germany's share in world exports in the same year (11.8 percent). This reflects the fact that, in contrast to the US dollar the German mark plays hardly any role as a trade vehicle currency in the narrow sense (i.e. for countries other than Germany), even not within Europe (see van de Koolwijk, 1994). Finally, the Japanese yen (JPY) is surprisingly weak in international trade invoicing (4.8 percent), which is only about half of Japanese exports (9.3 percent) and even less than the roles of the French franc (6.3 percent) or the British pound (5.7 percent).

¹⁸ For comprehensive discussions of spread estimations based on financial market micro-structure theory, see Hartmann (1996a, 1997a, 1997b, 1998 (chapter IV)).

¹⁹ I am not aware of any more recent and similarly comprehensive source of world trade invoicing practices.

Table 3: Trade invoicing in major currencies before and after EMU

| | World | | Intra-EU ¹ | | Extra-EU ¹ | | |
|-------------------|---------|-------|-----------------------|-------|-----------------------|----------------|----------------|
| | bn. USD | % | bn. USD | % | bn. USD | % ² | % ³ |
| USD | 1,740.5 | 47.6 | 141.1 | 3.9 | 1,599.4 | 43.7 | 59.4 |
| JPY | 175.5 | 4.8 | 4.3 | 0.1 | 171.2 | 4.7 | 6.3 |
| DEM | 559.4 | 15.3 | 296.6 | 8.1 | 262.8 | 7.2 | 9.8 |
| FRF | 230.4 | 6.3 | 116.8 | 3.2 | 113.6 | 3.1 | 4.2 |
| GBP | 208.4 | 5.7 | 103.0 | 2.8 | 105.4 | 2.9 | 3.9 |
| ITL | 124.3 | 3.4 | 61.9 | 1.7 | 62.4 | 1.7 | 2.4 |
| NLG | 102.4 | 2.8 | 48.3 | 1.3 | 54.1 | 1.5 | 2.0 |
| EU-5 ⁴ | 1,224.9 | 33.5 | 626.6 | 17.1 | 598.3 | 16.4 | 22.2 |
| EU-4 ⁵ | 1,016.5 | 27.8 | 523.6 | 14.3 | 492.9 | 13.5 | 18.3 |
| EU15 ⁶ | — | — | — | — | 679.1 | 18.6 | 25.2 |
| Exports | 3,656.1 | 100.0 | 963.0 | 100.0 | 2,693.1 | 100.0 | 100.0 |

Source: Hartmann (1996b).

Notes: 1992 invoice data from ECU Institute (1995), trade statistics from United Nations Statistical Yearbook (1995), intra-EU and extra-EU author's own calculations.

(1) Estimated from national export figures and invoicing practices.

(2) Percent of pre-EMU world exports.

(3) Percent of post-EMU («extra-EMU») world exports.

(4) France, Germany, Italy, Netherlands, United Kingdom.

(5) Excluding UK.

(6) Euro invoicing resulting from EU currencies not included in rows above estimated from those countries' exports to non-EU countries assuming 50 % home-currency invoicing: 80.8 bn. USD (2.2 %/3 % of world exports).

The sum of the 5 major EU currencies' shares amounts to a substantial 34 percent of world trade and could be taken — on a first order approximation — as a rough estimate of future euro trade vehicle use. It illustrates the first main difference between the potential impact of EMU and the historical experience with the pound and the dollar, reported in section 4. By unifying a number of single national moneys into a single currency EMU implies a discontinuous change for the international monetary system, which goes of course beyond the pure trade vehicle function. If this type of discontinuity is large enough, it could provide the shock to dislocate the current, partly self-fulfilling and dollar-dominated equilibrium (see the arguments in the previous section). However, because of the 'simple arithmetics of EMU' the raw sum of current EU currency invoicing overstates the shock on the international system, i.e. outside the EU (Hartmann, 1998). Most of European trade and investment is among EU member countries themselves and these transactions will become 'domestic' once the euro is introduced. Correcting for intra-European trade will show that the external shock through EMU is much more moderate than the raw data suggest.

On the right-hand side of table 3 I present estimates of the part of 'international' currency uses which would be erased if EMU would have happened in 1992 and those which would remain. Intra-EMU trade 'disappears' as international trade and becomes regional trade denominated in the 'domestic' currency, the euro. This implies a 'reduction' of total world trade by 26 percent (if all EU countries were 'in'; last row). EMU-to-rest-of-the-world (ROW) trade remains unchanged except that all trade that was denominated in an EMU currency before now switches to the euro.



