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# INTERNATIONAL FINANCIAL MARKETS



SAINT-PETERSBURG UNIVERSITY  
OF MANAGEMENT AND ECONOMICS

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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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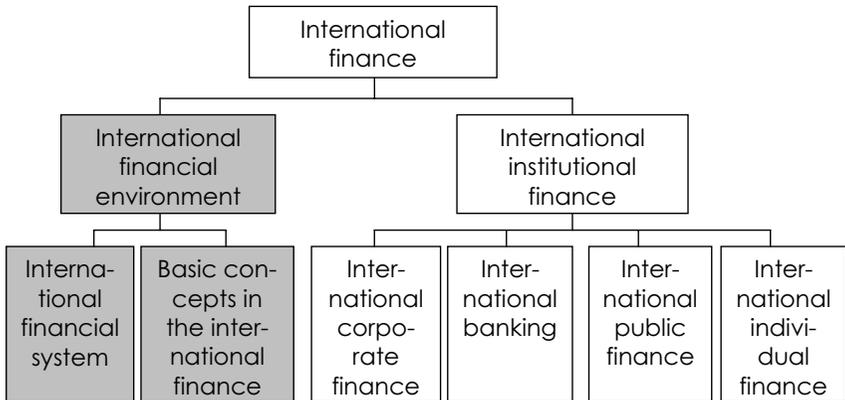
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# Introduction

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).



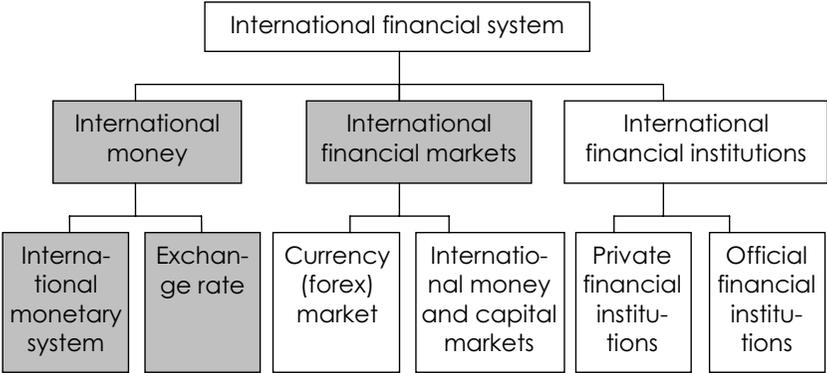
*Exh. 1.* Structure of international financial disciplines

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.

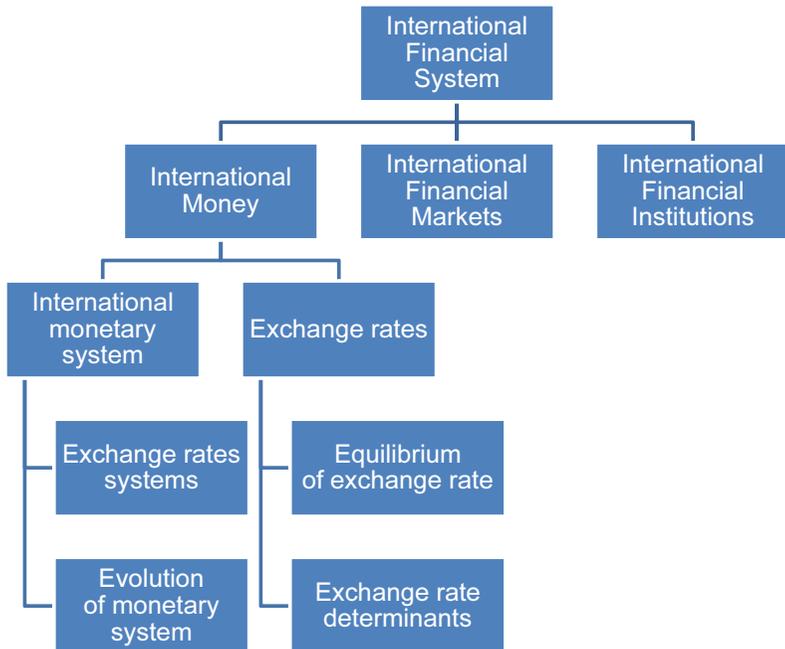
# Part I

## 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

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

## 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):

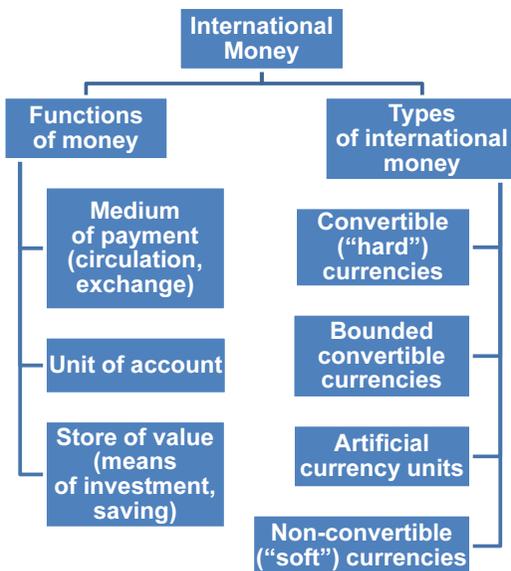
- medium of payment (circulation, exchange);
- means of investing (saving, store of value);
- unit of account.

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 globe<sup>1</sup>. One of influential financial

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

newspaper in the world “*Financial Times*”, published in London<sup>2</sup>, 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

<sup>2</sup> 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 translation<sup>3</sup>:



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<sup>3</sup> 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:

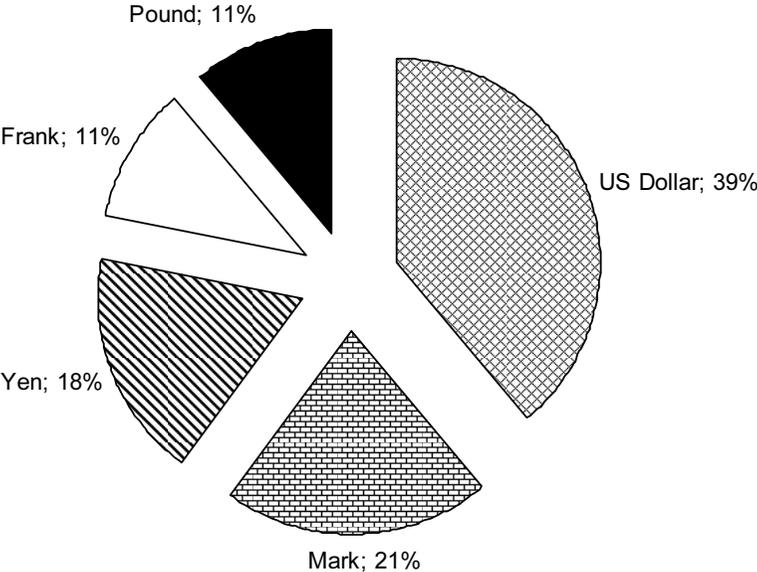
$$ACU = \sum_{j=1}^n ER_j \cdot w_j,$$

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**

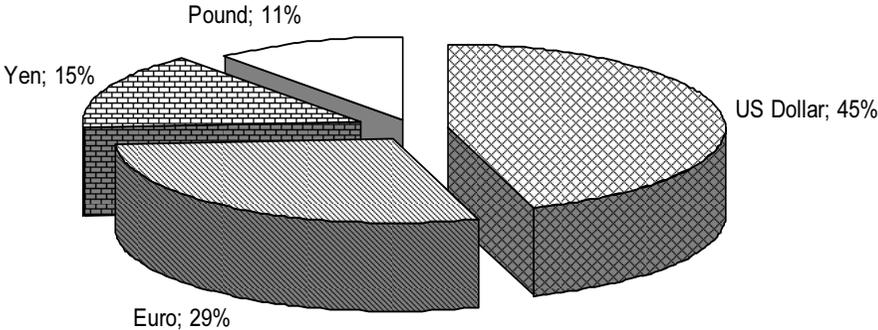
Initially, the value of *SDR* was fixed in US dollars: 1 SDR = 1 USD (since 1969 to November 1971), 1 SDR = 1.08571 USD (since December 1971 to January 1973), 1 SDR = 1.20635 USD (since February 1973 to June 1974).



*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 1<sup>st</sup> 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%)<sup>4</sup>.



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

<sup>4</sup> 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**

<b>Currency</b>	<b>Currency amount under Rule O-1</b>	<b>Exchange rate<sup>(1)</sup></b>	<b>US dollar equivalent</b>	<b>Percent change in exchange rate against US dollar from previous calculation</b>
<b>Euro</b>	0.4230	1.31400	0.555822	−0.030
<b>Japanese yen</b>	12.1000	80.96000	0.149457	−0.086
<b>Pound sterling</b>	0.1110	1.59590	0.177145	0.201
<b>US dollar</b>	0.6600	1.00000	0.660000	
			1.542424	
US \$1.00 = SDR			0.648330 <sup>(2)</sup>	−0.004 <sup>(3)</sup>
SDR1 = US \$			1.54242 <sup>(4)</sup>	
(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 LIBOR<sup>5</sup> 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:

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

<sup>5</sup> 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 1997<sup>6</sup>. These funds were spent to rectify the Russian balance of payments. SDR

<sup>6</sup> 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 XIX<sup>th</sup> 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).

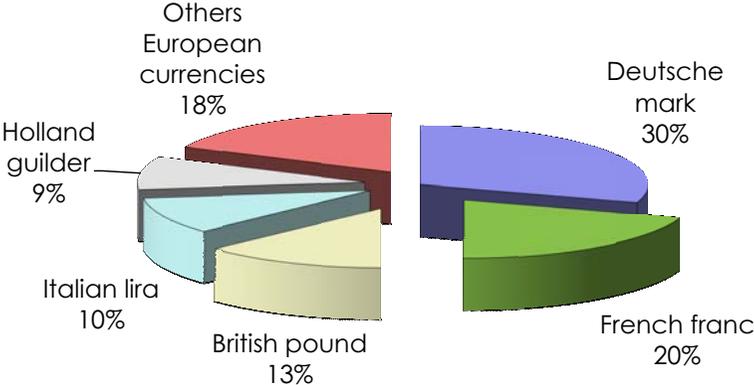
In the beginning of 1950's, the idea of the common currency was materialized in the form of the European unit of Account (*EUA*<sup>7</sup>) equals 1 US dollar within EPU, and then — average value of currencies of the ECS member countries. The successor of the EUA monetary unit since 1979 was ECU within 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.

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<sup>7</sup> 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 countries<sup>8</sup>, 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

<sup>8</sup> 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.

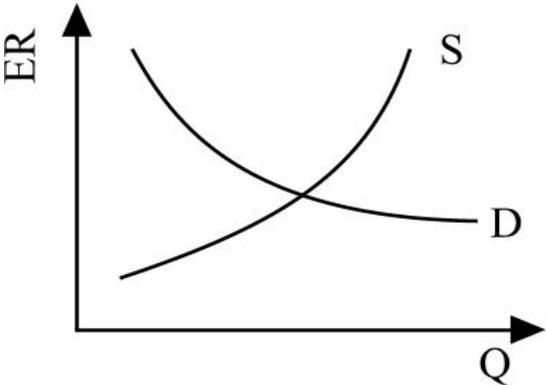
High volatility of the price hampers the gold to perform the function of world money. Throughout a lengthy period of time the price for gold fluctuated more drastically than the US dollar exchange rate.

## 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 1976<sup>9</sup>. 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"<sup>10</sup>.

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

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

<sup>10</sup> *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 ( $\Delta ER_t$ ) 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 increase<sup>11</sup>. *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*)<sup>12</sup>. Its traditional measures are:

- obligatory sale of export currency revenue<sup>13</sup>;
- limitation in import prepayment;

---

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

<sup>12</sup> 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.

<sup>13</sup> On the 31<sup>th</sup> 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.

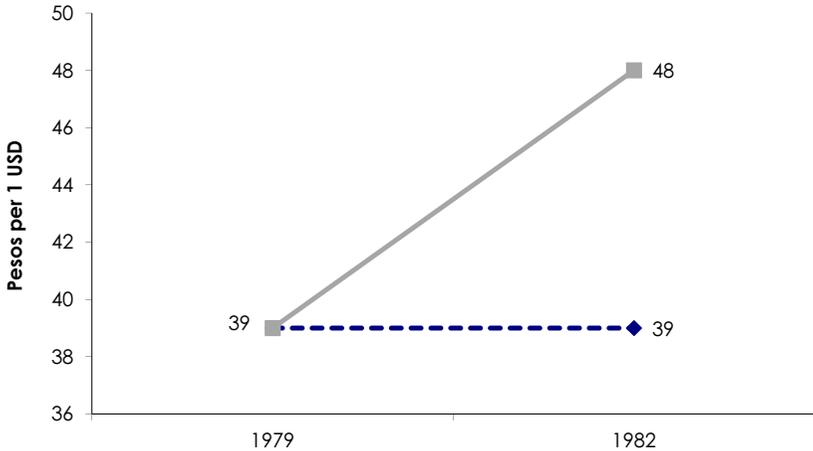
- limitation (prohibition) of some transfers (dividends, royalty);
- deposition of import prepayment, transfer in CB RF;
- ceilings for trade loans to foreign companies;
- control of the direct and portfolio investment abroad;
- limitations of foreign loans by maturity of repayment;
- taxation (limits) 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  $\pm 1\%$ <sup>14</sup>. 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” regime<sup>15</sup>.

### **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).

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<sup>14</sup> More detailed about this system look below in point 3.2.

<sup>15</sup> 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 situation<sup>16</sup>.

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<sup>16</sup> Official web-site of CBR is [www.cbr.ru](http://www.cbr.ru).

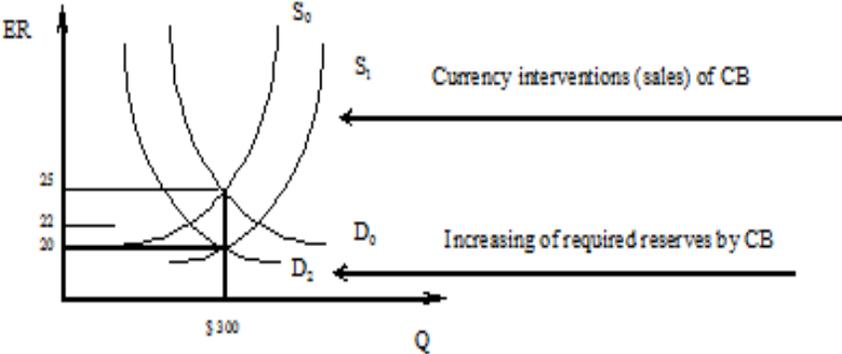
Monetary policy and exchange rates. The four classical instruments of monetary policy are: discount, reserve policies, deals in the open market, money supply targeting. Most often they are not utilized for the direct influence the currency rate. However, they influence it indirectly. Thus, increasing 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%<sup>17</sup>. 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

<sup>17</sup> 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 1<sup>st</sup> of February, 1995), it promoted the strengthening of ruble by 100% (on the 17<sup>th</sup> of December, 1991 the dollar quoted at 180 RUR/USD in Russia, on the 21<sup>st</sup> of January, 1992 — at 230 RUR/USD, on the 11<sup>th</sup> 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 1<sup>st</sup> 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 1<sup>st</sup> 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 15<sup>th</sup> of August to the 31<sup>st</sup> 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 31<sup>st</sup> 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 1<sup>st</sup> 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)<sup>18</sup>.

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 6<sup>th</sup> 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 11<sup>th</sup> of November, 1997 it was increased till 28%, in February, 1998 — till 42, on the 19<sup>th</sup> of May, 1998 — till 50, on the 27<sup>th</sup> 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.

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<sup>18</sup> 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 (%)
<b>06.07–31.12.95</b>	4.300–4.900	4.600	$\pm 6.5\%$
<b>01.01–30.06.96</b>	4.550–5.150	4.850	$\pm 6.2\%$
<b>01.07–31.12.96</b>	5.000–5.600	5.300	$\pm 5.7\%$
<b>01.01–31.12.97</b>	5.500–6.100	5.800	$\pm 5.2\%$
<b>1998–2001</b>	5.390–7.130	6.200	$\pm 15\%$
<b>17.08–01.09.98</b>	6.000–9.500	7.750	$\pm 22.6\%$
<b>2.09.98</b> 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)<sup>19</sup>. 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).

<sup>19</sup> 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
<b>1994</b>	<b>33.62</b>	<b>97.30</b>	<b>3.55</b>	<b>0.282</b>	<b>0.282</b>	<b>0</b>
<b>1995</b>	100.00	100.00	4.64	0.216	0.097	+123%
<b>1996</b>	147.54	102.90	5.56	0.180	0.068	+165%
<b>1997</b>	<b>169.11</b>	<b>105.30</b>	<b>5.96</b>	<b>0.168</b>	<b>0.061</b>	<b>+175%</b>
1998	216.19	107.00	20.65	0.048	0.048	0

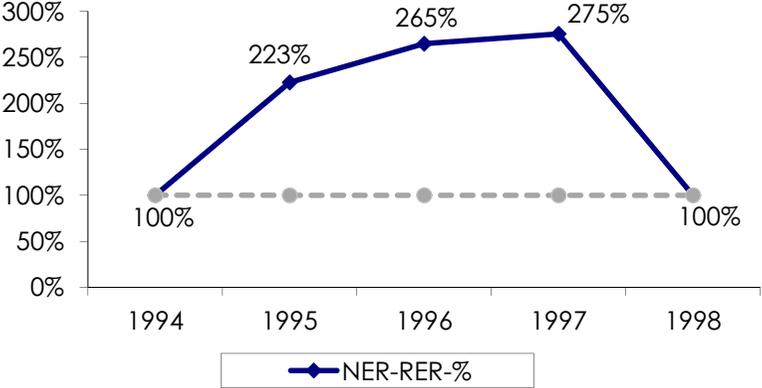
Overvaluation of national currency impaired the competitiveness of the domestic production, undermining the economic growth. However, simultaneously it decreased inflation rate, reducing import products' prices after recalculation them in national currency. For example, at the rate of 3.35 RUR per USD (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 22<sup>th</sup> 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, Germany<sup>20</sup>), 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 ( $p_1^{\text{USD}}$ ,

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<sup>20</sup> 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.

$p_1^{\text{GBP}}$ ) 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 1920s<sup>21</sup>. On the contrary, German “Reichsmark” and French franc have been undervalued.

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<sup>21</sup> 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 world<sup>22</sup>, 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.

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<sup>22</sup> 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

world central bank, because they could trade gold by prevailing fixed exchange rates. With this fact the “structural asymmetry” of the system was associated, because the higher were the growth rates of the world trade and investments, the bigger became the demand for dollars, and dollars could get into the channels of international settlements only as a result of the American balance of payments deficit, which required the USD devaluation, that has undermined the foundations of the system.

Finally, the world community had to face a choice — either preserve the Bretton-Woods system (and, thereby, artificially restrain the world economic growth) or to give the freedom to the world trade, investments (eliminating the conversion of the dollar into gold). The inevitability of such a choice got the name of “the Triffin’s dilemma” (named after the famous American macroeconomist, who has formulated it).

As a direct reason for the collapse of the Bretton-Woods system appeared the huge military-political expenses of the USA overseas. Thus, the US trade balance was positive for a long time due to the high competitiveness of the American goods. The investment balance in the long-term perspective was also positive (since the flow of income from capital investment in general exceeded the initial expenditure). Though, the construction of the military bases, the armed forces upkeep, carrying out the military operations and also supporting the “fraternal” political regimes abroad were not self-sustainable in the economical sense. Accordingly, the cumulative deficit of the US balance of payments in 1949–1970 was almost exactly equal to the total amount of the military-political expenses overseas of this country<sup>23</sup>.

