

# Key Currency Competition

## The Euro versus the Dollar

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### ABSTRACT

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In this article, I investigate whether the euro is set to eclipse the dollar as the world currency. Although the euro has gained in importance at the expense of the dollar in all key currency functions, I argue that it is not about to replace the dollar as the unique currency of global importance. Notwithstanding America's current weakness, I argue that different preferences for monetary and fiscal policy inside the euro-zone, and the need to coordinate these, will make it difficult to accommodate and correct large-scale imports over the long term. I also find that taking on the role of the world's preferred import destination is bound to exacerbate internal differences and complicate decision-making.

*Keywords:* financial crisis; fiscal policy; invoicing; monetary policy; oil; political economy; price stability; trade; trade deficit

### Introduction

One dimension of American hegemony is its role as provider of the key currency in the international economic system. Following Cohen (2007), I argue that the dollar has remained the key currency in the international system and that the euro is unlikely to replace it. I modify Cohen's position slightly by drawing attention to the way in which the dollar's role as unit of account, and especially store of value, has diminished to some extent. In addition, whereas Cohen says in passing that we can focus exclusively on private actors, I think it is worth making public actors' incentives to prop up the dollar explicit. These are modest, but non-trivial, additions that should be of interest for two reasons. On the one hand, the euro seems to have made more headway in challenging the dollar than Cohen's empirical assessment suggests. On the other hand, an evaluation of the incentives facing official actors reinforces Cohen's analysis of private actors' incentives to stick with the dollar. My main contribution, however, is to claim that the euro is unlikely to replace the dollar as key currency in the foreseeable future. As I will demonstrate, the area of trade, where the euro-zone now excels over the United States, is where the challenge for key currency status



will be the most difficult. First, I argue that the composition of the euro-zone's trade is not conducive to its adoption as unit of account. Second, I highlight the political difficulties euro-zone countries will encounter in effectively accommodating trade deficits, a task that has become closely associated with key currency status. A tentative conclusion, in view of this latter point, is that strict adherence to price stability may not be necessary, or even desirable, for key currency status.

In the first section of the article, I briefly outline the benefits and costs associated with key currency status. The second section is an empirical assessment of the relative use of the dollar and the euro across key currency functions. In the third section, I examine the prospects of the euro overtaking the dollar as key currency country given the various roles it will need to play. The special focus in that section is the euro-zone's ability to absorb large and persistently high shares of world imports, as the United States has done in the past quarter century. In order to significantly outperform the United States on this score, the euro-zone would either have to cope with external price instability, along with the associated risk to internal price stability, or expand by adding new members to the euro-zone. Both these scenarios have serious shortcomings.

### **Net Benefits with Key Currency Status**

The euro-zone now comprises 16 countries, i.e. the original Baffling group (Belgium, Austria, France, Finland, Luxembourg, Ireland, The Netherlands and Germany) with Italy, Portugal and Spain joined by Greece in 2001, Slovenia in 2007, Cyprus and Malta in 2008 and Slovakia in 2009. Providing a common currency with the potential to replace the dollar as key currency is where Europeans have come furthest in challenging the United States' hegemonic position and where it will hurt the most (for the United States) if they succeed.

What are the advantages and disadvantages of providing the key currency? Whether the benefits from key currency status outweighed costs was hotly debated in the 1970s (Bergsten, 1975; Cohen, 1977). Today, new evidence from economics suggests that the gains are substantial and greater than the costs (Tille, 2003; Gourinchas and Rey, 2005; Lane and Milesi-Ferretti, 2006). There are two main interrelated costs associated with key currency status. First, the provider of the key currency has a responsibility to maintain internal, and to some degree external, price stability. Second, and related, having key currency status entails higher opportunity costs in using fiscal or monetary policy (as opposed to exchange rate policy) as a tool of adjustment (Bergsten, 1975). There are several benefits from having key currency status: seignorage, positive valuation adjustments, a positive return differential, policy autonomy, prestige and leverage (Cohen, 1977; Tille, 2003; Gourinchas and Rey, 2005; Lane and Milesi-Ferretti, 2006; Norrlof, 2010). Seignorage is the ability to borrow without interest as a result of actors holding one's currency in cash balances. International use of the currency implies much

greater gains than a central bank normally receives when bills are stashed under the mattress or when cash percolates through the black market. Return differentials are the difference between the rate of return a country receives on its assets and what it pays on liabilities. These gains can appear on the international investment position (IIP) or the income balance. If a country's external liabilities are higher than its external assets, a positive income balance (or an improvement in the net IIP) implies that a state receives higher returns (and/or exchange rate gains) on its external assets than it pays on its external liabilities. A gain in policy autonomy is a consequence of these benefits, since they facilitate adjustment of external imbalances. There is also prestige and leverage tied to being provider of the key currency. All countries can influence who has access to its currency, but because the dollar is the medium of exchange for commercial and financial transactions, most international banks have pecuniary relations with the United States. This gives the United States a certain amount of influence over who has access to dollars. For example, American banks are no longer lending dollars to Iran; Iranian banks are unable to operate in the United States, and major European banks, such as Deutsche Bank, Commerzbank and Dresdner Bank have been persuaded not to deal with Iran.

Given these benefits of key currency status, we might expect other states to organize to obtain these benefits where possible. In the rest of this article, I assume for purposes of analysis that the euro-bloc, as a group of rational actors, would like to capture the economic advantages associated with key currency status if possible without incurring costs greater than benefits. To what extent have they managed to acquire such benefits and what obstacles do they face in making further progress?

### **An Empirical Assessment of Dollar and Euro Use**

A first step in reviewing the euro's prospects as key currency is to explain why we need one in the first place. The overarching rationale of a key currency is to achieve efficiency and stability in international transactions. In a world of nearly 200 countries, trading goods and assets would be prohibitively costly if the currency of each partner country had to be accepted (or acquired) at each sale (or purchase). Dealing in one currency dramatically reduces transaction costs. A key currency is needed for 'efficient management of information and the minimization of search costs [as well as] efficient management of risk [fostering] diversification' (Kenen, 2002: 348). An important implication of this article is that the former role of reducing transaction costs is by far more important than the latter role of providing a means for spreading risk. Consequently, it will be very hard for the euro to challenge the dollar's staying power.

A key currency has to effectively perform three main roles. It must serve as: (1) a medium of exchange; (2) a unit of account; and (3) a store of value,

TABLE 1  
The Role of a Key Currency

Role	Private use	Official use
Medium of Exchange	Vehicle	Intervention
Unit of Account	Invoice/Quotation	Peg/Reference
Store of Value	Banking/Investment	Reserve

Source: Krugman (1991: 167).<sup>1</sup>

<sup>1</sup> Krugman modifies the framework elaborated by Cohen, Benjamin J. (1971) *The Future of Sterling as an International Currency*. London: Macmillan.

and it must play these roles in private and public international economic transactions, though for different reasons (see Table 1 for a summary).

