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The euro and the changing role of currencies as transactions vehicles

Paul Mizen*

Summary

The paper addresses the important issue of the likely scope of the euro as an international currency. After a brief introduction, the characteristics of emerging moneys are examined. Section 2 documents the emergence of three currencies that are international in character and in use by a wider constituency than the issuing country. A series of summary statistics show that in international trade, financial markets and official transactions, the US dollar (USD), the German mark (DEM) and to an extent, the Japanese yen (JPY), dominate even when the issuing country is not involved directly on either side of the transaction. Section 3 discusses the emergence of the euro as a new currency. The euro is likely to emerge as the second most important international currency on the basis of the economic size, population, and influence in international trade of the EU-11, but it is unlikely to replace the USD for some time. The paper considers how the euro may be adopted by looking at the incentives for using it in international trade, financial markets, and official transactions within the EU-11 and in the out countries. While the "outs" remain out, there are implications of a large euro area on exchange-rate and monetary policy, and the paper concludes with the prospects for economic management in those countries.

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The countries of the European Union (EU) have embarked on a major new monetary arrangement. For 11 of the member states of the EU (hereafter the EU-11), exchange rates have been locked since 1 January 1999 as the precursor to the replacement of national notes and coins in 2002. Undoubtedly, the euro will be a major currency. It will be the largest home currency because the population group is well in excess of the US and has a combined purchasing power measured by the GDP of the participating states of about USD 8 trillion (hereafter TUSD), measured at the end of 1997. The market for securities and loans denominated in euro will be the deepest and the most liquid of all international markets. It is also likely that many countries will hold significant stocks of euros as official reserves. The questions that many people ask are: will the euro be an international currency and how important will the euro be for "out" countries? We take the questions in turn.

Will the euro be an international currency? Certain currencies such as the USD, JPY, and DEM have attained a higher status than others because they have been used beyond their own borders as international currencies. These are generally accepted as a means of exchange for trading transactions among third parties, as assets in private sector portfolios, or in official reserves (McKinnon, 1969; Swoboda, 1969; Black, 1981; Hartmann, 1996; Tavlas and Ozeki, 1992; Tavlas, 1998; Gebhard, 1998). Arguably, the euro could take on this role in place of the DEM (Gebhard, 1998) or even the USD (Portes and Rey, 1998).

In this paper, we give the greatest attention to whether the euro will become an international currency by considering how its use might be adopted in a transactions vehicle role. We start with the ba-

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sic theory of how moneys evolve as broadly acceptable media of exchange and from there, we conclude how international currencies emerge. By examining the evidence from existing currencies and their usage, we can determine the defining characteristics of international currencies. The USD has had a dominant position in the post-war era due to the extensive network advantages that lowered the transactions costs for users of the currency in third-party transactions (McKinnon, 1969; Swoboda, 1969; Chrystal, 1977, 1984; Dowd and Greenaway, 1993; Bessembinder, 1994; Hartmann, 1996). The DEM, and to a certain extent the JPY, built its post-war status on the basis of its reputation as stable nominal anchor, fostered by a steady monetary-policy stance, which gave it a security that other currencies could not provide (Gebhard, 1998). We assess whether the euro is likely to possess these characteristics and attain the status of an international currency through this route.

Will the euro matter for the out countries? Although 11 nations will adopt the new currency, the monetary restructuring in Europe will be incomplete. Greece and Sweden did not meet the Maastricht criteria for participation in the monetary union when evaluated in May 1998, and Denmark and the UK chose to opt out in the first round. These countries, collectively referred to as "outs", will retain their national currencies until such time as they choose, or are given the option, to join the single currency. As a result, there will be scope for substitution within the EU among the remaining national currencies and the euro in import and export trade, foreign-exchange transactions, and official reserves of foreign countries. We consider the implications for the out countries if the euro is widely used outside of the EU-11 area. If the euro becomes an international currency, we conclude that there may be significant demand for it from residents of non-participating EU countries. This may create a significant demand for euros in the out countries and further afield in the main EU import and export markets. The consequences of the demand for euros will be influential over the level of the euro exchange rate, the choice of nominal and real interest rates, real activity, and seigniorage revenues. This may well suggest that countries will be increasingly constrained by the activities of the private sector: if the euro becomes an international currency, then the incentives to use it as a transactions vehicle in place of other currencies may be a constraint on the policies of near neighbours.

1. How are moneys established?

The emergence of money can be illustrated from first principles. Exchange can occur in a market through a system of barter, but the coordination costs are reduced if one commodity, e.g., gold emerges as a commonly accepted medium of exchange, unit of account, and store of value. The commodity that can fulfil all of these functions is referred to as the "money" of the system.

In the analysis of Menger (1892), the assets destined for acceptability as money are distinguished by their superior saleability (marketability), and traders quickly demonstrate their preference to hold the asset most readily accepted in exchange. Others come to accept them for the same reason and not because of their intrinsic usefulness. These assets become more marketable and valuable as the demand for them as a medium of exchange increases relative to their non-monetary demand. Once a commodity is used to facilitate trade, it is convenient to record prices in terms of the exchange value of each good to that commodity. To qualify as a candidate for this process, a commodity should possess certain attributes, such as stability of value, ease of transport and identification, durability, divisibility, and be easy to store and be readily saleable: that is, the characteristics typically associated with *liquid assets*. Commodities that are highly marketable, reversible, divisible, and predictable evolve as money so that liquidity confers "moneyness", but equally, any commodity lacking these attributes would soon acquire them should it become accepted as a medium of exchange. Then moneyness would confer liquidity. This conundrum is at the heart of the emergence of *new* monies.

The basis for the use of moneys at the international level can be linked to these themes through patterns of exchange and trade, network externalities, and social conventions. Jones (1976) argues that a medium of exchange will arise even in an economy that starts with barter. In his model, people note which commodity is the most frequently encountered and adopt it as a convenient commodity standard. Some, who are trading relatively rare commodities, will reason that the probability of finding an exact match can be improved by two intermediate trades involving a vehicle commodity rather than a single, direct transaction into the commodity of their choice. Once these people begin to trade in the accepted commodity, this raises the probability of finding someone to accept it in trade and more traders will be induced to use it. If this process continues, then

eventually the majority of trades will involve this commodity, and it will become the exchange medium.

