

We consider today various exchange rate systems

- Floating exchange rates – or flexible exchange rates: The exchange rate is entirely determined by the market. Central banks do not intervene in the market to influence the price of the currency.
- Managed float: The exchange rate is primarily determined by market forces, but central banks do play a role in limiting fluctuations in the exchange rate or pushing it in one direction.
- Target zone: The central bank intervenes in the foreign exchange market to keep the exchange rate within a band. Market forces are allowed to move the exchange rate within the band. Sometimes central banks only intervene when the exchange rate nears the edges of the band, though more often they intervene to keep the exchange rate from nearing the edge of the band.

- **Crawling peg:** The central bank announces a target path for the exchange rate (such as a 2% depreciation per year) and then intervenes in the market to keep the exchange rate on the targeted path.
- **Fixed exchange rate:** The central bank announces a value for the exchange rate, and then intervenes to keep the exchange rate at or near the fixed rate. Usually it works like a target zone, but with very narrow bands (+ or – one-half percent)
- **Currency board:** An extreme form of a fixed exchange rate, where the only role of the central bank is to exchange local currency for the foreign currency at the fixed rate (and vice-versa.)
- **Currency union:** An even more extreme form of fixed exchange rates, where two or more countries adopt the same currency and follow a common monetary policy.
- **Dollarization:** Like a currency union, except that the country that dollarizes has not say in monetary policy. That is, it simply adopts the dollar as its currency.

Most of the time, floating exchange rates are much more volatile than controlled exchange rates.

However, this is not always true. When a fixed exchange rate country devalues, it often devalues by a large amount.

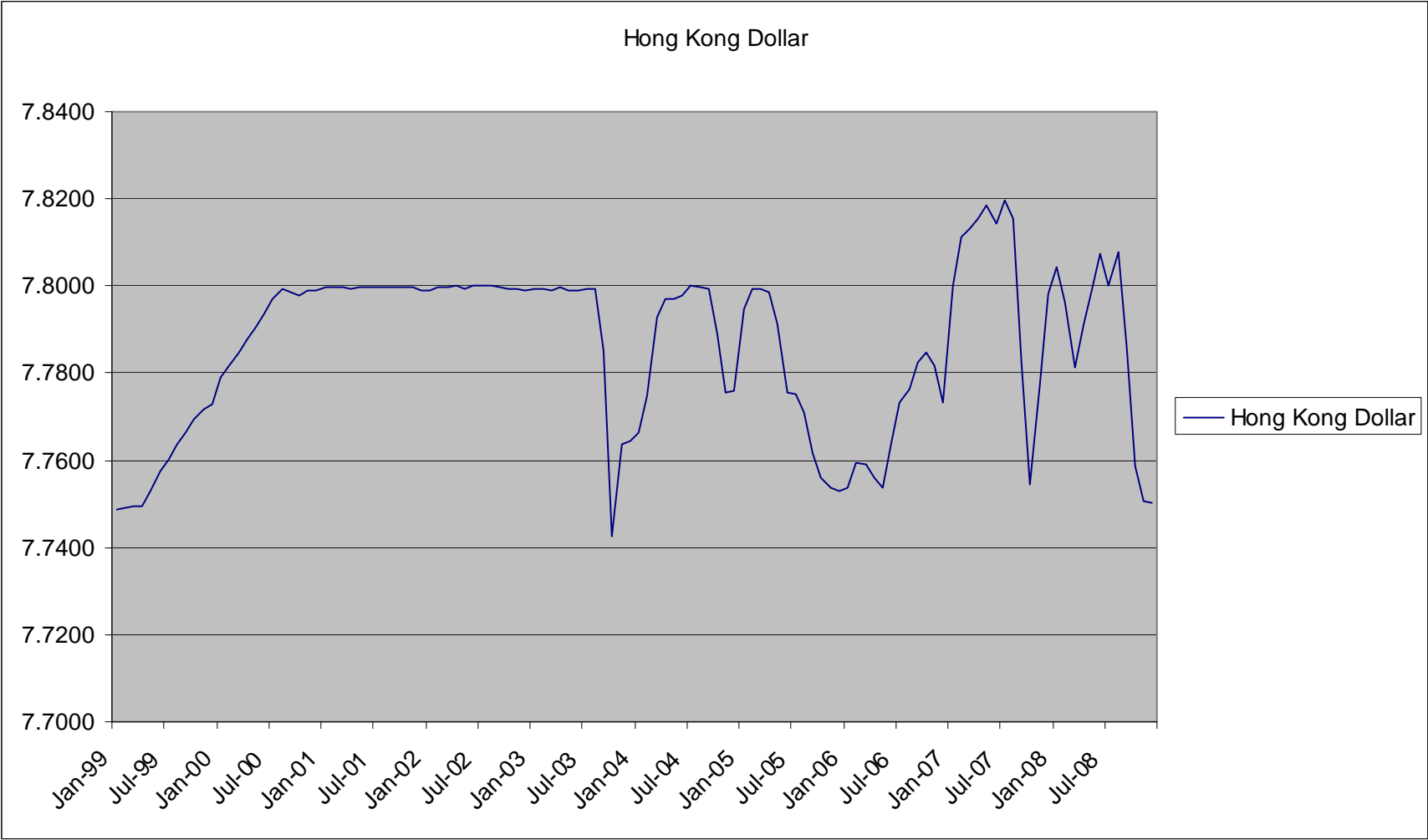
When we look at monthly changes in exchange rates, fixed exchange rate countries are more likely to have very large changes in the exchange rate than most floating rate or managed floating countries.