As a result, by 1970s there was an outflow of gold from the USA, which shortened its portion in the world reserves up to 1/3. Economic and political difficulties in the USA (economic stagnation, the war in Vietnam) undermined the credibility of

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<sup>23</sup> One of the first who drew attention to this was the Soviet researcher D. V. Smyslov from the Institute of World Economy and International Relations in Moscow (Contemporary inflation: sources, causes, contradictions / ed. by S. M. Nikitin. M.: Mysl, 1980. P. 165–172).

the dollar, serving the cause for the currency crisis, the main stages of which became:

- introduction of double gold market with the free price for the private operations and fixed — 35 USD per ounce — for the official ones (17 March 1968);
- termination of dollar conversion into gold for the governments (15 August, 1971<sup>24</sup>);
- dollar's devaluation from 35 to 38 USD per ounce (i. e. by 8%);
- increase of the official diapason for the exchange rates fluctuation around the parities up to  $\pm 2.25\%$  (Smithsonian agreement<sup>25</sup>, the 17<sup>th</sup> of December, 1971);
- devaluation of dollar up to the level of 42.2 USD per gold ounce, by 10% (13 February 1973).

However, these measures couldn't prevent the collapse of the Bretton-Woods system.

### **1.3.3. Multicurrency standard (*Jamaica system*)**

Since March, 1973, the majority of the countries has released currencies in “float” (“navigation”). The new monetary system was legalized at the conference of IMF in 1976 in Kingston (Jamaica), which adopted the relevant amendments to the Charter of the IMF. By 1978 these amendments have been ratified by the qualified majority of member countries.

Simultaneously, the significant regional system — European currency system (nowadays the European currency and economic union) was formed, that mentioned above — under consideration of the common European currency. The following criteria of the entering into the European currency union have been established:

- the proportion of federal debt to GDP (“debt ratio”) — 60% or less;

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<sup>24</sup> It was at the third Monday of August (the “predecessor” of the 19<sup>th</sup> August 1991 for the USSR and the 17<sup>th</sup> August 1998 for Russia).

<sup>25</sup> By name of the Smithsonian Institute in Washington D. C. (USA), which includes several museums, administrative buildings, zoo, research-scientific institutions.

- the proportion of the federal budget deficit to GDP — no more than 3%;
- the treasury bonds rate — no more than 8%;
- the rate of inflation — 3.5% or less.

Nowadays, each country independently chooses an exchange rate arrangement. The modern system of exchange rate is called as “managed float” due to existence of numerous currency regimes, interference of the central banks (separately and also coordinated) in a market mechanism. Contemporary world monetary system is titled also as the *multi-currency standard*, stressing legally the equality of various currencies.

It has made *volatile* (changeable) practically all financial quotations. Thus, gold is officially “demonetarized”, and its price is determined by demand and supply in the market. In 1860–1933, the official price of gold in the USA was 20.67 dollars per ounce, in 1934–1971 — 35 dollars. Further, its level began to grow, achieved the historical peak of 850 dollars in January, 1980 that was the reaction of the financial markets to input of the Soviet armies to Afghanistan (effect of “flight” from traditional assets in noble metal in response to an expected direct opposition of the USSR and the USA, as in times of the Korean and Vietnamese wars). Then, during the “super-dollar” period (1981–1985), the gold price has fallen, in 1987–1998 fluctuated in a diapason from 360 up to 420 dollars. In 2012, it is at a level above 1500 dollars per ounce.

*Interest rates* also became more changeable. Thus, in the beginning of 1950<sup>th</sup>, nominal rates for the US three-month treasury bills were around 1%. In 1970s, their level has raised, and, after October, 6 of 1979 (when FRS moved to the regulation of money supply by means of monetary base “*targeting*” instead of interest rates on federal funds, having stopped the direct regulation of the based rate in the interbank market and having released it in a “free float”), their volatility has sharply increased. Federal fund rates have increased in the spring of 1980 up to 20%, have fallen up to 9% in summer, having returned to 20% at the end of year. In 1981 the fluctuations have made from 13% in spring up to 20% in summer and 12% in

fall. Further, the amplitude of fluctuations was reduced: in 1981 three-month treasury bills rate was 15%, to the middle of 1980s — 6%, in 1990 — 7%, in 2012 — 2%. The rate of the American interbank market (on federal funds) demonstrated the similar long-term patterns of behavior. Similar volatility was observed in other national markets, having increased interest risks for banks, companies, governments, private persons.

“Floating” of currencies has increased a volatility *of the prices for the export-import goods*, in the 1<sup>st</sup> run, on the basic energy carrier — oil. Thus, in 1973 it has increased in 6 times (after 25-years of stability — about 1.5 dollars per barrel), in 1979–1980 — once again in 4 times (up to 40 dollars). In 1981–1982 there was a double reduction of price, in 1986 the prices have again fallen (that often is considered as the economic and currency prerequisite of the Soviet Union crash as a super-empire). The last significant fall has been happening since October 1997 till November 1998 (from 21 up to 9 dollars), which has played an essential role in financial crisis in Russia in the fall of 1998. Further, the prices again have jumped up to the almost record values (37 dollars in 2000). In 2012, the oil price counts around 120 dollars. Due to forecasts of American government analysts, uncertainty of petroleum prices will be also substantial in the 2<sup>nd</sup> decade of XXI century, as before since the beginning of 1970s<sup>26</sup>.

Functions and a role *of the international financial organizations* have remained without changes within the framework of the Jamaica system. IMF, in the first place, grants credits to developing countries for the current needs (equalizing the balance of payments, balancing the federal budget). These credits are stipulated by execution of the stabilization program, designed on the recommendations of “Chicago thinker” M. Friedman and his supporters (monetarists). This program usually consists of stabilization of currency, reduction of inflation rates, cutting of the federal budget deficit, opening the markets, privatization of state ownership. The International bank of recon-

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<sup>26</sup> Energy Information Administration, Annual Energy Review 1999. Washington, D. C. July 2000.

struction and development (*IBRD*) — a member of World Bank group — grants investment credits for financing the infrastructural projects (communications, construction, education, public health services, ecology) for the same category of the countries under condition of performance of the IMF program by them.

## Resume

*The international money* is the currencies serving international economic operations. Functions of the international money are reduced to means of payment (at commercial transactions, return of debts), means of invest (at investments), unit of account (at definition of prices of goods, denomination of debt, accounting).

*Types* of the international money are: reserve (key) currencies, artificial currency units and bounded convertible currencies. *Reserve* currencies refer to the hard currencies of the developed countries which form a significant part of world currency reserves. *Artificial* (“basket”) currency unit of IMF is SDR; unit of former European currency system is ECU.

The international *monetary system* consists of the currency markets, institutions, business customs, legislative norms, and mechanisms that determine the rate at which one currency is exchanged for another. The main component of monetary system is exchange rate arrangement defining its significant characteristics.

There are four hypothetical *exchange rate arrangements*. Thus, the “free float” means that currency rates are moved due to market demand and supply forces. The fixed exchange rate is the proportion of exchange fixed by the government. “The currency corridor” is an arrangement when authorities establish boundaries of rate fluctuations. “Managed float” is an arrangement of formally market exchange rate, but central banks may support desired exchange rate level by means of interventions (mass purchases, sales of currency in the monetary market), monetary policy (discount and reserve regulation, operations in the open market).

The monetary system differently combined the mentioned exchange rate arrangements in the various countries. *Golden*

*standard* fixed the proportions of exchange determined by golden currency parities (i. e. the official prices of gold in various currencies). *Bretton-Woods system* is international monetary system (1944–1971), based on the firm dollar price of gold and firm currency parities.

*Jamaican system* is the multi-currency standard existing since 1973. It is based on legal equality of currencies when each country can choose an exchange rate arrangement. *Current world monetary system* named as “managed float” or “dirty drift” that reflects a level of currencies interaction of in its framework.

### ***Control questions for discussion***

1. Define the concept of international money. What functions does the international money perform?

2. In Russia during the high inflation times many operations were executed in dollars, instead of rubles. Why? Whether there were rubles in Russia in the beginning of XXI century the better means of invest, than in 1990s? What is bi-currency monetary system?

3. What types of the international money do you know? What is the convertible currency? What positive and negative consequences of the reserve currency status do you know?

4. Give examples of the most well-known official artificial units. What attempts of projecting private artificial currency “baskets” do you know?

5. What are the basic alternative systems of exchange rates? What is the difference between the fixed and free float rates? Explain their advantages and disadvantages.

6. What methods of postponing the devaluation of national currency do you know? Analyse measures of the Russian government for postponing the devaluation of ruble at the end of 1997 — first half of 1998. Were they effective? How have they influenced the national economy?

7. How do currency interventions influence the movement of exchange rates? What tools of monetary policy governments use for managing the exchange rates?

8. Name the basic stages of evolution of the world monetary system. Compare the gold and the gold-exchange standards. What are the basic features of Bretton-Woods system?

9. What was the “Triffin’s dilemma” — the base concept explaining “constructive asymmetry” of Bretton-Woods system? Have the predictions based on this concept come true? What are the potential weaknesses of the existing world monetary system?

10. What are the differences of the Jamaica system from the previous ones? In your opinion, are the exchange rates fluctuations under the conditions of current system of “managed float” devastating? Explain.

11. What exchange rates system, in your opinion, is the best for the modern Russia? Give the examples of positive and negative influence of the international financial system on activity of Russian institutes and economic situation in the country.

### *Problems to solve*

1. Using quotations of currencies of the former USSR per US dollar from Table 1.2, calculate exchange rates of these currencies in relation to ruble.

2. “Dollarization” of the Russian foreign trade was in 1.7 times more, than on the average in the world, deposits in a foreign currency was in 1.4 times more (Table 1.4). Explain this fact.

3. Using data of Tables 1.5 and 1.6, current quotations of LIBOR and exchange rates of four leading currencies, calculate a level of interest rate on SDR and exchange rate of SDR in these currencies.

4. At the end of 1994 the US dollar exchange rate in Russia was 3.55 rubles (3550 in a then nomination), at the end of 1997 — 5.96 rubles. Consumer prices in the USA for this period have increased by 8% and in Russia — on 403%. In what proportion the dollar exchange rate corresponded to CPP of dollar against ruble? How you can explain so strong difference? What was result of such difference?

5. In 1934 Franklin Roosevelt’s government has risen the official price of monetary gold from 20.67 dollars for ounce up

to 35 dollars. What rate of increase in the price of gold was? On how many percent dollar was devaluated?

6. Last official USD exchange rate to DEM within fixed parities of the Bretton-Woods system has been established at a level of 3.2225 DEM per USD in December 1971. One of last market US dollar exchange rates to DEM within “managed floating” of the Jamaica system was about 2.2 DEM/dollar at the end of 2001 (before introduction of cash euro). What degree of depreciation of the American currency against German? On how many percent the DEM against USD has become stronger?

7. Suppose the dollar rate has risen on 500% against the Brazilian real. On how many percent real has devaluated with respect to US dollar?

## Chapter 2

### EXCHANGE RATE DETERMINATION

If you'd know the value of money,  
go and borrow some.

*Benjamin Franklin (1706–1790)*

American politician, diplomat,  
physicist, inventor

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

## Purposes of studying

- Explain the concept of static equilibrium rate at a currency exchange.
- Construct the supply and demand curves in the currency market.
- Formulate the basic ideas of dynamic equilibrium in the matured and emerging currency markets.
- Identify the basic factors that influence upon exchange rates in the “free float” system.
- Represent the link between exchange rate and a financial authorities policy and reputation of the country.
- Consider the financial reporting of country on the international economic operations in a context of the demand — supply on a foreign currency.
- Explain differences and interrelations between balance of payment and net international investment position, and also with macroeconomic indicators of the country.

Key element of international monetary system is the exchange rate. The establishing of exchange rate equilibrium in “floating” regime, determinants of its fluctuations, the balance of payments, the international investment position of the country in a context of a supply of and demand for currency are considered in this theme.

### 2.1. Establishing of equilibrium exchange rate

The currency (exchange) rate is the price of one country’s monetary unit, expressed in units of another one, or the ratio, on which one currency can be converted in another. Equilibrium exchange rate equalizes the supply and demand in the foreign exchange markets. The description of “floating rate” exchange rate equilibrium could be considered as a special case of equilibrium price in competitive markets, which is known from

out the disciplines “Economics” (“Economics theory”) or “Microeconomics”.

### **2.1.1. Demand for and supply of the foreign currency**

Demand for foreign currency depends on demand of residents — importers of foreign goods, services, and on demand of residents-investors on foreign assets<sup>27</sup>. For example, US importer should buy British pounds to pay for goods from England, while British importer should buy dollars to pay for American goods. If the US import from Great Britain exceeds American export to the Great Britain, then demand for pounds will be higher than demand for dollars, that will rise pound’s price in dollar terms. The reason for it is trade balance deficit of the USA with Great Britain.

Dollar value of pound growth, e. g. from 1.5 to 1.75\$ per £, will lead to appreciation of British goods in the USA. Say, box of candies, costing 1J in England, will increase in price in the USA from 1.5 to 1.75 dollars. Contrary, American goods become cheaper in Great Britain. For example, Englishmen for 1J can buy goods costing 1.75\$, whereas before price rise of pound they could buy goods costing only 1.5\$. This change in price will reduce British export and increase import, decreasing exchange rate of pound, because Americans will buy less pounds to pay for the British goods.

In Russia, during the period of “currency corridor”, when dollar rate increased at a low pace (figures and diagrams are shown in the chapter 1), essentially lagging behind rates of Russian inflation, demand for dollar for import’s purposes was highly intensive.

Changes in demand for foreign currency depend on capital movement. Let us suppose, interest rates in Great Britain are higher than in the USA. Then, American banks, corporations, individuals should buy pounds for dollars to acquire the assets in Great Britain. It will lead to increase of pound rate and also to reduction of interest rates in Great Britain.

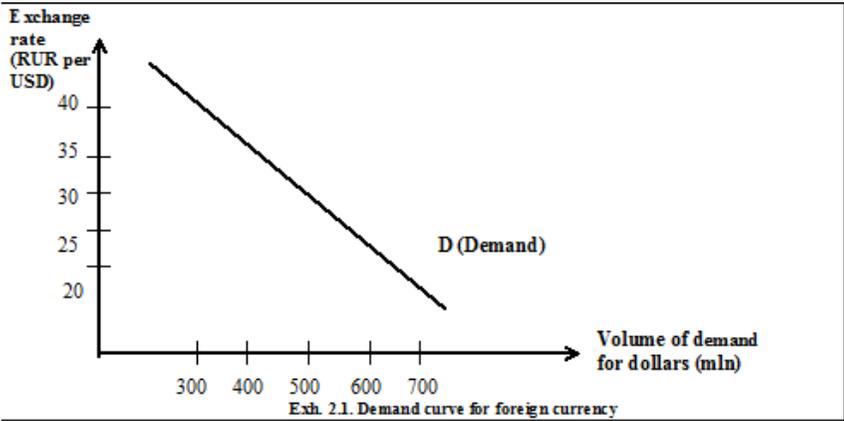
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<sup>27</sup> Resident is a legal entity, registered according to local legislation, or a natural person, constantly living in given territory.

If interest rates were initially higher, because of governmental aspiration to reduce inflation, then the international currency flows will neutralize such efforts. Thus, in the summer of 1981, Federal Reserve System of the USA, trying to stop inflation, has pushed interest rates up to record-breaking high level. It, in turn, has led to capital inflow to the USA from Europe. The Europe suffered at that time from rigid recession in production and wished to support low interest rates to stimulate the investments, but the policy of the USA embarrassed it.

In Russia, in conditions of restrictions on export of the capital, demand for a foreign currency is determined, in first line, by 2 factors:

- a) the demand of the population, holding its savings in dollars;
- b) the demand of the business, banks for legitimate (semi-legitimate) export of capital for reasons of its preservation (“capital flight”)<sup>28</sup>.

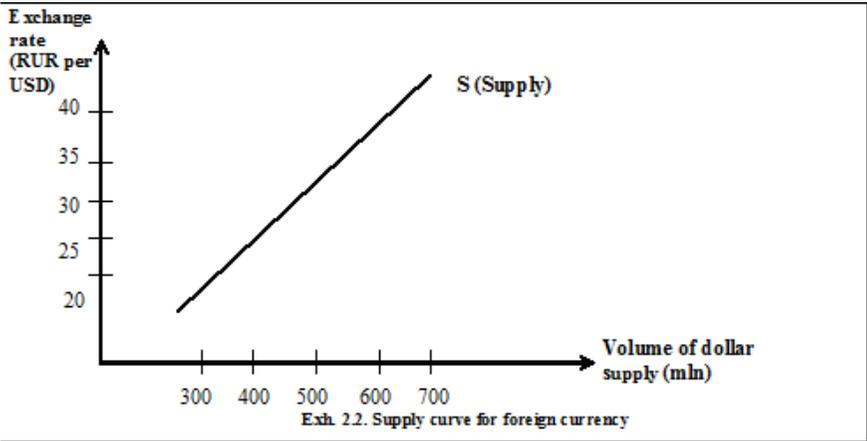


Demand curve for currency (Exh. 2.1) has a negative (downward) slope, being in inverse relation to its exchange rate. The higher rate, the less number of people wishing to buy cur-

<sup>28</sup> The government constantly tries to struggle with this phenomenon, but with variable success.

rency, when other things being equal<sup>29</sup>. Thus, at the rate of 25 rub. per doll., demand (D) is 600 mln dollars, and at the rate of 30 rub. per doll. — 500 mln dollars.

Thus, in 1981–1985 growth of dollar exchange rate and, accordingly, competitiveness of non-American goods has increased the supply of dollars on the currency markets from non-residents of the USA, because the Japanese export to the USA almost completely (and European — partially) is invoiced in dollars. In 1999–2001, after a currency default in Russia, which has given the advantages to the Russian exporters, the growth of currency revenue, and also stringent measures of currency control have sharply raised the supply of foreign currency in domestic market, having strengthened the ruble.



Also in the first half of 1980s, when interest rates in the American market have reached historical sky-rocket peaks, and non-residents of the USA placed savings in assets of this coun-

<sup>29</sup> This condition assumes, that influence of other factors (during our analysis) on the investigated phenomenon (in this case, demand for currency) remains constant. The assumption of other equal conditions is the abstraction, allowing study the influence of just one chosen factor on the result. It is clear, that in practice “other conditions” do not remain constant, however, the assumption of their invariance is the valuable analytical tool, a good starting point for studying this or that process.

try, the supply of the European and Asian currencies for purchasing dollars in the forex markets has strengthened. Russian residents also often place savings and incomes in dollars, supplying rubles in the domestic currency market.

*Supply curve* of currency (Exh. 2.2) has a positive (upward) slope, as the offer (supply) directly depends on the price. The higher exchange rate, the more people wish to sell it, and vice versa. So, at the rate of 25 rub per dol., supply is 400 mln dol.; and at the rate of 30 rub per dol. — 500 mln dol.

### 2.1.2. Equilibrium exchange rate

The equilibrium exchange rate equalizes supply and demand in the foreign exchange market<sup>30</sup>. Let's illustrate this mechanism on an example of dollar-ruble rate. At the rate of 40 rub. per dol., demand in the Russian market is submitted for 300 million dollars at the supply of 700 million dollars (Table 2.1). Excessive supply of 400 million dollars presses on a rate downwardly, as holders of a foreign currency sell it under lower price for receiving rubles for the operational purposes (for the payments to the Russian suppliers, payments of taxes, salaries, repayments of ruble credits to the banks).