Krugman (1980) and Chrystal (1984) propose similar models to explain the settlement of international trades and foreign-exchange transactions based on the minimisation of search and exchange costs. If dealers holding one currency *i* wish to minimise the costs of searching for an exchange at market prices into currency *j*, they will aim to use thick, liquid markets that increase the probability of finding a suitable match, and may go via an indirect route involving a third "vehicle" currency. Taking $p_i p_j$ as the probability of finding a dealer with currency *j* who is willing to exchange for currency *i*, the cost of search can be stated as the holding period defined by $1/\ p_i p_j$. If either currency *j* or currency *i* is a readily acceptable currency, then dealers may make a direct exchange. But if it is not, they may use a third currency. Hence, if $1/\ p_i p_k + 1/\ p_k p_j < 1/\ p_i p_j$ then the dealer will use currency *k* as a vehicle.

Krugman (1980) and Rey (1997a,b) have a similar relationship in the settlement of international trade. When there are unambiguously lower transaction costs of using a vehicle currency then Krugman shows trade between two countries will be settled in *partial indirect exchange*, i.e., trades through direct and indirect exchange markets. If trade between two countries is settled by indirect trade alone, so that one direct exchange market is eliminated altogether, *total indirect exchange* occurs. But the direction in which exchange is conducted matters. Multiple equilibria result in these models so that for three currencies, there are six possible cases: any currency can be the vehicle, but it depends on the transactions costs as to which will actually take on the role and whether indirect trade will be total or partial. But the basic point remains the same: the thicker and more liquid the market, the higher the probability of finding a match and therefore the lower the cost of search. Thick and liquid markets facilitate the emergence of currencies as international currencies.

Kiyotaki and Wright (1989) extend Jones' model and the notion of acceptability. They make trading strategies endogenous to show that there exists a fundamental equilibrium in which the good with the lowest storage cost should be chosen as the exchange medium. This model is based on "random matching", where one trader happens to meet another and trade occurs. Rey (1997a,b) criticises their model for the fact that money is indivisible and cannot be stored (traders can only store one unit of the money or one unit of the commodity);

it has no explicit supply side and rigid prices. It does not readily extend to an open economy case. Rey (1997a,b) offers an alternative based on a model developed by Lucas (1990) and the concept of network externalities discussed by Chrystal (1984) and Dowd and Greenaway (1993). Her model is international and involves three producers of different tradable commodities invoiced in different (national) currencies, there is a government, money and bond markets, a supply side, and flexible prices. The key assumption is that the cost of currency exchange is decreasing with the number of traders in the bilateral market so that thick and liquid markets have low transactions costs as in Krugman (1980) and Chrystal (1984). Rey shows that the same total and partial indirect exchange conditions emerge as in Krugman's case and international currencies can be efficient if sufficient traders use them to lower the transactions costs below the cost of direct exchanges.

This ties the model into the concept of "network externalities" discussed by Dowd and Greenaway (1993), which are derived from certain commodities when used as a means of exchange, i.e., advantages that accrue to the user of a popular currency. In their case, a currency obtains an advantage over others through the positive externalities that are conferred on the user as the domain of the currency grows. This has a double incentive effect because the growth in the network of one currency diminishes the network of another. Each person accepts payment in money only because the person expects others to accept it in payment at a later date. The value of a money, as money depends on acceptance by others; a social consensus leads to acceptability of money in the same way that many other social phenomena such as legal norms, social conventions, clothing, and language are understood to emerge. In essence, money is a pure illustration of consumer sovereignty, but whatever is considered as good as money becomes money. The establishment of a money by social convention is not easy to explain, but Scitovsky (1969) suggests several ways by which this might occur.

One way would be for all members of a group to formally pledge themselves to accept a certain object as a medium of exchange among themselves. This is the way in which the EU established the euro as a common currency in the 11 participating states after 1 January 1999. Establishment of necessary institutional arrangements, without a historical track record, requires considerable skill.

A second way to establish such a social convention is for authority to enforce acceptance of a money as payment as legal tender, and this is the proposal for 2002. Every participating country will then enforce the acceptance of euros in discharge of legal obligations to pay. But note that they have strictly limited ability to do so; as Cohen (1998) has shown, the domain of money is not confined to the geography or the political jurisdiction of the state but money can develop an extra-territorial domain beyond the borders of the issuing country. It is impossible to enforce the use of a currency by the private sector so that any monetary framework can be quickly undone by legal and illegal means as recent examples of currency substitution in Latin America, the former Soviet Union and eastern Europe illustrate (see Mizen and Pentecost, 1996). The private sector could settle obligations in foreign currency, i.e., not euros, and symmetrically, the private sector in the out countries could settle in euros.

In view of these characteristics, we now turn to the features of existing international currencies to attempt to determine how a new currency might gain acceptance within the borders of its own domain and equally important, outside of it.

2. International currencies

Many of the characteristics that cause moneys to emerge are also responsible, in a global context, for the use of international moneys as a preferred units of account, exchange media, and stores of value. The dominance of certain moneys, above others, is an observable reality. This section draws attention to some defining features of international currencies before we take the examples of the USD, the DEM, and also to some degree, the JPY, during the post-war period to illustrate our points.

2.1. Features of international currencies

Mundell (1998) points out that international moneys have been closely associated in world history with *political supremacy and power.* Political power and economic power have often been concurrent, and economic power has led to international currencies. First, an economic superpower has a large market, defined in terms of its size and its scope. This gives good reason for the superpower currency to be adopted by those that trade with them directly, in import or export markets, e.g., sterling (GBP). It also encourages those with ex-

cess balances of international currency to accept payments or invoicing in the international currency even for third-party trades. The argument is based on the liquidity of the market for the currency, the ready acceptability of the exchange medium, and network externalities, which accrue to users of the currency.

Second, international currencies are *economically stable.* Mundell notes that the GBP lost its position as top currency to the USD when its stability was questioned—not when the size of the US GDP outgrew the British output. Low inflation and predictability of prices reduces the costs of writing contracts in the stable currency for export and import trades. As the market for the currency gets thicker so the preference for using the currency is reinforced.

The third and fourth characteristics of international currencies follow from the second: the *political stability* of the nation state that is issuing the international money and a basis for a *fallback value* are vital. Political instability can cause a flight from the currency and examples abound in the 20th century of countries that have shown political weakness, resorted to unchecked money creation, and have experienced subsequent inflation. If the purchasing power of money could be eroded through inflation, the holder would have no assurance that the money would not become worthless at some date as an exchange medium, because its acceptability would decline. An inherent value to the currency is then a necessary characteristic that protects the holder from irresponsible governments or central bankers. Yet for the last quarter of the 20th century, moneys have been fiat monies, backed by promises but not by commodities or anything of intrinsic value. When they appear weak in the extreme, this leads to a run on the currency, firstly by non-resident users but ultimately by domestic residents, i.e., domestic currency is substituted successively in its medium of exchange, unit of account and store of value functions (see references in Mizen and Pentecost, 1996). Points two, three and four all point to instability as the precursor to the demise of a currency's status as an acceptable medium of exchange, unit of account or store of value. Stability is a necessary feature of an international currency.

