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INTERNATIONAL FINANCIAL MARKETS



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**INTERNATIONAL
FINANCIAL MARKETS**

Textbook

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The University training discipline “International financial markets” studies the behavior of economic institutions (business, financial institutes, governments, individuals) in the multicurrency environment. The text consists of two sections, 6 chapters. The world monetary system, exchange rates and “forex” markets are considered in part I. The international money and capital markets, and multicurrency investments are studied in part II.

The text is focused on the university students of the undergraduate and graduate levels, and business practitioners. Authors intended to instill in the readers a taste for work with the theoretical concepts, the empirical data, describing the evolution, current conditions and prospects of the international financial environment’ development in the framework of business decisions making.

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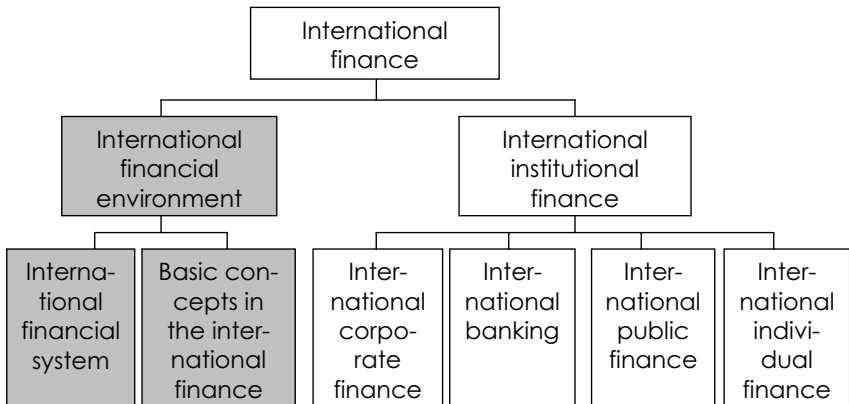
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Introduction

I place economy among the first and most important republican virtues, and public debt as the greatest of the dangers to be feared. To preserve our independence, we must not let our rulers load us with perpetual debt.

**Thomas Jefferson (1743–1826),
US Ambassador in France,
President of the USA**

The University course “International financial markets” is a part of wider discipline “International finance”. The international finance studies the behavior of economic institutions (business, financial institutes, governments, individuals) in the multicurrency environment. Two groups of the international financial disciplines analyze the financial environment and institutional finance (Exh. 1).



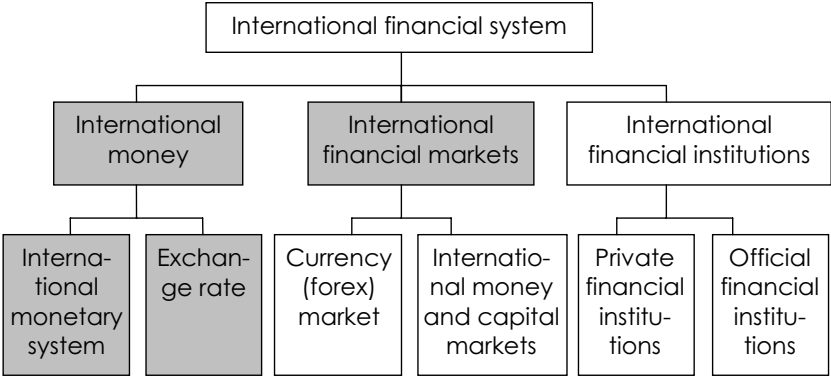
Exh. 1. Structure of international financial disciplines

The first group considers the international financial system (international money, financial markets, and institutions) and the basic concepts of the international finance. In turn, the es-

timations of financial environment perspective cause reactions of economic institutions to external signals, i. e. underlie their financial decisions that are being characterized by the second group of financial disciplines.

In international finance, thousands of different instruments are utilized. Therefore, it is titled as one of most sophisticated spheres in economics and management. For example, only so-called derivatives' contracts (which became wider applied after launching of free float exchange rates' regime in 1973 to decrease the currency, interest, price risks) count around 700 items. Nonetheless, financial deals are based on simple (even intuitively comprehended) basic concepts — arbitrage, hedging, efficient market hypothesis, asset pricing model, portfolio selection, time value of money, discounted cash flows model.

The main function of the financial system is to transfer the money from economic surplus units (with excessive financial resources) to deficit units (which expires the lack of funds, but able to use them profitable). Such transfer is carried out through the financial institutions, utilizing financial markets. Accordingly, the international financial system includes all these three elements (Exh. 2).



Exh. 2. The structure of international financial system

The text consists of two sections, 6 chapters. The international money, exchange rates and foreign exchange (“forex”)

markets are considered in section I, including monetary system — in chapter 1, exchange rates — in chapter 2, spot and forward currency markets — in chapter 3. The last theme appears here so far as in the international sphere not one, but some currencies (unlike the national financial systems), exchanged one for another, as a means of payment and of investment are utilized. The international money and capital markets, and multicurrency investments are studied in chapters 4–6. In the foreign exchange markets, one currency exchange for others. In the money and capital markets (also known as markets of debts and equity) — participants grant credits (or raise loans), invest in the bills, notes, bonds, stocks (or issue them). In the beginning of each chapter the basic purposes of studying for corresponding theme are given. The statement of the chapter comes to the end with conclusions after it, control questions, problems for self-checking.

The training course “International financial markets” usually delivers to the students on the fourth–fifth years of studying after they mastered disciplines “Economics”, “Economic statistics” (“Econometrics”), “Financial markets and institutions” (“Finance and credit”), “Accounting” (“Bookkeeping”), “Corporate finance” (“Financial management”), “Banking” (“Bank management”), “Public finance”, “International economics” (“World economy”).

As a result of studying the discipline “International financial markets”, exploiting the text presented, the university students, the audience of post-graduate programs (raising the level of proficiency, retraining, MBA, executive MBA courses) should get knowledge in the following areas:

- functions of money in the international sphere and multicurrency economy (for example, in Russia);
- world monetary system evolution and its contemporary condition;
- types of exchange rates regimes, definition of their equilibrium, and determinants (major influencing factors);
- structure of the foreign exchange market, and the trading by currencies in a mode of immediate delivery;

- derivative currency contracts of the first generation — forwards, futures, options, swaps;
- structure, tools, indicators of the international money (short-term) markets (currency tradable notes, and non-circulative deposits, credits);
- instruments, indicators of the international capital (long-term) markets (foreign and euro-currency bonds, equity, syndicated loans);
- international financial investments — risk-return trade-off, portfolio selection for trans-border deals.

The textbook is intended to instill in the readers a taste for work with the theoretical concepts, the empirical data, describing the development, contemporary condition and perspectives of the international financial markets.

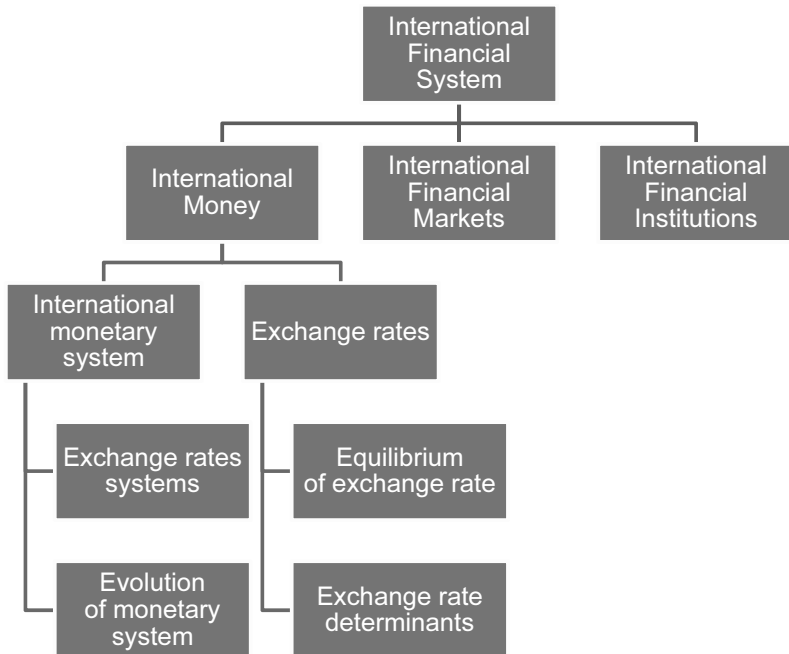
Part I

THE INTERNATIONAL MONEY, EXCHANGE RATES AND FOREX MARKETS

Only one fellow in ten thousand understands the currency question, and we meet him every day.

***Kin Hubbard (1868–1930),
American writer, humorist***

The international money represents one of the 3 components of international financial system (alongside with the international financial markets and institutions).



Exh. I.1. Money in the structure of international financial system

In this section of the text, the following themes are considered (Exh. I.1):

- functions and types of the international money;
- architecture of world currency system;
- comparative prices of the various monetary units, expressed one in another (exchange rates);
- financial reporting of the separate countries on external operations (balance of payment and international investment position) in a context of a supply and demand on currencies.

Chapter 1

INTERNATIONAL MONETARY SYSTEM

Money often costs too much.
Ralph Waldo Emerson (1803–1882),
American philosopher

INTERNATIONAL FINANCIAL MARKETS			
<i>Part one: INTERNATIONAL MONEY, EXCHANGE RATES AND FOREX MARKETS</i>	Chapter I: INTERNATIONAL MONETARY SYSTEM	Chapter IV: INTERNATIONAL MONEY MARKETS	<i>Part two: INTERNATIONAL MONEY AND CAPITAL MARKETS</i>
	Chapter II: EXCHANGE RATE DETERMINA- TION	Chapter V: INTERNATIONAL CAPITAL MARKETS	
	Chapter III: FOREIGN EXCHANGE MARKETS: SPOT, FORWARD	Chapter VI: MULTICUR- RENCY INVESTMENTS	

Purposes of studying

- Determine the functions and types of modern international money.
- Show the mechanism of artificial currency units construction — as official, and private ones.
- Formulate the differences between “free float”, “managed float”, “target zone” (currency corridor), fixed rate regimes of exchange rates.
- Identify the opportunities for currency devaluation in fixed rates system.
- Consider the methods of exchange rates regulations in framework of different currency regimes.
- Describe the evolution of world monetary (currency) system since golden standard to current multicurrency regime.
- Analyze the basic features of modern world monetary system.