*Table 2.1*

**Forming of an equilibrium exchange rate**

<b>Situations</b>	<b>Exchange rate</b>	<b>Demand for foreign currency</b>	<b>Supply of foreign currency</b>	<b>Movement of exchange rate</b>
<i>A</i>	40	300	700	<b>Down</b>
<i>B</i>	35	400	600	<b>Down</b>
<i>C</i>	30	500	500	—
<i>D</i>	25	600	400	<b>Up</b>
<i>E</i>	20	700	300	<b>Up</b>

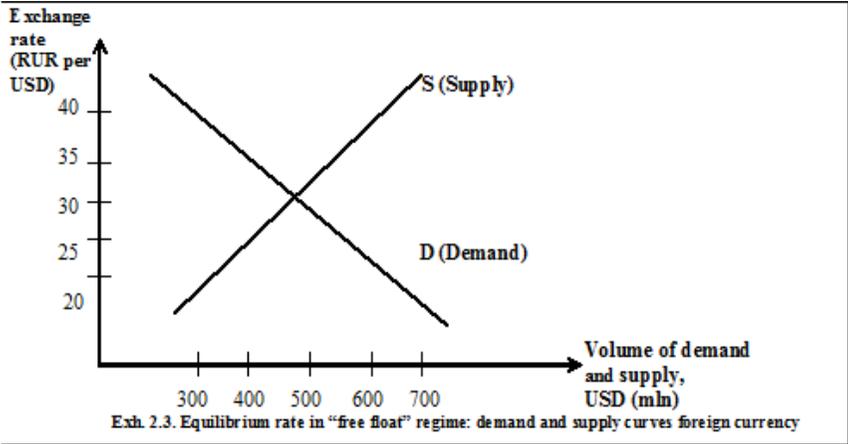
At the rate of 25 rub per dol., demand will exceed supply (for 200 mln dollars), upwardly influencing the rate, because

<sup>30</sup> Equilibrium rate for exchange the foreign currency for domestic is a special case of the equilibrium price, known from course of “Microeconomics”.

buyers begin to acquire dollars at the higher rate (for import payments, repayments of dollar credits to the banks). At the rate of 30 rub per dol., demand and supply become equal, and the rate do not experience neither upward (bullish), nor downward (bearish) pressure from buyers and sellers of currency (Exh. 2.3).

**2.1.3. Dynamic equilibrium in forex market:  
medium-term cycles of dollar rate**

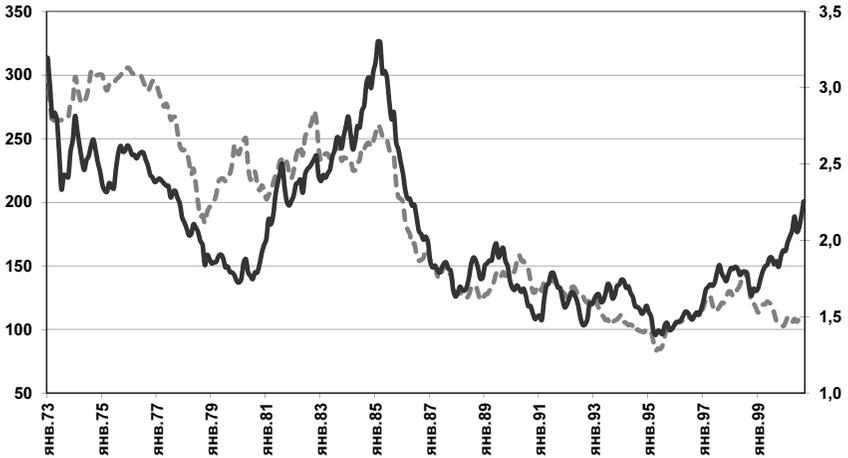
New levels of equilibrium are formed as a result of shifts of supply and demand curves. The diagram of their changes represents the movement of exchange rate in time. Let’s illustrate dynamic characteristics of equilibrium in the forex market.



After transition to “free float” (March, 1973), the movement of leading currencies has got wave-like behavior (Exh. 2.4). Thus, the first expressed medium-term cycle for leading currencies has fallen on 1975–1985<sup>31</sup>:

<sup>31</sup> In 1973–1974, the dollar temporary (“counter-wavy”) has increased in connection with a first “petro-shock” in September 1973, skyrocketed the reference price of oil barrel six times (approximately from 1.5 to 10 dollars), and oil is traditionally billed (that is to invoice) in US dollars. It stipulated an additional temporary demand for dollars.

- in 1975–1980, dollar exchange rate (against Deutsche mark, the Japanese yen) has fallen from 3.3 (on monthly average basis) to 1.7 marks per dollar (by 48%) and from 300 to 185 yens per dollar (by 38%);
- since the middle of 1980s and particularly to the beginning of 1985, it has increased up to 3.4 marks (by 100%) and up to 260 yens per dollar (by 41%).



*Exh. 2.4.* Dollar rate against mark (right scale) and against yen (left scale), 1973–2000

In the beginning of 1985, dollar was overvalued by 30–40%, concerning purchasing power parity (or the real exchange rate, i. e. nominal one, adjusted for inflationary differential between the countries) as a result of optimistic expectations of the policy “reaganomics” to be continue, which has been suppressing the inflation and pushing economic growth. It imbalanced the commodity prices, international trade (led to extraordinary current account balance deficit in the USA), deformed assets yield in different currencies, international investments (led also to extraordinary “capital flight” from over the globe to the USA).

In September 1985, central bank executives of 10 leading countries (“Group 10”) have concluded “Plaza Agreement” (named after the place of this meeting — Plaza hotel in New-York City), having begun the interventions for reducing the dollar rate (up to the “natural” level, which do not stir up trade and investments). To the beginning of 1987, the dollar costs 1.6 marks, 130 yens (having fell by 53% and accordingly 50%), showing the effect of “overshooting”. Therefore, the dollar exchange rate was underestimated (on 15-20%), that also deformed trading and investment flows, undermining competitiveness of Japan, Europe, having caused the capital outflow from the USA.

The dollar rate putting into a new equilibrium level became necessary. With this purpose, central bank executives have concluded “*The Louvre accord*” (on February 22, 1987). As a result, the dollar has become stronger a little bit (not having reached the overestimated heights of the middle 1980s).

In 1990s, the rate of the American currency expirieced two waves in medium run:

- has decreased from 1.75 in 1991 to 1.35 in 1995 against mark and from 160 in 1990 to 80 in 1995 against yen (that is for 23% and 50% accordingly);
- has increased to 2.26 marks in September of 2000 and to 145 yens in August 1998 (for 67 and 81% accordingly).

The beginning of 1990s is reunification of Germany, connected with the accompanying inflation, that stipulated smaller cyclic strengthening of mark (+30% from 0.57 to 0.74 dollars per mark) compared with strengthening of yen against dollar (+100 from 0.00625 to 0.0125 dollars per 1 yen).

The second cyclical wave of a dollar exchange rate in 1990s against mark has been accelerated by speed and prolonged in time (compared with yen) due to weakening of mark, connected with financial reform in Europe (technical, psychological difficulties of transition to the common currency), and also with the war in the Europe in 1999 (NATO bombing of Serbia, pollution of Danube, deterioration of relations with Russia).

Since 1987, medium-term fluctuations amplitude of a dollar exchange rate was considerably narrowed: it kept in a diapason

from 1.5 to 2 marks per 1 dollar and from 100 to 150 yens per 1 dollar.

It has allowed some analysts to speak, that the governments in the Louvre have agreed about unofficial “corridor” for dollar within the limits of  $\pm 15\%$  round the 1.75 marks and  $\pm 20\%$  round the 125 yens. Authorities deny absolutely the presence of such arrangement.

The changes of equilibrium rate in dynamics are defined by its determinants (or by the factors, shifting supply and demand curves).

## 2.2. Determinants of exchange rate in currency markets

Exchange rates are subjected to influence by many factors. Among them, 5 basic (relatively independent) determinants usually are distinguished:

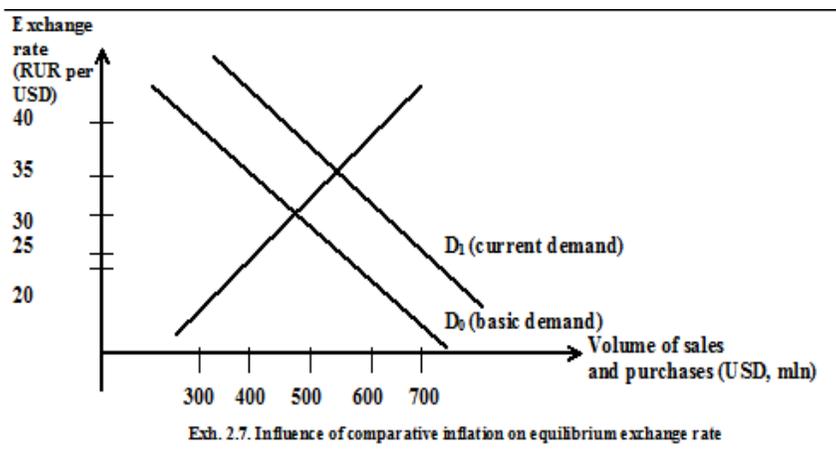
- dynamics of comparative good’s prices in different currencies;
- comparative interest rates;
- comparative returns (growth rates of real national product);
- reputation of authorities (central bank);
- market participants’ expectations.

Effect of the *first* determinant relates to function of money as medium of payment (circulation). Value of money in this function is stipulated by their purchasing power relatively goods, services, and it changes inversely proportionately to price growth (inflation). Effect of *second* and *third* determinants is derived from function of money as store of value. Worth of money in this function refers to return on investments in financial (physical) assets. Ultimately, *fourth* and *fifth* determinants are based on efficient market hypothesis, in which current prices reflect expectations of participants comparatively the returns on assets in certain currency, and, in first line, anticipations concerning monetary policy, linked with central bank reputation of the given country.

### 2.2.1. Comparative inflation and exchange rate

If inflation in some economy is higher, than abroad, consequently domestic merchandise (at the same exchange rate) become dearer than foreign goods. It increases the demand for the last ones (and simultaneously — on foreign currency). Demand curve shifts to the right and upward (in other words, to north-east), raising equilibrium rate of exchange. For example, at expected inflation in Russia 16.7%, and in USA — zero, then demand curve for dollars in Russian market ( $D$ ) moves, if other things being constant, from initial state ( $D_0$ ) to position  $D_1$  (Exh. 2.7).

As a result, equilibrium rate heightens to 35 rubles per dollar. The equilibrium volume of market ( $Q_1^e$ ) counts now 600 mln dol. (instead the initial 500 mln dol.). In general, exchange rate of currency relates to inverse dependence from comparative inflation in some country — the lower it, the higher comparative purchasing power of currency (and its exchange rate), and vice verse.



**Case of dollar-mark rate.** As the Table 2.2 represents, inflation in Germany in 1973–1995 increased by 89%, but in USA — by 242%.

Table 2.2

## Consumer price indexes, Germany and USA, 1973–2000

Years	Inflation indexes (1995 = 100)		Nominal exchange rate	Real exchange rate	Overvaluation (+), undervaluation (-) of dollar
	Germany	USA	Mark per dollar	Mark per dollar	
<b>1973</b>	<b>53.00</b>	<b>29.20</b>	<b>2.6577</b>	<b>2.6577</b>	<b>0</b>
<b>1975</b>	62.90	35.30	2.6217	2.6091	+0.5%
<b>1980</b>	76.40	54.10	1.9700	2.0678	-4.7%
<b>1984</b>	<b>91.10</b>	<b>68.20</b>	<b>3.1044</b>	<b>1.9559</b>	+58.7%
<b>1987</b>	88.70	74.60	1.6335	1.7410	-6.2%
<b>1990</b>	94.20	85.70	1.4982	1.6095	-6.9%
<b>1995</b>	<b>100.00</b>	<b>100.00</b>	<b>1.4403</b>	<b>1.4642</b>	-1.6%
<b>1998</b>	100.30	107.00	1.6689	1.3726	+21.6%

Consequently, mark lost 47% of its purchasing power against the standard basket of goods and services (1 mark in 1995 was estimated only as 53 pfennings of 1973), and dollar — 71% (1 dollar in 1995 was estimated only as 29 cents of 1973). To support the equilibrium in forex market, dollar should be cheaper relatively Deutsche mark by 45%:

$$100\% - \frac{29}{53} \cdot 100\% = 100\% - 55\% = 45\%.$$

Thus, if exchange rate in 1973 compiled 2.66 mark per dollar (and if consider this rate as the equilibrium one), then equilibrium level in 1995 should be equal 1.46 mark per dollar. Actual rate was 1.44 mark per dollar, i. e. dollar looked like slightly undervalued against mark (for 1%). It means, that market participants could expect some appreciation of American currency.

In long term retrospective, the link between comparative inflation in different countries and exchange rates of currencies existed (Table 2.3). Thus, mark in the period of Bretton-Woods system was revalued several times. The first after-war currency par of mark (May 1949) compiled 3.33 mark per dollar; “corrective” devaluation (to 4.2 mark per dollar) was rea-

lized in September of that year. In 1961 (in 2.5 years after introducing the full convertibility of mark), its first revaluation (to 4 mark per dollar) was accomplished; in 1969 — the second one (to 3.66), in December 1971 — the third one (to 3.2225 mark per dollar). In the period of “floating”, mark appreciated against dollar. At the same time, the strength of mark, unconditionally, was linked with relatively lower inflation in FRG. Vice versa, currencies of France, Great Britain, Italy (where inflation was cumulatively the whole period higher 3–5 times higher, than in Germany) were devalued several times in framework of fixed rates regime and then decreased in tendency against dollar.

*Table 2.3*

**Consumer price indices and exchange rates  
in industrially developed countries: after-war period  
(before Euro launching)**

<b>Countries</b>	<b>1950</b>	<b>1995</b>	<b>Loss of purchasing power (%)</b>
<b>Inflation growth: Consumer price indices (CPI)</b>			
France	100	1294	92.3
Germany	100	388	74.2
Great Britain	100	1617	93.8
Italy	100	2163	95.4
<b>Exchange rates (period average)</b>			
			<b>Changes of currency rates, %</b>
USA	100	622	83.9
Franc per dollar	3.5	4.9915	43%
Mark per dollar	4.2	1.4331	–66%
Dollar per pound	2.8	1.5785	–44%
Lira per dollar	624.6	1628.9	161%

*Source:* International Financial Statistics, Yearbook 1980, 2002.

**Case of dollar-ruble rate (1990s)**

In 1994 (before the currency corridor introducing in Russia), dollar is quoted as 3.55 rubles (in contemporary denomination, established in January 15, 1998), but actually nominal rate counted 3550. In 1994–1997, inflation in Russia compiled

394%, depreciated ruble against goods and services for 80% (in other words, 1 ruble of 1997 was the equivalent to 20 copecks of 1994), at the same time, corresponding figures for the USA were 8.2%, 7.6% (92 cents). Consequently, dollar should be estimated as 16.33 rubles ( $3.55 \times 92/20$ ). However, due to supporting of currency corridor by Russian authorities, actually exchange rate counted 5.96 ruble per dollar (many times overvaluing ruble in currency market — 17 instead of 6 cents) (Table 2.4).

Table 2.4

**Exchange rate dollar-ruble and inflation: period of target zone  
(in Russian terms — “currency corridor”)**

Years	Inflation indices: <i>CPI</i> (1995 = 100)		Nominal exchange rates	Real exchange rate
	Russia	USA		
			<b>Rubles per dollar</b>	
<b>1994</b>	<b>33.62</b>	<b>97.30</b>	<b>3.55</b>	<b>3.55</b>
<b>1995</b>	100.00	100.00	4.64	10.27
<b>1996</b>	147.54	102.90	5.56	
<b>1997</b>	<b>169.11</b>	<b>105.30</b>	<b>5.96</b>	<b>15.62</b>
<b>1998</b>	<b>216.19</b>	<b>107.00</b>	<b>20.65</b>	<b>20.76</b>

*Source:* International Financial Statistics, Yearbook 2002.

Such events decreased the prices of imported goods in Russia, making unprofitable the domestic production, and increased the demand for dollars to purchase foreign merchandise, that stipulated the upward pressure on exchange rate of American currency. Thus, Central Bank of RF have had raise several times the average level of corridor’s rate — from 4.6 in July 1995 to 6.2 rubles per dollar in November 1997 (for 35%). However, these adjustments were obviously insufficient. Only in the fall of 1998 after financial collapse, the equilibrium in currency market in Russia was restored — actual quotations counted 20.65 ruble per dollar, corresponding to equilibrium rate (in accordance with comparative inflation) — 20.76. The undervaluation of dollar compiled only 0.5% then.

### 2.2.2. Comparative interest rates and exchange rates

In function of medium of investment (saving), the value of money unit relates to return on assets, denominated in this currency. The basic level of profitability is reflected in interest rates, that can be divided into nominal (quoted, actual,  $i_n$ ) and real (inflation-adjusted, or in absence of inflation,  $i_r$ ) interests. First equal the second one plus *inflation expectation*, i. e. anticipated inflation rate ( $\Delta p^a$ ), that can be represented in approximation as follows:

$$i_n \cong i_r + \Delta p^a.$$

If annual real rate of return in Great Britain amounts 3%, and expected inflation rate compiles 6% per annum, then nominal interest rate tends to be equal 9% on annual basis:

$$i_n \cong 0.03 + 0.06 = 0.09, \text{ or } 9\%.$$

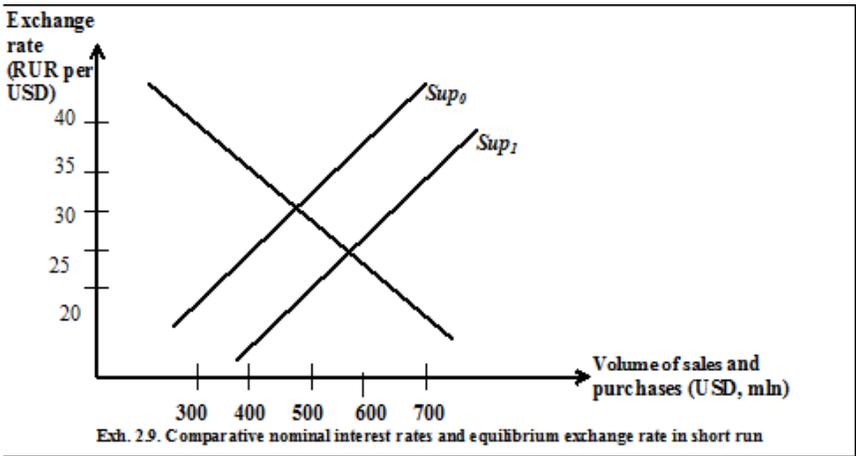
The expression for real interest (at approximation) we should write down as:

$$i_r \cong i_n - \Delta p^a.$$

In short run, the high nominal rate in some country (relatively abroad), with other things being equal, raises demand for assets, denominated in its currency, increasing the supply of a foreign currency (shifting a supply curve of currency to the right downwards from position  $Sup_0$  to position  $Sup_1$ ). It lowers the equilibrium rate — from 30 to 25 rubles for dollar (Exh. 2.5), i. e. strengthens ruble from 3.33 to 4 cents (by 20%).

In long run, on the contrary, the high nominal rate in some country testifies to the higher inflationary expectations relatively abroad, and consequently, to lower purchasing power of national currency, raising demand for a foreign currency and moving its equilibrium rate upwards (as it has been described above while considering influence of comparative inflation on the exchange rate).

The higher real interest in some country testifies to the higher return on investments in it, increasing demand for assets in its currency, and consequently; demand for the last one and its exchange rate. At the same time, it is important to take into



account, that the country risk premium is included in higher real rate of return (for example, in the emerging market):

$$i_r^{EM} \cong i_r^{DC} + CRP^{EM},$$

where  $i_n^{EM}$  — the real interest rate in emerging market;  $i_n^{DC}$  — the real interest rate in developed country;  $CRP^{EM}$  — country risk premium in emerging market.

