











Problem Set 4 • The currency market

1. Consider the following tables taken from the web site <http://www.x-rates.com/>. To interpret the data, the exchange rates on February 2, 2011, mean that 1 dollar can purchase 0.725837 euros and that 1 euro can purchase 1.37771 dollars.

Table 1








	 USD	 GBP	 CAD	 EUR	 AUD
	1	1.46719	0.81564	1.35069	0.698363
	0.681573	1	0.555918	0.9206	0.475985
	1.22603	1.79882	1	1.65599	0.856214
	0.740357	1.08624	0.603865	1	0.517037
	1.43192	2.1009	1.16793	1.93409	1

Tuesday, March 24, 2009

(i) Is the euro appreciating or depreciating with respect to the dollar from Table 2 to Table 3?

(ii) Is there any currency with respect to which the euro appreciates from Table 1 to Table 2 and also from Table 2 to Table 3?

Table 2

	 USD	 GBP	 CAD	 EUR	 AUD
	1	1.59507	0.943725	1.39369	0.881251
	0.626928	1	0.591648	0.873748	0.552481
	1.05963	1.69019	1	1.4768	0.9338
	0.717515	1.14449	0.677137	1	0.632311
	1.13474	1.81001	1.07089	1.5815	1

Tuesday, February 2, 2010

(iii) Identify a currency that, in the passage from Table 1 to Table 2 appreciated with respect to the dollar but, in the passage from Table 2 to Table 3, depreciated with respect to the dollar.

Table 3

	 USD	 GBP	 CAD	 EUR	 AUD
	1	1.61651	1.01183	1.37771	1.00617
	0.618615	1	0.625938	0.852278	0.622433
	0.9883	1.5976	1	1.3616	0.994399
	0.725837	1.17332	0.734429	1	0.730316
	0.993866	1.60659	1.00563	1.36926	1

Wednesday, February 2, 2011

(iv) Identify a currency that depreciated with respect to the euro from Table 1 to Table 2 but appreciated with respect to the euro from Table 2 to Table 3.

2. Let the dollar-euro exchange rate be $e = 2 \text{ \$/€}$. (i) Calculate the level of the exchange rate that makes the dollar appreciate a 50% with respect to the euro. (ii) Compute the level of the exchange rate needed to induce a 20% appreciation of the euro with respect to the dollar.

3. (i) Is it possible for the yen to depreciate with respect to the euro and, simultaneously, to appreciate with respect to the dollar? (ii) If so, would the euro appreciate or depreciate with respect to the dollar?

4. Figure 1 shows the peseta-dollar exchange rate from 1956 to 2000. The graph indicates how many pesetas could be purchased with one dollar.

(i) Select an interval during which the peseta depreciated with respect to the dollar.

(ii) Select any two years between which the peseta appreciated with respect to the dollar.

(iii) Conjecture how the graph showing the dollar-peseta exchange rate should look like.

5. In Figures 2-6, indicate a period in which the euro shows a tendency to appreciate (depreciate) with respect to the other displayed currency.