1.1. Functions and Types of International Money

Money performs *three basic functions* (Exh. 1.1):

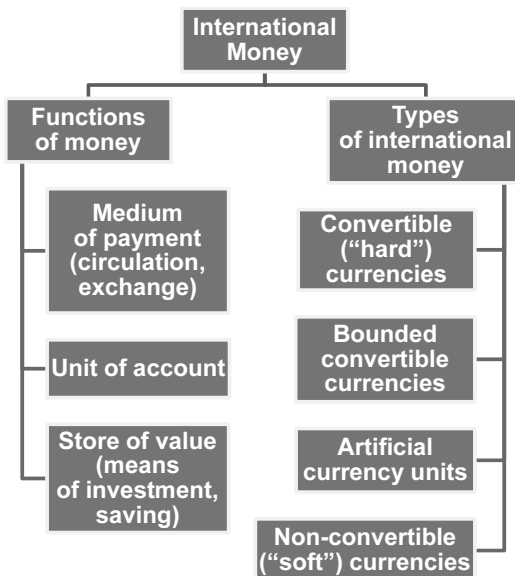
- medium of payment (circulation, exchange);
- means of investing (saving, store of value);
- unit of account.

International money executes the first function when export-import deals are paid, when foreign currency debts are repaid, and when 2 currencies are exchanged. Currencies become a store of value, when they are used to invest in the financial instruments (bank deposits, securities). The third function means that money acts as a basic unit to express the value of goods and services, stocks (shares), liabilities, interests.

Actually, above mentioned functions are performed by 4 types of international money:

- a) free convertible (“hard”) currencies (e. g. US dollar, Euro, Japanese yen, British pound, Swiss franc);

- b) artificial currency units (e. g. Special Drawing Rights, European Currency Unit, private baskets of currencies);
- c) bounded convertible currencies (Russian ruble, Ukrainian hryvnia, Mexico peso, Chinese yuan);
- d) non-convertible (“soft”) currencies.



Exh. 1.1. Functions and types of international money

To denote free convertible currencies, their unofficial (simplified) symbols and also official codes of *ISO (International Standardization Organization)* are utilized (see Table 1.1 below). For our purposes, we will use here, as a rule, the following informal symbols (notations) — ¥, €, SF, £, \$ (for short).

Bounded convertible currencies of former USSR republics also have their own exchange rates and symbols (Table 1.2). In London exchange, Russian ruble is related since 1999 to 13 leading currencies of the globe¹. One of influential financial

¹ “London organized exchange started quoting Russian ruble against Euro by the category ‘the main currencies of the world’, in which monetary units of 13th countries are included” (Today. 1999. August 04).

newspaper in the world “*Financial Times*”, published in London², considers ruble among 40 basic currencies.

Table 1.1

Symbols (notations) and codes of free convertible currencies

N	Issuing Country	Currency	Symbol (notation)*	ISO Code**
1	Australia	Dollar	A\$	AUD
2	Canada	Dollar	Can\$	CAD
3	Japan	Yen	¥	JPI
4	European Union (<i>EU</i>)	Euro	€	EUR
5	Switzerland	Frank	SF	CHF
6	The United Kingdom	Pound sterling	J	GBP
7	USA	Dollar	\$	USD
9	International Monetary Fund (<i>IMF</i>)	Special Drawing Rights (SDR)	XDR	SDR

* Informal notations of currencies which are used in financial press.
 ** ISO — International Standardization Organization

Table 1.2

Currencies of former soviet republics

Currencies	Symbols
Armenian dram	AMD
Azerbaijani manat	AZS
Belarussian rubel	BES
Estonian krooni	EEK
Georgian lari	GEL
Kazakhstanian tenge	KTS
Kyrgyz som	KYS
Latvian lat	LVR
Lithuanian litai	LTT

² Addition to *Financial Times*, overseas newspaper *Wall Street Journal*, titled due to street in Down-town of Manhattan (New York City), where the greatest stock exchange of the world – New York Stock Exchange (NYSE) – is located.

Table 1.2 (continuation)

Currencies	Symbols
Moldovian lei	MVS
Russian ruble	RUR
Turkmenian manat	TMS
Ukrainian hryvnia	UAK
Uzbekistanian sum	UZS

Monetary gold (i. e. bullions) can be a mean of saving. However it doesn't perform other functions of money. The Amendments to the Charter of IMF in the middle of 1970s forbade the member-countries to quote prices for goods and services in gold and to list debts in gold. Also the gold clause in contracts which links the amount of payment and the price for gold, was prohibited. For this reason, monetary gold is known as a “quasi-currency” by analogy with “quasi-monetary” aggregates of money supply. In terms of IMF, “quasi-money” are time deposits with fixed period, saving deposits, several kinds of highly liquid papers (e. g. Treasury bills, certificates of deposit).

1.1.1. Reserve Currencies

The vast majority of international transactions is carried out in convertible or “reserve” (“key”) currencies. Among them, three currencies are widely used — they are US Dollar, EURO, and Japanese Yen. Their symbols, located in inverse order, give us famous international word, which do not require the translation³:



³ For the first time the authors met this abbreviation in the “lecture notes” by professor Peter Sharp, Californian State University (Sacramento) in 1998. He delivered lectures in the Business School of Polytechnics University (Mikkeli, Finland). Professor Sharp kindly allowed the authors to use the abbreviation in this book.

The relevance of the currency is determined by its portion in official monetary (currency) reserves, denomination of international trade, international loans and securities. Before Euro launching in 1998, around 2/3 official reserves was denominated in US dollars, 1/7 — in Deutsche marks, 1/17 — in Japanese yen. Appropriate portions in international private assets provided 40%, 16%, 12%. In dollars was invoiced 50–66% foreign trade, in marks — 13%, in yen — 5%. Ultimately, 1/3 of international bonds was denominated in US dollars, 12% — in marks, 16% — in yen. Above listed 3 currencies serviced 3/4 of currency exchanged transactions.

The status of “reserve currency” is an advantages for the issuing country (e. g. external payments in the national currency, strengthening the positions of national institutions in the world market), but it also imposes charges (e. g. maintenance of the currency stability; the rejection of trade and currency restrictions; the regulation of balance of payments deficit; coordination if internal and external economic policies).

British pound sterling used to be dominating currency before the World War I, which serviced up to 90% of foreign trade transactions and was fundamental component of official reserves. US dollar became dominating currency after the World War II. Its portion of export-import contracts made up about 1/2, of foreign currency deposits — 2/3, of official monetary reserves — 2/3, of developing countries’ public debt — 1/2. The average share of US dollar for Russia was approximately 1.5 times larger. The single (common) European currency, which was introduced in 1999, changed slightly structure of international monetary reserves.

1.1.2. Artificial currency units

Artificial currency units (*ACU*) are constructed as “basket” (composite) ones, i. e. their values are calculated on “basket” (or portfolio) basis:

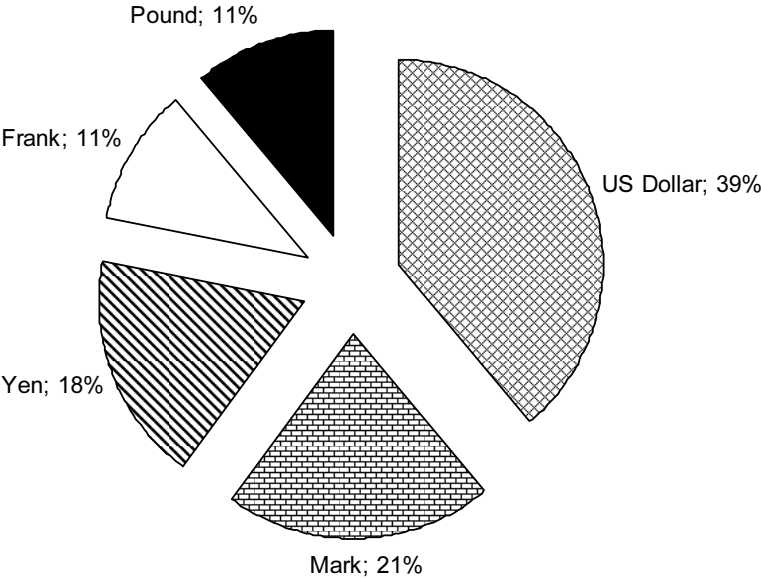
$$ACU = \sum_{j=1}^n ER_j \cdot w_j,$$

where w_j — weights of each currency in the “basket”; ER_j — exchange rates of each currency of the “basket”.

A weight of each currency is determined depending on volume of GDP, export, portions of currencies in official monetary reserves. Insertion of a currency, which rates have opposite trends to the portfolio, makes portfolio's value more stable, than values of individual currencies. This characteristic increases popularity of ACUs in some cases. For instance, the unit of European Monetary System — *ECU (European currency unit)* made up 8% of official reserves in 1998, the unit of International Monetary Fund — *SDR (Special Drawing Rights)* made up 4% there. EURO replaced ECU and it is expected to form up to 35–40% of the reserves.

Special Drawing Rights

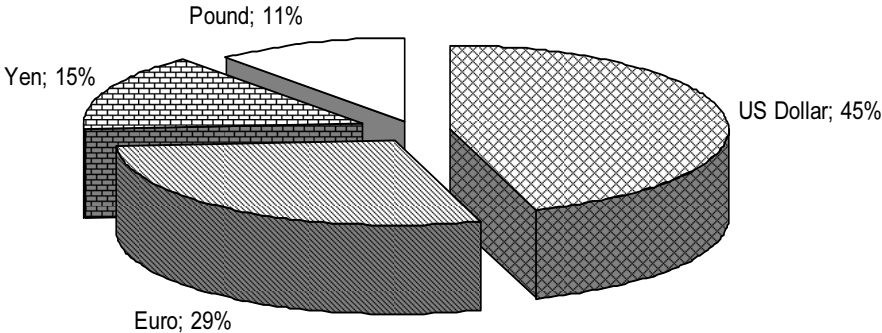
Initially, the value of *SDR* was fixed in US dollars: 1 SDR = 1 USD (since 1969 to November 1971), 1 SDR = 1.08571 USD (since December 1971 to January 1973), 1 SDR = 1.20635 USD (since February 1973 to June 1974).