International currencies take on a special significance as vehicles for international trade in goods and services, foreign-exchange transactions, and official transactions. Theoretical and empirical papers indicate a direct and an indirect (vehicle currency) connection between the extent of trade and foreign-currency holding: Grassman (1973); Page (1977,1981); Chrystal (1977,1984); Chrystal, Wilson and

Quinn (1983); Black (1990); Rey (1997a,b); Portes and Rey (1998); Milner, Mizen and Pentecost (1996,1998); Artis, Kohler and Melitz (1998). The result follows in large part from the observation by Grassman (1973) that exporters of manufactured goods tend to invoice in their own currency rather than in a foreign currency (to transfer the exchange risk to the buyer). Third-currency invoicing is only viable as an option when the benefits exceed the costs. Currencies that have this property are regarded as transactions vehicles. They are often used in these cases:

- Export and import trades among industrialised and developing countries are usually invoiced in the industrialised country's currency or a vehicle currency, such as the USD, DEM, or JPY.
- Inflationary currencies are not generally used for invoicing and again, a vehicle currency will typically be used instead. This can be a natural extension of the currency substitution phenomenon by which domestic trade is conducted through a foreign-currency medium.
- Trades in most primary commodities (e.g., oil) are conducted in one vehicle currency, predominantly USD.

International currencies readily take on this role as the third-party currency through which many other trades are conducted. They can substantially reduce the costs of foreign-exchange market activity even though the total number of trades increases. There is greater breadth and depth in the market for foreign exchange when a vehicle currency is used on one side of the transaction, than for trades between pairs of more exotic currencies. Bessembinder (1994) and Hartmann (1996) have shown that as predictable volumes of trades increase, the bid-ask spread declines due to economies of scale in market making. The total transactions cost of two trades (measured by the sum of the bid-ask spreads) is lower through two trades with an exotic and a vehicle currency on one side of the transaction, than through one trade between two exotics. This leads to the observation that certain international moneys become the "money of the money markets", Chrystal (1977).

The total volume of foreign-exchange trading vastly exceeds the total world trade in goods and services. Foreign-exchange deals that are directly related to trades are a small fraction of the total, because foreign-exchange markets can be put to many other uses. Traders or financial institutions taking short-term positions in the markets will

increase the total volume of transactions in the foreign-exchange market. The foreign-exchange market is also used for the reduction of risk, i.e., hedging activity as a means of insurance through financial derivative products and portfolio management practices by pension funds, dealers, and so on. A single transaction for trade in goods and services can lead to many other foreign-exchange deals because the dealers receiving the currency may hedge or pass on the currency several times to rearrange their portfolios.

Activities in the foreign-exchange market also involve official bodies such as central banks that intervene on behalf of their governments to manage the exchange rate. In the extreme this can involve the purchase or sale of domestic currency through the adjustment of foreign-currency reserves to enforce a fixed exchange rate. Alternatively, in a floating exchange-rate regime the central bank can intervene to prevent the rate from moving too far from an acceptable central rate, the so called strategy of "leaning against the wind". Because the volumes of currency involved are often large and the interventions must take immediate effect, international currencies fit the bill very well because they are readily accepted and are heavily traded in thick markets, in the main financial centres.

2.2. Evidence from existing international currencies

The evidence on the characteristics of the currencies that have already developed an international status is a useful pointer to the likelihood of the euro becoming an international currency. For this reason we consider some of the characteristics of the post-war international currencies, the USD, DEM, and the JPY.

From as early as 1870, the rise to prominence of the USD was seen as a likely event. Although inertia in the payments and settlements system ensured that the GBP continued to hold its position until 1914, Mundell (1998), and even into the 1970s in the "pound sterling area". The USD maintained its pre-eminent position in foreign exchange and international trade from that time onward as McKinnon (1969) and Swoboda (1969) pointed out in articles written exactly 30 years ago. The extensive network advantages of its usage have preserved its status for most of the century. This can be clearly illustrated by measures of network size and influence, such as the size of GDP, depth of the capital market operating in USD, or the population size using the USD. Consider Table 1. Today, the US population is 263 million, more than the combined total of Germany

and Japan. The size of the US GDP was TUSD 7.3 in 1995 and had risen to about TUSD 8.5 in 1997, making it easily the largest single currency domain by the scale of output of the issuing country. The Bank for International Settlements reported that the total of bonds, commercial paper, treasury bills, and international bonds outstanding in the US capital market was more than TUSD 11. And the market capitalisation of the stock market was a further TUSD 7, of which USD 12.2 billion (hereafter, BUSD) was traded daily. By any standard, this puts the value of the domestic market and the market for financial instruments traded in USD well ahead of the trade in any other single currency. This confers large network externalities on users of the USD by lowering the transaction costs for traders importing from or exporting to the US, but it also lowers the transactions costs for third-party transactions from other countries.

Table 1. EU, North America, and Japan: selected indicators of economic size, 1995.

	Population[a]	GDP	Total reserves[b]	Stock market capitalisation	Bank assets
EU-15	371.8	8,427.6	376.3	3,778.5	14,818.0
EU-11	289.0	6,804.9	284.5	2,119.4	11,971.6
US	263.0	7,253.8	74.8	6,857.6	5,000.0
Japan	125.2	5,134.3	183.3	3,667.3	7,382.2
Germany	81.6	2,412.5	85.0	577.4	3,752.4
UK	58.3	1,105.1		1,407.7	2,424.4

	Debt securities			*Bonds, equities, & bank assets*	*Bonds, equities, & bank assets (in % of GDP)*
	Public	**Private**	**Total**		
EU-15	4,809.9	3,863.5	8,673.4	27,269.9	323.58
EU-11	3,903.8	3,088.6	6,992.4	21,083.4	309.83
US	6,728.0	4,322.6	11,050.6	22,908.2	315.81
Japan	3,447.7	1,877.1	5,324.8	16,374.2	318.92
Germany	893.6	1,284.5	2,178.1	6,507.8	269.76
UK	429.9	396.3	826.2	4,658.3	421.53

Notes:

[a] In millions.