As medium of exchange, private actors use the key currency as an intermediary currency instead of their respective currencies to buy goods, services and assets. In other words, it functions as a means of payment. The key currency is thus the most frequently traded currency in foreign exchange markets. Governments too will use the key currency as a means of intervening in foreign exchange markets if they wish to defend the value of their own (or another) currency. The key currency also serves as a unit of account, with the price of goods, services and assets quoted in the currency. Officially, governments track the value of the key currency in order to determine the price of their own currency, by fixing their exchange rate against the key currency, by pegging to it, or, more loosely, by considering its value when delineating monetary policy. As store of value, private actors hold their investments in the international currency because they believe their value will increase not erode over time. A currency that is a good store of value is also an attractive reserve currency for official investors. How far has the euro come in fulfilling these tasks?

### *Medium of Exchange*

There is broad agreement that the initial test for a world currency is as medium of exchange in private markets and that the dollar continues to be the primary medium of exchange because of scale economies that favour dollar use. Here, the euro has only made modest progress.

Scholars infer which currencies are most widely used for international transactions by looking at foreign exchange trading. This is where the dollar has an especially strong lead (Hartmann and Issing, 2002: 337; Kenen, 2002: 349; Cohen, 2003; Chinn and Frankel, 2005: 18). By 2007, the frequency with which the euro appeared on one side of all currency transactions was actually down 0.6%, from 37.6% in 2001, whereas the dollar was down 4% from 90.3%, appearing 86.3% of the time on one side of foreign exchange transactions (BIS, December 2007).<sup>1</sup> Scale economies in currency use are

difficult to break because it makes sense to continue using a currency with high turnover, and low transaction costs, as opposed to switching to a start-up currency with high transaction costs. Still, in terms of currency in circulation, the euro surpassed the dollar in 2006 even though a much smaller proportion of euros was being used outside the euro-zone (10–20%) than dollars outside the United States (50–70%) (Walter and Becker, 2008: 4).

The dollar also retains its lead as the currency with which central banks frequently intervene. This is simply due to the fact that most of their reserves are in dollars.

### *Unit of Account*

As unit of account in private markets, the key currency is used to quote prices for traded goods (merchandise and commodities) as well as services. It therefore makes sense for the key currency country to be the largest economy in the world. It should command a high share of GDP, large trade shares and a big financial market. These size measures bear on the attractiveness of pricing in a particular currency.

The available data suggest two procedures for assessing the international role of the euro for invoicing in trade. For instance, one can consider how much of the euro-area's trade with countries outside the euro-area is denominated in euros as opposed to dollars or some other currency. An alternative approach is to look at whether the trade of countries of the European Union (not members of the euro-area), or candidate countries, or countries in other parts of the world, is denominated in euros in excess of their share of trade with the euro-area. In other words, to what extent the euro is used when euro-area countries are not involved.<sup>2</sup> As can be seen from Table 2, there is a marked increase in euro invoicing and a steady

TABLE 2  
Relative Use of Euro and Dollar for Invoicing in Extra Euro-Area Trade

	Euro area with countries outside euro-zone		
	1999	2004	Q1 2006
<i>EUR (exports)</i>	20.8	27.7	49.7
<i>USD (exports)</i>	55.4	49.1	44.0
<i>Other (exports)</i>	n.a.	n.a.	6.3
<i>Total</i>	n.a.	n.a.	100.0
<i>EUR (imports)</i>	n.a.	n.a.	35.2
<i>USD (imports)</i>	n.a.	n.a.	55.7
<i>Other (imports)</i>	n.a.	n.a.	9.1
<i>Total</i>	n.a.	n.a.	100.0

Source: Kamps (2006: 22), ECB (June 2007: 36).

decline in dollar invoicing when using the first measure, i.e. use of the euro as compared to the dollar in the euro-area's trade with countries outside the euro-area.

In terms of the second measure (i.e. how extensively non-euro-area countries use the euro when invoicing trade with countries outside the euro-area), the results are mixed. Table 3 shows how much more (or less) a country uses euros for invoicing than it trades with the euro-area. For instance, in the first row and third column of Table 3, we can see that in 2004 the amount of Cypriot exports invoiced in euros was 4% higher than Cypriot exports to the euro-area. This is an indication that euros are used for invoicing purposes with countries outside the euro-area. A negative figure on the other hand, as in the case of Denmark, reveals that in 2004 the amount of Danish exports invoiced in euros was 10% lower than to the euro-area. This suggests that Denmark does not use euros to invoice exports to other countries to any great extent and that some exports to the euro-area are invoiced in dollars or some other currency. With the exception of Denmark, Poland and the United Kingdom, the countries of the European Union tend to use euros for invoicing even when they are not trading with euro-zone countries. By 2004, other European countries, including accession countries, for the most part also used euros to a greater extent than indicated by their trade with the euro-area. However, Ukraine and countries in other parts of the world are not using euros for invoicing purposes in any significant way. Nevertheless, in all cases — except for Australia and Indonesia (on the export side) and for the Czech Republic, Slovenia, Australia (on the import side) — there was an increase in the use of the euro for invoicing between 2001 and 2004.<sup>3</sup> Contrasting Tables 3 and 4, we can see that by 2006, Ukraine and Asian countries were still mostly invoicing in currencies other than the euro when trading with the euro-area, albeit to a lesser extent than in 2004.

The main picture that emerges is a narrowing of the gap in use of the euro as invoicing currency relative to other currencies, primarily the dollar. However, the euro's role as invoicing currency only predominates in Europe. Thus, while the euro is still widely used for quoting prices of prospective and current members of the European Union, the dollar is used beyond its immediate trading bloc and has a particularly strong lead in primary commodities (Kamps, 2006: 6, 31).

Part of the reason for the dollar's resilience as key currency is simply due to the size of the American economy along various dimensions, its share of world GDP, its share of world trade, its share of world capital markets as well as the breadth, depth and liquidity of its capital markets. However, its size advantage is quickly eroding. In 2006, America's share of world GDP was 27%, while the euro-zone's share was 22%.<sup>4</sup> In addition, the euro-zone's share of world exports has been higher than that of the United States since the euro's inception, and its share of world imports surpassed the United States' share in 2007 by 6 basis points.<sup>5</sup> As I explain later, the euro-zone's import capacity is of particular importance for key currency status.