How does a central bank fix the exchange rate?

Typically, it allows the market to determine the exchange rate as long as it fluctuates within a narrow band.

But when the exchange rate starts to rise toward the top of the band (it depreciates), the central bank buys its own currency using foreign currency. This makes the currency worth more – the exchange rate falls back toward the middle of the band.

When the exchange rate starts to fall toward the bottom of the band (it appreciates), the central bank sells its own currency for foreign currency. This makes the currency depreciate – the exchange rate rises back toward the middle of the band.



Central Bank balance sheet (usually!)

Assets	Liabilities
Domestic Credit <ul style="list-style-type: none">• Government Bonds• Loans to Domestic Financial Institutions	Deposits of private financial institutions (Bank reserves)
Official international reserves	Currency in circulation
Other	Other

Reserve Bank credit, related items, and reserve balances of depository institutions at Federal Reserve Banks	Averages of daily figures			Wednesday Dec 26, 2007
	Week ended Dec 26, 2007	Change from week ended		
		Dec 19, 2007	Dec 27, 2006	
Reserve Bank Credit	873,512	+ 2,582	+ 21,265	877,148
Securities held outright	754,605	- 15,143	- 24,346	754,612
U.S. Treasury (1)	754,605	- 15,143	- 24,346	754,612
Bills (2)	241,856	- 15,163	- 35,163	241,856
Notes and bonds, nominal (2)	470,984	0	+ 3,120	470,984
Notes and bonds, inflation-indexed (2)	36,911	0	+ 6,806	36,911
Inflation compensation (3)	4,855	+ 21	+ 891	4,862
Federal agency (2)	0	0	0	0
Repurchase agreements(4)	39,536	- 16,214	+ 6,500	42,500
Term auction credit	20,000	+ 20,000	+ 20,000	20,000
Other loans	4,828	+ 209	+ 4,679	4,535
Primary credit	4,802	+ 216	+ 4,738	4,513
Secondary credit	0	0	0	0
Seasonal credit	26	- 6	- 59	22
Float	-902	- 533	- 1,777	-336
Other Federal Reserve assets	55,445	+ 14,262	+ 16,209	55,837
Gold stock	11,041	0	0	11,041
Special drawing rights certificate account	2,200	0	0	2,200
Treasury currency outstanding (5)	38,807	+ 14	+ 609	38,807
Total factors supplying reserve funds	925,560	+ 2,596	+ 21,873	929,196
Currency in circulation(5)	825,624	+ 6,053	+ 8,800	829,193
Reverse repurchase agreements (6)	39,120	+ 2,031	+ 8,611	40,542
Foreign official and international accounts	39,120	+ 2,031	+ 8,611	40,542
Dealers	0	0	0	0
Treasury cash holdings	246	- 1	+ 16	246
Deposits with F.R.Banks, other than reserve balances	11,906	- 2,569	- 529	11,535