[b] Minus gold.

Source: IMF (1997).

The emergence of the DEM and the JPY has accrued for entirely different reasons. Neither currency had a strong pre-war following nor was the scale of domestic operations sufficient to confer network benefits to users. In the post-war period, both countries were emerging from total economic devastation and only since the 1970s have these countries appeared to have sufficiently large economies to support network externalities. The key to the emergence of the DEM and the JPY has been the firmly held commitment to maintain the quality of the currency. The DEM and the JPY built their post-war reputations on the basis of their determination to avoid inflation by the judicious use of monetary policy. Table 2 shows the level of inflation has been remarkably low in Germany and Japan since the mid-1970s and almost exactly half, on average, relative to the US over the period. Likewise, the variability of prices, which is often positively correlated with the level of inflation, has been lower compared to the US, which reduces the uncertainty surrounding the quality of the currency. The DEM and the JPY have been used as transactions vehicles, particularly in their own economic regions of Europe and the Far East, because they have kept their value and have been suitable anchors for nominal contracts.

Table 2. Evidence of stability of currency.

	Inflation			
	1980	*1985*	*1990*	*1995*
Germany	5.4	2.0	2.7	1.8
US	13.5	3.6	5.4	2.8
Japan	7.8	2.0	3.1	-0.1

Notes: Annual percentage change in consumer price index.
Source: IMF, International Financial Statistics.

The results of network externalities and currency stability can be seen by the fact that the USD, DEM, and JPY are used as vehicle currencies in many trades that do not involve domestic residents on either side of the transactions. Table 3 shows the currency of denomination of exports (imports) of certain industrialised countries over the 1992-96 period. According to Grassman's law, we should expect the invoicing to be done in the seller's currency, because the exchange-rate risk is then borne by the buyer, Grassman (1973). The large proportion of trades conducted in local currency, indicated by the values on the leading diagonal for the first three coun-

tries/currencies, upholds this point. Yet many trades are conducted in currencies other than that of the seller. This is most noticeable for the USD that is used to invoice more than half of the exports of Japan, and about 20% of exports for the UK, France, and Italy. The DEM is also used widely in its own region to invoice exports of the UK, France, and Italy. The JPY is little used outside Japan, but the list of reported countries excludes the near neighbours of Japan in the Far East.

Table 3. Currency denomination of selected industrial countries, 1992-95 (percentages).

	USD	DEM	JPY
Exports			
US	98.0	0.4	0.4
Germany	9.8	76.4	0.6
Japan	52.7	--	35.7
UK	22.0	5.0	0.7
France	18.6	10.6	1.0
Italy	23.0	18.0	--
Imports			
US	88.8	3.2	3.1
Germany	18.1	53.3	1.5
Japan	70.4	2.8	22.5
UK	22.0	11.9	2.4
France	23.1	10.1	1.0
Italy	28.0	13.0	--

Source: Tavlas (1998).

A similar pattern is observed for data on the currency of denomination of imports of given industrialised countries. Except for Germany, the use of the USD dominates even the domestic currency of the exporter, for US imports. This shows that either the advantages accruing to the user of a vehicle currency outweigh the benefits of exchange-rate risk reduction or the US importers have sufficient market power to transfer exchange-rate risk to the seller. Germany and Japan have local spheres of influence that involve other countries that could invoice in their own currency but choose to use the DEM or the JPY. The evidence in Table 4 shows the DEM as dominant in Europe because the proportions of imports and exports invoiced in DEM exceed those invoiced in the sum of all other currencies. For

the JPY, about half of all Japanese exports to the Southeast Asian region were invoiced in JPY (the remainder were largely in USD).

Table 4. Currency use by denomination and region for export or import trade.

Germany 1989	DEM	Other
Exports		
Europe	80	20
US	62	38
Other	82	18
Imports		
Europe	60	40
US	14	86
Other	46	54
Japan 1989	**JPY**	**Other**
Exports		
Europe	42	58
US	16	84
Other	42	58
Imports		
Europe	28	72
US	10	90
Other	62	38

Source: Tavlas (1998)

Those transactions that are conducted in local currency rather than the currencies of Germany, Japan, or the US are still likely to be conducted indirectly through the spot, forward, and swap markets in international currencies for reasons given in Chrystal (1984). Because most currencies are quoted in USD (and possibly also DEM, GBP, or JPY on the exchanges in Frankfurt, London, and Tokyo) third-party transactions will often use one of these currencies as an intermediary in buying and selling the necessary domestic currency. Table 5 gives the percentage share of each currency used on one side of a transaction relative to the gross global turnover of the foreign-exchange market. Clearly, the USD, DEM, and JPY dominate, with the GBP as a fourth contender, probably because London has the largest global market for foreign exchange. Survey results indicate that London has the largest global turnover in foreign exchange, summing to more than the combined total of US, German, and

Japanese markets. It is easier to quote the rates of the two currencies in terms of a common third currency (e.g., the USD) and to exploit the depth of the market for each currency versus the USD, than to attempt to make a direct exchange. This can be illustrated by the dominance of the USD, DEM, JPY, and GBP pairs in foreign-exchange transactions.

Table 5. Use of selected currencies on one side of transaction as a percentage of global, gross, foreign-exchange market turnover (percentage shares).

Currency	April 1992	April 1995	April 1998
USD	82	83	72
DEM	40	37	32
JPY	23	24	15

Sources: Tavlas (1998), Bank of England Quarterly Bulletin (1998). Currencies can appear on more than one side of the transaction so percentages do not sum to 100.

Average daily foreign-exchange market turnover.

Market	1992	1995	1998
UK	291	464	637
US	167	244	351
Japan	120	161	149
Singapore	74	65	139
Germany	55	76	94

Source: Bank of England Quarterly Bulletin (1998).

Relative shares of total net turnover by currency pair.

Currency pair	1992	1995	1998
GBP/USD	17	11	14
USD/DEM	24	22	22
USD/JPY	12	17	13
GBP/DEM	5	3	3

Source: Bank of England Quarterly Bulletin (1998).