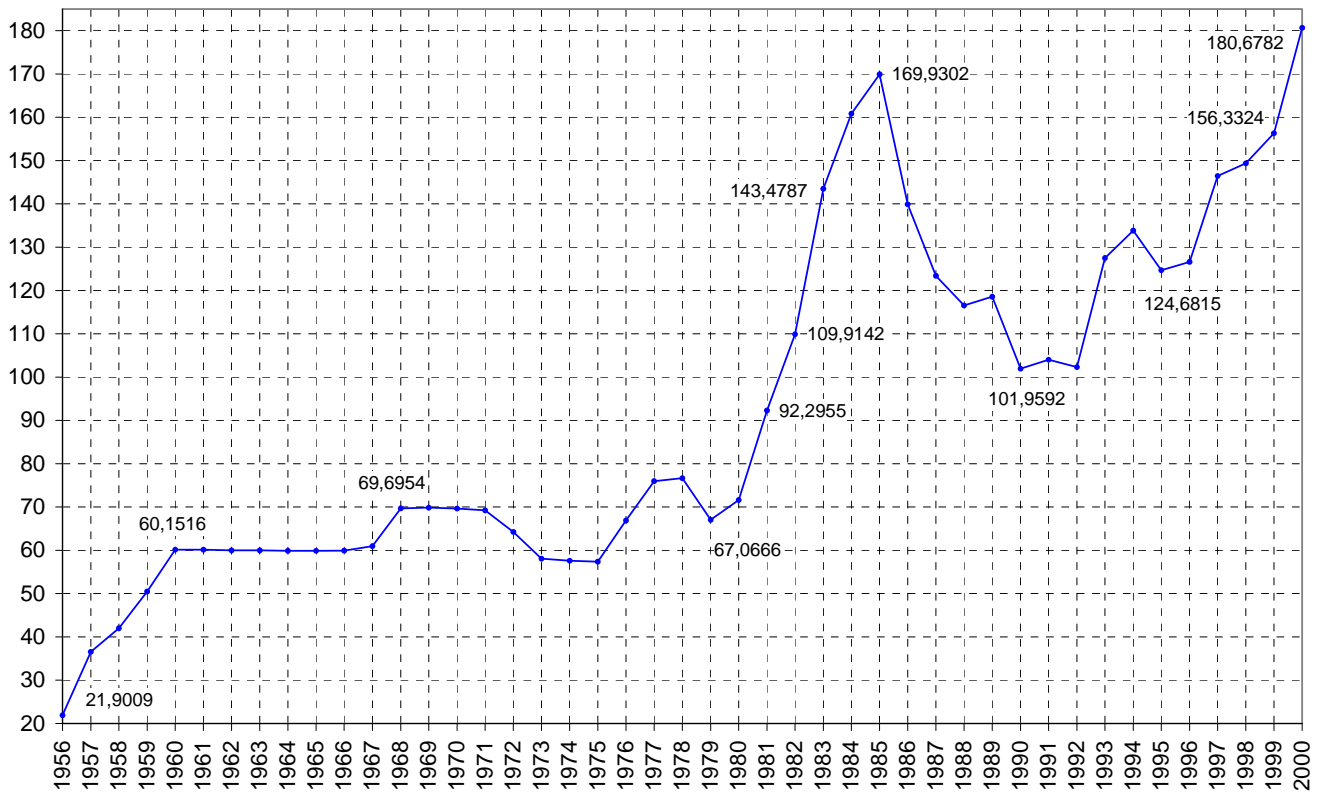


Figure 1. Peseta-dollar exchange rate, 1956-2000
<http://www.economicswbinstitute.org/data/worldexchangerates.zip>



Figure 2. Dollar-euro exchange rate (USD/EUR), 4 January 1999 – 2 February 2011
<http://www.ecb.int/stats/eurofxref/eurofxref-hist.zip>



Figure 3. Pound sterling-euro exchange rate (GBP/EUR), 4 January 1999 – 2 February 2011
<http://www.ecb.int/stats/eurofxref/eurofxref-hist.zip>