According to recent developments in the economics literature, there is nonetheless reason to believe that the dollar will continue to be the most

TABLE 3  
Percentage of Non-Euro-Area Countries' Invoicing in Euros, 2001 and 2004

	Export		Imports	
	2001	2004	2001	2004
<b>Non-euro area EU countries</b>				
Cyprus	n.a.	4%	n.a.	0%
Czech Republic	7%	10%	10%	15%
Denmark	-11%	-10%	-15%	-16%
Estonia	n.a.	32%	n.a.	15%
Hungary	10%	n.a.	18%	n.a.
Latvia	11%	23%	1%	19%
Lithuania	2%	20%	3%	19%
Poland	-2%	13%	4%	10%
Slovenia	27%	35%	15%	13%
United Kingdom	-31%	n.a.	-30%	n.a.
<b>EU acceding and accession countries</b>				
Bulgaria	-3%	11%	10%	20%
Croatia	12%	20%	23%	29%
Romania	-6%	8%	9%	19%
Turkey	n.a.	8%	n.a.	2%
<b>Other European countries</b>				
FYR Macedonia	n.a.	38%	25%	35%
Ukraine	-13%	-9%	n.a.	-6%
<b>Other countries</b>				
Australia	-6%	-6%	-6%	-8%
Indonesia	-9%	-9%	-4%	-3%
Japan	-4%	n.a.	-7%	n.a.
Pakistan	-17%	n.a.	-8%	n.a.
South Korea	-9%	n.a.	-7%	n.a.
Thailand	-9%	n.a.	-5%	n.a.

*Source:* Author's calculations based on (ECB, December 2005: 31-32, Goldberg and Tille, 2006).

widely used invoicing currency. The starting point for that literature was the advantage of using currencies with low transaction costs which were used as medium of exchange for invoicing (Swoboda, 1968). This explained the role of the American dollar as vehicle currency, i.e. its use between trading partners even when the American market was neither the producer nor the destination country. But which currency is likely to prevail in the choice between the producing country's currency and the destination country's currency? Here, the default position is that producers prefer to price in their own currency in order to eliminate exchange rate risk and the ensuing price uncertainty (Grassman, 1973). As Kamps (2006: 10) suggests,

TABLE 4  
Percentage of Non-Euro-Area Countries Invoicing in Euros, 2006

	Export	Imports
	2006	2006
<b>Non-euro area EU countries</b>		
Bulgaria	8%	28%
Cyprus	1%	4%
Czech republic	10%	8%
Estonia	25%	13%
Latvia	31%	25%
Lithuania	31%	20%
Romania	15%	24%
Slovakia	43%	31%
Slovenia	33%	15%
<b>EU candidate countries</b>		
Croatia	18%	21%
FYR Macedonia	22%	33%
Turkey	9%	7%
<b>Other countries</b>		
Indonesia	-8%	-2%
Thailand	-7%	-3%
Ukraine	-7%	-5%

*Source:* Author's calculations based on (ECB, July 2008: S4, Goldberg and Tille, 2006).

McKinnon (1979: 82–3) points to an incentive for exporters of substitutable goods to price in local currency. They want to prevent consumers switching to comparable local products when their currency depreciates. This connects price uncertainty with highly differentiated goods and demand uncertainty with less differentiated goods.<sup>6</sup> More recent work takes the size of the destination country into account in thinking about how the exporting country might reduce demand uncertainty for less differentiated goods. By invoicing in the currency that most of the competition in the destination country is using, exporters can avoid the higher average marginal costs associated with demand uncertainty (Bacchetta and van Wincoop, 2005). This 'herding effect', which is empirically salient, implies that vehicle currencies will be used in small markets, where foreign firms constitute most of the competition, whereas the local currency will be used in large ones, where domestic firms are the principal rivals (Goldberg and Tille, 2006). Given the higher share of goods with a low degree of differentiation in world trade, the dollar's continued lead over the euro can in part be attributed to its high share of world imports, even though (as I will discuss more fully) the euro-area actually accounted for a slightly higher world import share in 2007.



Another reason for the dollar's resilience is its continued use as vehicle currency. Primary commodities tend to be priced in vehicle or local currency. The dollar is used as a vehicle currency because the United States is a major centre for commodity exchange, facilitating global spot and future market assessments (McKinnon, 1979: 76–7). Invoicing in local currency occurs because developing countries sell their resources to many countries and find it difficult to estimate the risks involved with pricing in their own currency in these multiple relations (Krugman, 1991: 177). Kamps (2006: 22) gets around the dearth of bilateral data on invoicing by deducing which currency is most widely used as vehicle currency from the share of differentiated products in world trade. She reports a negative relation between the share of differentiated products in world exports and the share of world exports invoiced in dollars and a positive association between the share of differentiated world exports and the share of world exports invoiced in euros, suggesting a greater relative role for the dollar as vehicle currency since these tend to be in goods with a lower level of differentiation (Kamps, 2006: 28, 31).

Officially, governments will track the value of the key currency in order to determine the price of their own currency by fixing their exchange rate against the key currency, by pegging to it, or, more loosely, by considering its value when delineating monetary policy. There are two ways to gauge a currency's use as quotation currency in official markets. Either one looks at which currency is most widely used as pegging currency or which has the strongest gravitational pull (Galati and Wooldridge, 2006: 11). According to the first measure, the most recent ECB report suggests that the euro was used as pegging currency in 40 out of 100 pegs (ECB, 2007: 40). For comparison, roughly 60 currencies are pegged to the dollar (Walter and Becker, 2008: 4). Minor changes in the euro's bilateral exchange rates (low volatility) and increased foreign sensitivity to changes in the euro's price are both indicators of its gravitational pull. Using this measure, the euro's role is growing within the European Union, and also in relation to the currencies of Australia, Canada, New Zealand, South Africa, Brazil and Chile (Galati and Wooldridge, 2006: 11–12).

### *Store of Value*

The key currency should offer private and official actors a good store of value. Given the sharp decline in the dollar over the past five years, we have to expect increasing use of the euro as store of value. But of course this is an empirical question that can be investigated by examining where value is being stored. The relative size of capital markets is an indication of what private actors are using as investment vehicle, whereas the currency composition of central bank reserve holdings tells us which currency governments are choosing to store value.

The size of European capital markets increased significantly with the onset of the euro. The overall size of the euro-zone's capital market was

considerably smaller than that of the United States (25% versus 36%) in 2001, whereas their size was comparable in 2006 (28% versus 29%).<sup>7</sup> But, as can be seen in Figure 1, looking at the aggregate size of capital markets masks important differences in the two entities' respective size advantages. In the graph, all data points are shares of the world total. The black line measures stock market capitalization. The thick lines are consistently used for the euro-zone, the thin lines for the United States. Since the thin black line lies significantly above the thick black line, it is clear that the United States has a considerable lead in equities. Similarly, the euro-zone's share of debt securities, as measured by the thick dotted line, lies below the United States' share (thin dotted line). On the other hand, the euro-zone has a notable edge when it comes to bank-based financing reflected by the higher placement of the thick grey line for the euro-zone than the thin grey line for the United States.