Suppose, in emerging market of Russia in 1998, nominal interest rates compiled on interbank loans of 50.6%, clientele credits — 41.8, and the inflation rate — 27.7%. Hence, the real interest was equal in Russian interbank market 18%, on clientele one — 11%. In matured market of the USA, corresponding nominal interests in the same year were equal 5.4, 8.4%, and rate of inflation — 1.6%. Thus, real rates in the USA have made 3.7 and 6.7%. Excess of Russian real interests above the US real interests was equal 14 and 4%. These differences meant the premiums on the greater country risk on investments in Russia. If the differential of real rates of return during some periods is less, than this premium, hence, the currency of such country will not become stronger, but depreciate in the currency markets (the example is Russian default of 1998).

### 2.2.3. Comparative incomes (economic growth rates) and exchange rate

The higher economic growth (measured by growth rate of gross national product — *GNP*) in a certain country, the higher growth of incomes in it, comparing overseas. In *short run*, its inhabitants offer the higher demand for a foreign currency to travel abroad, purchase the import. Additionally, the demand for a foreign currency grows from the side of business (for import of the merchandise, capital export, business trips). Thus, in short run, the exchange rate fluctuates in inverse dependence to the growth of comparative incomes.

#### Case 2.1. The euro grows with higher rates

“Yesterday’s closing of the trading session in New York has removed euro on a new level in 95.17 cents. It is highest rate of common European currency to US dollar for last half-year. The reason became publication of official economic report, which has shown the reducing of industrial production in the USA”, — informed agency Bloomberg.

Experts anticipate the further dollar depreciation against euro, as slowing down of economic growth rates in the USA will push investors to place funds in the assets, denominated in euro.

*Vedomosti. 2001. January 4*

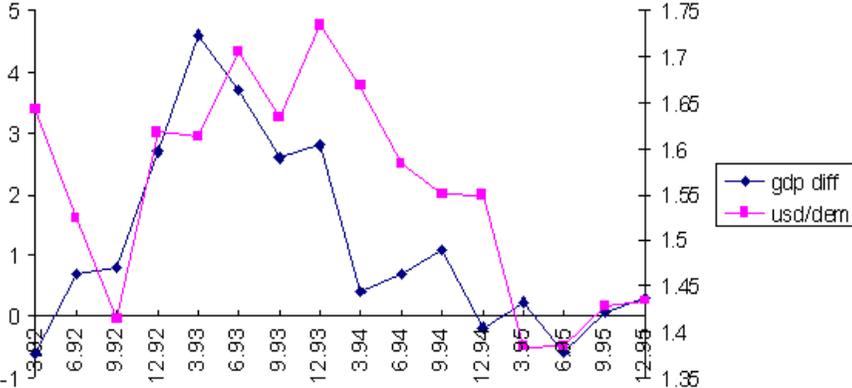
In the *long term*, direct dependence between exchange rate and comparative returns (exactly, real ones) exits, as the increased income in a certain country makes its assets more attractive to non-residents, increasing demand for currency of this country and its exchange rate<sup>32</sup>. Such connection is typical frequently and for the short-term periods. The mentioned below material testifies to the cheapening of dollar in response to official announce about decreasing of production in the USA.

In Exh. 2.6, the US and German *GDP* dynamics and changes of exchange rate dollar/mark are represented. It is vi-

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<sup>32</sup> In long run, real GNP growth rate and the level of real interest were greatly close in tendency, as many empirical researches demonstrate.

sible, that these economic parameters are closely interconnected, and acceleration in the USA in comparison with Germany (in Exhibit — the positive difference) led to strengthening of dollar positions, and vice versa. Exchange rate clearly enough corresponded to comparative dynamics of gross domestic products of the previous quarter.



*Exh. 2.6.* Comparative dynamics of US and German GDP and exchange rate, 1992–1995 (before Euro launching)

**Oil price and ruble exchange rate.** One of leading factors of income formations in the Russian economy refers to the proceeds from oil sales abroad, which forms the most part of the dollar supply in the internal currency market of Russia. It is directly connected to a world price level for “black gold”. Accordingly, dynamics of last one should influence ruble exchange rate seriously. Thus, among well-known “petrocurrencies”, it is necessary to designate British pound and Norwegian crone, which became such in the end of 1970<sup>th</sup>, after the beginning of oil wells exploitation in Northern Sea. In 1960<sup>th</sup> and after the beginning of “floating” in 1973, the pound was regarded as a weak currency concerning mark, the Swiss franc — it was devaluated several times, and then its rate went down (Table 2.5).

Table 2.5

**British pound (*GBP*) rate against various currencies:  
historical case**

<b>Years</b>	<b>Mark per GBP</b>	<b>Yen per GBP</b>	<b>Swiss franc per GBP</b>
<b>1972</b>	7.5186	709.17	8.8608
<b>1973</b>	6.2789	650.57	7.5355
<b>1974</b>	5.6589	706.73	5.9652
<b>1975</b>	5.3068	617.49	5.3014
<b>1976</b>	4.0217	498.51	4.1716
<b>1977</b>	4.0117	457.4	3.812
<b>1978</b>	3.7195	395.89	3.2959
<b>1979</b>	3.8511	533.07	3.5139
<b>1980</b>	4.672	484.16	4.1997
<b>1972–78</b>	–50.5%	–44.2%	–62.8%
<b>1978–80</b>	25.6%	22.3%	27.4%

Apparently from the Table, the cross-rate of pound against mark, yen, the Swiss franc in 1972–1978 has decreased by 45–60%, and in 1978–1980 has increased by 20–30%.

Obviously, the facts of dependence of a ruble exchange rate and sizes of export sales in Russia, directly connected with receipts for oil and its world price, are widely recognized. However, impressive fluctuations of oil prices represent a prerequisite risk factor for ruble exchange rate dynamics. For instance, according to forecasts of the Russian government in 2000, ruble could increase one-and-half times. It would take place within the 10 years, and just increased volatility of oil prices could render the market.

Now we shall consider the reputation of central bank as a factor of the exchange rate.

#### **2.2.4. Central bank's reputation**

In general, if market participants trust, that financial authorities is strong enough to stabilize monetary circulation, then it estimates currency of this country as having prospects, because strong monetary policy cuts down the inflation, creates stable conditions for economic growth, attracting foreign capital

and strengthening domestic currency. If there is no assurance of that kind, the currency of this country is estimated as weak.

For example, Central bank of FRG (“*Bundesbank*”) was associated with restrictive monetary policy, that was determined by German “anti-inflationary mentality”, existing after two hyper-inflations in XX century (1923 year, after World War II at the end of 1940s). Thus, in 1923 hyper-inflation mostly was stipulated by circulation of 500 quintillions marks (this ciphers consists of 20 nulls!). During the monetary reform, in 1924 one new Reich-mark was exchanging for 1 billion old Reich-marks. In October 1948, 6.5 of new Deutsche marks were exchanging for 100 old Reich-marks. Then, in the 2<sup>nd</sup> half of XX century (excluding several years after German reunification), Deutschemark was estimated as strong currency. It was revalued in 1961 by 5%, in 1969 by 9.3% and in December 1973 by 13.6%.

In 1972–1979 (Table 2.6) mark appreciated to the US dollar by 85%, then depreciated by 45%, in 1985–1987 appreciated twice, then it was fluctuating in the diapason of 0.55–0.7 dollars per mark. Just in euro launching year (1999) mark’s rate depreciation was relatively considerable.

Table 2.6

**Dynamics of exchange rate dollar/mark, 1972–1999**

Years	Dollar per mark						
1972	0.3123	1979	0.5775	1986	0.5153	1993	0.5793
1973	0.3700	1980	0.5105	1987	0.6309	1994	0.6457
1974	0.4150	1981	0.4435	1988	0.5617	1995	0.6976
1975	0.3813	1982	0.4208	1989	0.5889	1996	0.6432
1976	0.4233	1983	0.3671	1990	0.6685	1997	0.5580
1977	0.4751	1984	0.3177	1991	0.6596	1998	0.5977
1978	0.5470	1985	0.4063	1992	0.6196	1999	0.5170
1972–1979	84.9%	1979–1984	–45.0%	1984–1987	98.6%	1987–1998	–18.0%

On the contrary, Bank of France policy was considered as *stimulating* for economic growth, because Bank of France

can give up currency stability for the sake of social goals — like employment maintenance, pension indexation. Hence, frank was estimated as more weak currency, than mark. In this way, in 1970–1990s frank depreciated half times against mark. At the same time, frank rate has been appreciating only over 7 various years within this period from 0.1 to 1.5% (Table 2.7).

*Table 2.7*

**Dynamics of exchange rate mark / French franc, 1972–1998**

Years	DM/ FRF	Years	DM/ FRF	Years	DM/ FRF	Years	DM/ FRF
<b>1972</b>	0.6247	<b>1979</b>	0.4308	<b>1986</b>	0.3006	<b>1993</b>	0.2928
<b>1973</b>	0.5741	<b>1980</b>	<b>0.4337</b>	<b>1987</b>	0.2969	<b>1994</b>	0.2897
<b>1974</b>	0.5422	<b>1981</b>	0.3923	<b>1988</b>	0.2937	<b>1995</b>	<b>0.2926</b>
<b>1975</b>	0.5846	<b>1982</b>	0.3534	<b>1989</b>	0.2933	<b>1996</b>	<b>0.2969</b>
<b>1976</b>	0.4753	<b>1983</b>	0.3263	<b>1990</b>	<b>0.2935</b>	<b>1997</b>	<b>0.2993</b>
<b>1977</b>	0.4473	<b>1984</b>	<b>0.3283</b>	<b>1991</b>	0.2928	<b>1998</b>	0.2976
<b>1978</b>	0.4373	<b>1985</b>	0.3256	<b>1992</b>	<b>0.2931</b>		
<b>1972–1998</b>				–52.4%			
<b>1979– 1980</b>	0.7%	<b>1989– 1990</b>	0.1%	<b>1994– 1995</b>	1.0%	<b>1996– 1997</b>	0.8%
<b>1983– 1984</b>	0.6%	<b>1991– 1992</b>	0.1%	<b>1995– 1996</b>	1.5%		

Market assessments of monetary policy depend on the Chair of Central Bank reputation. Thus, in 1987 resignation of the US FRS Chair Paul Volker, known as “inflation fighter”, caused historical decline of the US dollar (against yen) in a day — by 2.6%. Moreover, it happened because of new FRS Chair’s policy temporary uncertainty. However, Alan Greenspen (successor of Volker P.) demonstrated his competence and performed a strict monetary policy<sup>33</sup>.

**Bank of Russia Chairs and ruble exchange rate.** In the history of Russian reforms, there was observed the distinct enough

<sup>33</sup> For example, the journal “Expert” several years published the advertisement ([www.web-invest.ru](http://www.web-invest.ru)) with the picture of Greenspen and titles: “He is else only saying, but You are already acting”.

link of ruble rate with Central Bank chair's reputation. Thus, in the first half of 1992, the policy of professor *Matjukhin G. G.* (the first Chair and "father-founder" of CBR), who considered to be an "inflation fighter", appreciated ruble twice, depreciating dollar from the level of 230 rubles (21.01.1992) to 115 rubles (11.06.1992)<sup>34</sup>.

Since the middle of 1992, a new team of *CBR* managers, headed by *Geraschenko V. V.* (former head of the USSR "*Gosbank*", substitute of Central Bank), who had a reputation of traditional Soviet conservator — supporter of unprofitable governmental sector funding (with simultaneous effects of deficit financing, money emission, inflation), "dropped" ruble rate by 5 to 450 RUR/USD in November. Then, dollar appreciated in 7 times (to 2833 rubles on 7.10.1994), i. e. ruble devaluation was 84% ( $450/2833 - 1 = 0.843$ ). On "the black Tuesday" (12.10.1994) dollar jumped to 3926 rubles (40% per day!). According to magazine "*Euro-money*" (one of the authoritative financial journal), Bank of Russia was titled "the worst central bank all over the globe" in 1993–1994.

*Dubin S. K.* got an appointment after "Black Tuesday" of October 12, 1994. He was ex-chairman of "Gasprombank" and was known as lobbyist of raw material exporters' interests, interested in undervalued ruble. Assuming the position of Central Bank Chair, market estimated ruble future trends as being weak and appreciated dollar by 70% per half a year — from 2994 (14.10.1994) to 5130 RUR/USD (5.05.1995).

In the summer of 1995, Russian government (due to IMF urgent request) implemented "currency corridor", which stopped ruble depreciation artificially. Short-term consequences of that operation were the young forward looking market crash, first banking "system" crisis of liquidity (August 1995). Medium-term consequences were represented by the overvaluation of ruble, competitiveness reducing of

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<sup>34</sup> June 8, 1992 CBR began weekly to declare the exchange rate of ruble against foreign currency. Besides official rate, market rate also existed, fixed as a result of trading sessions in MICEX (Moscow interbank currency exchange).

Russian production, currency crisis, and external debt default (August 1998).

*Geraschenko V. V.* new arrival in 1998 calmed market after “black Monday” of 17.08.1998. At that time, Geraschenko V. V. was considered already as conservator in marker sense — supporter of stable ruble. Indeed, dollar rate after the chaos in autumn 1998 and sharply upward trend (from 6.27 on 14.08.1998 to 20.65 on 31.12.1998, i. e. by 230%), ruble became stable since the spring of 1999. In 2000–2008 (before the global financial crisis), ruble started to strengthen against dollar. Since the summer of 2009 (after the global crisis), ruble appreciated since 37 to 30 per dollar. Further, it was relatively stable — around the level of 30.

Events in August–September of 1998 in Russia also illustrated links between rate of exchange and government reputation. Thus, on 31.09.1998 the State *Duma* (Russian Parliament) rejected *Chernomyrdin V. S.* as a candidature for prime-minister position. Then, dollar in retail market in Petersburg costed 7.9–9.2 rubles (with bid-ask spread 16%). Next Monday (after Chernomyrdin’s 2<sup>nd</sup> rejecting), exchange rate was 16.9–19.4 rubles per dollar, i. e. dollar grew up twice (with annual rate of return around 1000%). In one day (on Wednesday) rate jumped to 20.5–22.5 rubles per dollar. Next day, the president offered *Primakov E. M.* for prime-minister position, and market “accepted” the candidature by dollar depreciation to 13.45–15.8 rubles, i. e. on 32% at once. After confirmation of Primakov’s appointment as prime-minister (in Friday), dollar was quoted for 10–11.7 rubles. Therefore, overall market reaction on positive information is expressed in appreciation of national currency by 98% (from 4.6 to 9.2 cents).

### **2.2.5. Market expectations and exchange rate**

Market participants focus their forecasts for basic determinants of exchange rates (comparable inflation, interest rates, incomes, authority policy), reflecting them in current exchange rate. Thus, public speech of former Russian prime-minister stipulated stopping of ruble appreciation.

#### **Case 2.4. Kasianoff appeared as a bull**

***Decreasing of dollar rate (against ruble) stopped after negative speech of RF prime-minister (SV: former) Michael Kasyanov.***

He declared, that strengthening of ruble did not correspondent to the economic interest of the country. The clerk' announce of such high level should be reflected on the exchange rate. After receiving this information by market, dollar moved upward. In morning session of *MICEX* (Moscow interbank currency exchange), Central bank hampered it, offered \$100 mln for sale at 28.275 RUR per USD. This level was restrictive for sellers ("bears"), however, buyers ("bulls") were glad to purchase dollars at such a low rate. Volume of trading in *MICEX* exceeded sufficient for Russia amount — \$200 mln. After mid-day, traders could sale dollars by 10 copecks dearer, than in the morning, in the market floor — at 28.36–28.38 rubles. At the same time, *CBR* has been selling dollar in interbank market as well.

*CBR* had confidence in receiving the large volumes of revenue from the oil export, and it offered without emotions the large lots of dollar for sales. Increase the discount rate by the *US Fed* (US Central Bank) also added the advantages for dollar. Currently, buying dollars and placing them at 6.5% for non-residents is more beneficial, than invest rubles at 2–3%. Higher difference in profit ratio raises the demand for dollars.

*Delovoy Peterburg. 2000. June 25*

Below, we represent the example of US President announce influence on exchange rate and market expectations in matured economy.

#### **Case 2.3. "Clinton" dollar**

In the beginning of 1994, dollar decreased, while the President Clinton evidenced the public, that American economy was stronger, than ever during the decade, and consequently, the weakness of dollar was an error of market. "Ultimately, the market should response to the economic reality", — declared he. However, his opponents described dollar weakness as a global voting of non-confidence to his policy. They refer to difficulties in Clinton' overseas policy (for instance, Bosnia, Ghaity, North Korea, Somali, Ruanda), to threats of trade sanctions against Japan, China, together with intension of his administration to utilize weak dollar for pushing Japan to open its markets without fear that weakness of dollar can enforce the inflation.

Investors also noticed the White House resistance to interest rates increasing by the Federal Reserve Board for inflation dumping. Else worse,

Clinton administration did not care about decrease of dollar exchange rate. In June 1994, administration did not support dollar, when it fall against yen to record low level within 50 years. Ultimately, investors were not satisfied by internal economic policy of Clinton, directed to the sharp increase of taxes, expenditures and regulation. It is unrealistic, that such a policy could stimulate the savings and investments, decrease governmental expenses, what is necessary for lowering inflation and providing the long-term economic growth in the USA.

In 1995, administration, pushed by Republican majority in Congress, reoriented its economic policy in direction of balanced federal budget and stable dollar. Fast growth together with lower inflation made the USA the magnet for investments of capital. On the contrary, Japan and Europe demonstrated weak growth. As a result, dollar turned in side of appreciation.

*Wall Street Journal. 1994. June 24. P. C1*

For better understanding the short-term rates movements, market's moods are also important to know, besides expectations. Thus, expectations are formed prior to the appearance of economic, statistical, and financial data. If GDP growth in the USA is announced as 7% against 5% of the last quarter, then dollar unessentially goes up. If expectations were at the level of 8% growth, then 7% can disappoint the market, and stimulate negative reaction. Consequently, expectations are replaced by market's moods (prevailing attitudes of investors to the level of exchange rate), which can be a result of attitude toward country's economy and other external factors.

For example, even if GDP growth hasn't reached the forecast's figures, market may not show obvious antipathy, because its attitude is favorable for strong dollar regardless of proportion between actual and anticipated parameters. It can be stipulated by stable assets market in the USA or weak fundamental forecast for contrary currency (from a quotation pair).

Market moods (attitudes) is frequently called its psychology. For example, for the first 2 months of 2000, the strong pressure of sales against dollar influenced euro, despite of improving fundamental parameters in European economy, as long as market psychology was favorable to the US assets because of

constant features of further economic growth without inflation, and also existed moods, that later increasing of interest rate in the USA will be positive for the dollar.

**2.3. Balance of payments, international investment position: context of demand for and supply of currency**

Demand for and supply of currency are reflected in each country’ financial accounting (reporting) for trans-border economic activity. *Interval* statement in this sense is balance of payments (*BOP*), which represents a document, reflecting country’ currency inflows from and outflows to abroad for a certain period (year, 6 or 3 months).

**2.3.1 Balance of payments and level of exchange rate**

Balance of payments considers cash flows through the borders of a country due to export-import of goods, services, transfers, capital flows, credits, and some equalizing items. Thus, current account balance consists of net balances on trade account (exports-imports of merchandise), invisible trade (exports-imports of services), incomes (on investments, credits, labor contracts), one-way transfers (grants, donations, military help). Balance of payments’ generalized structure can be found in Table 2.8.