U.S. Treasury, general account	4,910	- 2,590	- 330	4,529
Foreign official	97	- 7	+ 5	97
Service-related	6,615	+ 17	- 222	6,615
Required clearing balances	6,615	+ 74	- 222	6,615
Adjustments to compensate for float	0	- 57	0	0
Other	283	+ 11	+ 17	293
Other liabilities and capital	42,799	- 10	+ 5,975	42,900
Total factors, other than reserve balances, absorbing reserve funds	919,694	+ 5,504	+ 22,872	924,415
Reserve balances with Federal Reserve Banks	5,865	- 2,910	- 1,000	4,781
Memo (off-balance-sheet items):				
Marketable securities held in custody for foreign official and international accounts(2,7)	2,056,411	+ 8,516	+ 304,309	2,062,315
U.S. Treasury	1,226,184	+ 1,551	+ 70,299	1,230,621
Federal agency	830,227	+ 6,965	+ 234,010	831,694
Securities lent to dealers	14,130	+ 3,378	+ 10,805	17,46

reserve balances of depository institutions at Federal Reserve Banks Reserve Bank credit, related items, and	Averages of daily figures			Wednesday Dec 24, 2008
	Week ended Dec 24, 2008	Change from week ended		
		Dec 17, 2008	Dec 26, 2007	
Reserve Bank credit	2,207,272	- 46,466	+1,333,775	2,241,288
Securities held outright	495,994	+ 3,229	- 258,611	496,892
U.S. Treasury (1)	476,067	- 111	- 278,538	476,014
Bills (2)	18,423	0	- 223,433	18,423
Notes and bonds, nominal (2)	410,491	0	- 60,493	410,491
Notes and bonds, inflation-indexed (2)	41,071	0	+ 4,160	41,071
Inflation compensation (3)	6,082	- 110	+ 1,227	6,029
Federal agency (2)	19,927	+ 3,340	+ 19,927	20,878
Repurchase agreements (4)	80,000	0	+ 40,464	80,000
Term auction credit	420,806	- 27,153	+ 400,806	450,219
Other loans	196,868	- 15,657	+ 192,040	186,630
Primary credit	86,260	- 2,147	+ 81,458	84,898
Secondary credit	51	+ 48	+ 51	40
Seasonal credit	3	+ 1	- 23	3
Primary dealer and other broker-dealer credit (5)	45,679	- 4,814	+ 45,679	38,190
Asset-backed commercial paper money market				
mutual fund liquidity facility	24,858	- 4,416	+ 24,858	23,993
Credit extended to American International				
Group, Inc. (6)	40,018	- 4,329	+ 40,018	39,507
Other credit extensions	0	0	0	0
Net portfolio holdings of Commercial Paper				
Funding Facility LLC (7)	325,796	+ 10,529	+ 325,796	331,686
Net portfolio holdings of LLCs funded through				
the money market investor funding facility (8)	0	0	0	0
Net portfolio holdings of Maiden Lane LLC (9)	26,918	+ 26	+ 26,918	26,966
Net portfolio holdings of Maiden Lane II LLC (10)	20,033	+ 2,514	+ 20,033	20,049
Net portfolio holdings of Maiden Lane III LLC (11)	28,085	+ 8,477	+ 28,085	28,191
Float	-1,167	- 138	- 254	-1,334
Other Federal Reserve assets	613,939	- 28,294	+ 558,497	621,990

Gold stock	11,041	0	0	11,041
Special drawing rights certificate account	2,200	0	0	2,200
Treasury currency outstanding (12)	38,843	+ 14	+ 141	38,843
Total factors supplying reserve funds	2,259,356	- 46,452	+1,333,916	2,293,372

Note: Components may not sum to totals because of rounding. Footnotes appear on the following page.