Exh. 1.2. Ultimate SDR “basket” of five-currency, 1996–1999

The first “basket” of SDR (since June 1974 to June 1978) was formed by 16 currencies of countries-members of IMF, which portion of world total export was more than 1% during the period 1968–1972. This method of calculation was a kind of scientific-sounding one, but actually, it made difficulties for calculating currencies’ rates in SDR and the same time it didn’t add stability to SDR because of the dominating share of US dollar. Since 1981 to 1999 the portfolio of SDR was formed by 5 currencies (US dollar, Deutsche mark, Japanese yen, French franc, British pound). The weights of the currencies in SDR’ “basket” are revised every 5 years. The figures for each weight have no strict basis, rather it is taken as intuitively sensible, reflecting the relative strength of each currency, and economies, standing behind them. Thus, since 1st January 1996 (Exh. 1.2) the last 5-currencies basket of SDR included US dollar (39%), mark (21%), yen (18%), French franc (11%), pound (11%).

Since 1999, portions of mark and franc were transformed in weight of euro, counting 32%. Since 2001, the weights in SDR basket (Exh. 1.3) are distributed in following manner — US dollar (45%), euro (29%), Japanese yen (15%), British pound (11%)⁴.



Exh. 1.3. First SDR “basket” of four currency, 2001–2003

⁴ The Official site of International Monetary Fund (*IMF*) — <http://www.imf/org>.

In April 2012, portion of dollar compiled 43%, of euro — 36%, pound — 11%, yen — 10%, based on SDR basket calculation by Finance Department of International Monetary Fund, represented in Table 1.4.

Table 1.4

Calculation of SDR “basket”, April 12, 2012

Currency	Currency amount under Rule O-1	Exchange rate⁽¹⁾	US dollar equivalent	Percent change in exchange rate against US dollar from previous calculation
Euro	0.4230	1.31400	0.555822	−0.030
Japanese yen	12.1000	80.96000	0.149457	−0.086
Pound sterling	0.1110	1.59590	0.177145	0.201
US dollar	0.6600	1.00000	0.660000	
			1.542424	
US \$1.00 = SDR			0.648330 ⁽²⁾	−0.004 ⁽³⁾
SDR1 = US \$			1.54242 ⁽⁴⁾	
(1)	The exchange rate for the Japanese yen is expressed in terms of currency units per US dollar; other rates are expressed as US dollars per currency unit			
(2)	IMF Rule O-2(a) defines the value of the US dollar in terms of the SDR as the reciprocal of the sum of the equivalents in US dollars of the amounts of the currencies in the SDR basket, rounded to six significant digits. Each US dollar equivalent is calculated on the basis of the middle rate between the buying and selling exchange rates at noon in the London market. If the exchange rate for any currency cannot be obtained from the London Market, the rate shall be the middle rate between the buying and selling exchange rates at noon in the New York market or, if not available there, the rate shall be determined on the basis of euro reference rates published by the European Central Bank			
(3)	Percent change in value of one US dollar in terms of SDRs from previous calculation			
(4)	The reciprocal of the value of the U.S dollar in terms of the SDR, rounded to six significant digits			

Prepared by the IMF Finance Department.

We will elaborate the calculation of the interest rate for assets in SDR, and of SDR exchange rate. Let's take a deposit of 1 billion USD with 1 year maturity. If the exchange rate for SDR was 1.3051 USD in the moment of investing, then the volume of a deposit would make up around 766 000 SDR:

$$I_0^{SDR} = \frac{I_0^{USD}}{ER\left(\frac{USD}{SDR}\right)} = \frac{USD\ 1\ 000\ 000.00}{USD/SDR\ 1.6051} = SDR\ 766\ 224.81.$$

The interest rate for SDR equals to 5.2%, calculated as weighted average rate from LIBOR⁵ rates for every currency of the basket (see Table 1.5 below).

Table 1.5

Calculation of the Interest rate for SDR transactions

Currency	LIBOR	Currency's weight in the SDR basket, %	Components of the SDR interest rate, %
(1)	(2)	(3)	(4) = (3) × (2) / 100
US Dollar	7.2	40	2.88
Deutsche (German) Mark	4.7	21	0.987
Japanese Yen	0.3	17	0.051
French Frank	4.6	11	0.506
British Pound	6.7	11	0.737
SDR	—	100	5.161

Consequently, the investor will withdraw 806000 SDR from deposit:

$$FV_1^{SDR} = I_0^{SDR}(1 + i^{SDR}) = SDR\ 766\ 224.81(1 + 0.05161) = SDR\ 805\ 769.67.$$

⁵ LIBOR — London interbank offered rate, it is an interest rate of various euro-currencies in the offshore money market of London. Since 1991 IMF uses yield of 3-month treasury bills of USA, France, UK, interest rates of interbank deposits in Germany, interest rates of deposit certificates in Japan to calculate SDR interest rate.

That is the equivalent to 1060473.46 USD, as far as the new rate of USD-SDR is calculated (see Table 1.6):

$$\begin{aligned}
 FV_1^S &= FV_1^{\text{SDR}} \times ER_1 = \text{SDR } 805\,769.67 \times \frac{\text{USD}}{\text{SDR}} 1.3161 = \\
 &= \text{USD } 1\,060\,473.46.
 \end{aligned}$$

Table 1.6

Calculation of the SDR exchange rate on the moment of the deposit closing

Components of the SDR	On the date of opening of the deposit		On the date of closing of the deposit	
	Exchange Rate	SDR Components in USD	Exchange Rate	SDR Components in USD
(1)	(2)	(3) = (1) / (2)	(4)	(5) = (1) / (4)
USD 0.5720	USD 1	0.5720	USD 1	0.5720
DEM 0.4530	DEM 2.1953	0.2063	DEM 2.2054	0.2054
JPY 31.800	JPY 109.09	0.2915	JPY 105.14	0.3024
FRF 0.8000	FRF 7.3629	0.1087	FRF 7.3528	0.1088
GBP 0.0812	GBP 0.6415	0.1266	GBP 0.6369	0.1275
SDR 1	—	USD 1.3051	—	USD 1.3161

Purchases of SDR assets represent portfolio investments diversifying an exchange-rate risk.

SDR are fiduciary (fiat) money (based on trust and unsecured). They are issued by the International Monetary Fund from time to time and distributed among the member-countries on the pro rata basis with respect to their contributions paid to the Fund resources. SDR are used in transactions between official authorities (IMF and its members, between central banks). Thus, the Russian government received about 2 billion dollars in the form of SDR with an additional issue of SDR by the International Monetary Fund in autumn of 1997⁶. These funds were spent to rectify the Russian balance of payments. SDR

⁶ Delovoy Peterburg. 24.9.1997.

transactions can not become adjusted for circulation in a private sector, although there were numerous attempts made to introduce them into the commercial turnover. Thus, London based branch of the American Chase-Manhattan Bank has been opening SDR deposit accounts since 1975. Principal deposit amount and interests have been charged in a combination of SDR basket currencies (with appropriate weights) or in any of them at a current rate. In the beginning of 1990's some syndicated loans, floating rate Euro-notes, and Eurobonds were denominated in the SDR.

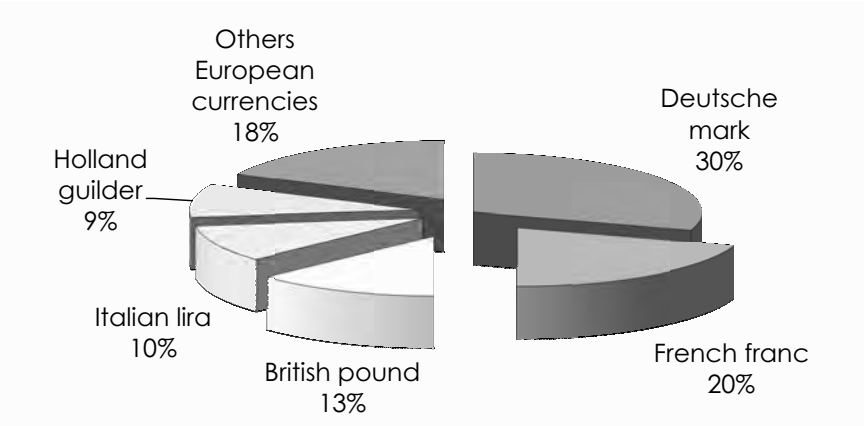
European Currency Unit. Historically, Europe tended to the currency integration. Thus, Latin Currency Union (France, Belgium, Italy, Switzerland, Bulgaria and Greece) was established and operated in the XIXth century; in 1950's — European Payment Union (EPU); in 1972–1979 — European Currency Snake (ECS); in 1979–1999 — European Monetary System (EMS); from 1999 — European Currency and Economic Union (ECEU).

In the beginning of 1950's, the idea of the common currency was materialized in the form of the European unit of Account (*EUA*⁷) equals 1 US dollar within EPU, and then — average value of currencies of the ECS member countries. The successor of the EUA monetary unit since 1979 was ECU within EMS, adopted for the purpose of stabilizing reciprocal exchange rates by establishing fluctuation margins. ECU represented a basket containing 12 currencies of EMS. Weights in the ECU basket were based on portions of each country in the common production, mutual trade, for example, weight of the Deutsche mark was about 30%, French frank — 20, British pound — 13, Italian lira — 10, gulden — 9% (Exh. 1.5).

Exchange rate fluctuation margins for certain currencies with reference to their par values in ECU were set as 2.25%. Approaching 75% of a permissible limit, the “intra-marginal” interventions automatically activated. ECU par values were subject to revision (re- or devaluation) in case of failure to restore the permissible limits.

⁷ In 1975, *EUA* was applied firstly in private sector.

ECU, unlike fiduciary SDR, were the full-value money secured by the US dollar and golden reserves (by 50%), as well as reserves of the member-countries in national currencies (by 50%). They were used for official payments and by private firms, banks, individuals for invoicing the external trading, denomination of bank accounts, bond loans, syndicated credits.