The official use of the USD, DEM, and JPY also clearly marks them out as international currencies. Industrialised countries have substantial holdings in USD and in DEM and JPY to a lesser extent. Estimates calculated by Gebhard (1998) suggest that the figures were 60%, 15%, and 8% in 1995 for total foreign-exchange reserve hold-

ings worldwide. In developing countries, shares are even more distorted toward the USD, which had the lion's share as a proportion of the total reserves at 72% at the end of 1996, whilst the DEM and JPY took the proportions 12% and 8%, respectively. The French franc (FRF) had a 10% share due to the CFA zone in francophone Africa. And this also explains the large number of countries using the FRF as an exchange-rate peg (Table 6). The dominant position of the DEM and the USD in composition of currency baskets in the emerging markets of Eastern Europe is also relevant. The combined share is 100% for the Czech Republic (65/35 split), Hungary (50/50 split), Slovak Republic (60/40 split), and 80% for Poland (45/35 split, with 10/5/5% taken by the GBP, French franc, and Swiss franc).

Table 6. Use of currencies as exchange-rate pegs.

	1980	1996
Total pegged of which:	72	45
USD	39	20
FRF	14	14
Special drawing rights	15	2
Other	4	9
	(5.6)	(14.9)

Source: Tavlas (1998).

Shares of major currencies in total foreign-exchange reserves 1975-95 (per cent).

End of period	USD	DEM	JPY
1980	69.7	14.7	4.2
1985	66.0	14.1	7.4
1990	56.4	19.1	9.0
1995	60.0	15.3	8.2

Source: Gebhard (1998).

We turn now to the emergence of the euro and the likelihood that it will become an international currency.

3. The emergence of the euro as a new international currency

This section considers whether the euro will be an international currency, the incentives that exist to increase the use of the euro within the EU-11 and beyond, and how *de facto* use of the euro may override exclusion clauses invoked by national governments.

3.1. Will the euro take on the characteristics of an international currency?

In terms of Mundell's four features, the euro appears to have the necessary characteristics of an international currency; see Table 1. It has a sizeable network (or domain) defined by the combined GDP of the EU15 countries. (This is as large as the US GDP at TUSD 8.5 and encompasses a larger population of 372 million residents.) If we consider the possibility of enlargement or the scope of the markets with which the EU trades imported or exported goods, the network could extend to a much larger market. Likewise on stability, the EU looks set to fulfil the criteria for an international currency. The ECB has shown that it intends to use a reference value for money and inflation targeting to achieve low inflation and low price variability to match the performance of the DEM, making the euro a suitable currency for pricing contracts. Mundell concurs with these views, although he is less than convinced that the euro has the political stability and fallback value to attain a true international currency status. But there are reasons to disagree with his conclusions. The euro has the political backing of its member states and that will probably be sufficient to support it in the absence of a central state. The economic incentives for countries to "make it work" would seem to be sufficient: one cannot otherwise explain the continuation of the European Monetary System after the disastrous experience of exchange-rate targeting in the ERM during 1992-93. On the question of the fallback value, it can be pointed out that none of the international currencies of the post-war period has a fallback guarantee because they are all fiat moneys built on trust. In the absence of this characteristic, a constitutional commitment to inflation control appears to have reassured wary investors that the purchasing power is not likely to be jeopardised.

Will the euro become the dominant international currency, replacing the USD? It will take some time for the euro to establish its

own credentials as a suitable international currency, but it will certainly assume a second place position to the USD for two reasons:

1. The euro is a direct replacement for the DEM, the second-placed international currency. This means that the domestic markets of Germany and the other EU-11 countries will all adopt the euro as their domestic currency. The euro will have considerable network externalities in their wider export and import markets and this will create incentives for residents of those countries to use the euro as a transactions vehicle. We agree with Gebhard (1998) that the euro will take on the transactions vehicle role of the DEM. Altogether, the euro will have a significant market, comprising a share of world trade at least as large as that of the US (a share equal to one-quarter of world trade), according to estimates by Hartmann (1996).
2. The ECB has shown that it has no intention of abandoning the low inflation reputation of the Bundesbank but rather, as an institution without a history, intends to reap as much credibility as possible by emulating the Bundesbank's monetary-policy stance. This ought to provide sound footing for the euro as a currency in which to conduct trade. Together, these features will create a large demand for the euro as a transactions vehicle outside and inside the EU-11.

Portes and Rey (1998) argue that the euro will take on some of the international status of the USD, possibly replacing its function in certain areas. This result is calculated using recent financial market data and estimates of the transaction costs of using the euro. The size of the euro area will be much greater than the USD area so their assumption of equal transactions costs leads naturally to the conclusion that the euro will take over the USD's position. The euro will probably have a more liquid and deeper capital market as a whole (bonds, equity, and foreign exchange combined) than the USD and this will lower bid-ask spreads below the level in the USD markets. Yet, history shows that dominant currencies tend to display inertia, and the encroachment of the euro on the USD will probably be much slower, notwithstanding the advantages of the use of the euro, than many commentators suggest. We may conclude that the euro will not displace the USD as the most heavily used international currency very rapidly, but it will gradually encroach upon the USD over time.

3.2. What incentives exist to encourage the use of the euro?

If the euro becomes an international currency, then what will encourage its use beyond the borders of the EU-11? We advance some arguments for the use of the euro by residents outside the EU area.

3.2.1. Swoboda's international square-root rule

With the emergence of an internationally acceptable currency, such as the euro, residents of the EU-11 countries will find their diversified deposits re-denominated into euros in 1999. Swoboda (1969) has shown, by an application of the Baumol-Tobin square root rule, that it is more efficient to hold deposits in one currency than in many, in proportion to the needs of trade and inversely with the relevant opportunity cost. The existence of a single currency would increase efficiency by reducing the total level of balances required. Applying Swoboda's argument to the case of the euro suggests a reduction in the optimal balance, required overall, will cause an excess stock of euros in the initial stages to be offloaded in other assets or goods. Ultimately, to offload the deposits, the euros will need to be exchanged for assets and goods priced in other currencies, so a hot-potato effect may cause the euro to depreciate. The economisation of liquid balances, the reduction in the costs of currency management, and lower staffing levels associated with foreign-exchange management for the EU-11members will put them at an advantage compared to those outside the euro area. The excess (the difference between the original diversified deposits and the new, lower, optimal level of deposits in euros) and savings from economisation could be reallocated into less liquid interest-bearing assets, earning a higher rate of return, or simply be spent on goods and services. These advantages may persuade those based in out countries, or outside the EU altogether, to hold deposits in euros rather than in domestic currency, so that they also gain from the reduction in total liquidity. The magnitude of changes required to maintain the share of foreign-currency deposits held in EU-11 currencies at the end of 1996 are given by Arrowsmith et al. (1998); see Table 9. In columns 1 and 2, the figures indicate that a switch into euro deposits of BUSD 250 and BUSD 182 by residents in the EU-11 and EU-15, respectively, would be required to maintain this share. To achieve the standing of the USD, euro deposits by residents in the EU-11 and EU-15 would need to rise by BUSD 225 and BUSD 138, respectively. Swoboda's

argument suggests that these numbers will be smaller than predicted due to the efficiency gains from holding one currency instead of 15.