1. Factors Affecting Reserve Balances of Depository Institutions, continued
Millions of dollars

Reserve Bank credit, related items, and reserve balances of depository institutions at Federal Reserve Banks	Averages of daily figures		
	Week ended Dec 24, 2008	Change from week ended	
		Dec 17, 2008	Dec 26, 2008
Currency in circulation (12)	881,463	+ 6,162	+ 55,94
Reverse repurchase agreements (13)	87,758	- 5,442	+ 48,63
Foreign official and international accounts	87,758	+ 15,987	+ 48,63
Dealers	0	- 21,429	
Treasury cash holdings	233	+ 6	- 1
Deposits with F.R. Banks, other than reserve balances	425,657	- 29,092	+ 413,75
U.S. Treasury, general account	125,933	+ 46,301	+ 121,02
U.S. Treasury, supplementary financing account	289,247	- 74,930	+ 289,24
Foreign official	644	+ 406	+ 54
Service-related	4,414	- 205	- 2,20
Required clearing balances	4,385	- 207	- 2,22
Adjustments to compensate for float	29	+ 2	+ 2
Other	5,418	- 665	+ 5,13
Other liabilities and capital (14)	79,640	- 2,434	+ 36,80
Total factors, other than reserve balances, absorbing reserve funds	1,474,750	- 30,801	+ 555,13
Reserve balances with Federal Reserve Banks	784,607	- 15,650	+ 778,78
Reserve Bank credit, related items, and reserve balances of depository institutions at	Averages of daily figures	Wednesday Sep 16, 2009	
	Week ended	Change from week ended	

Federal Reserve Banks	Sep 16, 2009	Sep 9, 2009	Sep 17, 2008	
Reserve Bank credit	2,088,554	+ 18,966	+1,155,924	2,125,180
Securities held outright (1)	1,532,747	+ 31,378	+1,052,929	1,570,018
U.S. Treasury securities	758,053	+ 4,518	+ 278,235	759,803
Bills (2)	18,423	0	- 3,317	18,423
Notes and bonds, nominal (2)	689,318	+ 4,536	+ 277,587	691,074
Notes and bonds, inflation-indexed (2)	44,588	0	+ 4,756	44,588
Inflation compensation (3)	5,725	- 17	- 790	5,718
Federal agency debt securities (2)	123,992	+ 1,416	+ 123,992	125,159
Mortgage-backed securities (4)	650,702	+ 25,445	+ 650,702	685,056
Repurchase agreements (5)	0	0	- 124,500	0
Term auction credit	196,020	- 16,090	+ 46,020	196,020
Other loans	111,490	+ 4,337	+ 63,521	111,879
Primary credit	28,681	- 1,693	+ 7,083	28,199
Secondary credit	561	- 20	+ 553	558
Seasonal credit	113	+ 6	+ 17	118
Primary dealer and other broker-dealer credit (6)	0	0	- 20,268	0
Asset-Backed Commercial Paper Money Market				
Mutual Fund Liquidity Facility	79	0	+ 79	79
Credit extended to American International				
Group, Inc., net (7)	39,428	+ 537	+ 33,428	39,371
Term Asset-Backed Securities Loan Facility	42,629	+ 5,508	+ 42,629	43,555
Other credit extensions	0	0	0	0
Net portfolio holdings of Commercial Paper				