*Table 2.8*

**Generalized structure of balance of payments**

<b>Exponent</b>	<b>Debit</b>	<b>Credit</b>
Exports of goods		(+)
Imports of goods	(-)	
(1.1.1) Trade balance	-	+
(1.1.2) Balance of services (invisible trade)	-	+
(1.1.3) Balance of transfers (incomes, grants)	-	+

Table 2.8 (continuation)

Exponent	Debit	Credit
(1.1) Current account balance	—	+
Capital transfers (inflows)		(+)
Capital transfers (outflows)	(-)	
(1.2) Capital accounts Balance	—	+
(1) Based balance	—	+
(2) Omissions and errors	—	+
Increase of official reserves	(-)	

Sum of current account balance (*CAB*) and capital balance (*CB*) should be equal theoretically to the change in official reserves:

$$CAB + CB = \Delta OR.$$

But as far as data on trade is given by customs; on money transfers, capital flows — by central bank, ministry of finance; on official reserves — by central bank, then the indicated equation is not frequently observed. “Errors and omissions” (*EO*) represents the equalizing item at consolidation of data of different reporting departments. It also includes cash flows (smuggling, illegal exports of capital); discrepancies on accounting standards of currency translations in different countries, which are not taken into account officially. That is why balance of payments equation in precise form may be written as follows:

$$BOP = CAB + CB + EO = \Delta OR.$$

**Balance of payments of the USA and exchange rate of the US dollar.** Trade balance of the USA was positive in 1946-1971 (with cumulative balance + 101 billion dollars) and reflected the high competitiveness of American economy (Table 2.9). In 1972–1998 its deficit became 2.5 trillion dollars (in average 90 billion dollars a year). It was positive only once — in 1973 (the year of floating exchange rates imposing and end of war in Vietnam). It was stipulated at the beginning of 1970s by overpriced exchange rate of dollar (that made American export noncompetitive), in 1980–1990 — by restructuring the American economy which moved to science-intensive goods producing and traditional goods importing.

Table 2.9

**Current balance of the USA, 1946–1999, million dollars,  
credit (+), debit (–)**

Year	Goods*			Balance of goods and services	Balance of incomes	One-way current transfers**	Current balance
	Export	Import	Trade balance				
1946	11 764	–5067	6697	7316	560	–2991	4885
1971	43 319	–45 579	–2260	–1303	7272	–7402	–1433
1980	224 250	–249750	–25 500	–19 407	30 073	–8349	2317
1990	389 307	–498 337	–109 030	–79 939	28 429	–27 821	–79 332
1998	670 246	–917 178	–246 932	–164 282	–12 205	–44 075	–220 562

\* Excluding military goods.  
\*\* Including transfers of goods and services within the limits of USA military help programs

Capital balance includes short-term and long-term investments (subdividing into governmental and private). Official reserves reflect the changes in balance on foreign accounts of government for a period of time (Table 2.10).

Table 2.10

**Capital balance of the USA, 1946–1999, million dollars**

Year	Capital accounts	Financial accounts							Statistical errors
		Net assets of the USA abroad, [increase (+)/decrease (–)]				Net assets of the foreigners in the USA [increase (+)/decrease (–)]			
		Total	Official reserves*	Other governmental assets	Private assets	Total	Official assets	Other foreign assets	
1946	–	–	–623	–	–	–	–	–	–
1971	–	–11 758	3066	–1884	–12 940	22 970	26 879	–3909	–9779
1980	–	–85 815	–7003	–5162	–73 651	62 612	15 497	47 115	20 886
1990	6579	–81 570	–2158	2317	–81 729	142 028	33 910	108 118	25 454
1998	617	–292 818	–6784	–429	–285 605	502 637	–21 684	524 321	10 126

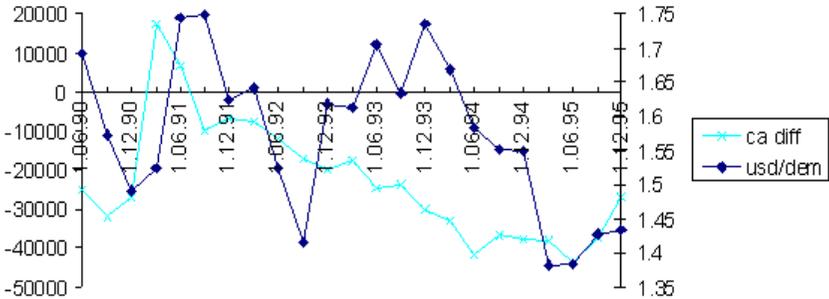
\* Consist of monetary gold, special drawing rights, foreign currency, reserve position of the USA in the International Monetary Fund

Source: Department of Commerce, Bureau of Economic Analysis.

Balance of payments is represented as an account of a country in a foreign bank, on which all its currency inflows and outflows are reflected. For a bank it is a passive account. Then inflows (export revenues, capital import) are credited on this account, and outflows (import payment, capital export) are debited. Items of inflows in balance of payment show the changes of supply and outflows — changes of demand on the foreign currency.

Therefore, exchange rate of currency in countries with balance of payments' deficit is decreasing in tendency, and with positive balance — increasing. Simultaneously, for exchange rate of currency not only actual balance of payments is important (for instance, at the end of a quarter), but the change in comparison with the anticipated one (at the beginning of a quarter). Thereby, the currency of country with balance of payment deficit can rise, and currency of country with positive balance of payments can fall.

On Exh. 2.7 you can see the complex connection between bilateral current balance of the USA and Germany and exchange rate of dollar-DM. Thus, during the first 2 years of explored period they were strongly positively correlated — exchange rate increased with a positive balance in current account. At the end of a period we can see rather inverse negative relationship.



**indigo** — change in balances of payment,  
**blue** — exchange rate, DM for dollar

*Exh. 2.7.* Balance of payments USA and Germany, exchange rate DM/dollar, 1990–1995

Table 2.11

US international transactions, 2000–2010  
[millions of dollars; quarterly data seasonally adjusted; credits (+), debits (-)]

Year	Goods			Services			Balance on goods and services	Income receipts and payments			Unilateral current transfers, net	Balance on current account
	Exports	Imports	Balance on goods	Net military transactions	Net travel and transportation	Other services, net		Receivements	Payments	Balance on income		
2000	784 181	-1 230 413	-446 233	-6610	2714	71 349	-378 780	350 918	-329 864	21 054	-58 645	-416 371
2005	909 016	-1 692 817	-783 801	-15 512	-13 121	98 258	-714 176	535 263	-462 905	72 358	-105 772	-747 590
2009 I	068 499	-1 575 443	-506 944	-13 378	14 951	130 463	-374 908	588 203	-466 783	121 419	-124 943	-378 432

Table 2.11 (continuation)

Year	Capital account transactions, net	Financial account						Statistical discrepancy			
		US-owned assets abroad, excluding financial derivatives [increase / financial outflow (-)]			Foreign-owned assets in the US, excluding financial derivatives [increase / financial inflow (+)]						
		Total	US of- ficial reserve assets	Other US Go- vern- ment assets	US private assets	Total	Foreign official assets		Other foreign assets		
2000	-1	-560 523	-290	-941	-559 292	1 038 224	42 758	995 466	-61 329	...	
2005	13 116	-546 631	14 096	5 539	-566 266	1 247 347	259 268	988 079	33 758	...	
2009	-140	-140 465	-52 256	541 342	-629 552	305 736	450 030	-144 294	50 804	162 497	...

For 2000s, the ciphers of American balance of payments are represented in the Table 2.11.

**Russian balance of payments and internal cash flows.** Main items of Russian balance of payments for the 1st quarter of 2000 are represented in Table 2.12. In the Law on the Central Bank, its participation in elaboration of Russian balance of payments' forecasting is pointed out among its main functions, and its main commitment is to organize compilation of Russian balance of payment.

*Table 2.12*

**Balance of payments, Russia, first quarter 2000, million dollars**

1. Current balance	11 200
1.1. Goods and services	12 072
1.1.1. Goods	13 606
1.1.2. Services	-1534
1.2. Income	-914
1.2.1. Compensation of employees	63
1.2.2. Investment income	-976
1.3. Current transfers	42
2. Capital and financial account	-8894
2.1. Direct investment	188
Abroad	-380
In Russia	- 569
2.2. Portfolio investment	141
2.3. Other investment	-6217
3. Reserve assets	-3102
4. Omissions and errors, net	-796

Balance of payments is closely related to internal cash flows of a country through the basic macroeconomic equilibrium between expenses and incomes:

$$I + G + M = S + T + X,$$

where  $I$  — domestic investment expenditures of private residents;  $G$  — government expenditures;  $M$  — expenditures for the foreign-economic activity;  $S$  — savings;  $T$  — income of government (taxes);  $X$  — incomes from the foreign economic activity.

Net cash flows for the foreign economic activity can be expressed through the macroeconomic aggregates as follows:

$$(X - M) = (I - S) + (G - T).$$

This equation indicates that the positive balance of payments finances the lack of internal savings, which are necessary for covering of investment demand and of government budget deficit.

For example, as we can see in Table 2.13, about a quarter of Russian federal budget surplus for the first half of 2000 was aimed on repaying of foreign debts. Moreover, in figures this sum was equal to the value of non-tax incomes of the budget.

*Table 2.13*

**Governmental transactions, January–June 2000**

<b>Russian budget</b>	<b>Blns RUB</b>	<b>%</b>
Incomes	504	100
Tax incomes	443	88
Non-tax incomes	25	5
Incomes of budgetary funds	36	7
Expenses	411	100
Percentage payments	85	21
Non-percentage payments	327	79
Balance, negative (-)/positive (+)	+93	–
Financing	–93	100
Foreign financing, net	–23	25
Domestic financing, net	–70	75

*Source:* official Ministry of finance site, [www.minfin.ru](http://www.minfin.ru).

In 1998, about 35% (1.3 of 3.7 trillion dollars) of federal government debt of the USA in treasury securities belonged to foreigners. In Russia before financial default in 1998, about 35–40% of federal government debt in GKO (Russian TB, treasury bills) belonged to non-residents.

The recent figures of Russian balance of payments, you could find in the official site of the Russian Central Bank — [www.cbr.ru](http://www.cbr.ru) (saying, for 2011 — in Table 2.14).

Table 2.14

**Balance of Payments of the Russian Federation, 2011**  
(billions of US dollars)

Current account	98.8
Goods	198.2
<i>Export</i>	522.0
<i>Import</i>	-323.8
Services	-35.9
Compensation of employees	-9.5
Investment income	-50.7
Current transfers	-3.2
Capital and financial account	-76.2
Capital account	-0.1
Financial account (excluding reserve assets)	-76.1
Liabilities ('+' — increase, '-' — decrease)	68.7
Assets, excluding reserve assets (+' — decrease, '-' — increase)	-144.7
Net errors and omissions	-10.0
Change in reserve assets (+' — decrease, '-' — increase)	-12.6

**2.3.2. International Investment Position:  
influence on currency exchange**

Net international investment position (*NIIP*) of the country is a momentary characteristics of its claims to foreign countries, or its international assets (*IA*), and international liabilities (*IL*) against abroad, that can be expressed as follows:

$$NIIP = IA - IL.$$

Aggregated scheme of International investment position (*IIP*) is represented in Table 2.15.

Table 2.15

**Aggregated scheme of International investment position**

<b>I. Domestic assets abroad</b>
<b>1.1. Official reserves</b>

Table 2.15 (continuation)

Foreign exchange
Official gold reserves
SDR, the reserve position in IMF
<b>1.2. Other government assets abroad</b>
Long-term credits, other long-term assets
Short-term assets in foreign currency
<b>1.3. Private assets abroad</b>
Direct investments abroad
Portfolio investments into foreign securities
Bank requirements to non-residents
Nonbank requirements concerning non-residents (not included previously)
<b>II. Assets of foreigners in the country</b>
<b>2.1. Official foreign assets in the country</b>
Governmental liabilities
Other foreign financial assets
<b>2.2. Private foreign assets in the country</b>
Direct foreign investments
Foreign investments in treasury securities
Foreign investments in other securities
Loans of the domestic nonbank organizations from non-residents
Loans of the domestic banks from non-residents
<b>III. Net International investment positions</b>

Let's note, that unlike the company or the bank, for the momentary reporting of the whole country the first balance equation isn't observed:

$$TA = TL + C.$$

Net international investment position (*NIIP*) can be positive or negative, because a certain country, not being registered as the legal entity, has no equity capital, and, consequently, it is, as a rule, international net creditor (*INC*) or international net debtor (*IND*):

$$IA > IL \Rightarrow NIIP > 0 \Rightarrow INC;$$

$$IA < IL \Rightarrow NIIP < 0 \Rightarrow IND.$$

**International investment position of the USA and Russian Federation.** Apparently the Table 2.16, in 1998 international “capital” of the USA was negative (1.2 trillions dollars), as liabilities exceeded assets by 1/4. Among the American assets abroad prevailed private ones (95%), including bonds and stocks (40% from the total assets), direct investments (23%), banks assets (20%), requirements of nonbank organizations of the USA to non-residents (12%). 3% of foreign assets of the USA accounted for official reserves (given the fact that gold was included in them at the market price). Assets of foreign official departments in the USA covered 1/7 of international liabilities of the USA with 10% placed in treasury securities of the USA Private investments of non-residents into the USA consisted of portfolio investments in non-treasury bonds, shares (33% of total liabilities), treasury securities (12%), deposits and other bank liabilities (16%), and of direct investments (14%).

*Table 2.16*

**International investment position of the USA, 1998**

Type of investments	Bln USD	%
1. Net international investment position	-1239.2	-
2. Assets of the USA abroad	4930.9	100
2.1 Official reserve assets	146.0	3
2.2 Other assets of the government of the USA abroad	82.4	2
2.3 Private assets of the USA abroad	4702.5	95
Direct investments abroad	1123.4	(23)
Foreign securities abroad: bonds, shares	1969.0	(40)
Requirements of banks of the USA to non-resident	1013.9	(20)
Requirements of nonbank organizations of the USA to non-resident	596.2	(12)
3. Assets of foreigners in the USA	6170.1	100
3.1 Official assets of non-residents in the USA	836.1	14
Governmental securities of the USA	620.2	(10)
Liabilities of banks of the USA to foreign authorities	123.9	(2)
3.2 Other assets of non-residents in the USA	5334.0	86

Table 2.16 (continuation)

Type of investments	Bln USD	%
Currency of the USA	228.3	(4)
Treasury securities of the USA	727.3	(12)
Direct investments into the USA	878.7	(14)
Non-treasury securities of the USA	2021.8	(33)
Liabilities of nonbank organizations of the USA to non-residents	460.8	(7)
Liabilities of banks of the USA to non-residents	1017.1	(16)
The gold is estimated at the market price.		

Source: Survey of Current Business, July 1999. Department of Commerce, Bureau of Economic analysis.

However, the net debtor status of the leading economic superpower not always existed. Really, up to the World War I, foreign investments in the USA (7.2 billions dollars) exceeded almost twice the American capital investments abroad (3.7 billions dollars). To the end of the war the situation was replaced to the opposite — the USA became the net creditor (3.7 billions dollars). By the end of 1920s (for the period of prosperity<sup>35</sup>) the net international wealth (*NIW*<sup>36</sup>) has increased up to 9 billion dollars. During 1930s capital flight from pre-war Europe into the USA has made this country the net creditor.

After the World War II, huge flows of the help from the USA to Europe, Japan, and then business investments have increased the international credit net position of this country up to 60 billion dollars by 1970. In 1980 it amounted almost 100 billion dollars.

However, overvalued dollar of the first half 1980s and policy of strong economic growth (“Reaganomics”) have led to massive inflow of the capital, having made the USA the net

<sup>35</sup> “Prosperity” is called the period of 1920<sup>th</sup> in the USA, which characterized by the high rate of growth (for example, in 1921–1929<sup>th</sup> the industrial production grew up for 80% with mid-annual rate of gain in 8%) and absence of cyclical recessions.

<sup>36</sup> It is used as synonym to *NIIP*. Compare net worth and net wealth as a differences between total assets and liabilities at the level of company, bank.

debtor, with what they stay till now (almost — 10 trillion dollars in 2011).

For 2000s, the ciphers of American international investment position are represented in the Table 2.17.

*Table 2.17*

**International investment position of the United States at year-end,  
2003–2009 (millions of dollars)**

Type of investment	2003	2009
<b>NET INTERNATIONAL INVESTMENT POSITION OF THE USA</b>	-2 093 794	-2 737 846
<b>US-OWNED ASSETS ABROAD</b>	7 638 086	18 379 084
Financial derivatives, gross positive fair value	.....	3 512 007
US-owned assets abroad, excluding financial derivatives	7 638 086	14 867 077
Official reserve and other US Government assets	268 349	486 579
US private assets	7 369 737	14 380 499
Direct investment at current cost	2 054 464	4 051 191
Foreign securities	2 948 370	5 470 998
Bonds	868 948	1 493 585
Corporate stocks	2 079 422	3 977 413
US claims on unaffiliated foreigners reported by US nonbanking concerns	594 004	794 225
US claims reported by US banks and securities brokers, not included elsewhere	1 772 899	4 064 085
<b>FOREIGN-OWNED ASSETS IN THE UNITED STATES</b>	9 731 880	21 116 930
Financial derivatives, gross negative fair value	.....	3 384 073
Foreign-owned assets in the United States, excluding financial derivatives	9 731 880	17 732 857
Foreign official assets in the United States	1 569 845	4 373 839
US Government securities	1 186 500	3 592 397
Direct investment at current cost	1 580 994	2 672 786
US securities	3 950 079	6 113 355
US Treasury securities	527 223	826 192
Corporate and other bonds	1 710 787	2 841 236
Corporate stocks	1 712 069	2 445 927

Table 2.17 (continuation)

Type of investment	2003	2009
US liabilities to unaffiliated foreigners reported by US nonbanking concerns	450 884	665 477
US liabilities reported by US banks and securities brokers, not included elsewhere	1 921 426	3 593 629
<b>Memoranda:</b>		
Direct investment abroad at market value	2 729 126	4 302 851
Direct investment in the United States at market value	2 454 877	3 120 583

Source: Department of Commerce (Bureau of Economic Analysis) — <http://www.gpo.gov/fdsys/pkg/ERP-2011/content-detail.html>.

Russian Federation in 1998 was the net debtor (−7.3 billion dollars) (Table 2.18). Structurally in 1998 financial assets prevailed. Thus, among assets only 2% was accounted for direct investments (among liabilities — 1%), whereas on portfolio investments in shares, bonds — 5% (among liabilities — 1%), bank investments — 38% (32%), official reserves — 55% of assets. Liabilities against foreign monetary authorities amounted to 65% of total international liabilities.

Table 2.18

**International investment position of Russian Federation, 1998**

Assets and liabilities	Mln USD	%
1. Assets of Russian Federation abroad	22 323	100
1.1 Direct investments of Russian Federation abroad	351	2
1.2 Portfolio investments	1196	5
Shares	16	...
Bonds	1180	...
1.3 Other assets	8553	38
Banks	8553	...
1.4 Reserve assets	12 223	55
2. Liabilities of Russian Federation to abroad	29 613	100
2.1 Direct investments of non-resident into Russia	373	1

*Table 2.18 (continuation)*

<b>Assets and liabilities</b>	<b>Mln USD</b>	<b>%</b>
2.2 Portfolio investments	387	1
Shares	36	...
Bonds	351	...
2.3 Other assets	28 853	97
Banks	9518	(32)
Monetary authorities	19 335	(65)
Net international investment position	-7290	...

*Source:* International Financial Statistics. Yearbook. Wash., 1999

In the beginning of 2000, foreign assets of Russian banks exceeded almost in 3 times their international liabilities, so the total net international investment position formed about 20 billion dollars (tab. 2.19). Among assets, direct, portfolio investments, credits accounted 13% (in the USA — 83%). Investments in foreign currencies and deposits covered 38%, and basically these were short-term positions (in the USA — 12%). About the half of international assets fell at official reserves (in the USA — 3%), including gold — 12%. As we can observe, the structure of Russia' claims to abroad strikingly different from the similar data for the USA, where only 5% of assets fell to the federal requirements to non-residents.