Exh. 1.5. Ultimate “basket” of ECU, 1998

In 1993 the European Council (council of the Ministers of the European Union member countries) decided to substitute ECU by the common currency and approved 11 countries⁸, which in 1999 launched it in their non-cash operations, and then starting from 2002 — in cash turnover. Since 2003 national currencies of the EU are taken out from circulation. Potential importance of euro in the world currency system is determined by the power of economies of the European countries. Thus, approximately 2/5 of GDP generated by the industrialized countries from three power centers (North America, Western Europe, Japan) fall on EU countries, as well as 1/2 of

⁸ In 4 member-countries of European Union, Euro was not introduced initially, as Great Britain, Denmark, Sweden comprised the group of “second wave”, and that Greece would not comply with the criteria for the economic convergence.

cial monetary reserves, 1/4 of stock market capitalization, 1/3 of debt obligations, 1/2 of bank assets.

Private artificial currency units. In 1970s, the float of exchange rates sharply increased risks in trading, investment, credit-and-deposit operations. In order to be protected against such risks, large banks, in particular, designed and offered “basket” units to their clients.

In 1973, London-based “Rotshild-&-Sons” bank created a European Composite Unit (EURCO) from 9 currencies (Deutsche mark; French, Belgium and Luxemburg francs; British and Irish pounds; lira, guilder, Danish crone) for Eurobond loans denomination. Use of EURCO was not successful (in view of weakness of certain currencies in the basket). However, the idea of private composite units was an innovative one.

In 1974, AMRO bank (Holland) introduced the Arab Currency Unit (ARCRU), initially equivalent to 1 US dollar, and consisting of 12 Arab currencies. That unit was created for Arab investors, placing their USD proceeds from oil exports. ARCRU also turned out to be an unsuccessful move due to a low quality of the constituent currencies.

In 1975, Credit Lyonnais bank (France) designed the International Finance Unit (IFU) for credits, deposits, other financial services. IFU basket consisted of the US dollar, German mark, British pound, Japanese yen, Canadian dollar, Italian lira, Holland guilder, Belgium frank, Swedish krona, with an initial value of 1 US dollar.

In 1974, Barclays Bank in London introduced the Barclays Unit (BU), consisting of the British pound, German mark, US dollar, French frank, Swiss frank with equal weights. It was not successful, however, later to the SDR basket (from 1981) nearly the same set of currencies were included.

Disadvantages of private (homemade) artificial units were stipulated by operational costs, lack of proper legal regulation of their status, small economy of scale, insignificant support of officials.

1.1.3. Quasi-currency asset: monetary gold

Traditional monetary commodity (monetary gold, i. e. golden bullions), that fulfilled all of the money functions for a long run, is utilized in the function of an investment medium (store of value) up to now. Thus, the price of “yellow metal” ounce (31.1 g of pure gold of 996 probe), reflecting the return on investment in gold, increased in 1980s almost in 15 times. In 1980s, fluctuations occurred in interval between 300 and 500 dol./ounce. In 1990s, diapason became narrower — 300–400 doll./ounce. In 2001, the gold price approached 270 doll./ounce. However, in 2012 it was above 1500 doll./ounce.

In the beginning of 2000s the gold reserves, valued at the historical price of 35 SDR per ounce, counted just 2% of the official gold-currency reserves (37 of 1728 billion SDR). But, a share of gold at the market price (in London — within a range of 250–350 US dollars per ounce) accounted for 1/8 of the reserves (227 of 1918 billions SDR).

However, “yellow metal” currently do not fulfill another 2 functions of money. The use of gold as a means of payment in the international trade, credit, investment transactions, as a payment unit (currency of price denomination in purchase-sale contracts, loan currency in credit agreements) is prohibited by the Charter of the IMF since 1976. Thus, according to Article 28 of the Central Bank of the Russian Federation Act (Russia is IMF member) “official ratio between the ruble and gold or other precious metals is not to be established”. By virtue of the restrictions imposed on the use of gold species as the international money, the monetary gold is called “quasi-currency” like some components of monetary aggregates (time deposits, short-term notes) are titled as “quasi-money”. This is due to the fact that the monetary function of the store of value is still retained by the gold. For example, almost all of the central banks in the world are reluctant to get rid of their gold reserves, even despite the persistent efforts in this direction undertaken by IMF (especially in 1970). The private sector uses gold as a pledge in obtaining international credits from the bank syndicates, national finance organizations. The gold species also serve as one of the shelters from fluctuations of currency exchange

rates and inflation. Thus, the flight from the US dollar (in periods of its weakening) took the form of turning to the assets in German marks, Swiss francs, monetary gold.

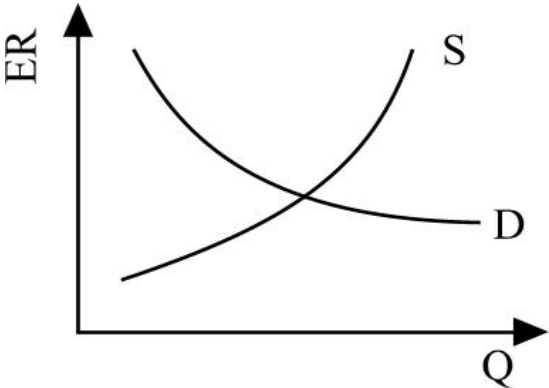
High volatility of the price hampers the gold to perform the function of world money. Throughout a lengthy period of time the price for gold fluctuated more drastically than the US dollar exchange rate.

1.2. Alternative exchange rate regimes

Exchange rates constitute a structural element of the monetary system. Their classical mechanisms include (a) free float, (b) fixed rates, (c) managed float, and (d) target zone (or in another words, “currency corridor”, “crawling peg”).

1.2.1. Free float of exchange rates

Floating (flexible) rates represent a currency regime, when the exchange rates are established as a result of interaction of the market demand and supply (given the fact that the authorities do not regulate the market). Graphical determination of an equilibrium exchange rate (ER) at a crossing point of demand (D) and supply (S) is illustrated in the Exh. 1.6.



Exh. 1.5. The exchange rate formation in a “free float” system

The advocates of the floating rates insist that it provides the automatic maintenance the equilibrium of the world economy (trade and monetary system). One of the first classical works with supporting the free market rates was the 1953 text of monetarist's leader Milton Friedman, Nobel prize-Winner in economics of 1976⁹. Friedman argues that fixed exchange rates impede the free trade and trade liberalization. Fixed exchange rates constrain the policy actions policy makers can take in order to ensure that the current account and the capital account balance out. He wrote particularly: "The argument for a flexible exchange rate is, strange to say, very nearly identical with the argument for daylight savings time. Isn't it absurd to change the clock in summer when exactly the same result could be achieved by having each individual change his habits? All that is required is that everyone decides to come to his office an hour earlier, have lunch an hour earlier, etc. But obviously it is much simpler to change the clock that guides all than to have each individual separately change his pattern of reaction to the clock, even though all want to do so. The situation is exactly the same in the exchange market. It is far simpler to allow one price to change, namely, the price of foreign exchange, than to rely upon changes in the multitude of prices that together constitute the internal price structure"¹⁰.

Frank D. Graham, Princeton economist, was, probably, the first twentieth-century economist to make a coherent case for flexible rates in 1920–1930s; he was an unappreciated forerunner of postwar, Chicago-based advocacy of flexible rates culminating in Friedman's 1953 classic. Graham's antipathy toward the Bretton-Woods plans for fixed rates (see next point 2.2) mirrored that of the Chicagoans. He advanced a liberal policy agenda including flexible exchange rates, capital mobility, rule-based independent monetary policies, and free trade.

However, opponents of this regime (first of all, another "Nobel prize-Winner" of 1999 — Robert Mundell, who often is

⁹ *Friedman M.* The case for flexible exchange rates // Essays in positive economics. University of Chicago Press, 1953. P. 157–203.

¹⁰ *Ibidem.* P. 173.

titled as “Father-founder of common European currency) consider, that the automatic leveling occurs during a long period within which negative economic and social consequences of high rate volatility are possible. The “floating” introducing increases the volatility of financial environment and strengthens the uncertainty of operations’ results. Nevertheless, since March 1973 the world monetary system bases predominantly on the regime of floating exchange rates.

1.2.2. Fixed rates of exchange

Under this regime, the authorities establish the proportion of exchange between national and foreign currency at the level of, for example, 4.2 marks per dollar (or 66 copeks per dollar). The exchange rate increase is called revaluation, decrease is devaluation. The change of exchange rate (ΔER_t) is calculated by the following formula:

$$\Delta ER_t = \frac{ER_t - ER_0}{ER_0},$$

where ER_t — exchange rate in the current period, ER_0 — exchange rate in the basic period.

For instance, the change of mark/dollar rate up to 4.0 meant the devaluation of dollar by 4.76%

$$\Delta ER_{\frac{\text{DEM}}{\text{USD}}} = \frac{4.0 - 4.2}{4.2} = \frac{-0.2}{4.2} = -0.0476 = -4.76\%.$$

Simultaneously, the exchange rate of mark in dollars changed since 0.238 dol. ($1/4.2 = 0.238095$) to 0.25 dol. ($1/4 = 0.25$), that means revaluation by 5%:

$$\Delta ER_{\frac{\text{USD}}{\text{DEM}}} = \frac{1/4.0 - 1/4.2}{1/4.2} = \frac{1/4.0}{1/4.2} - 1 = \frac{4.2}{4.0} - 1 = \frac{4.2 - 4.0}{4.0} = 0.05,$$

or 5%.

It was the first revaluation of Deutsche mark after the World War II (on the March 6, 1961). Further, prior to the floating rates launching of the major currencies in March 1973, mark was twice else revaluated against the dollar (in October

1969 by 9.3%, up to 3.66 DM per dollar, and in December 1971 by 13.6%, up to 3.2225 DM/dollar).

The governments can delay devaluation due to different reasons: political (to support reputation), economical (because of inflation spring and living's standard fall danger). They use several ways for this, such are:

- foreign loans raising;
- financial restrictions;
- price and wage control;
- currency control.

The first action (being temporary one) leads to national currency overestimation, balance of payment deficit growth, capital flight, the threat of introducing or strengthening the currency control. *Financial restrictions* (money supply limitation, federal budget and balance of payment deficit cutting down, inflation containment) may be a constant alternative to devaluation. However, they are dangerous because of their consequences, such are delay of economic growth, unemployment increase¹¹. *Price control* (Keynesian alternative to monetarist “*austerity*”) is politically popular (into force of fixed income indexation, including pensions, according to inflation). However, it is inefficient for long run as it does not influence the fundamental factors of exchange rates.