Many of the economies will be reaped in the first instance by multinational firms through more efficient foreign-exchange management. Anecdotal evidence suggests that changes are underway to ensure that they are exploited. The toolmakers, (Trumpf, Germany), cited by the *Financial Times* (17 December 1998), suggest that although conversion will involve costs of installing new software and currency management systems amounting to a one-off payment of MDEM 2, they will save MDEM 1 annually from the reduction in staff costs and payments made to banks for currency conversion. If these figures are representative, a payback period of two years provides good incentive for companies to make the conversion to handle euro deposits and price in euros rather than in national currency.

3.2.2. Trade patterns, externalities and currency usage

If the introduction of the euro is to have a major effect on the holdings of currency and deposits, then it will probably operate through trade patterns and invoicing behaviour. The consensus view of the long-running optimal currency area (OCA) debate is that similarities in economic characteristics and responses (including trade patterns) are ideal precursors to an OCA but that these characteristics are also likely outcomes of an OCA. Whether the euro area is an OCA is a debatable point, and some authors (e.g., Tavlas, 1993 and Cohen, 1998) have argued that OCA characteristics matter less than the political decision to join a currency space and engage in substantial trade denominated in euros. It is quite likely that trade and foreign-currency holding are endogenous variables that interact with each other, so firms that have substantial bi-directional trade with EU-11 countries may prefer to invoice in euros. Survey evidence suggests that up to half of sales to the EU will be invoiced in euro and many sales outside the EU will be invoiced in euros to make pricing more transparent. The dividing line will probably be between large companies, which will be invoiced in euros, and small- or medium-sized enterprises, which will continue to pay for goods and services in domestic currency. On 1997 direction of trade statistics, if half of exports to the rest of the EU from Euroland countries are invoiced in euros, then this would amount to BUSD 540 of trade, while if importers from the rest of the EU insist on paying in euros this would amount to BUSD 417. By holding the proceeds in euro (transactions)

accounts rather than in other currencies (that will later need to be transferred back to euros at a future, uncertain exchange rate), firms will reduce their transactions costs in the foreign-exchange market and their exposure to exchange-rate risk.

Chrystal (1984) and Dowd and Greenaway (1993) identified that there may be positive network externalities from currency usage and the argument that the euro may become a large international currency used as a vehicle in third-party transactions rests on this characteristic. Network advantages will probably also accrue to companies pricing in euros. Those that do so will gain from the transparency that reveals competitiveness, whilst those that do not may very well face prejudice from their customers. The positive benefits conferred on the holder of a currency as a larger number of others make use of the currency in receipt (invoicing behaviour) and payment, causes the number of "international" currencies to be small. It also accelerates the process of transition between the use of currencies that are waning in popularity and those that are growing. The extent of the externality relative to the transition costs of establishing new financial arrangements and networks is the main issue.

In an interview with the *Financial Times*, Peter Everett, deputy head of ICI, indicated that the euro will probably be the normal transactions vehicle for trade between ICI and its customers and suppliers in the UK, Denmark, Sweden, and Greece as well as the EU-11. Whilst the customers may not always be invoiced in euros, suppliers will probably be paid in euros under the "no compulsion, no prohibition" ruling to facilitate a hedging operation against the large euro takings from elsewhere in Europe. The network externalities to customers and suppliers in these countries will be large and even for countries outside of the EU, such as Switzerland, which imports BUSD 58.3 of goods from the EU and exports BUSD 45.3 to the EU, the rewards for using the euro could be considerable.

3.2.3. Financial markets

The size of the European capital market is greater than any other. Table 1 shows that the EU-15 area had a larger total trade in bonds, equities, and bank assets at TUSD 27 versus the US at TUSD 23, although the EU-11 area was marginally smaller at TUSD 21 at the end of 1995. The market for futures and forwards is more skewed toward the US, because the derivatives trade in Europe represented only 36% of the US level according to 1995 figures, Thom et al. (1998).

Accounting for the total trade within Europe, the capital market will be very large, but much of this trade will fall off now that intra-EU trade has been eliminated by the single currency. But the deeper capital market (which lower the transactions costs of operating through euros versus the USD or the JPY) may gain trade for the euro, which may offset the reduction due to monetary union (Hartmann, 1996). Financial institutions that do not deal in the euro will lose credibility and therefore business. Recent estimates by *Morgan Stanley Dean Witter* suggested that up to BUSD 1300 of new money would flow into new equities in euros from fund managers alone. Many investors have begun to treat financial markets as if they were pan-European (even though this is some way off) by no longer conducting operations on a national level but adopting a new sectoral basis for investment. Companies now work to raise finance on a continental level in larger markets and bid-ask spreads will probably fall in Europe as a result. Restructuring of financial arrangements will help remove segmentation in the market and improve competition through transparency, first of all at the corporate level, but subsequently for the retail sector, and the outlook for some small traders with specialisations in niche markets is therefore bleak. The markets for debt will probably experience some redenomination into euros as banks issue debt in euro to buy back current debts in USD, McCauley (1997).

The USD will probably retain a significant position in financial markets due to inertia. The size of transfers into euro denominated debt securities that would be necessary to meet the share held by the EU-11 countries at the end of 1996 is estimated as BUSD 408 and BUSD 321, respectively (columns 1 and 2 in Table 9). To achieve the standing of the USD, the deposits would need to rise by BUSD 397 and BUSD 228, respectively. Over time, we may observe a binary divide in emerging markets between exchanges involving eastern European currencies dominated by the euro and exchanges involving Latin American and Asian currencies conducted through the USD.