Funding Facility LLC (8)	44,779	- 2,360	+ 44,779	42,974
Net portfolio holdings of LLCs funded through the Money Market Investor Funding Facility (9)	0	0	0	0
Net portfolio holdings of Maiden Lane LLC (10)	26,114	+ 31	- 3,219	26,146
Net portfolio holdings of Maiden Lane II LLC (11)	14,639	- 41	+ 14,639	14,649
Net portfolio holdings of Maiden Lane III LLC (12)	20,516	+ 86	+ 20,516	20,545
Float	-2,057	- 162	- 987	2,358
Central bank liquidity swaps (13)	61,101	- 506	- 899	61,101
Other Federal Reserve assets (14)	83,205	+ 2,294	+ 43,126	84,207
Gold stock	11,041	0	0	11,041
Special drawing rights certificate account	2,200	0	0	2,200
Treasury currency outstanding (15)	42,469	- 82	+ 3,794	42,449
Total factors supplying reserve funds	2,144,264	+ 18,884	+1,159,718	2,180,871

Note: Components may not sum to totals because of rounding. Footnotes appear at the end of the table.

1. Factors Affecting Reserve Balances of Depository Institutions (continued)

Millions of dollars

Reserve Bank credit, related items, and reserve balances of depository institutions at Federal Reserve Banks	Averages of daily figures			Wednesday Sep 16, 2009
	Week ended Sep 16, 2009	Change from week ended		
		Sep 9, 2009	Sep 17, 2008	
Currency in circulation (15)	914,350	- 1,568	+ 82,049	914,179
Reverse repurchase agreements (16)	66,951	+ 425	+ 21,208	68,934
Foreign official and international accounts	66,951	+ 425	+ 21,208	68,934
Dealers	0	0	0	0
Treasury cash holdings	266	+ 10	- 1	277
Deposits with F.R. Banks, other than reserve balances	234,973	+ 11,203	+ 220,607	278,897

U.S. Treasury, general account	25,346	+	8,548	+	20,405	72,399
U.S. Treasury, supplementary financing account	199,932		0	+	199,932	199,932
Foreign official	2,358	-	156	+	2,190	2,369
Service-related	3,866	-	211	-	3,494	3,866
Required clearing balances	3,866	-	211	-	3,494	3,866
Adjustments to compensate for float	0		0		0	0
Other	3,470	+	3,022	+	1,573	330
Other liabilities and capital (17)	60,096	+	644	+	15,227	59,601
Total factors, other than reserve balances, absorbing reserve funds	1,276,635	+	10,713	+	339,089	1,321,887
Reserve balances with Federal Reserve Banks	867,629	+	8,171	+	820,629	858,984

Unsterilized intervention to support the currency:

- Foreign exchange intervention directly affects the amount of money held by public (through currency in circulation or reserves held by banks.)
- For example, suppose the central bank buys its own currency using its foreign exchange reserves. Perhaps it buys 50 units:

Assets	Liabilities
Official international reserves	Bank reserves or currency
-50	-50

- In fact, reserves are not generally held purely as currency, but instead as bonds.
- So the central bank would first sell its foreign bonds for foreign currency, then sell its foreign currency and buy its own currency.

Sterilized intervention to support the currency:

The central bank offsets any effect on the money supply by taking an offsetting position in domestic credit. For example:

Assets	Liabilities
Official international reserves -50	Bank reserves or currency -50
Domestic credit +50	Bank reserves or currency +50

- In essence, the central bank has sold off its holdings of foreign bonds to the public, and bought domestic bonds from the public.
- It has changed the composition of the public's bond portfolio but not changed the money supply.
- This may strengthen the currency, but the evidence is not clear.

- When central banks undertake foreign exchange intervention, usually it is sterilized.
- Currency boards are the big exception.
- If capital markets are deep and capital flows freely, it is generally believed that the effects of sterilized intervention are small.
- Many countries that support their currencies through sterilized intervention either limit capital flows or have underdeveloped markets in bonds.
 - The action that changes public's holdings of bonds can have a significant effect on the currency.
- But in countries with free capital flows and deep capital markets, domestic and foreign bonds are close substitutes so sterilized intervention has little effect.
- However, the empirical evidence is weak. It is difficult to gauge the effects of sterilized intervention.

The impossible trinity:

- 1.Fixed exchange rates
- 2.Free capital mobility
- 3.Independent monetary policy

If sterilized intervention is unlikely to be very successful when capital mobility is free, then monetary policy must be devoted to maintaining the exchange rate.