Much of the debate about the euro's future prospects surrounds its role in the bond market. In 1999, the share of international debt securities issued in euros was 29% as compared to 47% of the outstanding amount issued in dollars.<sup>8</sup> Within a span of 7 years it began to look as if the positions were starting to reverse. By 2006, the euro's share had increased to 47% against the dollar's 36%.<sup>9</sup> While some saw the higher issues of euro-denominated debt securities (as compared to dollar-denominated debt) as a substantial achievement, others were more sceptical. Cohen (2003: 580), for instance, pointed out that a greater supply of euro-denominated debt securities would have to be matched by a corresponding demand for them. The euro's lead may also reflect the fact that more euro-denominated assets are traded within the euro-zone (Chinn and Frankel, 2005: 17). There are three possible

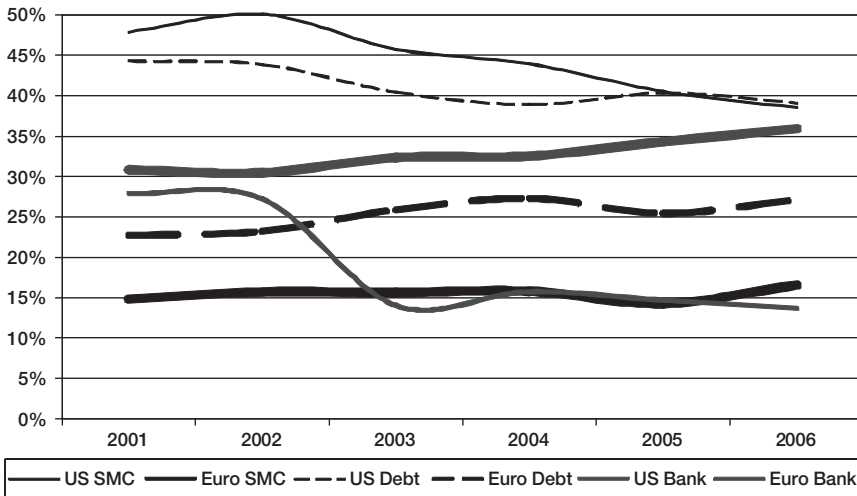


FIGURE 1  
Share of Capital Markets

measures of the supply of debt securities: narrow, broad and global (ECB, 2005). The narrow measure reports debt securities issued in euros outside the euro-zone; the broad measure includes euro-denominated securities originating in the euro-zone as long as they target the international financial market; and the global measure includes all issues, even those intended for the domestic market. To evaluate the international role of the euro, the most accurate measure is the number of issues denominated in euros outside the euro-zone, i.e. the narrow measure. This is the measure the ECB uses to gauge the international role of the euro (ECB, 2007). According to this measure, and up until 2006, dollar-denominated bonds (44%) still accounted for a higher share than euro-denominated bonds (31%) (ECB, 2007).

The underlying differences in the components that make up the size of capital markets (referred to earlier) are important. Although the euro-area has an advantage in bank-based financing, the United States' position in the equity and bond market is significant because securities financing is more fungible than financing through bank loans (Eichengreen, 1998: 500; Hartmann and Issing, 2002: 320). The United States also stands apart in issuing very liquid short-term obligations (Eichengreen, 1998: 500). This liquidity advantage is not as strong as it used to be. Interest rate swaps denominated in euros now have a higher turnover than those denominated in dollars (Galati and Wooldridge, 2006: 14). In addition, with the unfolding crisis in structured financial products, Galati and Wooldridge (2006: 13) were right in anticipating the dangers associated with the United States' advantage in higher quality credit ratings for corporate bonds, which was mainly due to its larger share of collateralized (asset- and mortgage-backed) securities. The greater emphasis on securities financing — as related to non-equity and particularly collateralized debt obligations — can hardly be viewed as an advantage today. It is still too early to tell how the subprime mortgage-induced credit crisis will play out in terms of relative winners and losers. In the midst of the turmoil, we saw the dollar strengthen relative to the euro and a reaffirmation of the United States' safe-haven status, with investors even willing to pay to hold the 3-month Treasury bill for a brief moment in December 2008, helping the government fund stimulus and bailout plans. Congress approved an additional tranche of \$825 billion (to the \$168 billion approved in February 2008) in February 2009. Congress also passed the troubled asset relief package (TARP), a financial bailout, amounting to \$700 billion, \$350 billion of which has already been spent. For comparison, members of the euro-zone agreed on a \$270 billion stimulus package in December 2008, but there is no coordination between governments on how the money is to be spent and some countries have been reluctant to implement fiscal measures. This, combined with the Fed's wider range of supervisory authority, as compared to the ECB, is something the ECB itself sees as a problem. The present situation in which supervisory authority is mostly carried out by national central banks and other national authorities is a constraint on the ability of the euro-zone to reach the depth of the American market for securities, for equities in particular (Eichengreen, 1998: 500–4; Cohen, 2003). Reform is currently being considered, but any

proposal by the European Union's executive commission will require support in the European Parliament and consensus among all 27 member states.

In terms of the official sector, central banks will also hold their reserves in the currency that is the better store of value, although they may also factor in other motives, such as market access or maintaining positive allied relations, when choosing a particular reserve currency. Here, change has been modest. Even though multiple currencies are used for reserve purposes, 64% of official reserves were held in dollars at the end of 2007 as compared to 17% in euros (IMF, 2008). Official actors holding very large dollar positions find themselves in a curious bind. If they sell, their actions will prompt a further decline in the value of the dollar, reducing the value of their reserves further. In contrast to private actors, they sometimes also have other reasons for holding dollar assets. For instance, they may extend credit to facilitate the capacity of the American market to absorb their export products (Dooley et al., 2003). They may also hold reserves in order to reimburse dollar-denominated debt. Security motives may also factor in.

### **Euro's Prospects as World Currency**

Even though the euro lags behind the dollar in fulfilling key currency tasks, it is quickly catching up. What are the main arguments for and against the euro unseating the dollar? This question attracted a lot of interest at the time of the euro's inception. Economists were essentially split in three camps. Some scholars saw the dollar's role as heavily entrenched (Eichengreen, 1998; Kenen, 2002; McKinnon, 2002; Cohen, 2003); others believed the euro would displace the dollar (Mundell, 1998; Bergsten, 2002); a third intermediary position predicted serious competition for the dollar and a possible bipolar currency order (Wyplosz, 1997). With the euro below parity to the dollar until 2003, the debate petered out until a sustained wave of euro appreciation sparked a new round of debate. Two themes dominate the debate about whether the euro can eclipse the dollar in the near future; namely the impact of the euro-zone's enlargement and the dollar's long-term depreciation (Chinn and Frankel, 2005; Cohen, 2007). With the unfolding financial crisis and concomitant strengthening of the dollar, yet another round of debate might be in store.