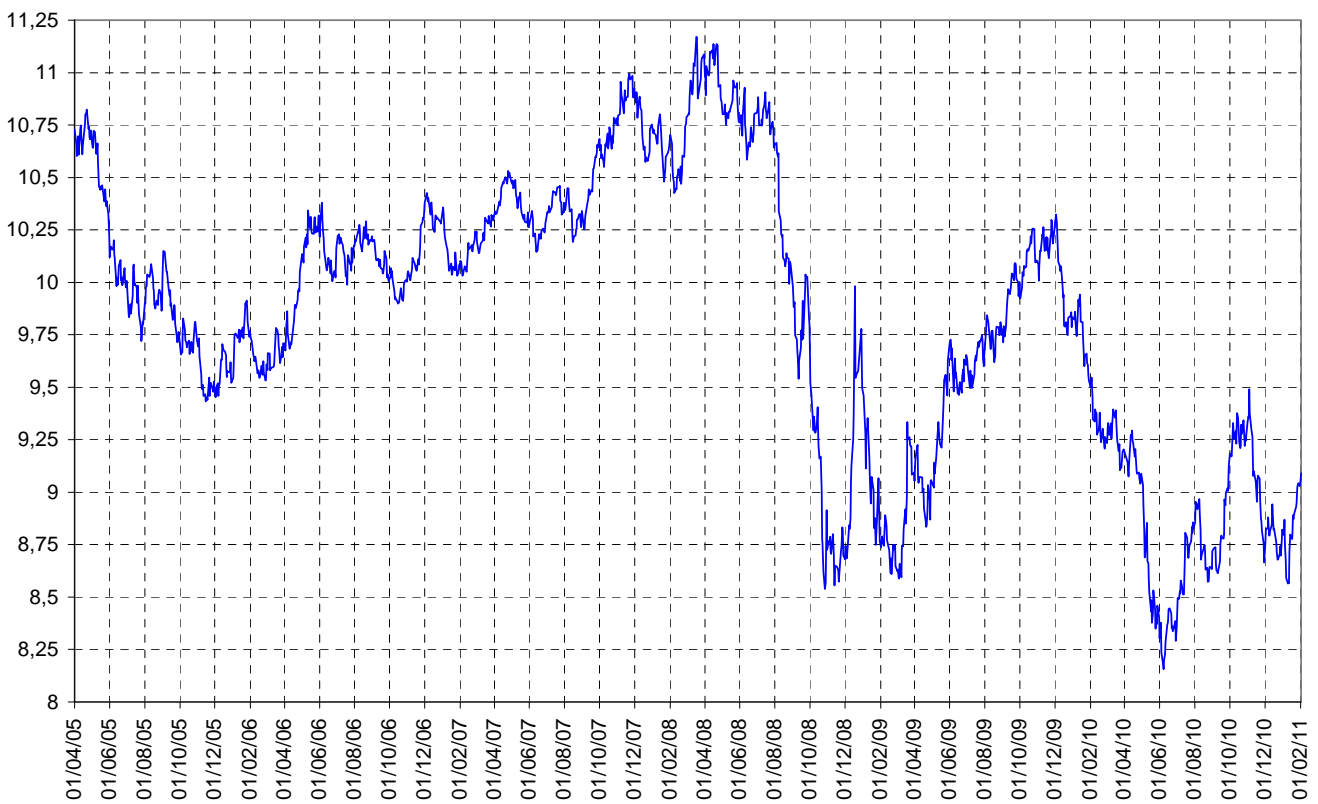


Figure 4. Yuan-euro exchange rate (CNY/EUR), 1 April 2005 – 2 February 2011
<http://www.ecb.int/stats/eurofxref/eurofxref-hist.zip>

CNY = ISO 4217 Code of the Renminbi (RMB), official currency of the People's Republic of China
 The *yuán* is the primary unit of renminbi · <http://en.wikipedia.org/wiki/CNY>