Currency control is widely applied in developing countries (*economies in transition*)¹². Its traditional measures are:

- obligatory sale of export currency revenue¹³;
- limitation in import prepayment;

¹¹ Study the standard textbook on macroeconomic to see the relations between financial restrictions and economic growth.

¹² According to article N 53 of the Law on Central Bank of the Russian Federation CB RF is an organ of federal currency regulation and currency control and accomplishes this function according to the Law of the Russian Federation “About the currency regulation and the currency control” and other federal laws.

¹³ On the 31th of December, 1998 in Russia the size of obligatory sale of export receipts was temporary increased from 50% (existed from June 29, 1992) up to 75% and the term of sale decreased from 14 to 7 calendar days.

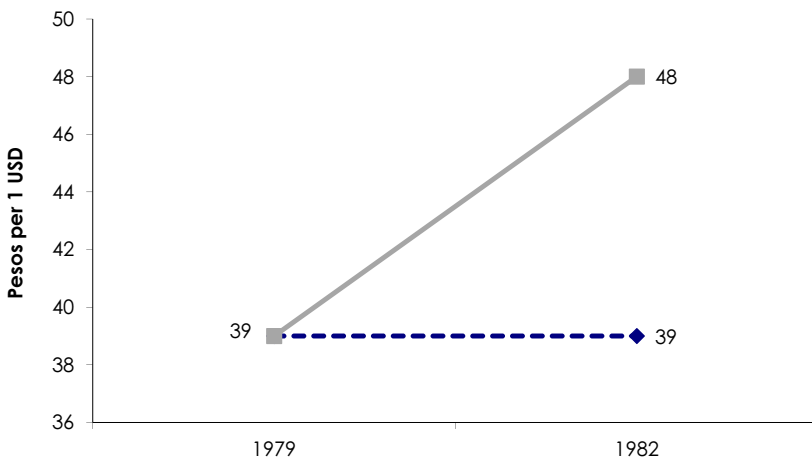
- limitation (prohibition) of some transfers (dividends, royalty);
- deposition of import prepayment, transfer in CB RF;
- ceilings for trade loans to foreign companies;
- control of the direct and portfolio investment abroad;
- limitations of foreign loans by maturity of repayment;
- taxation (limits) of non-resident deposits in domestic banks;
- plural exchange rates for the trading of various products and for capital movement.

For instance, until 1958 in FRG (West Germany) all the export revenue should be sold to the Central Bank, which re-distributed it to priority industries. In France, Italy, and Belgium there were two-tiered currency markets, where current operations conducted under the official rate, and capital deals — under the market rate.

In general case, countries with overvalued currency (for example, Russia until the August 1998 or Brazil) limit the capital export, countries with undervalued currency (for instance, Switzerland in 1970s) limit the capital import. These measures lead to market imperfections, giving opportunities for international companies, banks, but also stipulating risks for national economies.

Fixed rates provide the stable currency environment, and better anticipations of economic indicators. However, they should be reconsidered periodically. Otherwise, the authorities spend resources on disequilibrium rate support and delay the collapse in time, but (because of decrease of currency reserves) the crisis of national economy could be intensified.

An example with the peso rate fixation in Chile illustrates the possibility of such dangers. Thus, the government of this country has fixed the nominal exchange rate (*NER*) to fight inflation in 1979 at the level of 39 peso per dollar (0.02564 dol. per peso). During the next 2.5 years, the price level in Chile increased by 60% and in the USA by 30% (Exh. 1.6). Thus, at the beginning of 1982 the real exchange rate (*REER*) of dollar (i. e. nominal rate, adjusted for relative inflation) was 48 peso (0.03156 dollars per peso). That meant the undervaluation of dollar by 19% (and, vice versa, peso overvaluation by 23%).



Exh. 1.6. The discrepancy between nominal (*NER*) and real exchange rates (*RER*) of dollar against Chile peso (Ps/\$ — peso per dollar)

Peso's rate overestimation made Chile goods more expensive abroad, and import goods — cheaper inside the country, undermining domestic production. As a result, many manufacturing companies went bankrupt, building projects were frozen, farms were sold out at the auctions, minerals mining stopped, banks become insolvent, unemployment increased (up to 25%), the entire regions were turned into “economic cemetery”.

The government carried out in 1982 a correcting 18% devaluation. It confirmed that overvalued rate of national currency acts like a duty on export, tax on domestic production, and subsidy for import (vise verse, in the Federal Republic of Germany, the introduction of a tax on imports or the provision of export subsidies in 1960s, when mark showed the increasing power in the framework of the fixed exchange rates, was called “ersatz-revaluation”). Therefore, firms (exporting or competing with import) suffer from overvaluation, and, just the opposite, they receive benefits from national currency undervaluation.

The world monetary system in 1944–1971 was based on the fixed exchange rates of non-American relatively to US dollar with official volatility limits $\pm 1\%$ ¹⁴. The Soviet Union has a fixed exchange rate of ruble within the long period of 1928–1991. Since 1991 ruble exchange rate is moving in the regime of “managed float”. It actually started in July 24, 1991, when Gosbank (Central bank of the USSR) decided to introduce “tourist” rate on the level of 32 rubles per dollar. It became an official rate, and since December 2, 1991 banks were permitted to quote the currencies for individual clients voluntary. In 1995–1998 there was a temporary shift from “managed float” to the “currency corridor” regime¹⁵.

1.2.3. Managed float of exchange rates

Within the managed float, the rate is legally free floating one, however, it is regulated by monetary authorities actively. It is supposed, that Central Bank can make the difference more exactly between fundamental and temporal factors of exchange rate, than it is made by the market. Monetarists, who don't believe in successful regulation of market by the authorities, call this regime as “*dirty drift*”. The term “*managed float*” is applied by Keynesians, who believe in the success of governmental regulations. Authorities influence the exchange rate with following ways:

- direct method (currency interventions of Central Bank);
- indirect methods (monetary policy measures, currency control);
- discrete measures (direct quantity limitations).

Intervention is a massive release of assets on the market by authorities (for price reduction) or its purchase (for price rising). According to the Russian legislation, currency interventions of Central Bank are defined as purchase and sale of foreign currency on the market with the purpose of influence the ruble exchange rate and the total money supply and demand (article 41 of the Law on Central Bank of the Russian Federation).

¹⁴ More detailed about this system look below in point 3.2.

¹⁵ More detailed about this system look below in point 2.4.

The majority of interventions are *sterilized* (which neutralize a currency market impact on internal money supply). For instance, a central bank throws out national currency into the market to reduce its exchange rate (to support domestic exporters competitiveness). It sells at the same time treasury bills in the money market, neutralizing money supply growth, which has been created by the previous intervention in the currency market. Interventions are effective, when they are announced publically and interstate coordinated, that send to the market the signals about desirable exchange rates and supposed monetary policy. It can correct trader's anticipations and change the exchange rate actually. That is the benefit of interventions in disorderly markets, as they can suppress the speculative boom. But the intervention does not control the market at a long run, if it is not supported by change of monetary policy and real economy. Thus, the strongest signal of Central Bank to support the currency is an increase of the discount rate. And if markets interpret an intervention as a temporary delay of this measure it can only weaken the currency.

People say also about *verbal interventions*, when authorities try to convince the market to play on reduction or increase by spreading the appropriate information and hints.

Direct quantity limitation is an establishing by Central bank the limits for some bank operations. But Central Bank of the RF (Bank of Russia, CBR) has a right to use these measures only in exceptional cases after consultations with Government of the RF.

In the document, titled "The purposes of monetary policy for 2000", it is indicated that in middle-term perspective CBR continue to support the policy of floated exchange rate that suits to the country priorities. CBR's main actions in the currency market are evening-out of abrupt rate fluctuations. It is combined with currency regulation and currency control measures with the purpose of the consistency of exchange rate and economic situation¹⁶.

¹⁶ Official web-site of CBR is www.cbr.ru.

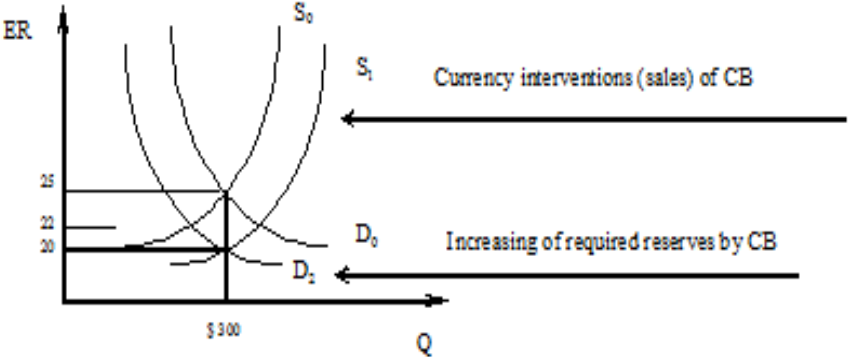
Monetary policy and exchange rates. The four classical instruments of monetary policy are: discount, reserve policies, deals in the open market, money supply targeting. Most often they are not utilized for the direct influence the currency rate. However, they influence it indirectly. Thus, increasing the discount rate by central bank (i. e. the rate, under which a central bank grants loans to commercial banks) means the monetary policy toughening, and it increases, as a rule, market interest rates, restricts the domestic money mass and, accordingly, the supply of national currency in the forex market, raising the exchange rate. For example, the Central Bank of the RF in May 27, 1998 increased “the rate of refinancing” (Russian title of the discount rate) from 50 up to 150% in order to increase profitability of Russian treasury securities. This slowed down “non-resident flight” temporary, and accordingly the “bearish” (downward) pressure of market on the ruble value (its exchange rate).

The discount rate of the US Central Bank (Federal Reserve System, FRS, “Fed”) grew intensively in the period of inflation and exchange rate decrease fighting in 1977–1980 (Exh. 1.7), when it was raised several times from 6 up to 13% (historical peak). And later on in the first half of 1980s (Superdollar period), the discount rate was reduced to stimulate the economic growth. In general case, the increase of discount rate (dear monetary policy) is directed to struggle with inflation, but it can restrict the economic growth (indirectly, such a policy, as a rule, strengthens the national currency rate). Decreasing the discount rate (cheap monetary policy) has, usually, the opposite effect.