Most scholars agree that a major limiting factor for the euro is the dollar's incumbency advantage, the 'hysteresis' effect (from history) of being the key currency country (Bergsten, 2002: 310; Hartmann and Issing, 2002: 327–30; McKinnon, 2002: 356; Cohen, 2003; Chinn and Frankel, 2005). There are three related components of this advantage: scale economies, network externalities and economies of scope. Scale economies are involved since frequent use of the key currency keeps transaction costs down. Network externalities suggest an advantage in using the key currency because everyone else is using it. Economies of scope exist since network externalities are interactive across different roles. If a currency is used as a medium of

exchange, it makes sense to use it as unit of account and a store of value, and, if private actors are using a particular currency, governments will find it attractive to use that currency as well. The relationship works the other way round too, so that persistent official use of an international currency as unit of account and store of value encourages private use. Briefly, history favours the currency in use, and this path dependence creates inertia and a bias in favour of the established currency that is difficult to overcome. In the following sections, I examine the likelihood of the euro surpassing the dollar in the near future. I use the same setup as in the previous section. First, I look at the dollar's predicted role as medium of exchange, then as unit of account, and lastly as store of value.

### *Medium of Exchange*

The dollar's incumbency advantage is most entrenched as medium of exchange. This is also where scale economies are most ingrained. Reducing transaction costs is especially important for this function, more so than for unit of account and store of value functions. Major change is required to break the dollar's incumbency advantage in this area. However, if the euro were to acquire a significant role as medium of exchange, change would likely be rapid and decisive.

### *Unit of Account*

One of the major conclusions of the empirical assessment of the unit of account function undertaken above is that the dollar's continued advantage is linked to its role in trading commodities, especially oil, as well as America's role as the world's single first importer. In this section, I focus on prospects of the euro ousting the dollar as oil pricing currency and defer the discussion of the role that high import shares play until later when I examine the key currency's store of value function. As will become clear, the reason for this is that the capacity to maintain and correct high import shares intersects with price stability.

In 2002, Saddam Hussein asked for euros instead of dollars for Iraqi oil. Recently, Hugo Chavez of Venezuela and Ahmadinejad of Iran have followed suit. However, the recent drop in the price of oil has derailed Chavez's anti-Americanism; he is now busy courting American business (Romero, 2009). Iran is the world's fourth producer, and non-dollar trades started on Iran's oil bourse in February 2008. However, domestic constraints in the form of weak governance structures, property rights protection and financial markets to support oil trades make it unlikely that Kish Island, where the exchange is located, will do much to dent the dollar's role in trading oil (Looney, 2007). So far, all attempts to invoice oil in euros have come from regimes that are highly critical of American foreign policy. For them, reduced dollar hegemony is seen as a way of scaling back America's influence in the world. What are the economic incentives to price oil in

euros? If one assumes that dollar depreciation (appreciation) is offset by a rise (fall) in the dollar price of oil, there is little reason for either oil exporters or importers to price oil in euros out of a concern for the import or revenue bill (Feldstein, Summer 2008). Past revenues piled up in dollar reserves might pose a problem for oil exporters, however, unless effective hedging strategies are available. But even if oil exporters have concerns about the store of value function of their invoicing currency, their capacity to improve their situation by pricing in euros is limited. When OPEC ministers met to discuss the future of oil, at their annual summit, in November 2007, Saudi Arabia was reluctant to include any statement about the falling dollar in the final declaration for fear of the impact such a statement might have on markets. Saudi Arabia's caution is symptomatic of the dilemma OPEC members face. Pricing in euros signals a desire to diversify out of dollars and risks sparking a dollar sell-off, thereby exacerbating the effect of the dollar's reserve values. Unless the switch is coordinated and complete, the dollar portion of their oil income would also fall in value, undoing the intended effect of the transfer. Quite apart from the fact that it is self-destructive to diversify out of dollars, because so much is already invested in it, the geopolitical context would have to change a whole lot before Saudi Arabia, the world's largest oil producer, stops pricing in dollars.

The assumption that a fall in the local currency price of dollars (i.e. dollar depreciates) is associated with higher oil prices seems to be right for oil exporters, such as Norway, but not for oil importers like Germany (Noreng, 1999: 43, 49).<sup>10</sup> Noreng (1999: 49) views Germany as representative of other euro-zone countries and sees strong motivations for them to price in euros in order to prevent higher real oil prices as a result of dollar appreciation. But since there has rather been a secular rise in the value of the euro vis-à-vis the dollar, there is no corresponding incentive for the euro-area to promote euro invoicing of oil. If anyone has the market power to price oil in euros, it is Norway and the United Kingdom, both non-euro-area countries, and Noreng (1999: 50, 53–4) suggests that they have economic incentives to do so in order to stabilize oil revenues and mitigate unfavourable terms of trade effects from a rising euro. Norway and the United Kingdom trade extensively with the euro-area. As a share of their overall exports, their exports to the EU-27 amount to 81% and 57%, respectively, and the corresponding figures for imports are 69% and 55% (WTO, Trade Profiles 2009). If one were to assume that a larger proportion of imports from the EU-27 (than exports to the group of EU-27 countries) is highly differentiated than exports to the group of EU-27 countries, more imports will be invoiced in euros than exports, causing a potential problem if the euro rises. This is more likely the case for Norway, which has a much higher share (72.6%) of fuel and mining products in overall exports than the United Kingdom does (14.8%) (WTO, Trade Profiles 2009). However, an examination of spot prices for Brent crude oil (the North Sea benchmark) and the respective countries' exchange rate to the dollar between 1999 and 2008 shows that there was only one year, 2001, when the rise in the price of oil did not compensate for the decline in the dollar.<sup>11</sup> The overall pattern

during this period is for the dollar exchange rate to appreciate with oil price increases before depreciating. Krugman (1980) showed that this is because oil exporters tend to invest the surplus in dollar assets before they start spending it on (American) goods. So, while there may be some motivation for them to price oil in euros, they do not seem to have a strong interest in doing so. The inefficiency and instability of pricing in multiple currencies also speaks against a large-scale shift into euros as invoicing currency for oil (Looney, 2004: 32). Finally, as in the case of Saudi Arabia, neither the United Kingdom nor Norway has any political incentive to break its strategic alliance with the United States.