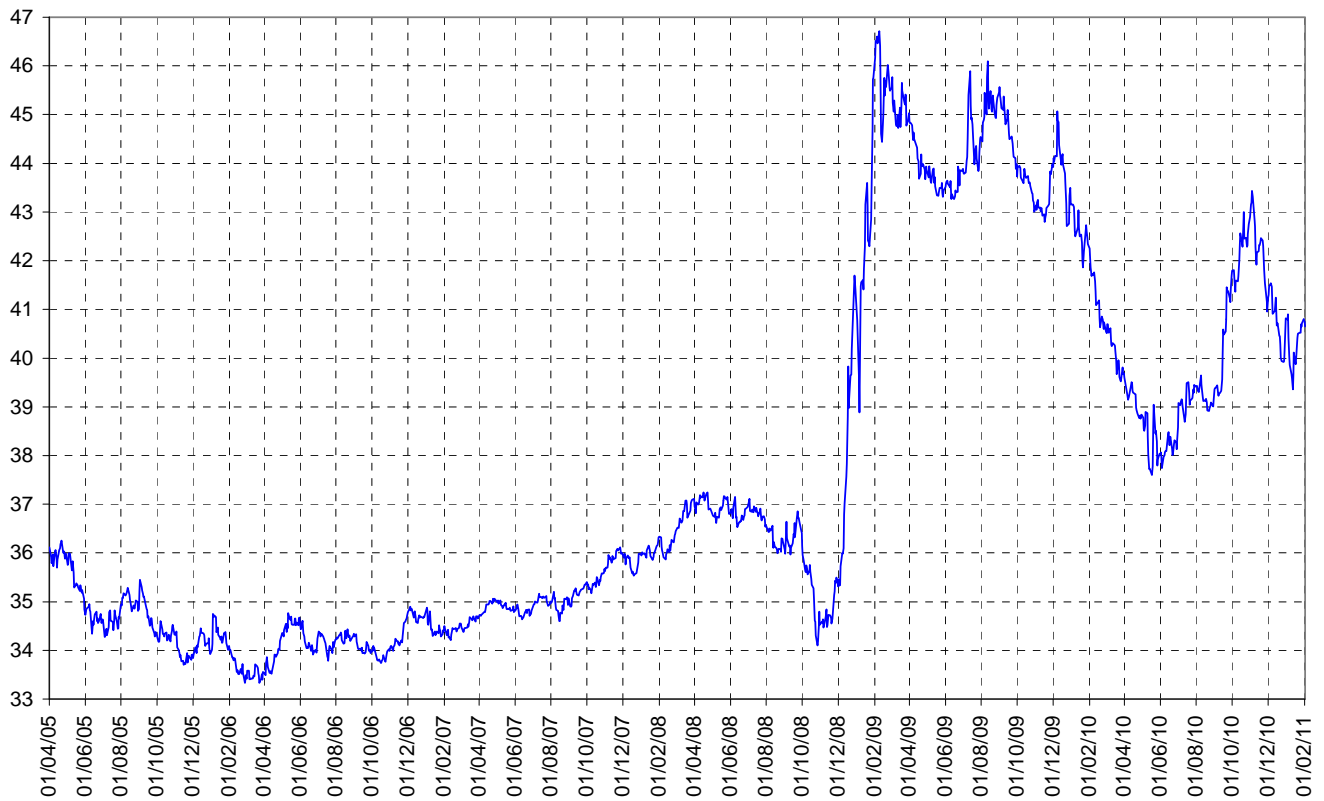


Figure 5. Ruble-euro exchange rate (RUB/EUR), 1 April 2005 – 2 February 2011

<http://www.ecb.int/stats/eurofxref/eurofxref-hist.zip>

<http://en.wikipedia.org/wiki/Ruble>

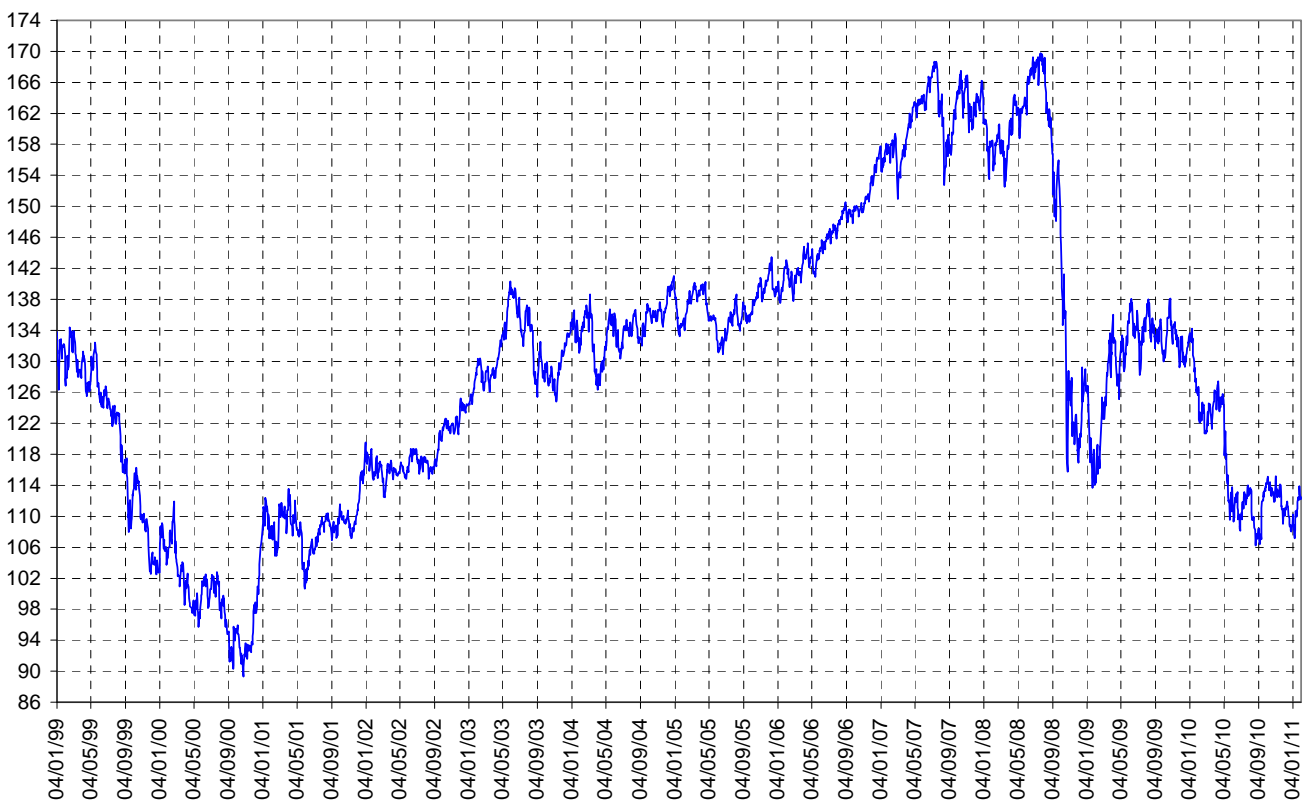


Figure 6. Yen-euro exchange rate (JPY/EUR), 4 January 1999 – 2 February 2011

<http://www.ecb.int/stats/eurofxref/eurofxref-hist.zip>

6. (i) Suppose a currency is overvalued according to its PPP value. What can be said about the associated real exchange rate? [Hint: is greater, smaller, or equal to 1?] (ii) Assume that P^* is twice P . What is the value of the nominal exchange rate consistent with (implied by) PPP?