*Table 2.19*

**International investment position of Russian banks,  
31 March 2000**

<b>Type of investment</b>	<b>Mln USD</b>	<b>%</b>
1. Assets	32 768	100
1.1 Direct investments abroad	1052	3.2
1.2 Portfolio investments	816	2.5
Bonds	810	2.5
Including long-term securities	659	2.0
1.3 Other investments	15 213	46.4
Foreign currency and deposit	12 275	37.5
Including short-term	11 446	34.9

Table 2.19 (continuation)

Type of investment	Mln USD	%
1.4 Credits	2407	7.3
Including long-term	1187	3.6
1.5 Reserve assets	15 532	47.4
Monetary gold	4076	12.4
Foreign currency	11 455	35.0
2. Liabilities	11 605	100
2.1 Direct investments into Russia	731	6.3
2.2 Portfolio investments	350	3.0
Shares	43	0.4
Bonds	307	2.6
Including long-term	124	1.1
2.3 Other investments	10 524	90.7
2.3.1 Currency and deposits	3659	31.5
Including long-term	2909	25.1
2.3.2 Credits	5787	49.9
Credits of IMF	2905	25.0
Other long-term credits	1733	14.9
Short-term credits	1150	9.9
3. Net international investment position	21 163	...

The figures of Russian international investment position and its structure in 2011 are represented in the Table 2.20.

Table 2.20

**International investment position of Russian Federation, 2011:  
foreign assets and liabilities, beginning of the period**

	Mln USD	%
<b>1. Assets</b>	1 173 185	100
<b>Direct investments abroad</b>	369 076	31
<b>Portfolio investments</b>	37 300	3
Equity securities	3963	
Debt securities	32 671	
<b>Financial derivatives</b>	1639	0.1
<b>Other investments</b>	285 790	24
<b>Reserve assets</b>	479 379	41

Table 2.19 (continuation)

	Mln USD	%
<b>2. Liabilities</b>	1 157 500	100
<b>Direct foreign investments in Russia</b>	493 354	43
<b>Portfolio investments</b>	278 332	24
Equity securities	230 835	
Debt securities	45486	
<b>Financial derivatives</b>	2 840	0.2
<b>Other investments</b>	382 973	33
<b>3. Net international investment position</b>	15 684	

Source: The official site of CBR — [www.cbr.ru](http://www.cbr.ru).

The balance of payments and the international investment position of the country reflect foreign economic activities of the country accordingly in interval and momentary manner. In Table 2.21 portion of the European Union (EU), the USA and other countries in the external economic operations of Russia are resulted. As we can see, portions of the EU and the USA in foreign investments into Russia (about 80%) twice exceeded their portions in the Russian foreign trade in which the turnover with other countries (mainly from the near abroad, China, the Near East) prevailed.

Table 2.21

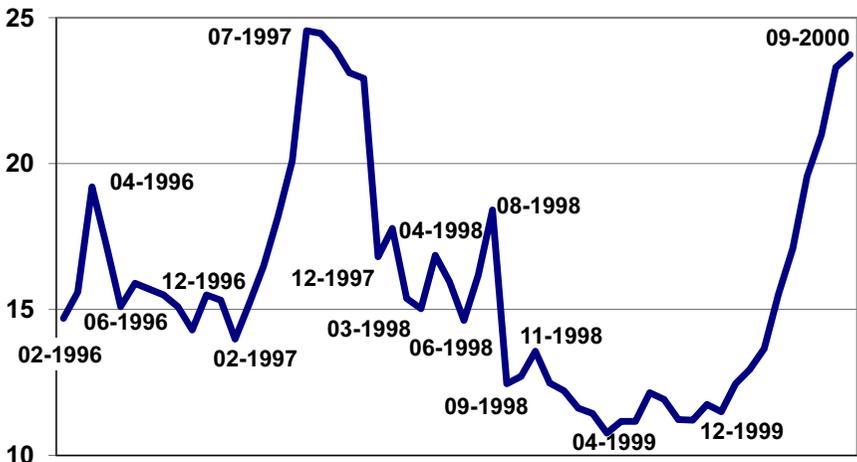
**Portion of the EU, the USA and other countries in the external economic operations of Russia, 1998, %: historical example**

Position	EU	USA	Total	Other
External turnover	33	8	41	59
Direct foreign investments (sum)	38	41	79	21
Direct foreign investments in 1998	44	35	79	21
Foreign investments in 1998	64	19	83	17

The result of the international payments of the country for the period (its balance of payments) is reflected in the change of official gold-currency reserves.

### 2.3.3 Official gold-currency reserve and exchange rate

Dynamics of official gold-currency reserves influences the exchange-rate expectations. Their level is resulted in International Investment Position of the certain country (Table 2.13). Thus, since July, 1997 up to September, 1998 the gold-currency reserves of the Central Bank of Russia have gone down from 25 to 12.5 billion dollars, by April, 1999 they have reached “the bottom” in 11 billion dollars, further reserves grew, having reached 25 billion dollars in September, 2000 and even 50 billion dollars in March, 2003 (Exh. 2.8).



Exh. 2.8. Gold-currency reserves of Russian Central Bank, blns USD, 1992–2000

According to data of the Central Bank of Russia, official gold-currency reserves of Russia for June, 1, 2000 accounted 20 billion dollars, having increased for one month on 15% (for a year — by 57%, or by 7 billion dollars) and having reached the maximal mark for the period since November, 1997. In September, 2001 they have increased already up to the new historical peak — almost 40 billion dollars.

Note, that such dynamics of gold-currency reserves wasn't the unexpectedness for the Russian authorities. Thus, at the end

of June, 2000 Chairman of Central Bank of Russia V. V. Geraschenko forecasted the growth of these reserves till the level of more than 50 billions dollars in the nearest future<sup>37</sup>. Visually there was a direct link between the quantity of the official reserves and the movement of the ruble's rate. Thus, with the decrease of the first one the dollar's rate increased (ruble depreciated). This situation lasted during the most part of 1999. However, when reserves had increased during 2000, dollar's rate became stable and even started to decrease.

The structure of Russian international reserves in 2001–2012 is demonstrated in Table 2.22.

*Table 2.22*

**The structure of Russian international reserves, mln USD,  
2001–2012**

International reserves	Including:					Monetary gold
	Currency reserves	including:			Reserve position in IMF	
		Foreign exchange	SDR account			
<b>01.01.2001</b>						
27 972	24 264	24 263	1	1	3708	
100%	87%	87%	0.004%	0.004%	13%	
<b>01.01.2005</b>						
124 541	120 809	120 805	1	3	3732	
100%	97%	97%	0.001%	0.002%	3%	
<b>01.01.2012</b>						
498 649	453 952	441 162	8729	4061	44 697	
100%	91%	88%	1.8%	0.8%	9%	

*Source:* The official site of CBR — [www.cbr.ru](http://www.cbr.ru).

## Resume

*Equilibrium exchange rate* is a result of the equilibrium between supply and demand of the foreign currency. *Dynamical equilibrium* on exchange market is a result of the fluctuations of the exchange rate in time. Thus, in developed countries currency's

<sup>37</sup> Delovoy Peterburg, 2000. 30<sup>th</sup> of June.

courses after adoption of the floating rate are moving in the *medium-term cycle*, showing the market's auto-regulation. The forex dynamics of the developing Russian market was characterized by perpetual increasing tendency and lack of the definite cycles.

*Determinants* of exchange rate include comparative inflation, comparative interest rate (shares' yield), comparative income (economic growth), reputation of the central bank, market's expectations. Exchange rate has an *opposite* dependence to *comparative inflation* in the country. High *nominal* interest rate increases the exchange rate in *short term*, but decreases it in *long-term*, because of the significant inflations' expectations comparatively abroad. High real interest rate increases the exchange rate because of the high investment's income. The higher the economic growth in the country, the higher is the income growth in it comparing to abroad. Exchange rate depends *oppositely* on the growth of comparative incomes in *short-term* and depends *directly* — in *long-term*.

If the market believes that the *government* can stabilize the circulation of money then the currency will be considered as a perspective (strong policy restricts the inflation, increases economic growth and attracts capital to the country). Without this confidence the exchange rate will be estimated as a weak one. *Market's expectations* reflect the exchange rate's estimation of all the market participants. Psychology of the market forms on the basis of correlation between the expected and realized levels of the economical indicators, correcting the exchange quotations.

*Interval and momentary* levels of currency's supply and demand are reflected in the balance of payments and in the international investment position of the country. Balance of payments includes trade, current, capital balances, reflecting supply and demand of foreign currency for foreign trade, transfer, investment operations. In general, *surplus* strengthens the national currency and *deficit*, on the contrary, enfeebles it. Currency of the net-creditor's countries are fortified in tendency, the net-debtors countries — on the contrary. Changes in official gold-currency reserves show the external cash flows of the country.

### *Control questions for discussion*

1. What's the connection between comparative inflation and exchange rate? Show graphically how will modify the exchange rate if the comparative inflation's rate changes. Let's assume that in Russia prices started to grow in comparison with the prices in Ukraine. How will the exchange rate ruble-hryvnia changed?

2. What kind of products (national or imported) will you buy, if the national currency grows? What is more profitable for national companies: periods of strong or weak national currency?

3. Retrace using an example of any country the dependence between exchange rate, speed of real economic growth and income's level (salary, profit, interest rate). Explain the relationship between ruble's exchange rate and petroleum's world price.

4. What is the role of the central banks in the process of exchange rate's forming? Central Bank of Russia bought in the market 100 million dollars to maintain the dollar's exchange rate over the ruble. What are the possible consequences of these interventions for the Russian economy?

5. Give a comment: "The losses of the central bank are a result of the monetary interventions for maintenance of the exchange rate in conditions when the market equilibrium changed. The central bank can maintain the rate temporary, but the market forces lead to its reevaluation and the central bank had to calculate the losses".

6. "Market expectations" and "disposition (psychology) of the market" — what does it mean? How can they influence the exchange rate?

7. If the movement of the exchange rates is not disorderly, does it mean that on the market exist the unutilized possibilities to get the profit. Is it true, false or indefinite? Explain.

8. What will happen with a ruble exchange rate (increase, decrease, stay the same) contra euro if: a) growth of the national income in Russia higher than in Europe; b) inflation is higher in Russia than in Europe; c) prices in Russia and in Eu-

rope grow equally; d) real interest rate in Russia is higher than in Europe; e) Russia sets the restrictions for foreigners to buy Russian companies and real estate; f) salary in Russia has grown as compared to Europe, productivity in Russia had decreased versus Europe.

9. Describe the relationship between the balance of payments, international investment position and the exchange rate. In the situation with floating exchange rates, what are the consequences of the current account balance's deficit for the capital balance and the general balance of payments? Why with a significant deficit of the commercial balance in the USA, dollar's exchange rate continued to grow in certain periods?

10. Russian company buys an equipment in the USA per 500 million dollars in 2010, using the 5 years credit of the American bank, it's not obligatory to pay interest and the debt amount until 2012. What kind of influence has this purchase on the current, capital and balance of payments of Russia for 2010?

11. USA set import restrictions to Japanese steel. What will happen with a current account balance of the USA? Suppose, the USA expropriated all the foreign investments in their assets. What happens with American savings and investments?

12. What joins the trade disproportion and global movement of capital? Let us assume, that trade imbalance, characterized the 1980s, disappeared in the beginning of XXI century. What can probably happen with the global cash flows?

### ***Problems to solve***

1. Anticipated prices in USA increase by 3.5% (next year), the prices in the UK — by 5.25%. How will change (in %) the spot-rate of the pound in one year?

2. Daimler Chrysler (*DCH*) is planning to sell a new model of auto in Russia. DCL gets 20.000 euros per one auto in Europe and would like to get the same from export. Exchange rate 40 ruble per euro, what price (in rubles) should choose DCH? If exchange rate will grow till 45 ruble per euro, how will the price change?

3. Using the publication of balances of payment of International monetary fund, choose Russian balance of payments and another country and write an analytical memo about deficit and profit reasons.

4. Using the following data compile the commercial balance of Russia:

- a) Kirovsky factory (St. Petersburg) delivered to Belorussia spare parts for tractors, for the total amount of 10 million rubles;
- b) Import of autos from Western Europe and the USA — 100 million rubles per year;
- c) Air factory, producing airplanes Tupolev and Ilushin, delivered in CIS their production per 500 millions of rubles;
- d) Network of Russian supermarkets bought a batch of knitwear in China, total amount — 20 millions of rubles;
- e) Russian fishermen sent to Japan the catch per total amount — 50 millions of rubles;
- f) Phillip Morris imported raw materials for own manufacture, total amount — 20 millions of rubles;
- g) Branch of Russian company “Soviet-petro” (Vietnam) delivered equipment for petroleum platform in Asiatic countries per total amount of 50 millions of rubles;
- h) “Gazprom” delivered gas in European countries per total amount of 70 millions of rubles;
- i) “Severstal” exported in South Korea metal per total amount of 50 millions of rubles;
- j) “Ivanovskie fabriki” exported cotton in Lithuania per total amount of 15 millions of rubles;
- k) American manufacturers of vodka “Stolichnaya” sold in Latin America their production per 50 millions of rubles.

## **Factors of dollar exchange rate**

On one of Internets — sites of the US government the key factors influencing dollar exchange rate, are described as follows.

*Federal reserve system.* It is completely independent in the monetary policy directed on the achievement of maximal non-inflationary growth. The main signals of FRS policy are operations in the open market, the discount rate, the rate on federal funds.

*Federal committee of the open market.* It makes decisions on the monetary policy, including announcements of the key interest rates (eight times a year). The committee consists of 7 members of the Council of FRS managers, the president of Federal reserve bank of New York, the remaining 4 places the presidents of the other 11 federal reserve banks occupy for one year in order of rotation.

*The Ministry of Finance.* It is responsible for issue of the governmental debt, decision-making under the fiscal budget. Its decisions have the important influence on the currency market.

*The federal funds rate.* It is the most important rate of interest which is charged by depository institutes for the mutual one-day loans. These rates have the big influence on the markets of stock, bonds, currency.

*The discount rate.* FRS charges it from commercial banks under credits for amplification of liquidity in necessary cases. Announcements of changes in this rate are clear signals of the monetary policy.

*30-years exchequer bonds of the USA.* Rates under “long bonds” — the most important indicator for market expectations about inflation. The markets usually use the income (instead of the price), considering bonds. The cost of bond falling (growth of the return) because of inflationary expectations puts pressure upon the dollar (to downturn).

Such expectations can arise on the basis of the strong economic data. Depending on the phase of business cycle the strong economical data have different influences for the dollar.

If inflation has not reach the threatening size, the strong data strengthens the dollar. When threat of inflation (high rates of interest) is actual, the strong data weakens the dollar (taking into account the volume of bonds sales).

Being the “*benchmark*” (from English *benchmark* — “reference point”) of assets, the long-term bonds (“bonds”) are usually subject to the effects of capital movement caused by the global reasons. Financial and political failures in critical markets will probably strengthen the exchequer bonds of the USA in virtue of their safe nature and, hence, will help dollar.

*Three-monthly euro-dollar deposits.* The rate on dollar deposits in banks outside of the USA is used as “*benchmark*” for definition of differences in interest rates when the exchange rate evaluating. The bigger these differences in favor of euro-dollar against, for example, euroyen deposits, the more likely growth of the dollar rate. Sometimes this parity is not supported because of joint influence of other factors.

*Ten years' exchequer notes.* The forex markets compare their profitableness to the similar papers abroad. The differential of profitableness between the American and not American notes influences the exchange rate. The greater income on the American papers usually is favorable to the dollar exchange rate against foreign currencies.

*The stock market.* Among stock indexes, the average industrial index Dow-Jones the most strongly influences the dollar. From the middle of 1990s the index showed the strong positive correlation with dollar when foreign investors have been buying the American shares. Three basic forces influence the index Dow-Jones: 1) corporate profits (forecast and actual); 2) expectations concerning rates of interest; 3) global factors.

*Cross-rate effect.* Cost of dollar against any currency is sometimes the subject of the other pair the currencies rate (not including dollar) influence. For example, sharp rise of yen against euro can cause the general downturn of euro, including decrease of the rate of dollar/euro.

*The future contract on the rate for federal funds.* Expectations concerning interest rates can be made through the rates of fu-

tures on federal funds. Cost of the contract shows, what the rate of interest on federal funds in the future is expected depending on the maturity of the contract. Hence, the contract is a barometer of market expectations concerning FRS policy. The rate is received by means of subtraction of cost of contract from 100 and comparison the result with the prevailing rate on federal funds in the spot-market.

*The future contract for three-monthly euro-dollar.* Reflects expectations concerning the interest rate on three-monthly euro-dollar deposits in the future. The difference between future contracts on three-monthly euro-dollar and euro-yen deposits is an essential variable at definition of expectations concerning the rate dollar/yen.

*The economic data.* The most important of them are labor reports (the rate of unemployment, the average hour salary), indexes of consumer and wholesale prices, the total internal product (gross national product) data on international trade, the productivity of labor and capital, the industrial production, started and completed housing construction.

## Chapter 3

# FOREIGN EXCHANGE MARKETS: SPOT, FORWARD

Opportunity often comes disguised in the form of misfortune or temporary defeat.

*Napoleon Hill (1883–1963),  
American journalist, writer*

### INTERNATIONAL FINANCIAL MARKETS

***Part one: INTERNATIONAL MONEY, EXCHANGE RATES AND FOREX MARKETS***

**Chapter I:  
INTERNATIONAL  
MONETARY  
SYSTEM**

**Chapter IV:  
INTERNATIONAL  
MONEY  
MARKETS**

**Chapter II:  
EXCHANGE  
RATE  
DETERMINA-  
TION**

**Chapter V:  
INTERNATIONAL  
CAPITAL  
MARKETS**

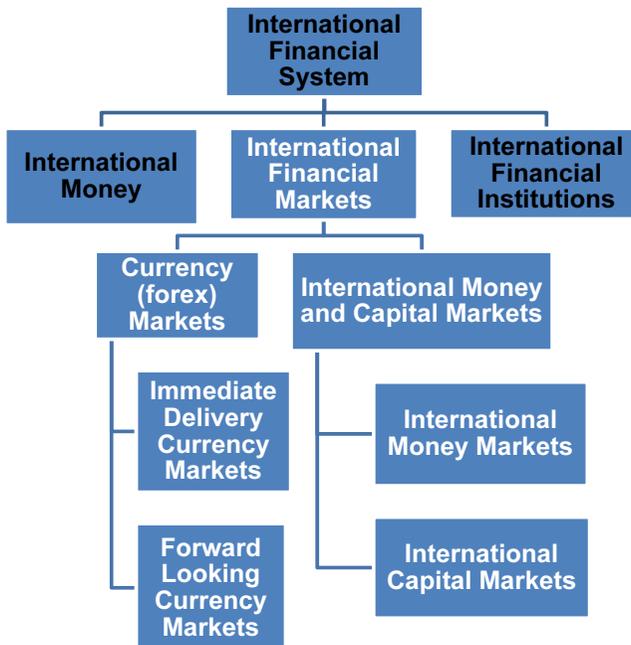
**Chapter III:  
FOREIGN  
EXCHANGE  
MARKETS: SPOT,  
FORWARD**

**Chapter VI:  
MULTICUR-  
RENCY  
INVESTMENTS**

***Part two: INTERNATIONAL MONEY AND CAPITAL MARKETS***

## Purposes of studying

- Classify the foreign exchange market due to different features — currency, geographic, institutional, term ones.
- Consider the basics of foreign currency trading, and define the exchange risk (exposure) by means of currency position.
- Characterize the customs in markets of spot currency deals.
- Introduce the definitions of currency quotations, and represent its basic types.
- Describe the cross-rates, and mechanism of triangular arbitrage.
- Represent the definition of forward rate, discounts, and premiums.