Increase of required reserves rate for commercial banks by the Central Bank decreases opportunities for growth of money supply inside the country. Thus, if this rate is 10%, it means, that 90 from every 100 rubles of deposits may be directed by banks to grant credits or to buy securities. These monies, raised by borrowers or received from sales of securities, are placed on current accounts of banks, increasing money supply in the country. Let us suppose, that the Central Bank (in the framework of fighting the inflation, the

overheating of national economy on the phase of cyclical boom or for the stabilization of exchange rate) increases rate of required reserves up to 20%¹⁷. Then, only 80 from every 100 rubles of deposits can be credited (invested) by banks. As a result, increase of national money supply slows down. Therefore, supply of national currency in the foreign exchange market decreases as well, pressing the exchange rate in the direction of decline.

You can see the influence of intervention (sale of currency) on exchange rate and increase of required reserves rate at Exh. 1.8.



Exh. 1.8. The reserve politics of the Central Bank impact on the exchange rate

¹⁷ It is clear that such a radical change of rates of required reserves is chosen only for obviousness. In fact as the reserve politics is “heavy artillery” in arsenal of monetary tools, the size of changing is regulated by the government. In this way, in accordance to the article 30 of Law on the Central Bank: “Size of required reserves as a percentage of the liabilities of credit organization and the also the order of their deposition in the Bank of Russia are established by the Board of Directors. Rate of required reserves can not be higher than 20% of liabilities of credit organization and can be differentiated for different credit organizations. Norms of required reserves cannot be changed at a time by more than 5 points”. In Germany great changes of norm of required reserves is to be confirmed by the Bundestag (Parliament).

In the first case, increase of foreign currency supply (from 300 to 350 mln USD) reduces its rate by 12% (ruble appreciation amounts 13.6% — from 4 to 4.54 cents per ruble):

$$\Delta ER_{\frac{RUR}{USD}} = \frac{22 - 25}{25} = \frac{-3}{25} = -0,12, \text{ or } -12\%.$$

In the second case, restriction of ruble's money supply (due to increasing of required reserves rate) reduces the demand for dollars (from 350 to 350 mln USD) in the forex market, and its exchange rate by 9.1% (ruble appreciation amounts 10% — from 4.54 to 5 cents per ruble):

$$\Delta ER_{\frac{RUR}{USD}} = \frac{20 - 22}{22} = \frac{-2}{22} = -0.0909, \text{ or } 9.1\%.$$

Cumulative effect of intervention and money restrictions led to 20% depreciation of USD against RUR:

$$\Delta ER_{\frac{RUR}{USD}} = \frac{20 - 25}{25} = \frac{-5}{25} = -0,2, \text{ or } -20\%.$$

The Russian Central Bank carries out in the domestic market not only foreign currency interventions, but also it sells national currency. The last one (being the equivalent to dollar purchasing interventions) is made for supporting the USD exchange rate.

Operations (*interventions*) of the Central Bank in the money market with treasury bills change the money mass by the influence the national currency supply in forex market, and as a result the demand for foreign currency. In accordance to the article 39 of Law on Central Bank of the RF, the operations in the open market are officially interpreted as purchases and sales of treasury bills and other governmental papers by the Central Bank, and also short-terms operations with securities with the settlement of reverse transaction (*REPO*). At the same time, limits on such operations are established by the Board of Directors.

Ultimately, the Central Bank establishes the guiding line for growth of money supply (which is called "*targeting*"), oriented on the main direction of public monetary policy. Money supply

influences the prices, that was described by the equation of the quantity theory of money, formulated back to XVI century by French philosopher J. Boden:

$$MV = pQ \Rightarrow p = \frac{MV}{Q},$$

where p — prices; M — money supply; V — velocity of money circulation; Q — production volume (real gross national product).

The dependence of price dynamics of the money supply

Dependence of price dynamics and the money supply is described by approximation as follows:

$$\Delta p = \Delta M + \Delta V - \Delta Q.$$

Increase of prices reduces the purchasing power of money. Comparative inflation in two countries stipulates exchange rate expectations. Thus, monetary policy influences on the last one.

Monetary policy of Russian Central Bank and ruble's exchange rate in 1990s

Basic actions and indicators of monetary policy in Russia looked in the following way. From June 1, 1991 the norm of required reserves at the rate of 2% of bank's deposits came into force, and this caused the existence of great multiplication of inflationary money supply, which pushed on the exchange rate. Not without reason, on July 24, 1991 ruble was devaluated repeatedly after introducing the "tourist's" exchange rate of 32 RUR per USD. By the end of 1991 the "tourist's" rate was canceled, and commercial banks received the right to fix a bid-ask rates independently for operations with citizens.

In February–March of 1992, reserve requirements for deposits with maturity of up to one year were increased from 10 to 20% (and were fixed at this rate until till the 1st of February, 1995), it promoted the strengthening of ruble by 100% (on the 17th of December, 1991 the dollar quoted at 180 RUR/USD in Russia, on the 21st of January, 1992 — at 230 RUR/USD, on the 11th of June, 1992 — only 115 RUR/USD):

$$\Delta ER_{\frac{\text{RUR}}{\text{USD}}} = \frac{1/115 - 1/230}{1/230} = \frac{1/115}{1/230} - 1 = \frac{230}{115} - 1 = 1.00, \text{ or } 100\%.$$

During that half of year dollar was depreciated by 50% (that was achievements of the direction of the Russian Central Bank headed by professor Matuhin G. G.). Intervention of the CBR influenced the strengthening of ruble as well (during the first half of 1992 they covered 60% of dollars sales on the stock exchange).

The new management of the CBR (headed by Gerashenko V. V.) from the middle of 1991 changed the strategy of exchange rate regulation by moving from the support of the ruble to smoothing the fluctuation of exchange rates. After defrost on the 1st of February, 1995 norms of reserve requirements were differentiated in time and till November, 1995 (period of “currency corridor”) changes were negligible on ruble’s deposits, norm was reduced from 22 to 14%, on dollar’s deposits, right the contrary, norm was increased from 2 to 9%. Both factors created the necessary prerequisites for the increase of USD exchange rate (i. e. for overvaluation of ruble): the first one increased potentially the supply of ruble in the Forex and the second one limited the supply of dollars in the market.

The Central Bank of Russia established single norm at the rate of 11% on bank’s funds in rubles and foreign currency on the 1st of February, 1998 continuing described above policy. In August–December of 1998 decrease of norms of required reserves were continued (till 5%) for the liberation of ruble’s supply with object of covering the potential growth of prices and stimulation of national production. It promoted the growth of dollar’s exchange rate in 3.5 times more.

In March, 1999, in January, 2000 norm of reservation on corporate entities funds was increased till 7% and 10%. Such toughening stabilized ruble (as in 1992). Thus, if from the 15th of August to the 31st of December, 1998 in Russia dollar went up by 230% (from 6.29 to 20.65 RUR/USD), in 1999 it rose in price by 30% (till 27.00 RUR/USD on the 31st of December, 1999) and during the ten months in 2000 — by 3% (till 27.79 RUR/USD). At the end of 2000 — during the first half of 2001 stable dynamics of exchange rate RUR/USD continued. Thus,

during September–December, 2000 it increased from 27.8 to 28.0 RUR/USD (by 0.7%), at the same time in October it fell (from 27.9 to 27.7 RUR/USD). Then by March, 2001 exchange rate increased till 28.8 RUR/USD.

Discount policy strengthened ruble as well in the first half of 1992. The rate of refinancing was increased from 20% (on the 1st of January, 1991) to 80% (on the 23 of May, 1992). Than by the end of 1993, it increased several times till 210% to fight the inflation and increase the yield of government notes (with purpose of covering the state budget's deficit)¹⁸.

On “black Tuesday” (on 12, October, 1994) the rate of refinancing was increased till 170% to counteract the collapse of the ruble, and on the 6th of January, 1995 it reached the new maximum at the rate of 200%. After announcement of “currency corridor” and following fall of ruble in Russia in May, 1995 the rate of refinancing was reduced till 195% for stimulation the investments (as inflation was suppressed by the “corridor”. It reached the “bottom” at 21% in October, 1997.

At the height of financial crises in developing markets the rate of refinancing was used to deter speculative attacks on the ruble. Thus, on the 11th of November, 1997 it was increased till 28%, in February, 1998 — till 42, on the 19th of May, 1998 — till 50, on the 27th of May, 1998 — till 150%. The last increase was aimed at stopping the “flight” of residents and non-residents from Russian assets (first of all from government notes), which pushed on ruble's exchange rate in the direction of decrease. After the August default (1998) the rate of refinancing was used basically for stimulation of investments and growth of production. It was decreased several times — from 60% to 24% (in summer of 2001).

1.2.4. Target zone (“currency corridor”, “crawling peg”)

Under the regime of target zone, authorities permit the exchange rate to fluctuate in the officially or secretly established diapason around the fixed rate.

¹⁸ In accordance with Russian legislation cost of borrowings for the government of all levels can not be higher the “rate of refinancing” (CBR' discount rate).

Official “currency corridor”. For currencies of the European currency system, target zone amounts $\pm 2.25\%$ (in 1979–1999), for ruble — from $\pm 5.2\%$ up to $\pm 15\%$ in 1995–1998 (Table 1.6).