7. Fill out the following table, where P is the CPI in the Eurozone, P^* is the CPI in the US, e_{PPP} is the exchange rate $\$/\epsilon$ ensuring purchasing power parity, e is the equilibrium exchange rate $\$/\epsilon$ in the currency market, and the last column is the one where it must be specified in which percentage the euro is overvalued or undervalued with respect to the dollar according to e_{PPP} .

P	P^*	e_{PPP}	e	Overvalued/undervalued (%)
100	200		1	
100	200		2	
100	200		$\frac{1}{2}$	
150	150		2	

8. [Warning: slightly hard] Consider Figure 7. (i) Explain whether the Argentinean peso was overvalued or undervalued with respect to the dollar according to purchasing power parity. Specifically, explain what the numbers in each column mean and how they are obtained. (ii) Do the same for the euro. (iii) In the case of Sweden, $e_{PPP} = 10.29$ crowns (Swedish kronor) per $\$$ and e from the currency market is 7.90 crowns per dollar. The percent deviation of e from e_{PPP} turns out to be -27.52% . But Figure 7 contends that the crown is overvalued a 38%. Explain the discrepancy.

9. Reus and Tarragona are independent countries with their own currency, the reuro and the tarragollar, respectively. The exchange rate between reuro and tarragollar is 2 reuros per tarragollar. The price of French bread is 3 reuros a piece in Reus and 1 tarragollar a piece in Tarragona. (i) Is the reuro overvalued or undervalued with respect to its PPP value? If so, by how much? (ii) Assuming that there is no significant transportation cost, what changes would cause the commercial arbitrage of French bread in the exchange rate and the prices in Reus and Tarragona?

10. (i) Identify 5 events shifting the market supply function of euros to the right. (ii) Identify 5 events shifting the market demand function for euros to the right.

11. (i) If the dollar-euro exchange rate is 20 $\$/\epsilon$ and the yen-euro exchange rate is 10 \yen/ϵ , what should presumably be the yen-dollar exchange rate? (ii) Let the dollar appreciate versus the euro and the yen depreciate versus the euro. Must the dollar appreciate or depreciate versus the yen? (iii) What is to be expected to happen to the real exchange rate between the dollar and the euro if the euro depreciates with respect to the dollar and the inflation rate in the US is higher than the inflation rate in the Eurozone?

12. In the currency market model, determine the effect on the equilibrium exchange rate of these events.

- (1) The arrival of a significant number of immigrants from the US
- (2) The Federal Reserve buys government bonds
- (3) Both the Federal Reserve and the European Central Bank purchase government bonds
- (4) The Federal Reserve buys government bonds and the European Central Bank sells them
- (5) The reduction of the number of tourist coming from the US
- (6) An increase in the US GDP
- (7) An increase in the US GDP combined with a decrease in the Eurozone GDP
- (8) An increase in the Eurozone CPI
- (9) An increase in both the Eurozone CPI and US CPI
- (10) The belief that the risk associated with bonds from Eurozone governments has increased
- (11) A new American civil war breaks out
- (12) Germany leaves the Eurozone