3.2.4. Official holdings

Estimates from the *IMF International Capital Markets* suggest that about 25% of EU official reserves are denominated in EU currencies; these have been converted into euros since 1 January 1999 and have disappeared from the reserves of EU-11 countries altogether. Other things being equal, the countries would need to buy other currencies

as reserves, but the pooling of reserves will result in an excess of foreign currency in official hands that could be reduced. The reduction in reserves, due to economies of scale along the lines of the Swoboda argument previously outlined and the diminished ERM intervention obligations on the part of EMU participants, will reduce total foreign-exchange reserve requirements. According to Table 7, this stock of total reserves in the EU area amounts to about BUSD 137 for the EU-15 or BUSD 85 for the EU-11. The majority of the remainder are in USD and some of these would be pooled, leaving a net excess supply—the so-called *dollar overhang*—estimated to range between BUSD 230 (European Commission, 1990) to BUSD 50 (Masson and Turtelboom, 1997). But not all of this will be offloaded to the markets, because the ECB has the right to call upon national central banks to provide further reserves beyond the initial requirements of the Maastricht treaty. If some countries must borrow to meet these obligations, the likely USD overhang may shrink to BUSD 42 according to Arrowsmith et al. (1998).

Table 7. EU countries' gold and foreign-exchange reserves after EMU, in BUSD, end-1996 data.

	Total FX reserves in 1996	*Of* which: in USD	In EU currencies	Non-EU (total)
Austria	20.6	12.5	7.4	13.2
Belgium	14.7	6.4	7.0	7.8
Denmark	14.1	3.4	9.0	5.2
Finland	6.4	2.0	3.7	2.7
France	15.3	10.3	4.1	11.2
Germany	69.1	62.0	7.0	62.1
Greece	17.6	5.2	10.4	7.2
Ireland	9.8	3.0	5.8	4.1
Italy	43.0	22.6	17.2	25.8
Luxembourg	--	--	--	--
Netherlands	22.1	6.1	13.4	8.7
Portugal	13.7	3.7	8.4	5.3
Spain	50.6	37.9	10.7	39.9
Sweden	23.6	5.4	15.3	8.3
UK	36.1	14.7	17.6	18.4
EU-15	356.7	195.2	137.0	219.9
EMU-11	265.3	166.5	84.7	180.8
Non-EMU 4	91.4	28.7	52.3	39.1

Source: Tavlas (1998)

The official holdings of non-EU central banks are also likely to be rebalanced to reduce the current holdings of USD and increase euro either for the purpose of foreign-exchange diversification or for exchange-rate pegging. It is unlikely that these operations will be hurried and the rebalancing will probably occur over a longer period than the market has come to expect, but they will enhance the position of the euro as a reserve currency. The fact that the total official reserves worldwide (at some TUSD 1.4) is small relative to the asset holdings of the private sector will probably diminish the impact of this rebalancing on exchange rates and asset prices.

Table 8 shows the component due to EU-11 currencies in the official reserves of all countries central banks was BUSD 229 at the end of 1996. This comprised about 16% of all currencies. Non-EU countries held about half of these, and the likelihood that they will increase is quite high. The total effect of all readjustments to international private sector and official portfolios to achieve an equal share with the USD is estimated by Arrowsmith et al. (1998) and reported in Table 9. They calculate that if the euro becomes attractive as an official reserve currency outside the EU-11, several scenarios could result. If the official use restored the euro share to the present share for the EU-11 national currencies, then euro holdings would increase by BUSD 66 (column 1, row 1). To achieve an equal status with the USD, it would need to rise by BUSD 358, which entails a switch from the USD to the euro of BUSD 260 in 1996 terms. An equivalent number is calculated for the EU-15 in columns 3 and 4. Whilst these figures are large, the time frame over which the adjustment will probably occur is unknown: the numbers give a guide to the extent of the change but provide no indication of the time period that would elapse before such changes were complete.

As the euro grows in status as an international currency, it is likely that central banks will readjust their portfolios in a gradual manner and the share of euros in the official reserves of non-EU central banks will probably increase.

Table 8. Official reserves in the EU (at the end of 1996).

	Amount (BUSD)	As % of all currencies	As % of USD holdings	As % of EU GDP
All countries' official reserve holdings of EU currencies	276.4	19.0	31.9	3.2
Holdings of EMU-11 currencies	228.6	15.8	26.4	3.3
Of which:				
Non-EU countries' official reserve holdings of EU currencies	155.2	14.1	23.1	1.8
Holdings of EMU-11 currencies	118.5	10.8	17.6	1.7

Source: Arrowsmith et al. (1998).

Table 9. Potential increases in international holdings of euro assets: some illustrative figures (BUSD), end-1996 data.

	With an EMU of 11		With an EMU of 15	
	To restore present EMU-11 share	*To achieve equal share with USD*	*To restore present EMU-15 share*	*To achieve equal share with USD*
Official currency reserves	66	358	111	364
Foreign-currency deposits	250	182	225	138
International debt securities	408	321	397	228
Total	724	861	733	730

Source: Arrowsmith et al. *(1998).*

3.3. The impact of the euro on the out countries

One of the more difficult questions to answer is what will happen to currencies of countries that have opted out of the euro launch. This topic could become a separate paper, but our discussion must, by necessity, be brief. In part, uncertainty over the ECB's monetary policy and its exchange-rate implications will probably prevent the euro from being readily accepted as an international currency at the very start. Some market participants may wish to see how the euro behaves before using it as a transactions vehicle, and they may be

hesitant before switching deposits, liabilities, and investments into euros. However, currencies in Europe that are regarded as safe havens, such as the GBP, have not experienced the appreciating exchange rates against the euro that might be expected under these circumstances, as cautious investors avoid the uncertainty of euro markets. We conclude that a flight to safe havens seems remote, and international currencies or even those of the out countries are unlikely to appreciate significantly due to euro holders offloading their excess balances.

Currency substitution is more likely in the other direction as traders and investors in countries outside the EU-11 area move progressively into euros. It is likely that Denmark and Sweden would be the first to experience this effect as their private sectors warm toward the euro, and the network externalities they would experience become more compelling. As investment portfolios, deposits, and invoicing patterns are re-arranged, increasing the relative share of the euro denominated trade, they would experience a depreciation of their currencies relative to the euro. It is unlikely that these will be sufficiently large adjustments to significantly alter the exchange rate at the outset, because the portfolio-size shifts amount to less than the weekly standard deviation of the pre-euro DEM-USD exchange rate, McCauley (1997). Yet, the logic of network externalities suggests that as portfolio flows into the euro occur, the benefits of switching into the euro grow, whilst the benefits of not doing so (retaining national currencies) diminish. So these shifts may be cumulative over longer horizons and should not be ruled out because they are small relative to other short-term shifts.

There are at least four scenarios that could emerge in the use of the euro that may affect the out countries:

1. The honeymoon launch could be followed by a period of retrenchment.
2. The euro could continue to experience steady growth by investors and exporters or importers to and from Euroland with little use outside.
3. The euro could grow rapidly within the EU-11 area and be adopted steadily by the out countries.
4. The euro could expand rapidly inside the EU-11 and among the outs, with all the eligible participants joining up quickly, and could grow steadily internationally.