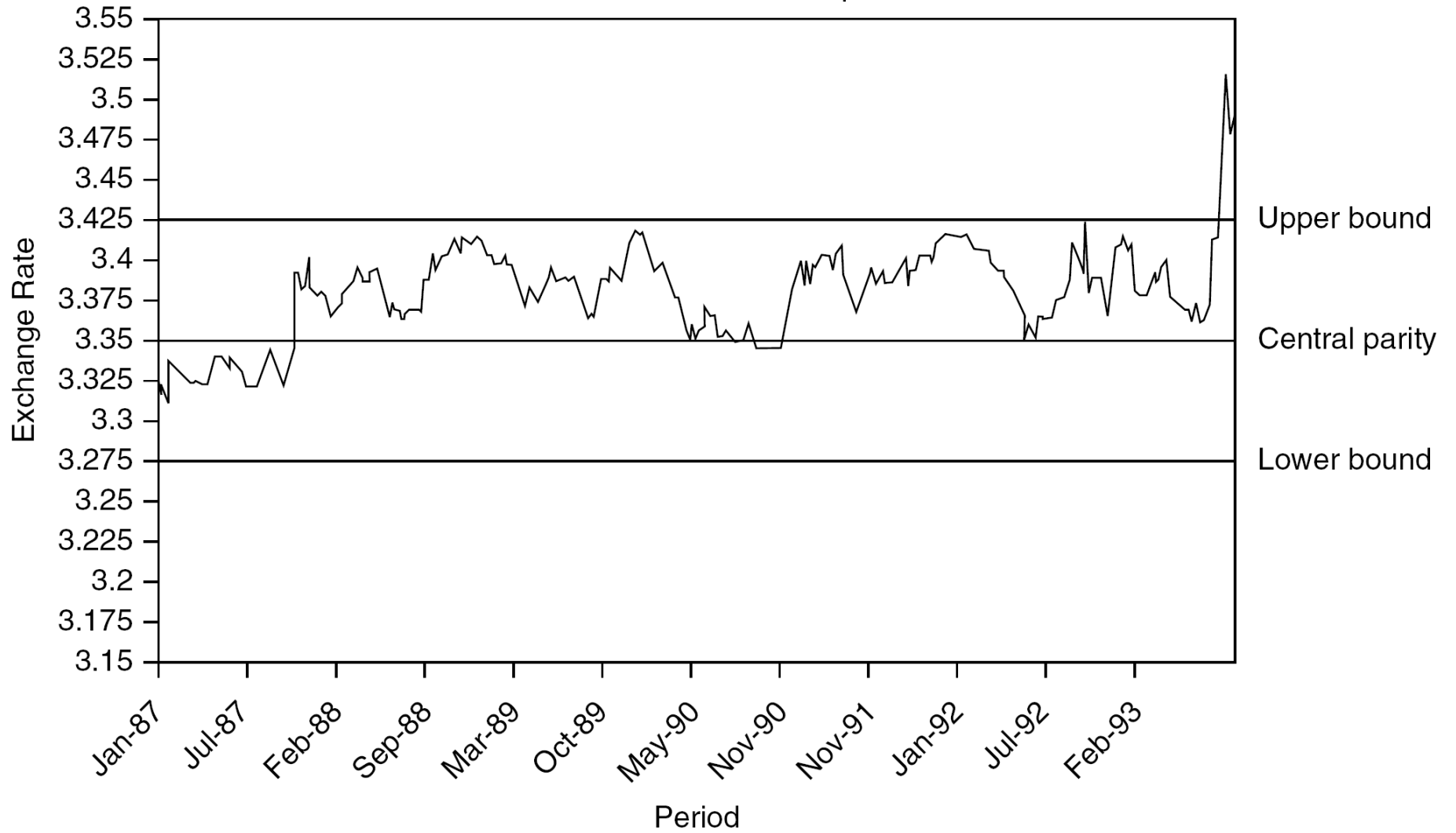
Fixed Rate System

No Separate Legal Tender	Currency Boards	Conventional Pegs Against a Single Currency	
Dollarized	Bosnia and Herzegovina	Aruba	Maldives
Ecuador	Brunei Darussalam	Azerbaijan	Mauritania
El Salvador	Bulgaria	The Bahamas	Namibia
Kiribati	Djibouti	Bahrain	Nepal
Marshall Islands	Estonia	Barbados	Netherlands, Antilles
Micronesia	Hong Kong SAR	Belarus	Oman
Palau	Lithuania	Belize	Pakistan
Panama		Bhutan	Qatar
San Marino		Cape Verde	Saudi Arabia
Timor-Leste		Comoros	Seychelles
ECCU		Egypt	Solomon Islands
Antigua and Barbuda		Eritrea	Suriname
Dominica		Guyana	Swaziland
Grenada		Honduras	Syrian Arab Republic
St. Kitts and Nevis		Iraq	Trinidad and Tobago
St. Lucia		Jordan	Turkmenistan
Vincent & the Grenadines		Kuwait	Ukraine
CFA Franc Zone		Latvia	United Arab Emirates
Benin		Lebanon	Venezuela
Burkina Faso		Lesotho	Vietnam
Cote D'Ivoire		Macedonia, FYR	Zimbabwe
Guinea Bissau		Against a Composite	
Mali		Fiji	
Niger		Libyan Arab Jamahiriya	
Senegal		Morocco	
Togo		Samoa	
Cameroon		Vanuatu	
Central African Republic		China	
Chad			
Republic of Congo			
Equatorial Guinea			
Gabon			
Euro Area			
Austria			
Belgium			
Cyprus			
Finland			
France			
Germany			
Greece			
Ireland			
Italy			
Luxembourg			
Malta			
The Netherlands			
Portugal			
Spain			
Slovenia			

Target Zones		Managed Floats	Floating	
Conventional	Crawling Pegs			
Denmark	Bolivia	Afghanistan	Madagascar	Albania