Value Meals

The hamburger standard

	Big Mac prices		Implied PPP† of the dollar	Actual dollar exchange rate July 13th	Under(-) / over(+) valuation against the dollar, %
	In local currency	In dollars*			
United States‡	\$ 3.57	3.57			
Argentina	Peso 11.5	3.02	3.22	3.81	-15
Australia	A\$ 4.34	3.37	1.22	1.29	-6
Brazil	Real 8.03	4.02	2.25	2.00	+13
Britain	£2.29	3.69	1.56§	1.61§	+3
Canada	C\$ 3.89	3.35	1.09	1.16	-6
Chile	Peso 1750	3.19	490	549	-11
China	Yuan 12.5	1.83	3.50	6.83	-49
Czech Republic	Koruna 67.92	3.64	19.0	18.7	+2
Denmark	DK 29.5	5.53	8.26	5.34	+55
Egypt	Pound 13	2.33	3.64	5.58	-35
Euro Area**	€ 3.31	4.62	1.08††	1.39††	+29
Hong Kong	HK\$ 13.3	1.72	3.73	7.75	-52
Hungary	Forint 720	3.62	202	199	+1
Indonesia	Rupiah 20900	2.05	5,854	10,200	-43
Israel	Shekel 15	3.77	4.20	3.97	+6
Japan	Yen 320	3.46	89.6	92.6	-3
Malaysia	Ringgit 6.77	1.88	1.90	3.60	-47
Mexico	Peso 33	2.39	9.24	13.8	-33
New Zealand	NZ\$ 4.9	3.08	1.37	1.59	-14
Norway	Kroner 40	6.15	11.2	6.51	+72
Peru	New Sol 8.056	2.66	2.26	3.03	-25
Philippines	Peso 99.39	2.05	27.8	48.4	-42
Poland	Zloty 7.6	2.41	2.13	3.16	-33
Russia	Ruble 67	2.04	18.8	32.8	-43
Saudi Arabia	Riyal 11	2.93	3.08	3.75	-18
Singapore	S\$ 4.22	2.88	1.18	1.46	-19
South Africa	Rand 17.95	2.17	5.03	8.28	-39
South Korea	Won 3400	2.59	952	1,315	-28
Sweden	SKR 39	4.93	10.9	7.90	+38
Switzerland	CHF 6.5	5.98	1.82	1.09	+68
Taiwan	Taiwan \$ 75	2.26	21.0	33.2	-37
Thailand	Baht 64.49	1.89	18.1	34.2	-47
Turkey	Lira 5.65	3.65	2.45	1.55	+2
United Arab Emirates	Dirhams 10	2.72	2.80	3.67	-24
Colombia	Peso 7000	3.34	1,961	2,096	-6
Costa Rica	Colones 2000	3.43	560	583	-4
Estonia	Kroon 32	2.85	8.96	11.2	-20
Iceland	Kronur 640	4.99	179	128	+40
Latvia	Lats 1.55	3.09	0.43	0.50	-13
Lithuania	Litas 7.1	2.87	1.99	2.48	-20
Pakistan	Rupee 190	2.30	53.2	82.6	-36
Philippines	Peso 99.39	2.05	27.8	48.4	-42
Sri Lanka	Rupee 210	1.83	58.8	115	-49
Ukraine	Hryvnia 14	1.83	3.92	7.66	-49
Uruguay	Peso 61	2.63	17.1	23.2	-26

*At current exchange rates †Purchasing-power parity; local price divided by price in United States

‡Average of New York, Chicago, Atlanta and San Francisco §Dollars per pound **Weighted average of prices in euro area ††Dollars per euro

Sources: McDonald's; The Economist

Figure 7. Big Mac index, 13 July, 2009,

http://www.economist.com/businessfinance/displaystory.cfm?story_id=E1_TQDPGJTR

12. In Figure 8, rank economies according to their competitiveness. Justify the ranking. Check that it is consistent with the information for Spain and Germany displayed in Figure 9.