Given the successful launch, it seems unlikely that there will be a reduction in the use of the euro so we suggest (scenario 1) is unlikely and recent experience bears out this view. Likewise, if the euro is used extensively inside the EU-11, it is likely to be used by other EU countries that trade heavily with them, we rule out (scenario 2) on this basis.

According to 1997 figures, exports from the EU countries to the UK, Sweden, Denmark, and Greece are respectively: BUSD 141.1, BUSD 44.4, BUSD 32.0 and BUSD 4.8bn, whilst their imports to the EU are BUSD 145.2, BUSD 42.8, BUSD 31.6, and BUSD 19.0. Previous evidence suggested that up to half of these would be invoiced in euros at the outset.

Scenarios 3 and 4 seem plausible but on balance—given the evidence from the previously quoted sources—the latter seems more likely. Euro use would probably first occur in transactions for goods and services and exchanges of financial assets by the corporate sector (including third parties seeking exchange of "other" currency pairs through the euro market, in much the same way as they currently do through the USD). Exporters and importers to these countries (in the corporate sector) may find themselves using euros gradually over time as competitive advantages of pricing and depositing in one currency become apparent. This would be extended to other parts of the private sector as banks and retailers prepare to handle products and take payments in euros in retail markets. Last of all, official holdings of reserve assets will alter over time.

Whatever the actual outcome, advantages generated by small flows at the start will generate incentives for larger flows, and the floodgates may open rather quickly. The steady launch and the likely network advantages have already persuaded the national governments of Denmark, Sweden, and the UK to re-consider entry earlier than anyone was predicting two years ago. Hence, we suggest that many of the out countries may find themselves being driven by the invoicing and payments practices of manufacturing, tourism, banking, and insurance sectors rather than by their own policy preferences. Questionnaires and surveys would be particularly helpful in judging the changing patterns of behaviour and speed of adjustment and euro preparedness in different sectors.

The final question to address is the effect of the euro on monetary policy in the countries that remain out. Some small open economies may choose to dedicate their monetary policy toward stabilisation of

the exchange rate so that the ECB will provide the nominal anchor. Other countries may aim to follow a different nominal anchor, such as an inflation forecast target, whilst keeping an eye on the external demand for their own currency and the demand by domestic residents for the euro. This will involve controlling inflation against a specified target given in terms of a domestic price index. If the euro is used extensively to invoice sales, price goods and services and financial products and the euro deposits of domestic residents grow, the task may become more complicated for three main reasons.

1. If the central bank is successful in meeting its inflation target, it will need to stabilise prices for the proportion of goods and services priced in domestic currency and the remainder in foreign currency converted at the prevailing spot-exchange rate. Although the inflation target in the euro zone is similar to the objectives followed by the outs (a point that could be made more apparent by converting the domestic target into a Harmonised Index of Consumer Prices (HICP) equivalent, which would avoid numerical discrepancies in the target due to different price indices), it will introduce the exchange rate into the objective function in a significant way. Part of the solution for the national central bank may be to use an open economy indicator of its policy stance, to allow it to judge the impact of the instrument of policy on inflation and the exchange rate. But this will not make the task of policy setting any easier if the exchange rate is volatile.
2. The central bank would have further difficulty in determining the appropriate setting for the policy instrument if the euro is used extensively. When demand for external components becomes large in either direction, there will be a positive (negative) effect on the velocity of circulation as currency holdings fall (rise) relative to nominal income. The effect may not be entirely transactions dominated but may also involve precautionary and speculative elements as an analogue response in monetary aggregates to exchange-rate volatility. Demand for domestic money may appear unstable, relative to conditions that have been the norm while currency substitution has been small (see Kremers and Lane, 1990; Monticelli and Strauss-Kahn, 1993; Mizen and Pentecost, 1994; Artis, 1996; Janssen and Bhundia, 1998). Under these circumstances, the central bank must have more accurate estimates of the extent of currency substitution and the likelihood of a change in market sentiments toward one currency or another.

3. The influence or leverage of the instrument might be reduced if money markets begin to operate in euro-denominated instruments or if financial institutions offer corporate and personal sectors loans and credit facilities in euros rather than domestic assets. The relevant interest linkages in the transmission mechanism on which the central bank relies would be increasingly under the control of the ECB rather than the national central bank. So the normal channels of transmission and monetary control could be gradually undermined as the markets through which they operate become increasingly dominated by euro markets. The effects will be more severe for those countries with business cycles that are out of phase with the euro zone, because policies might be constrained by the opportunities for participation in money markets elsewhere. With a large difference in the levels of rates, perhaps arising from differences in the stage of the cycle, there might be a shortage of buyers or sellers in domestic money markets if rates are more favourable in euro markets. The size and direction of changes to the domestic instrument might need to reflect, even more so than at present, the monetary situation in Europe and not just domestic inflationary pressures. The distortionary effects on different sections of society may emerge if euro-denominated financial arrangements are more common among the corporate sector than the personal sector, or among traders in manufactured goods as opposed to non-manufactures and services. If certain large companies have greater access to international financial markets than medium- and small-sized enterprises, there may be further distortions in the market place among the sources of funds available to firms of different sizes.

4. Conclusions

This paper explored the way in which moneys emerge. The exchange medium, unit of account, and store of value functions are adopted by common consent in a national and an international context as certain assets are found to have the necessary properties to facilitate trade. International moneys are often used as vehicles to conduct trade, foreign-exchange operations, and official interventions well beyond the realm of the issuing country. A network of users and stability of the currency, in terms of its purchasing power, have been associated with the post-war currencies—the USD, DEM, and JPY—that have fulfilled this role. We then considered whether the euro is likely to

fulfil this role. Our conclusion is that it will do so but not all at once. And it will take second place to the USD. There is considerable inertia in the system to ensure that existing international currencies retain their place even when a strong rival emerges. Nevertheless, we judge that the euro will become a significant international currency, first of all in the extended import and export market of the EU and in the emerging markets of eastern Europe, then in the out countries and later in third-party trades of non-European countries as a transactions vehicle. The consequences for the out countries are difficult to predict. They may end up joining more quickly than most commentators thought a few years ago or they may opt to remain out and conduct monetary and exchange-rate policy alongside the euro for the time being. So we conclude that the euro will take a prominent role as an international currency and transactions vehicle.

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