Rows EU-5 and EU-4 report the trade vehicle currency uses (erased or remaining) for all EMU currencies together for which invoicing data are available; in the first case including the United Kingdom and in the second case excluding it. Thus, on the right of these rows one finds estimates of the future use of the euro in international trade in absolute terms, in percent of pre-EMU world trade and in percent of post-EMU world trade.

It appears that, with UK participation in EMU, a sum amounting to at least 17 percent of pre-EMU world exports would be 'lost' for euro invoicing, because it is now regional trade. This is about half of the total amount of EU-currency invoicing and more than the total share of Deutsche mark invoicing before EMU. (Without the UK this number reduces to 14 percent.) Hence, one can infer that total euro invoicing will be 16.4 percent (13.5 percent) of pre-EMU world trade or 22.2 percent (18.3 percent) of post-EMU world trade.

These estimates may be imprecise for two reasons. On the one hand, they could understate the likely starting level of the euro in international trade, since the Commission data only cover the 5 major European Union currencies. On the other hand, the available data do not contain information on differences between intra-EU trade invoicing and EU-to-ROW trade invoicing. Therefore, the assumption had to be made that the currency distribution of trade invoicing is the same in both cases. This assumption may lead to an overestimation of future euro use, although the Deutsche Bundesbank (1991) found it to be roughly valid for the German case.²⁰

Addressing the former problem first, a back-of-the-envelope estimation based on the assumption of 50 percent home-currency invoicing of exports from the remaining 10 EU countries results in an additional 80.8 bn. USD of euro invoicing (row EU-15 in table 3).²¹ The main reasons why the inclusion of these countries has only a minor impact on future euro invoicing (about 2 percent of world trade) are that, first, their weight in international trade is comparatively small and, second, the larger part of their trade becomes 'domestic' trade after EMU. Including them in the estimations implies that roughly a quarter of world trade would be invoiced in euro, right from the start of EMU. It is also apparent from this result that — apart from the EMU core countries and the UK — the fact that a particular country is 'in' or 'out' does not have an important impact on the potential of the euro to become an important international trade vehicle currency.

In order to check against the possible overestimation of euro use in table 3 I compare four scenarios of euro invoicing in EU exports (assuming that all countries participate), which are reported in descending order of euro use in table 4. The most optimistic scenario (from a European perspective) assumes that 92 percent of EU exports after EMU will be denominated in euro, which is the share of dollar invoicing in US exports (ECU Institute, 1995). The most pessimistic scenario (from a European perspective) hypothesizes a share of 55 percent euro invoicing, corresponding to the current fraction of franc invoicing in French trade. The other two cases correspond to the export invoicing shares as implied in table 3 (82 percent) and to the current mark-invoicing share in German exports (77 percent). Grosso modo the results from table 3 can be confirmed. Under the new scenarios total euro invoicing will be between 19 and 28 percent of (post-EMU) world trade. The most likely starting scenario, that the invoicing of EU foreign trade will roughly resemble current invoicing of German trade, results in a share of 24 percent of world trade denominated in euro.

²⁰ The difference between mark invoicing of German exports to non-European countries and to European countries is very small (Deutsche Bundesbank, 1991: 41f.). The reason is that mark invoicing of Germany's trade with the US is lower than the average, whereas mark invoicing with most other non-EU countries (in particular with developing countries) is much higher than the average. Nevertheless, this home currency invoicing pattern might still be different for other EU countries.

²¹ The average of home-currency invoicing for the 5 EU currencies explicitly reported in table 3 is 49.8 percent of their exports.

Table 4: Scenarios of euro invoicing after EMU

| Scenarios of invoicing shares | Euro invoicing in EU exports | | Euro invoicing in world exports ¹ | |
|-------------------------------|------------------------------|---------|--|--------------------|
| | % of EU exports | bn. USD | bn. USD | % of world exports |
| like USA | 92 | 566 | 741 | 28 |
| like EU-15 2 | 82 | 505 | 679 | 25 |
| like Germany | 77 | 474 | 648 | 24 |
| like France | 55 | 339 | 513 | 19 |

Source: Hartmann (1996b).

Notes: See table 3, author's calculations.

(1) Euro invoicing in EU exports plus euro invoicing in the rest of the world, the latter estimated to be 174.3 bn. USD (not in the tables). Shares in percent of post-EMU world trade.

(2) Euro invoicing in EU exports for EU-15 (505 bn. USD) is estimated from world euro invoicing for EU-15 in table 3 (679 bn. USD) minus the estimate of euro invoicing in the rest of the world in note (1) above (174 bn. USD). The resulting number (505 bn. USD) is 82 percent of total EU exports (616 bn. USD; calculated from the difference of total EU-15 exports and intra-EU exports).