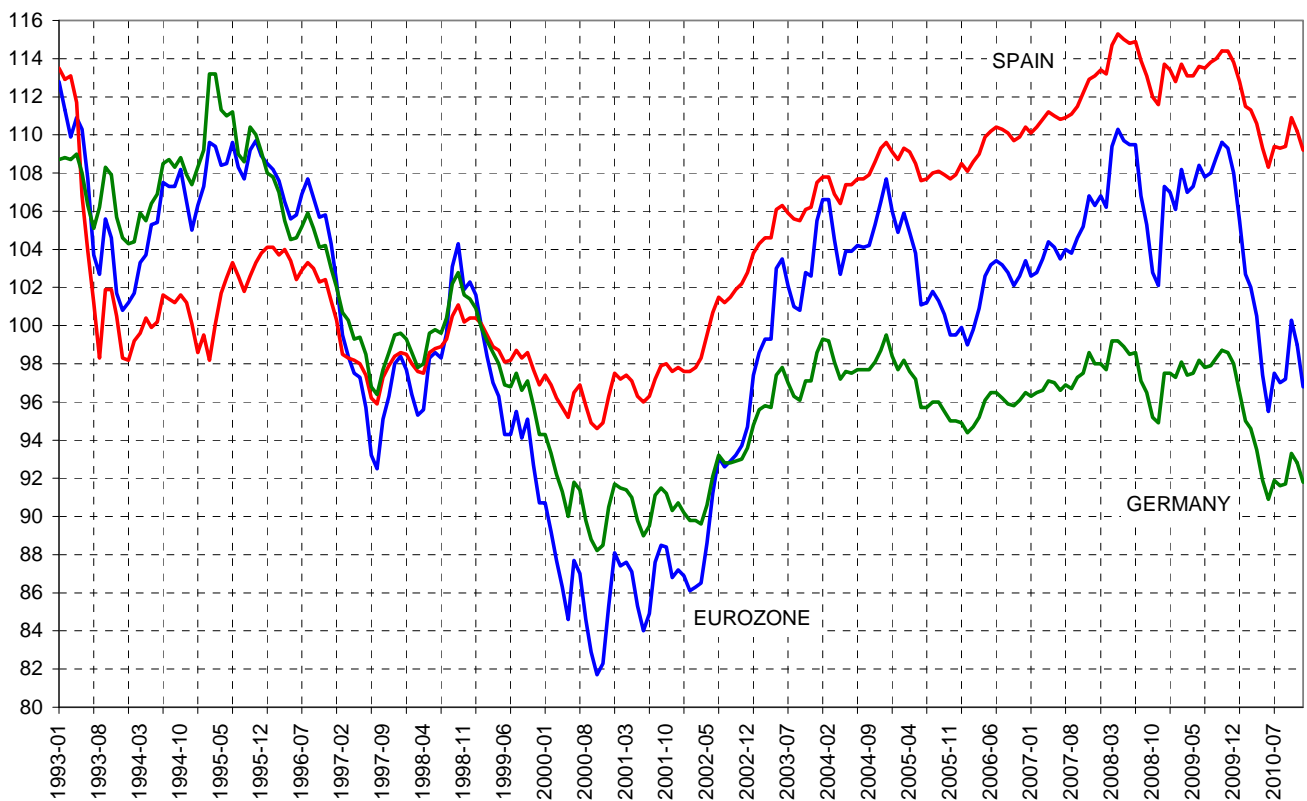


Figure 8. Real (effective) exchange rate of the € (with respect to the set of countries EER-41), 1993–2010
http://www.ecb.int/stats/exchange/hci/html/hci_2010-12.en.html