Table 1.6

Official “corridor” of exchange rate RUR/USD in 1995–1998

Periods	Scope of corridor (Rub. per USD)	Average exchange rate (Rub. per USD)	Permitted deviations (%)
06.07– 31.12.95	4.300–4.900	4.600	$\pm 6.5\%$
01.01–30.06.96	4.550–5.150	4.850	$\pm 6.2\%$
01.07–31.12.96	5.000–5.600	5.300	$\pm 5.7\%$
01.01–31.12.97	5.500–6.100	5.800	$\pm 5.2\%$
1998–2001	5.390–7.130	6.200	$\pm 15\%$
17.08–01.09.98	6.000–9.500	7.750	$\pm 22.6\%$
2.09.98 CBR canceled upper limit for official ruble rate fluctuations			

Currency corridor (*crawling peg*) stabilizes the exchange rate. Actually, before introducing the “corridor”, dollar rate in ruble terms increased tremendous pace: during the second half of 1992 — by 230% (from 125.26 to 414.50 RUR); during 1993 — by 200 (till 1247 RUR); during 1994 — by 185% (till 3550 RUR). After introducing the “corridor”, actual fluctuations of exchange rate decreased sharply and amounted 2% (from 4538 RUR 30.06.95 to 4640 RUR 29.12.95) for the second half of 1994; 20% (to 5560 RUR 31.12.96) — for 1996; 7% (to 5960 RUR 30.12.97) — for 1997; 4% (to 6.20 RUR 30.06.98) — for the first half of 1998. However, corridor’ stabilization was artificial one, and caused deviation of nominal exchange rate from the real one (i. e. adjusted for comparative inflation)¹⁹. Thus, nominal ruble’s exchange rate was overvalued in comparison with real exchange rate by 120–180% every year in 1995–1997 (Table 1.7).

¹⁹ It was similar to the case of Chilean peso fixing (see above).

Table 1.7

**Change of nominal exchange rate USD/RUR in 1994–1998
at the end of the year**

Years	Inflation indices (1995 = 100)		Nominal Dollar rate	Nominal Ruble rate	Real Ruble rate	Overvalua- tion of RUR
	<i>Russia</i>	<i>USA</i>	Rub. per USD	USD per Rub.	USD per Rub.	(in %)
(1)	(2)	(3)	(4)	(5)	(6)	(6)=[(4)/ (5)]-1
1994	33.62	97.30	3.55	0.282	0.282	0
1995	100.00	100.00	4.64	0.216	0.097	+123%
1996	147.54	102.90	5.56	0.180	0.068	+165%
1997	169.11	105.30	5.96	0.168	0.061	+175%
1998	216.19	107.00	20.65	0.048	0.048	0

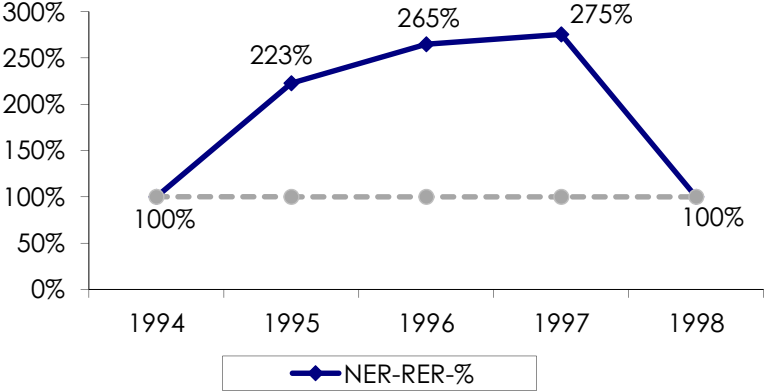
Overvaluation of national currency impaired the competitiveness of the domestic production, undermining the economic growth. However, simultaneously it decreased inflation rate, reducing import products' prices after recalculation them in national currency. For example, at the rate of 3.35 RUR per USD (0.282 USD per RUR), import good with price 100 USD was worth 355 RUR at the beginning of period, and identical Russian good was worth as well 355 RUR. With rates of inflation in 403% in Russia, 8.2% in the USA and exchange rate 5.96 RUR per USD (0.168 USD per RUR) at the end of period the first one (with price 108.2 USD) will be worth 645 RUR and the second one — 1786 RUR, i. e. almost 3 times dearer (more expensive). It leads to consumption of cheaper import (decreasing inflation in Russia) and to reduction of home production and export.

In Russia, similar effects were observed in 1995–1998. Ruble was overvalued, that was reflected, for instance, by the gap of 123% in 1995 and 175% in 1997 between indexes of nominal exchange rate (*NER*) and real exchange rate (*RER*). It's represented in Exh. 1.9 (herein, real exchange rate for each year is taken 100%).

In general, real exchange rate is a nominal (actual) exchange rate, adjusted for comparative inflation (measured by

proportion of price levels) in two countries. For example, dollar nominal rate was 3.55 RUR per USD in 1995 (i. e. ruble exchange rate was 28.2 cents per RUR). During that year consumer price index (*CPI*) in Russia increased from 33.6 to 100 points and in the USA — from 97.3 to 100. As a result, the ruble real exchange rate in 1995 turned out to be 9.7 cents per RUR.

$$RER_{1995} = NER_{1994} \cdot \frac{1 + \Delta p^{RF}}{1 + \Delta p^{US}} = 0.282 \cdot \frac{100/33.6}{100/97.3} = \frac{USD}{RUR} 0.097.$$



Exh. 1.9. Proportion of nominal and real exchange rates of ruble against dollar

Nominal exchange rate of ruble in 1995 happened to be 0.216 USD per RUR (or 4.64 RUR per USD). Hence, ruble was actually 2.23 times higher, than its “natural” (real) level (223% in Exh. 1.9), or overvalued by 123%. Following the correction, that started in August 1998, ruble depreciated to its real level, and dollar accordingly increased in 3 times.

As a whole, at the time of “currency corridor” the exchange risks and the threat of economic collapse, which are typical for the fixed rate regime, climb (the example of this kind related to the Chilean economy is given above).

The non-official “currency corridor”

As many analysts believe, the main developed countries' financial authorities supported the informal “corridor” of the exchange rate dollar-mark and dollar-yen since the 22th of February, 1987 (accordingly to so-called “*Louvre agreement*”) up to time of euro introduction.

Actually, the volatility of the dollar exchange rate against the leading currencies reduced substantially after 1987 in comparison with preceding 15 years. Indeed, in 1975–1987 the USD exchange rate fluctuated in the interval of 1.5–3.4 DEM per USD (i. e. 39% around the average level of 2.45) and of 300–150 JPY per USD ($\pm 33\%$ around 225). In 1987–2000 the dollar rate noticeably narrowed the medium-term scope of oscillation. Thus, the amplitude of fluctuations was kept in the range of 1.5–2 marks and of 100–150 yen per 1 dollar.

It permitted for some observers to say, that the leading central banks on the “Louvre meeting” have agreed to maintain the *non-official* “corridor” (“target zone”) for the dollar exchange rate within these limits ($\pm 15\%$ around 1.75 DEM per USD and $\pm 20\%$ around 125 JPY per USD). The financial authorities completely deny the existence of such type of arrangement. However, the existence or absence of dollar corridor since 1987, and also interferences of central banks in market mechanism by way of currency interventions and by the measures of monetary policy do not preclude the problem of estimation the medium-term wavy (cyclical) dynamics in forex markets.

Definite countries may choose the foreign-exchange regime for their currencies among the alternatives, characterized above (free, managed float, fixed rates and “currency corridor”). In the different periods, the priority was given to the various systems.

1.3. Evolution of the world monetary system

The international monetary system (as a part of the global environment, where the exchange of currencies for the purchases of goods, services, for investments, and for arbitrage-

speculation is made) has gone through several stages of development.

1.3.1. The golden standard (*Paris and Genoese systems*)

In 1862, in Paris, the financial officials of several leading countries concluded an agreement on gold parities of their currencies. The mutual exchange value of the currencies was determined by their gold content. Thus, gold parities of 4.2474 GBP and 20.67 USD per ounce stipulated the exchange-currency parity (*EP*) of 4.87 USD per GBP:

$$EP = \frac{\text{USD } 20.67 / \text{ounce}}{\text{GBP } 4.2474 / \text{ounce}} = \frac{\text{USD } 20.67}{\text{GBP } 4.2474} = \frac{\text{USD } 4.8665}{\text{GBP } 1}.$$

Inside the countries, belonging to the system, the golden coins circulated; and the banknotes and the demand deposits exchanged for gold. Thus, in Germany and France the gold standard was supported by the principle of “tertiary” and “quaternary” cover (33% and 25% of the money supply were secured by the gold reserves); in England and in Russia — by the principle of fiduciary (not covered by gold) issue (for instance, 11 mln pounds could be issued without gold backing, the remaining money in circulation required the 100% gold backing). The foreign-exchange rates fluctuated within the bounds of so-called “golden points” ($\pm 3-5\%$ around par values — depending on the distances between the money centers of the countries, specified by the costs of transportation, storage, and insurance of gold bullions during their delivery between, for example, London and New York, Petersburg and Berlin, Paris and Rome). Let us assume, that an American importer had to pay 10 000 British pounds for the goods. He/she had at least two possibilities:

- a) to buy a bill of exchange (check) of the well-known London company, received by the American exporter and sold by him for dollars to New-York bank, or
- b) to buy gold bullions for the payment in London.

Let us suppose, that the transportation costs of gold bullions between London and New-York equal 5% of the transaction value. Therefore, if the value of the bill of exchange for the exporter (including commissions, costs for transfer) is more

than 51098.25 USD ($48\,665 \times 1.05$) then the payment conducts in gold; if less — then by bill of exchange (a check).

In the first case, in the USA, the decline of the demand for the bills, issued in London, force their holders to decrease quotations below the level of the gold price plus the costs of transportation to London, so the bills starts to be purchased again. As a result, the system provided the self-maintaining stable exchange rates (i. e. not requiring the official's interference). Among the disadvantages of the system were its expensiveness (measured by the opportunity cost of the gold reserves) and its static character (the increase of the volumes of gold-mining lagged behind the world economic growth, restraining the last one).

Gold-currency standard was formed after the World War I in the framework of the agreement, signed on the after-war conference of the League of Nations (predecessor of the United Nations Organization, *UNO*) in Genoa (1921) and functioned practically only till the Great Depression of 1929–1933. The currencies of definite countries (the USA, Great Britain, France, Germany²⁰), which kept or reestablished the conversion of their money into gold, were defined as the “reserve” ones. The remaining currencies (such as polish zloty, Czech crone) were converted into one of the reserve currencies and then were provided to the Federal Reserve System of the USA or the Bank of England in exchange for gold bullions.