### *Store of Value*

Are euro-zone countries likely to offer a currency for international use that is a better store of value than the American dollar? One dimension of this is the ability to maintain price stability, since that will offer investors reassurance of future purchasing power. However, as Cohen (2003) points out, the ability to deliver strong growth is equally important in assessing how well a particular currency is able to serve as store of value, since the value of the assets in which currencies are stored is (for the most part) dependent on growth.

Many see the euro-zone's ability to deliver price stability as its greatest promise, particularly at a time when the United States has failed to offer external price stability, and internal price stability remains at risk (Mundell, 1998; Bergsten, 2002: 312; Chinn and Frankel, 2005). However, thinking through the implications of credibly committing to price stability in the long term exposes major sources of weakness in the euro-zone. To see this, consider how the capacity to absorb a large share of world imports bears on key currency status. This requires us to think outside the box presented in Table 1, and to highlight one of the most important reasons for the persistence of the dollar as key currency; namely, the capacity of the United States to provide an open market where countries can sell their export products.<sup>12</sup> In order for the euro area to become more attractive than the American market, its import absorption capacity should exceed that of the United States by quite a bit more than a few basis points. How might the euro-zone countries increase their share of world imports? Although the import/export ratio depends on a variety of factors, there are two principal ways this could happen. A first possibility is that extra euro-zone imports rise significantly as the euro-area expands to include more members. Second, if we were to see large-scale diversification into the euro, the current 16-member zone's buying power would rise and we should expect import shares to swell above export capacity in ways similar to the American experience. In turn, I consider each of these avenues for the euro-zone to efficiently challenge the United States as the world's first importer.

*The Relative Size of the Euro-Zone*

One way to enhance the euro-zone's share of world imports and world capital markets is to include new members. Although I will concentrate on the potential to increase the area's buying power, it is important to note that both are needed, since large-scale merchandise imports require large-scale capital imports. What are the possibilities and implications of embracing new members?

Incorporating the United Kingdom within the euro-zone is widely believed to significantly enhance the euro's prospects as key currency (Bergsten, 2002; Cohen, 2003; Chinn and Frankel, 2005). Along with New York, London is the world's leading financial centre, and its inclusion would be a big boost to the size, depth and liquidity of the euro-zone's financial markets. When scholars first started discussing the future potential of the euro as key currency, the prognosis for an extended 15-member euro-zone was based on including the United Kingdom, Sweden and Denmark. However, between 2001 and 2009, it was Slovakia, Slovenia, Cyprus and Malta that joined. Integrating countries with advanced capital markets, such as the United Kingdom, Sweden and Denmark, in addition to those already admitted, can only occur by trading off some efficiency, since the euro-area would, at the very least, consist of 19 members. But not everyone agrees that size is a constraint. In some scenarios, notably a continued decline of the dollar, the euro is expected to supplant the dollar even if the United Kingdom stays out of the euro-zone, provided that 12 to 14 other member-states join and the dollar continues to depreciate sharply (Chinn and Frankel, 2005: 56).

One of the problems with expansion, however, is that it poses familiar collective action problems (Olson, 1965). The ECB's decision-making body is the Governing Council, which consists of the Executive Board (President, Vice-President and four other members) and the national central bank governors, who number 16 members, for a total of 22 members of the Council. With 9 states expected to join, the Council would amount to 31 members, but voting rights are capped at 22 (the six Executive Board members have permanent rights). For comparison, the Federal Reserve's Open Market Committee has 12 members with voting rights. Under the new system, 16 votes are divided among Council members, while the Executive Board retains its 6 votes. A rotation model has been proposed in order to enhance decision-making. The model has been highly criticized for being inefficient, undemocratic, for lacking transparency and for departing from the 'one country one vote principle', thus encouraging countries to take national positions (Belke, 2003; Gros, 2003; Heisenberg, 2003; Meade, 2003). In December 2008, the ECB issued a statement saying that it would wait to implement the rotation model until three new countries joined the euro-area and the Governing Council reached a total of 19 members (ECB, 2008). Regardless of the way the ECB chooses to deal with decision-making in the context of a sizeable and growing body of decision-makers, there is bound to be a trade-off between effectiveness and representation.



*Price Stability*

Some scholars see recurrent and prolonged periods of sizeable American trade deficits along with associated and fairly high net external liabilities as presenting fertile ground for a euro takeover (Mundell, 1998; Bergsten, 2002: 312; Chinn and Frankel, 2005). A stable currency that is expected to appreciate is viewed as a more attractive store of value than a falling one (Hartmann and Issing, 2002: 321). Indeed, the problems that the United States encountered in trying to maintain internal price stability in the mid-1970s up until the early 1980s is seen as having contributed to the emergence of a fixed exchange rate regime within Europe, whereas America's success with controlling inflation in the 1990s is viewed as having entrenched the dollar's role in the world economy (Bergsten, 2002: 308; McKinnon, 2002: 358–9). Consequently, the depreciation required to adjust current account imbalances (and associated external liabilities) through export growth and valuation effects could undermine confidence in the dollar as store of value (Chinn and Frankel, 2005: 21, 37).<sup>13</sup> But this perspective fails to scrutinize the future pull of the euro beyond its appeal as a hedge against a falling dollar. To be sure, the slide in the dollar will cause investors to flee into euros, and many of them already have. Although the euro may be an attractive hedge, however, there are structural obstacles with a transfer into euros. So, this strategy has limited range.

How might diversification into euros play out? The euro would increasingly acquire a store of value function for private actors, and official investors might follow suit. The value of the euro would rise, imports would become more affordable and exports less competitive. This is the direction in which a strong euro has taken the currency bloc. The euro-zone's trade balance with the outside world was in deficit for the first time in 2007 and the euro-zone's share of world exports has consistently declined since 2002.<sup>14</sup> Thus, so far significant diversification has taken place independently of the euro attaining key currency status.

Although there is some empirical evidence that the euro-zone is tending towards trade deficits, as a result of large-scale diversification into the euro, the United States established itself as key currency when exporting dollars on capital account, so why would it not be possible for the euro-zone to do so as well rather than export dollars on current account, as I have assumed? One reason has to do with the move from fixed to flexible exchange rates, which creates greater pressure, and indeed incentives, for the key currency to fluctuate. There is greater stress on the key currency country to run trade deficits under floating rates, since the capital inflow that results in appreciation makes the relative purchasing power of the key currency country more obvious. There are also greater incentives on the key currency country to accept large and persistent trade deficits because subsequent depreciation facilitates the process of external adjustment through 'valuation adjustments' (cf. Gourinchas and Rey, 2005). The interests of the key currency country also intersect with the interests of

other countries, particularly in East Asia, that pursue a strategy of export-led growth (Dooley et al., 2003).