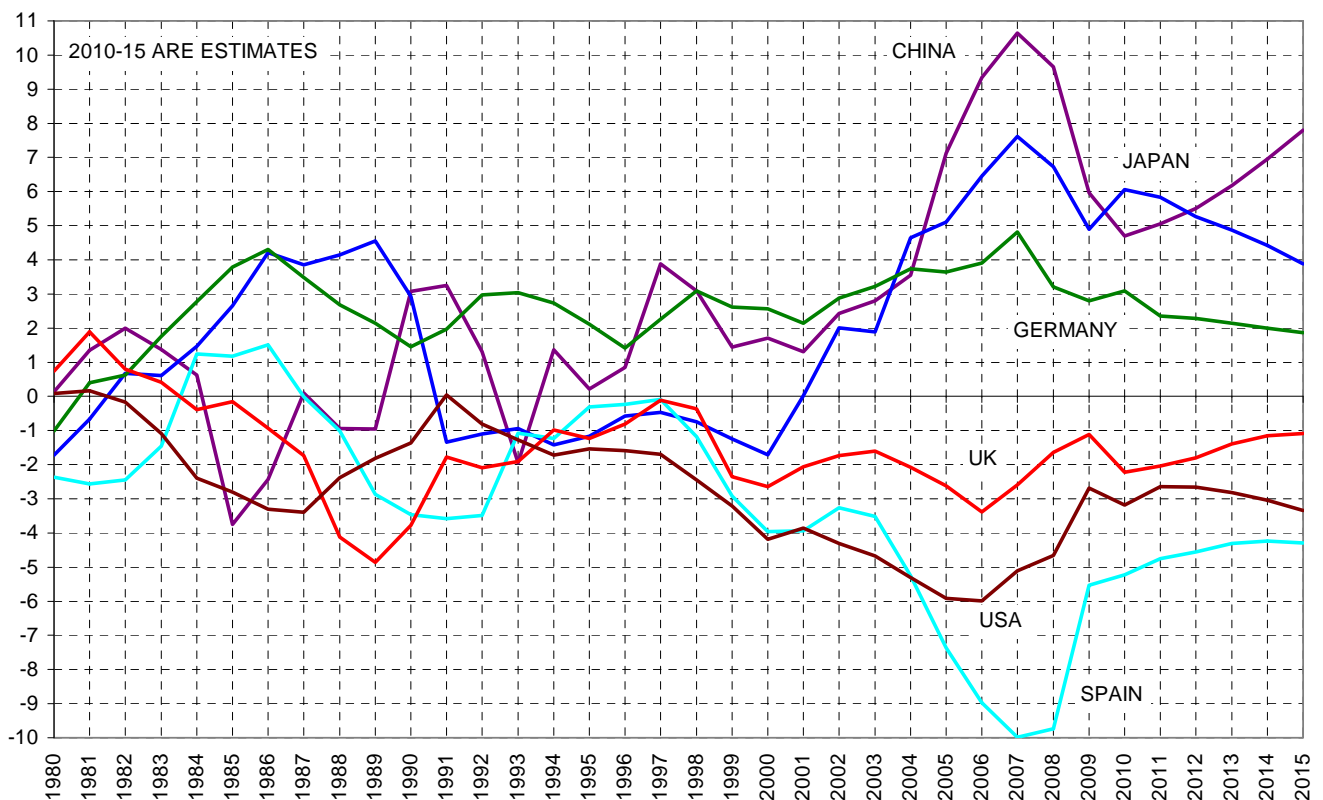


Figure 9. Current account balance, % GDP, China, Japan, Germany, Spain, UK, and USA, 1980–2015
<http://www.imf.org/external/pubs/ft/weo/2010/02/weodata/weoselgr.aspx>

Multiple-choice questions

- Arbitrage and speculation differ from each other in that
 - arbitrage only takes place in the currency market, whereas speculation only takes place in the loan market.
 - there is absolutely no difference between them.
 - the outcome of speculation is always a sure event for the speculator, while the outcome of arbitrage is always uncertain for the arbitrageur.
 - None of the above
- Depreciation and devaluation differ from each other in
 - absolutely nothing.
 - that depreciation is a government decision, whereas devaluation is determined by the currency market.
 - that depreciation is a reduction of the exchange rate, while devaluation is an increase of the exchange rate.
 - None of the above
- In which case could triangular arbitrage be carried out?
 - 1 \$/€ 1 \$/¥ 1 €/\$
 - 2 \$/€ 4 \$/¥ 2 €/\$
 - 2 \$/€ 2 \$/¥ 1 €/\$
 - 2 \$/€ 2 \$/¥ 2 €/\$
- The open economy trilemma refers to
 - interest rates, monetary policy, and capital mobility.
 - exchange rates, monetary policy, and monetary base.
 - discount factors, open market operations, and speculation.
 - exchange rates, monetary policy, and capital mobility.
- The denial of which sentence is not true?
 - The real interest rate may be smaller than the real exchange rate.
 - The real interest rate is always higher than the real exchange rate.
 - The real interest rate is always equal to the real exchange rate.
 - The real interest rate is always smaller than the real exchange rate.
- Reus is an independent country with the reuro as home currency. What action by the Central Bank of Reus would cause an appreciation of the reuro versus the euro?
 - A contractive open market operation
 - An increase in the reserve ratio
 - The purchase of euros (paid with reuros)
 - The purchase of reuros (paid with euros)
- What is the foreseeable effect on the exchange rate \$/€ of the purchase by the European Central Bank of financial assets?
 - Appreciation of the € with respect to the \$
 - Depreciation of the \$ with respect to the €
 - There is absolutely no connection between the loan market and the currency market
 - None of the above
- From which value to which value the dollar depreciates with respect to the euro?
 - From 4 \$/€ to 2 €/\$
 - From 2 \$/€ to 2 €/\$
 - From 2 €/\$ to 0.5 \$/€
 - From 2 €/\$ to 4 \$/€
- What could explain the depreciation of the euro with respect to the dollar?
 - A fall in the prices of the Eurozone
 - An increase in the Eurozone interest rate
 - A decrease in the US interest rate
 - A fall in the prices of the US
- What could not explain the depreciation of the euro with respect to the dollar?
 - A fall in the prices of the Eurozone
 - An increase in the Eurozone interest rate
 - A decrease in the US interest rate
 - None of the above
- Let the real exchange rate be expressed as foreign baskets/domestic basket. How does an increase in the foreign CPI affect the real exchange rate, with the rest of variables determining the real exchange rate held fixed?
 - Causes a rise in the real exchange rate
 - Causes a reduction in the real exchange rate
 - Does not affect the real exchange rate
 - None of the above
- If $P = 100$, $P^* = 50$, and $e = 1$ \$/€, then, according to PPP, the euro is
 - overvalued.
 - undervalued.
 - at its parity level.
 - None of the above