Hungary	Botswana	Algeria	Malawi	Armenia
Slovak Republic	Costa Rica	Angola	Malaysia	Australia
Tonga	Iran	Argentina	Mauritius	Brazil
Cyprus	Nicaragua	Bangladesh	Moldova	Canada
		Burundi	Mongolia	Chile
		Cambodia	Mozambique	Rep. of Congo
		Colombia	Myanmar	Iceland
		Croatia	Nigeria	Israel
		Czech Republic	Papua New Guinea	Japan
		Dominican Rep.	Paraguay	Korea
		Ethiopia	Peru	Mexico
		The Gambia	Romania	New Zealand
		Georgia	Russian Fed.	Norway
		Ghana	Rwanda	Philippines
		Guatemala	Sao Tome & Principe	Poland
		Guinea	Serbia & Montenegro	Sierra Leone
		Haiti	Singapore	Somalia
		India	Sri Lanka	South Africa
		Indonesia	Sudan	Sweden
		Jamaica	Tajikistan	Switzerland
		Kazakhstan	Thailand	Tanzania
		Kenya	Tunisia	Turkey
		Kyrgyz Republic	Uruguay	Uganda
		Lao	Uzbekistan	United Kingdom
		Liberia	Rep. of Yemen	United States

	Central Bank Objective	Exchange-rate Volatility		Inflation Variability	Countries Adhering to System
		Historical	Latent		
Pure Floating	Domestic	—	—	—	0
Dirty Float	Domestic and Exchange rate	Large	None	Large	79
Target Zone or Crawling Bands/Pegs	Domestic and Exchange rate	Small	Large	Small	10
Pegged Exchange Rates	Exchange rate	None	Large	Small	48
Currency Board	Exchange rate	None	Small	Small	7
Dollarized	Domestic	None	Small	Small	9
Monetary Union	Domestic	None	Very small	?	15

French Franc/Deutsche Mark Spot Rates



Peso/US\$ Exchange Rate

Weekly Spot Rate Within Intervention Bands