Concerning the impact of EMU on non-European currencies, absolute dollar invoicing will diminish, while the change for the Japanese yen is negligible (table 3). This is due to the fact that the dollar still plays some role as a trade vehicle currency (in the narrow sense) within Europe (for example for some oil trade (McCauley, 1997)) and the yen does not play any such role at all. Nonetheless, the dollar will be able to maintain its dominant role in international trade directly after completion of EMU, in absolute and relative terms, with a fraction of 44 percent of pre-EMU trade and 59 percent of post-EMU trade being denominated in the US currency. This is more than twice as much as the likely initial level for the euro.

From the above one can see that the advantage of the euro compared to the currently most important international currency from Europe, the mark, would be between 0 and 120 bn. USD, depending on whether the union will be narrower or wider. In relative terms the starting share of the euro in world trade could be between 5 and 10 percentage points larger than that of the mark today, but about 5 percentage points of that are due to the 'reductionary' effect on world trade through EMU. In other words, the discontinuity created by EMU, the external shock on the international monetary system, is — from the perspective of world trade — of rather limited size. And it is doubtful that a shock of such moderate order will be sufficient to unlock the current equilibrium, leading to a strong dynamic adjustment out of the dollar into the single European currency.

Nevertheless, the numbers for euro invoicing found in the last column of table 3 and in rows 3 and 4 of table 4 have to be interpreted as estimates of the starting level of the new European currency. Given the likely stability of the euro, the comparable sizes of the US and EU-15 economies and Europe's larger share in international trade than, say, Germany's, it is quite likely that invoicing in domestic currency of EU exports reaches the level of the US and, therefore, euro invoicing rises to 28 percent of world trade later on (table 4, row 2). Overall, then, a gradual increase of the euro's role as a trade vehicle currency can be expected after the currency changeover. As argued in Hartmann (1996b and 1998), this gradual trend will be more pronounced in the regions closer to the monetary union, such as non-EMU European countries, in particular Central and Eastern Europe, as well as the Southern and Eastern part of the Mediterranean.



6. The Euro and International Investment

A second element which could qualify the historical analogy to the slow transition from sterling to dollar earlier this century has to do with the existence of dynamic financial markets in modern times. Those markets may be in a position to bring about regime changes at a much quicker pace than the case earlier in history. International trade is nowadays clearly smaller than international lending and securities investment as well as foreign exchange trading. Total world trade of 5,080 bn. USD in 1995 is less than a third of cross-border bond and equity transactions by the Group of 7 (G-7) largest industrial countries.²² This fact also provokes the thought that investment currency use could be more important than trade invoicing or other functions for the internationalization of currencies. Although «purists» might object that investment in a store of value is not money use in the narrow sense, it can still be a major source of international payments flows and through this channel, as described for example in Hartmann (1994 and 1998), an important determinant of the exchange structure in the foreign exchange market, which can feed back through network transaction cost effects into trade vehicle use (and also further investment decisions).

The strongest case following this line of argument to date has been made by Portes *et al.* (1997), who sketch some elements of a potential three-country transaction cost model linking international trade and investment with the exchange structure in currency markets. In this framework thick-market externalities apply not only to forex markets but also to domestic financial markets. When investors shift funds from foreign countries to a country A not only transaction costs in the A currency markets decline but also transaction costs in A's domestic, say, government bond market do (whereas those in the countries facing disinvestment go up), further attracting international investors. In the framework chosen different structures of currency use in forex, trade and investment can be sustained by transaction costs, depending on the initial conditions, exogenous values for trade and investment flows as well as market expectations on those structures.

Portes *et al.* link spot foreign exchange turnovers, cross-border trade, equity and bond flows between the US, Europe and Japan as well as domestic government bond turnovers within the US, Europe and Japan with bid-ask spreads and the empirical relationship between trading volumes and transaction costs derived in Hartmann (1997b). As a result of this first empirical simulation they conclude that EMU will immediately shift the global equilibrium from what they have defined to be the «status quo» equilibrium to their «quasi status quo» equilibrium, in which the US dollar keeps its position as the absolute forex vehicle for currency exchanges between Europe and Asia from the «status quo» but the euro takes over the financial investment flows between these two regions.