*Exh. 3.1.* Foreign exchange markets in the structure of international financial system

International financial markets represent the second of three “bricks” of international financial system. (alongside the international money and international financial institutions) — Exh. 3.1. Foreign markets occupy the one of two aggregative sectors of financial markets (besides money and capital markets, to discuss in next section).

Financial markets are categorized in

- a) money and capital;
- b) forex ones.

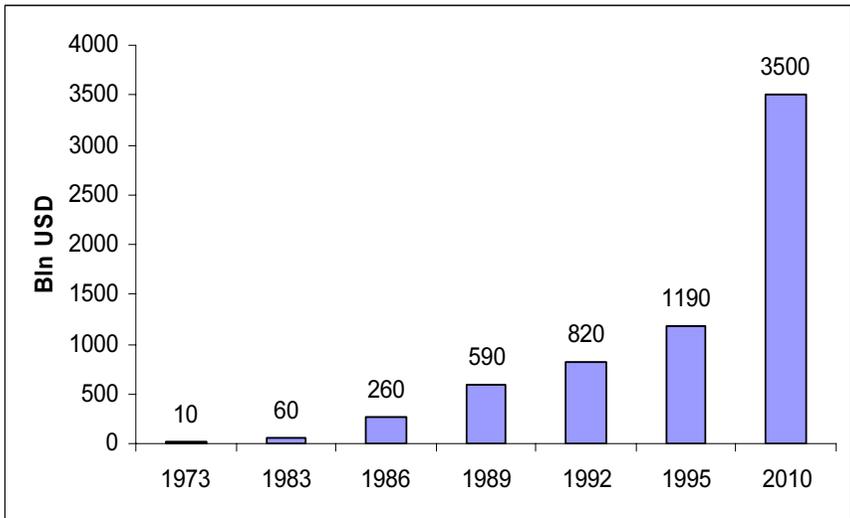
In the first sector, the capital (funds) moves, i. e. creditors grant loans and investors buy securities with postponed repayment of debt and deduction of interest (dividends). In foreign exchange markets (shortly, forex), participants convert one currency for another.

### **3.1. Structure of forex market**

Currencies change in forex market for different goals — payments for external trade goods, international investments, debt repayment, risk neutralizing, arbitrage. Progress of electronic networks made global this market, functioning practically 24 hours a day. As of the beginning of the business day in various time zones, trade moves from Tokyo, Singapore to Moscow, the Europe, then to New York, San-Francisco (“San-Frisco”).

The contemporary daily turnover in the market is around 3.5 trillion dollars, that much more than a total turnover of the American shares and treasury bonds markets. In the middle of 1980-s it has made 260 billions dollars, in the beginning of 1970s — only 10 billions of dollars (Exh. 3.2). Due to unprecedented turnovers, the currency market is most approached to model of the perfect competition. It realizes all its conditions therefore theoretical concepts, wich describe market dynamics, are most distinctly evident on it.

Forex market is structurized due to several features — currency, space (geographical), institutional, term ones.



*Exh. 3.2.* Daily turnover of trading in forex market, blns dollars, 1973–2010

*Source:* BIS Surveys

### **Currency, space, institutional structures of forex market**

Utilizing of separate currencies (as percentage portion in market turnover) demonstrated the domination of dollar, two times exceeding deutsche mark in 1990s. Now, market share of euro is close to dollar one.

*Space* structure of the forex represents different *geographical* segments of trading by foreign currencies. Global forex business is concentrated in the eight world centers — London, New-York City, Tokyo, Singapur, Hong Kong, Zurich, Frankfurt, Paris. By the way, the first center covers around 35% of total turnover, the second one — 20%, eights — 5%.

The main institutions in the market represent are banks, operating for their own account and for clientele fee. Portion of 5 biggest banks (Citibank, Deutsche Bank, Goldman Sachs etc.) in the market counts around 30%, underlining high degree of deal concentration without, however, no one dominated state.

Incomes from currency transactions stay on the 1<sup>st</sup> place in financial reports of such banks as *Chase Manhattan Bank*, *Barclays Bank*, *Soceite Generale Bank&Trust*, *Swiss Bank Corporation*. For instance, up to 80% profit of largest banks could give currency speculation, and the remaining 20% — crediting activity, security trading.

Forex dealing is also conducted by the specialized intermediaries (brokers), business companies, other legal unities, and individuals. Important participants of forex market represent central banks, influencing on exchange rates (in order to economic policy implement, supporting international commitments), fulfilling orders of clients (governments, other central banks, supranational organizations), regulating domestic markets by administrative norms.

According to amount of deals, participants of forex markets are grouped in “wholesale” (large banks, MNC, central banks, investment funds, brokerage firms) and “retail” (importers, exporters, investors, individuals) ones.

### **Interbank, clientele forex markets and trading in organized exchange**

In a whole, institutional structure of the forex market is described in the following terms:

- *Interbank* (direct and broker) market, where financial institutions make deals between each other.
- *Client* market, in which banks make deals with non-financial customers (industrial, trade companies, governments, individuals).
- *Organized* exchange market (deals with immediate delivery on specialized currency exchanges and with currency derivatives in mercatnale and stock exchanges).

Forex turnover in the US interbank market, for instance, consist of direct transactions (around 50%), through brokers (25%), swapand options trading (5%).

There are no specialized currency exchanges in Anglo-American countries, but they function in Europe, and partly in Asia. For example, their number in Germany are 5 (largest —

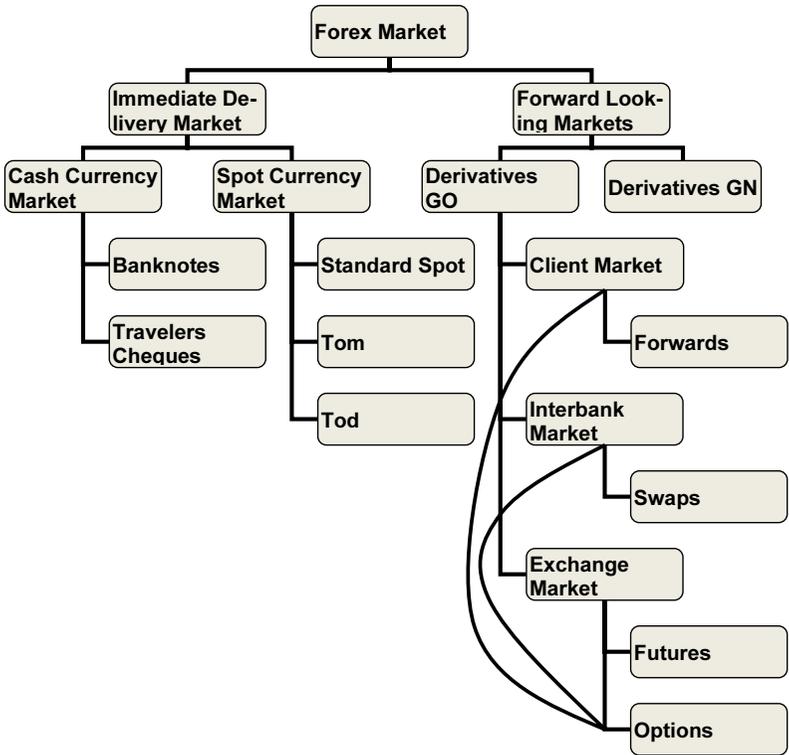
in Frankfurt), in Russia — 7 (main — Moscow interbank currency exchange, MICEX).

Currency derivatives (futures, options, caps and floors) trading is concentrated in mercantile (trade), stock or specialized futures exchanges. Thus, the leading floor (global center) for currency futures operations is Chicago Mercantile Exchange (CME); in Europe — London International Financial Futures Exchange (LIFFE); for currency options — Philadelphia Stock Exchange (PHLX). Saint-Petersburg future exchange, introduced in 1994, is located on the corner of Ligovsky and Moscovsky avenues.

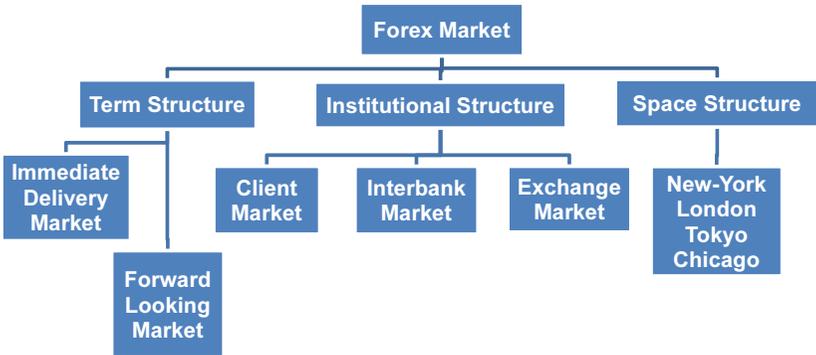
### **Term structure of forex market**

According to this feature, forex differ as is divided into immediate delivery and forward looking (or with delivery at a future date) markets (Exh. 3.3). The First one is divided into cash market (i. e. trade by banknotes and travelers cheques) and spot market (with delivery in 2 business days since the contract date). Forward looking market represents the deals with delivery in 1, 3, 6<sup>th</sup> months, sometimes several years. Forward, futures, option currency contracts are traded there. Their title is derivatives of Generation One (*GO*). In this case foreign currency appears as a primary asset. Derivatives of next generations (*GN*) count several hundreds tools. According to BIS (Bank for International Settlements), in interbank markets of developed countries, spot deals cover around 40% of forex transactions, swap and forward ones — 55%, option — 5%. In the US market, appropriate data were as follows — 50, 40, 10%.

Forex markets are also classified — due to character of transactions, currency traded — as global (concentrated in the world financial centers), regional (operating with local currencies), internal (transactions with currency inside of the certain country). From the point of following legislation, legal and illegal (“black”) currency markets differentiate. Distinctive classifications of forex market are represented schematically in Exh. 3.7.



Exh. 3.3. Term structure of currency (foreign exchange) market



Exh. 3.7. Different classifications of the forex market

## 3.2. Basics of foreign currency trading

Foreign currency trade is concentrated, mainly, in banks, which currency departments, as a rule, consist of 2 subdepartments — dealing (operating) and settlement (payment) ones.

### 3.2.1. Dealing (front) and settlement (back) offices (rooms)

Currency traders (dealers) perform transactions in the dealing room (front office). For trading (to execute the customers' orders or to arbitrage, speculate), dealer utilizes 3 especially installed screens on his/her (his/r) computer — informational, analytical, and operational. Thus, first one provides quotations of currency (exchange rates), interbank deposits (interest rates), securities (notes, bond, stock prices), commodities (prices), and verbal information (news, can effect the decisions' making). *Analytical* screen helps to process the information, including, at least, facilities for technical, fundamental analysis of forex, commodity, security' quotations dynamics.

Through *operational* screen, dealer conducts the dialog with the counterparty, realizing some transaction. For example:

- Dealer: Need 5 funds (SV: 5 mln USD) per 0.83241 euro.
- Counterparty: Sell 3 — per 0.83241, and 2 — per 0.8597.
- Dealer: Done. Credit my dollar account in Bank X,

№1234.

- Counterparty: My Euro account in Bank Y, №5678. End of connection.

Such a three-screen installation, combining the quotations, news, financial analysis, facilities for conducting deals in real-time regime, is acquired by banks from the companies Reuters or Dow-Jones<sup>38</sup>. Transactions are conducted also by direct phone, if counterparties locate in single financial center.

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<sup>38</sup> Relevant dealing systems are represented by “Reuters” and “Telerate”. They are often titled as “Pepsi & Coke” of informational world. The first service the 80% of Europe dealing rooms, the second — 80% of American.

Notes (slip) of a deal proceed automatically in settlement section (back office). It send the confirmation by electronic connection, and also interbank instructions (“advice”) for money transfer to accounts, indicated by the counterparties, checking the timelines of inflows (receipts) bought funds. Settlement section operates, as a rule, in framework SWIFT (Society for world-wide interbank financial telecommunications) for transfers of electronic defended interbank mails. Also, confirmations are transferred by telex, telefacs.

Dividing of trading into dealing and settlement offices aims to decrease the fraud risk, i. e. threat of unfair transactions of dealers for personal wealthening with bank goals damaging. Trade limits for single dealers, and control from the side of head-dealer over the operations is served the same purpose.

### 3.2.2. Currency position and risk

Forex trading is described in terms of currency position (exposure), measuring exchange risk.

Momentary definition of currency position

In *momentary* definition, it (*MCP*, *Moment Currency Position*) represents the co-relation between claims (assets,  $A$ ) and liabilities ( $L$ ) in foreign currencies for a certain moment of time:

$$CdP: A_{C,Q,t} = L_{C,Q,t}.$$

Position is considered as *covered* (*CdP*), if claims equal liabilities in terms of 3 criteria — currency ( $C$ ), sum ( $S$ ), and timing ( $t$ ). In this case, expression for covered currency position due to higher called criterias looks like this:

$$CdP: \times A_{C,Q,t} = L_{C,Q,t}.$$

If claims don’t equal liabilities, then position is defined as the *open* one (*OP*):

$$OP: \times A^{\neq} L.$$

When position is covered, then *exchange rate risk* (*ERR*) equals zero:

$$A = L \Rightarrow ERR_{MCDP} = 0.$$

When position is opened, then *exchange risk* over zero:

$$A \neq L \Rightarrow ERR_{MOP} > 0.$$

Open (risky) position, in turn, is divided on the long and short ones:

➤ *Long position (LP)* means exceeding claims over liabilities, or net assets

$$A > L \Rightarrow (A - L) > 0 \Rightarrow NA > 0.$$

➤ *Short position (SP)* means the opposite proportion, or net-liabilities

$$A < L \Rightarrow (L - A) > 0 \Rightarrow NL > 0.$$

### **Interval currency position**

In *interval* definition (more important for the market participants, than for the corporate financial managers), *interval* currency position (*ICP*) is a function of purchases' (*P*) и sales' (*S*) sum for a certain period (a day, a week):

$$ICP = \phi(P, S).$$

Then, interval *covered* position (*ICP*) is characterized by equality of foreign currency' purchases и sales (in terms of *CAT* — currency, amount, timing):

$$P_{CAT} = S.$$

Thus, herewith exchange rate risk equals zero:

$$ERR_{ICP} = 0$$

Interval open position (*IOP*) is characterized by inequality of currency purchases and sales:

$$P_{CAT} \neq S.$$

In this situation, herewith exchange risk is above zero:

$$ERR_{IOP} > 0.$$

Then, interval long position (*ILP*) is characterized by the excess of purchases (claims) over sales (liabilities), i. e. net-purchases (or *overbought*):

$$P_{CAT} > S.$$

*Interval short position (ISP)* is characterized by exceeding of sales (liabilities) over purchases (claims), i. e. net-sales (or *over-sold*):

$$P_{CAT} < S.$$

Open currency position is exposed to the risk of losses due to changes of exchange rates — repayment of short position requires more national currency, than it was expected, for buying the strengthening foreign currency, and long position is exposed to the risk of foreign currency exchange rate decreasing.

### **Open position and exchange risk limiting**

Banks limit their open position, managing risk of exchange operations. The US banking regulators require from American banks to establish their own rules for the foreign exchange operations, which should include limits on currency positions, consistent with the principles of sound and careful banking practice. How can the bank determine their own limits of open position? Let's illustrate it on the following example.

Suppose, the ratio between bank's profit and its capital — 15% per annum. Then, position limits' establishing is reasonable relatively the value of capital to support the maximal losses on such a level, which can not decrease substantially the equity capital of the bank. It can be done in several ways. For instance:

- limiting the sum of short and long positions as a portion equity capital (C):

$$\sum P_{ij} + \sum S_{ij} \leq \alpha \times C;$$

- limiting the biggest position among long and short:

$$\max(\sum P_{ij}, \sum S_{ij}) \leq \beta \times C;$$

- limiting the “net” position, i. e. the difference between aggregate long and short positions:

$$|\sum P_{ij} - \sum S_{ij}| \leq \chi \times C;$$

- limiting the “gap” position, i. e. the difference between long and short positions for each maturity:

$$|P_j - S_j| \leq \chi_j \times C.$$

For the first 3 cases, it can be seen, that:

$$\alpha < \beta < \chi.$$

In the case of “gap” position, with maturity increasing, position limit becomes more restrictive, so that:

$$\chi_1 > \chi_2 > \dots > \chi_n.$$

Later, assume profit on capital  $\phi$  is the ratio of Earnings After Taxes (*EAT*) to equity. Then, let's express profit to capital as:

$$EAT = \phi \times C.$$

Admitted limit for forex dealing can be established by management as a certain percent, saying,  $\theta$ , of *EAT*. As a result, admitted losses =

$$\theta \times EAT = \theta \times \phi \times C.$$

Many central banks install obligatory norms for open currency positions. For example, Bank of Russia (in accordance with article 70 of Law of Russian Central Bank) regulates the amount and order of credit institutions' open positions accounting in terms of currency, interest and other financial risks.

**Case 3.1. “Establishing of open currency position limits and their monitoring by chartered banks in RF”**

From CBR Regulation No 41

For decreasing of chartered banks exposure to currency risk, Central Bank of Russia establishes the following limits of currency position:

- at the end of each business day, the aggregated amount of all long (short) currency positions should not exceed 30% of bank equity capital;
- at the end of each business day, amounts of long (short) currency positions in the individual money units and in rubles should not exceed 15% of bank equity capital

Official site of CBR — [www.cbr.ru](http://www.cbr.ru)

Since 1999, this instruction has been changed. Thus, due to results of operational day, each of long positions in currency should not exceed 10% of equity capital of chartered bank. Limit of position in Russian rubles has been decreased from

15% to 10% of equity capital. This restriction obviously restrains the demand of bank for currency in internal market.

### **3.3. Immediate delivery market**

In spot market, operations with immediate delivery are fulfilled.

#### **3.3.1. Customs of spot market: value dates, quotes of foreign exchange**

Conditions of currency trade are consolidated by *customs* and traditions of market transactions. They include value date, methods of currency quotations, two-side exchange rates, cross-rates for pairs of non-dollar currencies. Thus, *value dates* are the dates, when currencies actually are credited to the accounts of counterparties. These dates are known also as *settlement date*. Standard spot date is 2 business of *contract* (dealing) *date*. It is enough for transfer of interbank advice, documentary designation of deals, conducting of settlements. Aside of standard spot transactions, deals with near-spot dates are fulfilled:

- “*tod*”, i. e. deals with value date “*today*”;
- “*tom*”, i. e. deals with value date “*tomorrow*”.

Also, transactions are implemented on *asymmetrical* value dates — “*tod-next*” (when one side delivers currency today, and another — next day), “*tom-spot*”. In cases of non-standard and asymmetrical dates, spot rates of currencies will be adjusted for appropriate differences in interest rates for overnight or 2-days deliveries.

#### **Quotations of currencies in client and interbank markets**

*Quotation* of exchange rates in client market could be *direct* (national currency per foreign one, for example, 30 rubles per 1 USD) and *indirect* (foreign currency per national one, for example, 3.3333 cents per 1 ruble). The majority of countries utilize direct quotations of foreign currency. Indirect quotes are applied, mainly, in countries of British Commonwealth and for

euro quoting. In quotations, routine symbols of currencies are utilized. But some popular currency pairs have had specific names due to tradition. For example:

Quote GBP/USD (dollars per pound) is known as *Cable*,  
USD/CHF (swiss frank per dollar) — as *Swissy*,  
USD/DEM — as *Mark*,  
USD/FRF — as *Paris* (antique name or French capital city)

Thus, proportion in of 1.5 doll. per euro will be direct quote of the last currency, and 0.6667 euro per 1 doll. — indirect quote of euro in the USA. In Europe, vice versa, the first expression means indirect quotation, and the second one — direct quote of dollar<sup>39</sup>. In clientele market, currency is quoted by *outright* method — including 4 figures after comma (or basic points, *bps*), for instance, 1.4985 dol. per euro.