So, how would the euro as primary world currency differ from the dollar as major world currency? While the dollar's decline since 2002 has mostly taken place vis-à-vis the euro, the dollar's depreciation could in principle be diffused across a wider range of countries, including countries in East Asia. Consequently, instability in the key currency's (viz. dollar) exchange rate need not imply the same scale of instability in the exchange rate of other major currencies (viz. euro). Another difference between being a major and a primary currency is the incentive facing official actors to prop up the key currency for their own political reasons. If the euro were the key currency, we would expect countries to intervene in the foreign exchange market in order to prolong the region's buying power. Here, political factors play a role. In the post-war era, economic and security reasons have often overlapped in official investors' decisions to hold dollar reserves. Apart from strengthening America's capacity to absorb imports, major purchasers of American Treasury Bills — France, Germany, Japan and other East Asian countries (even China at the moment) — have prospered under the United States' security guarantee. The euro-area, on the other hand, is nowhere near as potent a military force.<sup>15</sup>

Another reason for the dollar's staying power is that the United States is in a better position to act effectively in the face of economic shocks. Unlike the euro-zone, which can only achieve a massive fiscal stimulus by drawing on national budgets in a concerted effort, the American government can tap the federal budget. Although supplementary spending in the United States is conditional on congressional approval, the absence of a 'European taxpayer' is a constraint on fiscal policy under normal times as well. As for a monetary response, the Federal Reserve is entrusted with two goals, to combat inflation and to promote growth, allowing it to ease interest rates in order to safeguard the second objective. This brings us back to Cohen's point about the significance of the Federal Reserve's dual mandate to promote price stability and growth. By contrast, the ECB has a very strict mandate to ensure price stability. Quite apart from the disadvantage this creates when managing shocks, as made plain by the present financial crisis, its special focus is good for countries that give priority to inflation-fighting, but not for countries that need lower interest

TABLE 5  
Difference between the Euro-zone's Share of World Trade  
and the United States's Share

Extra euro-zone trade	2001	2002	2003	2004	2005	2006	2007*
Imports	-4.30%	-4.09%	-2.45%	-2.00%	-2.03%	-1.34%	-0.06%
Exports	3.49%	4.98%	5.99%	6.38%	5.85%	5.72%	6.30%

Source: Author's calculations based on (Eurostat, 2008; GOFT, 2008; WTO, 2008).

\* Euro-13

rates to feed growth. Striking a balance between these different needs will prove especially difficult when attempting to boost competitiveness in the wake of ongoing deficits. If adjustment takes place through a long-term descent in the value of the euro, we are back to the American example and a key currency that does not fare better in terms of external price stability. Some inflation may also creep in through the trade channel, and so internal price stability may be at risk. If, on the other hand, adjustment is to occur through high interest rates and price pressures within the euro-zone (to induce substitution towards domestic goods), unemployment will rise. Without the option of pursuing beggar-thy-neighbour policies in the form of competitive devaluations against each other (or the rest of the world), the less competitive euro-zone countries will be particularly exposed. While the euro-area as a whole could adopt protectionist policies (and calls for such measures reverberate quite strongly today), doing so would vitiate one of the main functions that the key currency country is expected to play, namely to maintain an open market where countries can offload their products. The real question therefore boils down to whether Europeans are prepared to adjust to periods of variable job security and the accompanying social unrest, which comes with key currency status, to the same extent that Americans have.

If the problems that currently haunt the dollar are inherent to key currency status, we cannot expect the euro to oust the dollar as key currency, but for the dollar to retain its number one position, or eventually for a bipolar key currency system to emerge.

### **Conclusions**

The dollar's position as key currency has weakened relative to the euro. Although the dollar is still dominant as a medium of exchange, its role as unit of account is partially diminished, and its store of value function is not as steady given the dollar's decline since 2002. Although these developments could snowball into the euro overtaking the dollar, there are significant obstacles to the euro actually replacing the dollar as key currency, and so built-in stabilizers to this aspect of American hegemony.

Common explanations for the dollar's current and expected resilience are concerned with its incumbency advantages, decision-making complexity, the trade-off between price stability and growth, as well as the uncertain entry of the United Kingdom and enlargement more generally. While I draw on the above-mentioned literature, my analysis is focused on the trade dimension of key currency tasks. I find that the dollar is likely to remain the main unit of account despite the lead that euro-zone countries have in world trade shares. The reason for this is the expected difficulties euro-zone countries will face in expanding the international use of the euro. That will require an increase in the euro-area's world share of less differentiated imports and a decision by oil-exporters to price oil in euros. I predict that the euro-zone will have trouble absorbing significantly greater imports than the United States. Although enlargement could raise the region's world

import shares without compromising other policy objectives, it is widely believed that the outward extension of the euro-zone will increase the scope for discord and inefficiency in ECB decision-making. I also predict greater problems for euro-zone countries in accommodating large ongoing trade deficits. The preceding analysis complicates our understanding of the key currency country's commitment to price stability, as some price flexibility is needed.

### Notes

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1. Since two currencies are involved, the percentage shares are out of 200.
2. Because of data limitations, I cannot track the evolution of the euro and the dollar's relative use as invoicing currency for a complete run of years.
3. The data for both years are not available for all countries, so there may be other exceptions as well.
4. The author's calculations based on IMF (October 2007).
5. Based on the author's calculations using Eurostat (2009).
6. It is assumed that demand is more sensitive to price, the more highly differentiated the good.
7. IMF (March 2003).
8. IMF (September 2004).
9. IMF (October 2007).
10. I do not attempt to sort out the direction of causality in this article, i.e. whether oil prices influence the dollar exchange rate or whether the dollar exchange rate influences oil prices.
11. Author's calculations based on Eurostat and EIA.
12. Although we are not entirely outside the box, since the ability to sustain high and regular trade deficits is related to the key currency's store of value function.
13. As the study points out, however, there is no statistically significant relationship between the net international investment position and reserve currency status; in part, this is due to the major role of the United States in the sample (see Chinn and Frankel (2005).
14. These calculations are based on Eurostat (2008).
15. For a comprehensive treatment of the link between key currency and military status, see Carla Norrlof (forthcoming 2010).

### References

- Bacchetta, Phillippe and van Wincoop, Eric (2005) 'A Theory of the Currency Denomination of International Trade', *Journal of International Economics* 67: 295–319.
- Belke, Ansgar (2003) 'The Rotation Model is Not Sustainable', *Intereconomics* 38: 119–24.