In a second step the authors assume that the domestic component of European transaction costs (say, the spread in government bond markets) declines to (or below) the level of US domestic transaction costs. This is based on the argument that «within a time horizon of five to ten years, financial market integration will be completed within Europe» (p. 29), which may have the effect described because of the similar aggregate sizes of both areas' domestic financial markets. Under this assumption a new set of simulations leads the authors to conclude that there are multiple equilibria, including both a «medium euro» scenario and a «big euro» scenario. The former scenario implies that the dollar still retains its forex vehicle role (though with lower trading volume against the yen) but the euro takes over as the dominant international investment currency, with asset flows between Europe and Asia as well as between Europe and the US being primarily in euro. The latter, «big euro», scenario implies that the European currency also takes over as the forex vehicle, i.e. in this case the only international role of the dollar is in investment flows between the US and Asia.

²² I estimated from McCauley (1997, table A.3.4) and Alogoskoufis *et al.* (1997, table 7) that these transactions from the G-7 countries must have been equal to or larger than 17,151 bn. USD in 1995 (after correction for double-counting).

The analysis leads Portes *et al.* to the following two strong conclusions: First, «scenarios in which the euro does share international currency status more or less equally with the dollar are indeed plausible scenarios» (p.37). Second, «the future of the euro will be determined on the financial markets not on the goods markets» (p. 14). In this latter respect they attach quite an important degree of responsibility to European policy-makers' decisions, such as the ECB's stance towards capital inflows or unremunerated reserve requirements and its readiness to act as a lender of last resort in financial crises. They also point to regulators' inclinations to pursue financial deregulation as well as to their and central bankers' efforts to promote cost-effective euro payments systems. And they note that, in their view, private initiatives to harmonize market conventions and to consolidate markets are already underway.

Is their prediction plausible? McCauley (1997, table 13) has recently advanced an estimate of euro, dollar and yen starting levels in international banking and financial markets, applying the 'simple arithmetics of EMU' (section 5) to BIS data on international bonds, cross-border bank liabilities to non-banks, foreign currency liabilities to domestic non-banks and euronotes outstanding. According to this data the total share of the euro would be 13 percent of the total, as compared to a current sum of 34 percent for all EU currencies together. Even compared to the previous estimates on international trade (tables 3 and 4) and on foreign exchange turnovers as well as foreign exchange reserves reported in Hartmann (1998), this is a surprisingly low number, indicating considerable cross-currency finance within Europe.²³ The dollar's share after EMU would be 53 percent (40 percent before EMU), and the yen's share 15 percent (12 percent before). Again, it has to be cautioned that this provides a purely static picture. But in the presence of some circularity and inertia, is a quick portfolio shift balancing the relative positions of the dollar and the euro, as also claimed e.g. by Bergsten (1997), plausible?

Several key factors will decide about whether quick changes in international investment currency use after EMU are likely or not. One factor, which could — in theory — be at least as important as any liquidity/transaction cost effects and which is not covered in Portes *et al.*'s framework, is the post-EMU correlation between US, EMU-area and Japanese financial market returns. Should that of euro-to-dollar or euro-to-yen returns be lower than the current correlations observed for European currencies, then a higher potential for diversification effects could further increase investment demand for the new European currency, if international investors feel overexposed to dollar risk.

Unfortunately, there is considerable uncertainty about how these future correlations may look like. With the help of the IMF's multicountry model MULTIMOD Masson and Turtelboom (1997) simulated potential future dollar, yen and euro short-term government debt returns after EMU from the perspective of an international investor. Although their main interest has been in optimal official reserve holdings, and not in private investments, their results suggest that euro/yen correlations could be lower than historical mark/yen correlations, whereas euro/dollar correlations might turn out to be higher than historical mark/dollar correlations. Notice however, that there may also be some counterbalancing effects involved. For example, reduced correlations make it not only more attractive for Americans to hold more euros in their portfolios, but it can also give incentives for Europeans to take on more dollars. Finally, due to home bias actual portfolio changes might be more modest than those predictable with international capital asset pricing theory.²⁴

The other key factor, as rightly identified by Portes *et al.*, is EMU's effective impact on internal financial markets. It is potentially large, but — in my opinion — it is also rather likely to be spread out over quite an important period of time, given the present heterogeneity and fragmentation of the national segments. And it is not guaranteed that their aggregate size would become

²³ Henning (1997, table 5) had estimated a smaller arithmetic effect on the basis of some more ad hoc assumptions on intra-European investments.