Though, restored pre-war gold parities ceased to respond the changed fundamental factors. For instance, in 1914–1920 the wholesale prices escalated by 225% in the USA, 300% in Great Britain. That is, if a certain item costs 4.8665 dollars in the USA, 1 pound in Great Britain before the war, maintaining the “commodity” parity on the level of par of exchange, then the after-war prices of this good in dollars and pounds (p_1^{USD} ,

²⁰ In Germany, for instance, the gold exchange standard was introduced in the course of the monetary reform in 1924 and has been maintained till the July 1931. The 30% of the banknote issue and demand deposits had to be covered by gold and 10% — by foreign currencies, convertible into gold.

p_1^{GBP}) amounts 15.82 and 4 respectively, causing the new “commodity” parity (EP_1^g) of 3.954 USD/GBP:

$$EP_1^g = \frac{p_1^{\text{USD}}}{p_1^{\text{GBP}}} = \frac{\text{USD } 15.82}{\text{GBP } 4} = \frac{\text{USD } 3.954}{\text{GBP } 1}.$$

At the same time, the prices of gold in both countries remained at the pre-war level and, conformably, the nominal currency parity (EP_1^n) also equaled 4.8665 USD per GBP. In the upshot, the British pound was overvalued almost by j against dollar:

$$OVD = \frac{EP_1^n - EP_1^g}{EP_1^g} = \frac{4.8665 - 3.954}{3.954} = 0.23,$$

where OVD is a degree of currency overvaluation.

It’s clear, that the price of American goods, evaluated in British pounds ($p_1^{\text{USD, GBP}}$), was below the price of the similar English items. Thus, our hypothetic commodity from the USA after converting costs only 3.25 pounds:

$$P_1^{\text{USD(GBP)}} = \frac{P_1^{\text{USD}}}{EP_1^n} = \frac{\text{USD } 15.82}{\text{USD } 4.8665/\text{GBP } 1} = \text{GBP } 3.25.$$

Thus, it became substantially cheaper, than the similar British product. As a result, both American and English consumers started abandoning English goods in favor of American ones. Consequently, the industry production in Great Britain began stagnating, wages and prices — decreasing (in order to come into line with the currency parity), interest rates — growing (because of the lack of capital caused by its flight into more profitable American assets).

Apropos, exactly the reestablishment of gold standard in England on the pre-war conditions in 1926 by Sir W. Churchill, who has been at that period the ministry of finance (lord-chancellor of Her Majesty’s treasury) was interpreted by many researchers as the main prerequisite for the Great crisis, ensuing at the end of 1920s²¹. On the contrary, German “Reichsmark” and French franc have been undervalued.

²¹ Above in this chapter, we described the negative effects of overvalued currency for Russian and Chilean economy, which exchange rates were overestimated during the 3 years in both cases.

After the New York Stock Exchange (*NYSE*) collapse, as a result of several “black trading days” in October 1929 and the following ruin of the real sector practically in the whole Western world²², the majority of countries refused from convertibility of their currencies into gold (for example, Great Britain — in 1931).

One of the methods of domestic goods promoting into the world market became the policy of *currency dumping*, i. e. home currency devaluation below the level determined by the comparative purchasing power (prices level). Great Britain was actively blamed for it. For instance, the exchange rate of pound sterling declined from 99.9% (on the average monthly basis in 1930) to 68.1% (in 1933) of gold parity, i. e. by 1/3. The wholesale prices index dropped from 114.1 to 93.7 points (1913 = 100), i. e. by 18%. In the USA, the prices decreased from 126 to 96 points (1910 – 1914 = 100), i. e. by 14%, but gold par of dollar remained invariable. Correspondingly, the purchasing power of British pound rose by 22%, and by 5% as compared to dollar (17%). Hence, pound turned out to be underestimated against dollar, cheapening English merchandise and encouraging other governments to use the measures of “*trade wars*”, such as increase of import customs duties, restraint of import. Utilizing the currency dumping to increase competitiveness of domestic merchandises is titled in these years as “beggar-thy-neighbor devaluation”.

1930s is called the period of “currency chaos” (predominance of currencies, not convertible into gold; renaissance of barter; payments by gold; cross-countries clearing), though in 1930s such currency collapses as of ruble in the USSR and mark in Germany in the fall of 1923 (each currency depreciated in several hundreds of billions times) weren't observed any more. By the end of the World War II up to 4/5 of the world gold reserves were concentrated in the USA, that's why it was necessary to build a monetary system, responding to the new reality.

²² In the USA in 1929–1932, the industrial output decreased threefold, and in Germany — by 40%.

1.3.2. The gold-dollar standard (*Bretton-Woods system*)

In 1944 on the conference of the United Nations Organization (*UNO*) — successor of the League of Nations — in Bretton-Woods (New-Hampshire state, the USA), the new international monetary system was established. It was characterized by four following principles:

- 1) fixed official price of gold in dollars (35 USD per ounce);
- 2) fixed (but revising) par exchange rates against dollar;
- 3) maintenance by central banks the exchange rates to USD in the diapason of $\pm 1\%$ from the parity (by means of currency interventions and other measures);
- 4) necessity of International Monetary Fund sanction for the alteration of the exchange parities (devaluation, revaluation) by more than 10%.

For example, in 1964 the British pound was fixed on the level of 2.80 USD per GBP. If the pound sterling exchange rate sank, the Bank of England bought up pounds in the market for dollars or gold. Such governmental purchases had to push up the pound exchange rate. On the contrary, if the pound appreciated, the Bank of England sold pounds. The other countries' governments acted in the same manner. If they were unable to hold the currency exchange rate within the limits — they executed devaluation or revaluation.

For maintaining the exchange rates, the mechanism of reciprocal crediting of the member countries required. For this purpose, the inter-governmental International monetary fund, receiving the membership contribution and granting loans to the governments suffering hardships with the balance of payments, was established. Thereafter, the central banks began to conclude special swap agreements for joint interventions in the foreign exchange market — for instance, the German central bank (“Bundesbank”) sold marks for dollars on the spot to the USA's FRS and simultaneously bought deutsche marks on the forward.

The Bretton-Woods system could exist, until the American gold reserves provided the conversion of dollars, claimed by the foreign governments, into gold. In fact, the USA used to be a

CONTENTS

Introduction	3
Part I. THE INTERNATIONAL MONEY, EXCHANGE RATES AND FOREX MARKETS	7
Chapter 1. International monetary system	9
1.1. Functions and Types of International Money.....	10
1.1.1. Reserve Currencies	13
1.1.2. Artificial currency units	14
1.1.3. Quasi-currency asset: monetary gold	23
1.2. Alternative exchange rate regimes.....	24
1.2.1. Free float of exchange rates.....	24
1.2.2. Fixed rates of exchange	26
1.2.3. Managed float of exchange rates	30
1.2.4. Target zone (“currency corridor”, “crawling peg”)...	37
1.3. Evolution of the world monetary system	41
1.3.1. The golden standard (Paris and Genoese systems)...	42
1.3.2. The gold-dollar standard (Bretton-Woods system)...	46
1.3.3. Multicurrency standard (Jamaica system)	48
Chapter 2. Exchange rate of determination	55
2.1. Establishing of equilibrium exchange rate.....	56
2.1.1. Demand for and supply of the foreign currency.....	57
2.1.2. Equilibrium exchange rate.....	60
2.1.3. Dynamic equilibrium in forex market: medium-term cycles of dollar rate	61
2.2. Determinants of exchange rate in currency markets	64
2.2.1. Comparative inflation and exchange rate	65
2.2.2. Comparative interest rates and exchange rates	69
2.2.3. Comparative incomes (economic growth rates) and exchange rate.....	71
2.2.4. Central bank’s reputation	73
2.2.5. Market expectations and exchange rate.....	77
2.3. Balance of payments, international investment position: context of demand for and supply of currency.....	80
2.3.1 Balance of payments and level of exchange rate	80
2.3.2. International Investment Position: influence on currency exchange	88
2.3.3 Official gold-currency reserve and exchange rate	97
Appendix 2.1. Factors of dollar exchange rate	103

Chapter 3. Foreign exchange markets: spot, forward	106
3.1. Structure of forex market.....	108
3.2. Basics of foreign currency trading.....	113
3.2.1. Dealing (front) and settlement (back) offices (rooms)	113
3.2.2. Currency position and risk	114
3.3. Immediate delivery market	118
3.3.1. Customs of spot market: value dates, quotes of foreign exchange	118
3.3.2. Cross-rates of currencies. Triangular arbitrage	123
3.4. Forward currency markets	126
3.4.1. Discounts, premiums for forward contracts.....	128
3.4.2. Quotations of forward rates	131
3.4.3. Forward trade: position holding	135
Part 2. INTERNATIONAL MONEY AND CAPITAL MARKETS	141
Chapter 4. International money market	143
4.1. Classifications of money and capital markets	144
4.2. Instruments of money markets.....	148
4.2.1. Treasury bills and commercial papers.....	149
4.2.2. Bankers' acceptances and certificates of deposit	153
4.2.3. Non-tradable instruments of money markets	154
4.3. Benefits and costs of internal and off-shore markets	157
4.3.1. Actual data: markets of the USA and Germany.....	157
4.3.2. Numerical example: on-shore Citibank in New-York City	159
4.3.3. Numerical example: off-shore operations of Citibank in London	163
4.3.4. Interest spreads in internal (domestic) and off-shore markets.....	165
Appendix 5.1. Returns in the US money market for 80 years	172
Chapter 5. International capital market	173
5.1. Overview of capital market	174
5.2. Instruments of international debt markets	176
5.2.1. Foreign bonds: governmental, corporate papers. Public issue and private placement. Junk bonds	176
5.2.2. Eurobonds: fixed interest papers, floating rate notes, zero-coupon bonds, cocktail issues.....	180

5.2.3. Market of non-tradable credits: securitization, euro-syndicated loans. Costs of Euro-currency credits	182
5.3. Instruments of international equity markets	187
5.3.1. Foreign stocks, euro-equity	187
5.3.2. Primary and secondary stock markets	189
Chapter 6. Multicurrency financial investments	196
6.1. Principles of international investments	197
6.1.1. Rate of return on financial assets	197
6.1.2 Risk for international financial instruments.....	204
6.2. International short term investments	214
6.2.1. Efficient return on currency instruments of money market	214
6.2.2. Currency investment as a portfolio of 2 assets	218
6.3. International long term investments	220
Appendix 6.1	226

САНКТ-ПЕТЕРБУРГСКИЙ УНИВЕРСИТЕТ
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