- Bergsten, C. Fred (1975) *The Dilemmas of the Dollar*. New York: New York University Press.
- Bergsten, C. Fred (2002) 'The Euro versus the Dollar: Will There Be a Struggle for Dominance?' *Journal of Policy Modeling* 24: 307–14.
- BIS (December 2007) 'Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity in 2007 – Final Results'. Basel: Bank for International Settlements.
- Chinn, Menzie and Frankel, Jeffrey (2005) 'Will the Euro Eventually Surpass the Dollar as Leading International Reserve Currency?' *National Bureau of Economic Research* 11510.
- Cohen, Benjamin J. (1977) *Organizing the World's Money: The Political Economy of International Monetary Relations*. New York: Basic Books.
- Cohen, Benjamin J. (2003) 'Global Currency Rivalry: Can the Euro Ever Challenge the Dollar?' *Journal of Common Market Studies* 41: 575–95.
- Cohen, Benjamin J. (2007) 'Enlargement and the International Role of the Euro', *Review of International Political Economy* 14: 746–73.
- Dooley, Michael, Folkerts-Landau, David and Garber, Peter (2003) 'An Essay on the Revived Bretton Woods System'. NBER 9971.
- ECB (2005) *Review of the International Role of the Euro*. Frankfurt am Main: European Central Bank.
- ECB (2007) *Review of the International Role for the Euro*. Frankfurt Am Main: European Central Bank.
- ECB (2008) 18 December 2008 — ECB Governing Council decides to continue its current voting regime. Press Release.
- Eichengreen, Barry (1998) 'The Euro as a Reserve Currency', *Journal of the Japanese and International Economies* 12: 483–506.
- Eurostat (2008) *External and Intra-European Union Trade: Statistical Yearbook – Data 1958–2006*. Luxembourg: Office for Official Publications of the European Communities.
- Eurostat (2009) *Exchange Rate Database*. Luxembourg: Statistical Office of the European Communities.
- Feldstein, Martin (Summer 2008) 'The Dollar-Oil Link', *The International Economy*, 15.
- Galati, Gabriele and Wooldridge, Philip (2006) 'The Euro as a Reserve Currency: A Challenge to the Pre-eminence of the US Dollar?' In *BIS Working Papers*. Basel: Bank for International Settlements.
- GOFT (2008) *Ranking of Germany's Trading Partners in Foreign Trade*. Cologne: Federal Ministry of Economics and Technology.
- Goldberg, Linda S. and Tille, Cédric (2006) *Vehicle Currency Use in International Trade in International Research Function*. New York: Federal Reserve Bank of New York.
- Gourinchas, Pierre-Olivier and Rey, Hélène (2005) 'From World Banker to World Venture Capitalist: U.S. External Adjustment and the Exorbitant Privilege', *NBER Working Paper* 11563.
- Grassman, Sven (1973) 'Currency Distribution and Forward Cover in Foreign Trade', *Journal of International Economics* 6: 215–21.
- Gros, Daniel (2003) 'An Opportunity Missed', *Intereconomics* 38: 124–9.
- Hartmann, Philipp and Issing, Otmar (2002) 'The International Role of the Euro', *Journal of Policy Modeling* 24: 315–45.
- Heisenberg, Dorothee (2003) 'Cutting the Bank Down to Size: Efficient and Legitimate Decision-making in the European Central Bank after Enlargement', *Journal of Common Market Studies* 41: 397–420.

- IMF (March 2003) *Global Financial Stability Report: Statistical Appendix*. Washington DC: International Monetary Fund.
- IMF (September 2004) *Global Financial Stability Report: Statistical Appendix*. Washington DC: International Monetary Fund.
- IMF (October 2007) *Global Financial Stability Report: Statistical Appendix*. Washington DC: International Monetary Fund.
- IMF (2008) *Currency Composition of Official Foreign Exchange Reserves (COFER)*. Washington DC: International Monetary Fund.
- Kamps, Annette (2006) 'The Euro as Invoicing Currency in International Trade', *Working Paper Series*. Kiel: ECB.
- Kenen, Peter B. (2002) 'The Euro versus the Dollar: Will There Be a Struggle for Dominance?' *Journal of Policy Modeling* 24: 347–54.
- Krugman, Paul (1980) Oil and the Dollar. *NBER Working Paper* 554: 1–18.
- Krugman, Paul (1991) *Currencies and Crises*. Cambridge, MA: MIT Press.
- Lane, Philip R. and Milesi-Ferretti, Gian Maria (2006) 'The External Wealth of Nations Mark II: Revised and Extended Estimates of Foreign Assets and Liabilities, 1970–2004', *IMF Working Paper*. Washington DC: International Monetary Fund.
- Looney, Robert (2004) 'Petroeuros: A Threat to U.S. Interests in the Gulf?' *Middle East Policy* 11: 26–37.
- Looney, Robert (2007) 'The Iranian Oil Bourse', *Challenge* 50: 86–109.
- McKinnon, Ronald I. (1979) *Money in International Exchange*. Oxford: Oxford University Press.
- McKinnon, Ronald (2002) 'The Euro versus the Dollar: Resolving a Historical Puzzle', *Journal of Policy Modeling* 24: 355–9.
- Meade, Ellen E. (2003) 'A (Critical) Appraisal of the ECB's Voting Reform', *Intereconomics* 38: 129–31.
- Mundell, Robert (1998) 'The Case for the Euro – II', *Wall Street Journal*, A.22 (March 25).
- Noreng, Øystein (1999) 'The Euro and the Oil Market: New Challenges to the Industry', *Journal of Energy Finance and Development* 4: 29–68.
- Norrlof, Carla (forthcoming 2010) *America's Global Advantage: US Hegemony and International Cooperation*. Cambridge: Cambridge University Press.
- Olson, Mancur (1965) *The Logic of Collective Action*. Cambridge, MA: Harvard University Press.
- Romero, Simon (2009) 'Chávez Reopens Oil Bids to West as Prices Plunge', *New York Times* (15 January).
- Swoboda, Alexander (1968) 'The Euro-Dollar Market: An Interpretation', *Essays in International Finance* 64.
- Tille, Cédric (2003) 'The Impact of Exchange Rate Movements on U.S. Foreign Debt', *Current Issues in Economics and Finance* 9: 1–7.
- Walter, Norbert and Becker, Werner (2008) 'The Euro Hits the Big Time', *EU Monitor* 58.
- WTO (2008) *Time Series on Merchandise and Commercial Services Trade*. Geneva: World Trade Organization.
- WTO (2009) *Statistics Database. Trade Profiles*. Geneva: World Trade Organization.
- Wyplosz, Charles (1997) 'An International Role for the Euro', *Report Prepared for the European Capital Market Institute*. Geneva: Graduate Institute of International Studies.

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