²⁴ See, for example, Tesar and Werner (1992).





comparable to those of the United States. More precisely, money, bond and equity markets in Europe have usually been strongly separated by national borders and, therefore, market micro-structures tend to be extremely country-specific. Those differences relate to the type of intermediaries, to the way trading is organized, such as screen-based trading systems versus decentralized telephone markets, to the types of instruments traded and to their relative importance, to payments and settlement systems and to legal and tax provisions as well as to the regulatory environment and, last but not least, domestic market conventions. The way in which national monetary policy is conducted is, of course, a strong factor shaping these arrangements, in particular in money markets, but it is not the only one.

A number of segmenting factors are likely to remain even on a more long-term basis. One is the existence of credit risk differentials between different national government debt markets, because in contrast to monetary policy fiscal policy will remain on the national level (Goodhart and Lemmen, 1997), and the existence of differences in market conventions (European Commission, 1997), such as the coupon frequency of bonds (annual vs. semi-annual) which complicates yield comparisons. Others are differences in securities clearing and settlements systems as well as regulatory provisions, such as the exemptions of conduct of business rules and over-the-counter markets from the non-discrimination principles of the EU Investment Services Directive (see e.g. Steil, 1996).

Moreover, it is quite important for the post-EMU size of financial markets that the UK joins the union at a later stage. London is not only the largest stock market in Europe, but also leads other EU countries in foreign exchange, derivatives (BIS, 1996) and international bonds trading. Additionally, some of the world's leading commodity exchanges are also located in London, whereas the Continent does not have any such market of comparable size. Although the participation of the UK need not in all cases lead to a beneficial liquidity/transaction cost effect when it competes for business with the Continent, the standing of London as an international financial center, the broadness, depth and sophistication of its markets should on balance give a boost to the scope of the euro as an attractive investment currency.

The introduction of the euro, with the related size jump in existing securities markets, could accelerate the process of disintermediation in Europe, reducing the importance of traditional bank lending to the benefit of further growth of securities markets. If such a development would gain momentum and EU financial regulators and central bankers take an accommodating stance towards it, Europe's securities markets could grow beyond the presently larger aggregate size of US markets.

However, it is now widely accepted that, even with considerable competitive pressures through technological change, the growing role of private pension funds and financial deregulation, the restructuring of European banking systems advances at surprisingly low paces. Prati and Schinasi (1997: 52) claim that «counterbalancing factors suggest that any shift of financial activity away from the large European universal banks will be gradual» after the start of EMU. And one could add that even when this gradual restructuring and consolidation of EU banking markets is completed the European financial system will not necessarily look exactly like the US system. If EU universal banks succeed in continuing their diversification into investment business, they may still maintain a larger lending activity than US non-universal banks do, implying less development for EU securities markets.

The main conclusion which emanates from this summary of the likely impact of EMU on Europe's domestic financial markets is that, while there are also some important initial size jumps involved, the full development and restructuring of these markets will rather be a gradual process,²⁵ and due to the segmenting effects of national borders continuing to exist within the union they might

25 A similar conclusion has been reached by Peter Kenen (1995: 118) at an earlier stage, who wrote that «the size of the increase in demand for ECU[euro]-denominated assets will depend on the contribution of EMU to the unification and quality of EC [EU] asset markets, and this will take place gradually».

even not attain the same degree of integration as the domestic markets in the US or Japan at a longer time horizon. In spite of remaining uncertainties this makes a quick financial market driven rise of the euro a quite unlikely scenario. While financial markets may somewhat accelerate euro internationalization after the elimination of national currencies in the euro zone in 2002, the overall process is still most likely to be a slow and gradual upward trend.



7. Conclusions

In this paper I have tried to give a first evaluation of the likely international role of the euro after the European currency changeover scheduled for January 1999. I have first reviewed the main functions of international money and then argued that currency internationalization is important for both policy makers and businesses. Based on the historical experience provided by the transition from the pound sterling to the US dollar, I have illustrated that changes in dominant international currencies tend to be slow and I have provided an empirical argument explaining hysteresis in this case, which is based on network externalities in the use of money. The remainder of the paper discussed whether the particular character of a monetary union between various important countries, involving a discontinuity in currency uses, and the important role of dynamic financial markets in modern times may invalidate the historical experience of gradual changes.

Based on data for trade vehicle and investment currency use (the latter reported by McCauley, 1997), I found that the initial discontinuity of EMU or the external shock to the international monetary system is relatively moderate. Although EMU financial markets will grow substantially after the currency changeover, they are not likely to reach the same size, variety and degree of integration as those of the euro's main international competitor currency, the dollar, in the foreseeable future. Whereas the data show that the euro should immediately jump to the second place leading the Japanese yen but lagging the dollar, the European currency is likely to grow at a gradual pace afterwards, without causing major turbulences in the international monetary and financial system.



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