In interbank market, *American* (dollar price of some currency) and *European* (price of dollar in some European currency) quotations are used. For unification interbank trading, New-York association of forex dealers in 1978 has made a decision to quote foreign currency in European way. By the way, quotes often include only “*small figures*”, i. e. last 2 ciphers (for example, 67 euros)<sup>40</sup>.

*Two-sided* quotations, obligatory for standard deals (1 to 10 mln doll.), setting out by traders on clients demand, also refer to the customs of the market. The left side of quote is bid rate (*BR*), and the right side — ask (offer) rate (*AR*).

Bank — *market-maker* buys the based currency (adopted by one unit — for instance, dollar in Russia) and sells the quote currency (expressing a value of based currency, for example, ruble) to *market-takers* at a bid rate. At ask rate, bank sells the based currency and buys the quote one. For instance, at the quote of 0.6665–0.6669 euros per dollar, bank undertakes the

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<sup>39</sup> Further we utilize in text the direct quotation, if otherwise is not specified.

<sup>40</sup> Consequently, the first figures of quotation are called “big figures” in professional market jargon.

commitment to purchase dollars at 0.6665 euros, and to sell — at 0.6669.

### **Bid-ask currency spread**

The difference between bid and ask rates is called the bid-ask spread (*BAS*):

$$BAS = AR - BR.$$

Its amount depends on several factors, among which are following ones:

- Status of counterparty (more wider spreads are offered for non-bank institutions, as operations with them are more riskier and less in amount).

- Market conjuncture, or business conditions (in unstable market — spreads are wider, as reverse deal for profitable covering the position is harder to make).

- Liquidity of forex market (for liquid currencies, narrower spreads are quoted).

- Sum of deal [spreads are minimal ones for standard amounts of transactions; for larger (due to risks) and smaller (due to operational expenses), spreads are wider].

- Character and history of relationship between counterparties.

Under any conditions, the bid-ask spread is designed to cover the transactional cost of dealing (*TAC*), to secure normal profit (*P*), and risk premium (*RP*).

$$BAS = TAC + P + RP.$$

In percentage form, spread (*PBAS*, Percentage BAS) is expressed as follows:

$$PBAS = \frac{AR - BR}{AR} \times 100\%.$$

If two-sided quotation is 0.6665–0.6669 euros per dollar, then the bid-ask spread in absolute terms equals 4 basic points<sup>41</sup> (0.04 european cents per 1 dollar):

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<sup>41</sup> 1 PPS = 100 BPS, 1 BP = 0.01% of quotation.

$$BAS = AR - BR = 0,6669 - 0,6665 = 0,0004 = 4bps.$$

Percentage bid-ask spread counts 6/100 of percent (0.06%):

$$PBAS = \frac{AR - BR}{AR} \times 100\% = \frac{0.0004}{0.6669} \times 100\% = 0.06\%.$$

Spreads in interbank market are narrower (for example, 2 bps by quotation 66–68).

### Reading the spot-quotations of currencies

Below, the spot-quotes of currencies in international and Russian markets are represented. Table 3.1 demonstrates the historical data of Financial Times.

Table 3.1

### Spot rates of currencies against Euro

Countries	Currencies	Closing exchange rate	Daily change	Bid-ask spread	Daily average	
					Higher	Lower
<b>Europe</b>						
<b>Czech Rep.</b>	<b>Koruna</b>	35.5610	-0.0683	393–826	35.6940	35.5220
<b>Hungary</b>	<b>Forint</b>	260.483	+0.1630	328–637	260.660	260.050
<b>Poland</b>	<b>Zloty</b>	4.0390	-0.0075	358–422	4.0480	4.0208
<b>Russia</b>	<b>Ruble</b>	<b>26.0769</b>	<b>+0.0142</b>	<b>619–918</b>	<b>26.1316</b>	<b>26.0168</b>
<b>Sweden</b>	<b>SKr</b>	8.4810	+0.0709	745–875	8.4893	8.3992
<b>Switzerland</b>	<b>SFr</b>	1.5502	-0.0019	495–509	1.5560	1.5495
<b>UK</b>	<b>BP</b>	0.6197	-0.0013	195–199	0.6229	0.6186
<b>Americas</b>						
<b>Argentina</b>	<b>Peso</b>	0.9390	-0.0031	388–392	0.9440	0.9365
<b>Brazil</b>	<b>R\$</b>	1.6751	-0.0144	742–759	1.6901	1.6701
<b>Canada</b>	<b>C\$</b>	1.3819	+0.0011	811–826	1.3836	1.3747
<b>Mexico</b>	<b>New Peso</b>	8.7947	-0.0276	900–994	8.8443	8.7666
<b>USA</b>	<b>\$</b>	<b>0.9392</b>	<b>-0.0031</b>	<b>390–394</b>	<b>0.9442</b>	<b>0.9367</b>
<b>Pacific/Middle East/Africa</b>						
<b>Australia</b>	<b>A\$</b>	1.5936	-0.0008	923–949	1.5958	1.5852
<b>Hong Kong</b>	<b>HK\$</b>	7.3233	-0.0242	213–253	7.3620	7.3038
<b>India</b>	<b>Rs</b>	42.1325	-0.1369	188–462	42.3965	42.0063
<b>Indonesia</b>	<b>Rupiah</b>	8405.85	-163.9200	058–112	8591.60	8380.58
<b>Israel</b>	<b>Shk</b>	3.8395	-0.0186	353–436	3.8648	3.8316
<b>Japan</b>	<b>Y</b>	<b>102.523</b>	<b>-0.4460</b>	<b>483–564</b>	<b>103.100</b>	<b>102.000</b>

Table 3.1 (continuation)

Countries	Currencies	Closing exchange rate	Daily change	Bid-ask spread	Daily average	
					Higher	Lower
<b>Pacific/Middle East/Africa</b>						
Malaysia	M\$	3.5690	-0.0116	682-697	3.5875	3.5596
New Zealand	NZ\$	2.0446	+0.0024	426-466	2.0491	2.0349
Philippines	Peso	42.1373	-0.3111	142-603	42.3757	42.0110
Saudi Arabia	SR	3.5229	-0.0115	220-238	3.5415	3.5133
Singapore	S\$	1.6285	-0.0135	278-291	1.6439	1.6241
South Africa	R	6.5134	-0.0306	073-194	6.5372	6.5007
South Korea	Won	1046.74	-4.1500	605-743	1053.63	1046.05
Taiwan	T\$	29.1340	-0.1041	808-872	29.3230	29.0808
Thailand	Bt	38.4368	-0.3792	051-684	38.8291	38.3485

Source: Official site of newspaper Financial Times (27.07.2000) — www.ft.com.

The first 2 columns provide the list of countries and quoted currencies (against Euro, in European and American terms). In column 3, the average (of bid and ask rates) quotes of currency at the moment of the market closure in appropriate country (for non-convertible currencies) or in international market (for leading currencies) are represented, and the last 2 columns — the highest and the lowest daily average rates. 4<sup>th</sup> column provides daily changes (to the average closing rate of the previous trading day), the 5<sup>th</sup> one — the bid-ask spreads for closing (rigorously, small figures of bid and ask exchange rates).

For example, the average TOD quote for closing makes up 26.0769 ruble per Euro, increasing by 0.0142 daily (of level 26.0627), with “mini-max” ciphers 26.0168 and 26.1316. The bid rate was 26.0619, and the ask rate — 26.0918.

The newspaper “Kommersant” (Table 3.2) offers simplified type of quotation’ table, providing currency name and bid-ask rates, priced against the US dollar by outright method in European terms (excluding British pound and Euro, quoted usually in American terms).

Table 3.2

**Average quotations of currencies to the US dollar (historical data)**

Currencies	Bid rate / ask rate
<b>British pound*</b>	1.46 / 1.4602
<b>Euro*</b>	0.8982 / 0.8984
Canadian dollar	1.474 / 1.475
<b>Russian ruble</b>	<b>27.757 / 27.777</b>
Sweden crone	9.335 / 9.345
Swiss frank	1.7245 / 1.7255
Japanese yen	105.73 / 105.83
*US dollar per currency (01.09.2000)	

Source: Official site of newspaper “Kommersant” — www.kommersant.ru.

**3.3.2. Cross-rates of currencies. Triangular arbitrage**

The majority of currencies quotes against the US dollar<sup>42</sup>. For quotation of non-dollar pairs of currencies, cross-rates are applied, i. e. proportions of exchange between 2 currencies (for example, ruble and Chinese uan), calculated on the basis of their rates to the 3<sup>rd</sup> currency (the USA dollar).

**Quotations of currency cross-rates**

Financial news-papers publicate the average cross-rates of different currencies. Below (Table 3.3) are quotes, placed in *Financial Times*, are shown:

Table 3.3

**Cross-rates of leading currencies**

Currency	USD	GBP	EUR	JPY
USD	—	0.66538	1.08137	109.65000
GBP	1.50290	—	1.62519	164.79298
EUR	0.92475	0.61531	—	101.39883
JPY	0.00911	0.00606	0.00986	—

Source: official site of Financial Times — www.ft.com.

<sup>42</sup> It is happened for natural reasons, as only one unit can play the role of money in each market, all the rest can only be the goods (assets). Before the World War I, British pound played this role in foreign exchange markets, after the World War II — the USD. Now also euro provides this service.

Actually, if 109.65 yen or 1.08137 euro is given for 1 US dollar, then euro should be quoted as 101.39915 yen.

In Table 3.4, quote is 101.39883 yen per dollar. Probably, inequality of both quotations (calculated and published) was a consequence of approximation, because the quote up to 5<sup>th</sup> figure in both cases amounts 101.40.

Table 3.4

**Cross-rates of world currencies**

	<b>BP</b>	<b>USD</b>	<b>EURO</b>	<b>DEM</b>	<b>FIM</b>	<b>FRF</b>	<b>SFR</b>	<b>JY</b>
<b>BP</b>	1	1.460	0.615	1.491	4.532	5.000	1.181	0.724
<b>USD</b>	1.460	1	0.898	0.459	0.151	0.137	0.580	0.945
<b>EURO</b>	1.625	0.898	1	0.511	0.168	0.152	0.645	1.052
<b>DEM</b>	3.178	2.177	1.956	1	0.329	0.298	1.262	2.058
<b>FIM</b>	9.663	6.618	5.945	3.040	1	0.906	3.836	6.256
<b>FRF</b>	10.660	7.301	6.558	3.354	1.103	1	4.232	6.902
<b>SFR</b>	2.519	1.725	1.550	0.792	0.261	0.236	1	1.631
<b>JY</b>	154.449	105.780	95.022	48.592	15.984	14.488	61.322	100

Quotes of British, Irish pounds and Euro against US dollar are provided in traditional (American) form: dollar per currency.

Source: official site of newspaper “Kommersant” — www.kommersant.ru.

In practice, cross-rates, quoted on two-sided base, are meaningful. Utilizing dollar-yen rate as 105.73–83, and dollar-euro — 0.6665–0.6669, let’s calculate two-sided cross-rate of euro to yen. Cross bid rate (*CBR*), representing proportion of dollar bid rate for yen to dollar ask rate for euro<sup>43</sup>, counts 158.5395 yen per euro:

$$CBR_{\frac{\text{Yen}}{\text{Euro}}} = \frac{BR_{\frac{\text{Yen}}{\text{USD}}}}{AR_{\frac{\text{Euro}}{\text{USD}}}} = \frac{\frac{\text{JPY } 105.73}{\$ 1}}{\frac{\text{Euro } 0.6669}{\$ 1}} = \frac{\text{JPY } 158.5395}{\text{Euro } 1}.$$

<sup>43</sup> The smaller of yen quotations for greater Euro quotation, as purchase of Euro for yen is equivalent for the bank-“market-maker” to second consecutive operations: purchase dollars for yens first, sale dollars for euro then.

Ask cross-rate, representing proportion of dollar ask rate against yen to dollar bid rate against euro<sup>44</sup>, equals 158.7847 yen per euro:

$$CAR_{\text{Euro}}^{\text{JPY}} = \frac{AR_{\text{USD}}^{\text{JPY}}}{BR_{\text{USD}}^{\text{Euro}}} = \frac{\text{JPY } 105.83}{\$1} = \frac{\text{JPY } 158.7847}{\text{Euro } 1}.$$

However, in recent decades, the market share, where non-dollar currencies are quoted directly to each other (for example, Euro to British pound, yen to Euro, ruble to yen), increased significantly.

### Cross-rate (triangular) arbitrage

If actual direct quotations do not coincide with cross-rates, then conditions for cross-rate, or triangular, arbitrage appear.

Let us suppose, the dealer found, that in London (in euro-market), yen quoted to dollar as 100 to 1, and euro — as 0.8 to 1. Then, the average cross-rate quote of yen-euro amounts 125 yen per euro. In the same time, in Japan, banks directly quote euro as 130 yen. In this case, euro is overvalued in Tokyo and undervalued in London. Consequently, dealer will buy euro for yen (through dollars) in London market, and sale it in Japanese market. For 125 mln yen in London, he/she buys 1.25 mln dollars, at which 1 mln euro will be acquired. Then, in Tokyo, 130 mln yen will be purchased for these euros (4% over initial sum). If all deals are settled on spot conditions, then profit counts more than 1000% on annual basis. If dealer should pay 5.2% per annum on borrowing funds (on 1 week), i. e. 0.125 mln yen, then net profit will be 4.875 mln yen.

Clearly, any other market participants, discovered such arbitrage opportunities, will work in the same manner. As a result, dollar rate is dearer to yen (for example, 102.5), and quote

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<sup>44</sup> The greater of yen quote for smaller euro quote, as sale of euro for yen is equivalent for the bank-“market-maker” to second consecutive operations: purchase dollars for euro first, sale dollars for yens then.

of euro in Tokyo falls. Last event appears due to increasing supply of euro in Japanese market. If its new level approaches 128.13, then arbitrage opportunities disappear, and markets return to equilibrium.

In September 1998 in Russia, extraordinary situation for triangular arbitrage occurred. Thus, in Monday morning (September 14<sup>45</sup>), dollar was quoted as 8.5 rubles in system of electronic trade (*SELT*) on MICEX (Moscow interbank currency exchange), and mark rate counted also 8.5 rub., while mark price of dollar in world market reached around 1.7. Consequently, arbitrageurs in Russian market should bring quotes to the levels of 14 rub. per dol. (holding mark rate as constant at 8.5 rub.) or to 5 rub. per mark (holding dollar rate as unchangeable at 8.5 rub.), or to some intermediate variant. Actually, first scenario was realized, at which ruble price of dollar increased almost twice.

### 3.4. Forward currency markets<sup>46</sup>

In forward looking (derivatives) markets, currencies are traded with delivery in future date at the fixed (predetermined) rate. In interbank market, standard terms are 1, 2, 3, 6, 9, 12 months. Non-standard terms (from several days to several years) characterize rather clientele market. Basic technics of forward looking deals stipulate following market segments:

- market of forward contract on currency;
- market of currency swaps;

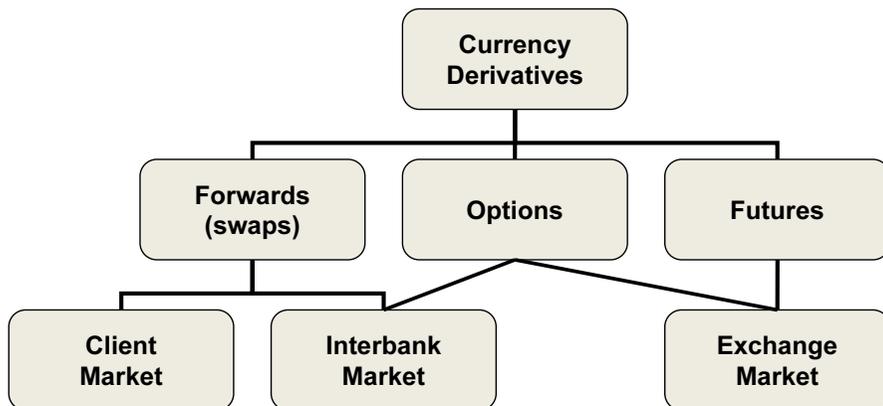
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<sup>45</sup> Before a day from the date of forward contracts maturity for currency sale by Russian banks, contracted earlier the August default (often back in the spring) for the price of 6.5 rubles. It is clear, that rate of 8.5 rubles for 1 dollar was deliberately undervalued as it is considered into force of coordinated operations of large banks and the CBR in a bid to gain dollars at the lowest possible prices for payments under forward contracts

<sup>46</sup> One of the classical author in forward market theories is considered P. Einzig (*Einzig P. The theory of forward exchange*. London: Macmillan, 1937).

- market of currency futures;
- market of currency options;
- market of modified contracts, appeared on the basis of previous ones.

Forwards and swaps are circulated in interbank and client-tele markets (Exh. 3.5); futures — on organized exchanges; options are traded in all highly listed market segments.



*Exh. 3.5.* Traditional currency derivatives and sectors of forward looking markets

Instruments of these markets (derivatives) are the response to needs for hedging (neutralizing) of risks, stipulated by exchange rate fluctuations. Thus, exchange risk appears in the moment of currency position opening, then, it is necessary to cover (close) such position for defending of this exposure. As a result, in forward looking market (for hedging), deals, opposite to basic ones, are conducted. Thus, spot-purchase of currency is hedged by selling this currency in derivatives' market, and, vice versa, spot-selling is covered by forward-buying. Growth of derivatives' contracts trading is observed in 1970–80<sup>th</sup>, the period of specific non-stability of exchange rates, commodity prices, interest rates, and also in 2000–2008, the period of intensifying of so-called financial innovations introduction in business practice.

Derivatives also are utilized actively for arbitrage, speculation. The last type of activity is the supporting of open positions for extracting of profit due to exchange rates changes (risky strategy). Arbitrage do not link with risk, assuming, that simultaneously the opposite deals are conducted (buying and selling) for extracting of guaranteed (riskless) profit, based on quotes discrepancies in different market segments.

### 3.4.1. Discounts, premiums for forward contracts

*Forward rate* is a price of currency with delivery on a future date. Exceeding of forward rate over spot one is defined as *premium*. Market-makers quote it, expecting the growth of a certain currency spot rate. *Discount*, or lower forward rate against the spot one, reflects expectations of spot rate decrease<sup>47</sup>. Appearing forward differentials are quoted in absolute (in basic points) and in relative form (on annual percentage basis):

$$f = \frac{FR_t - SR_0}{SR_0} \times \frac{360}{t} \times 100\%,$$

where  $f$  — forward differential (premium, discount on annual basis);  $FR_t$  — forward rate;  $SR_0$  — current spot rate,  $t$  — maturity of forward contract.

For example, if mark quoted against dollar in spot market as 0.5000, and in 1-year forward contract as 0.5100, then premium counted 100 basic points (1 US cent) or 2% per annum. If 3-month forward was 0.5040, then premium will be counted 3.2% on annual basis. These are calculations of forward differentials, if we want rigorously follow the formal definition.

However, in practice (due to the customs), situation is different a little bit. Calculations of forward premiums (discounts) are more unified and simpler, but more approximate (less exact). For instance, at March 27, Hungarian forint was quoted as 260.483 against euro in spot market, and as 274.2231 in 1-year forward market (Table 3.5).

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<sup>47</sup> The explanation of this pattern is given by the hypothesis of unbiased forward rate hypothesis.

Table 3.5

## Spot, forward quotations of euro

Countries	Currencies	Spot rates	Forward rates		Forward premiums / discounts	
			1 month	1 year	1 month	1 year
Hungary	Forint	260.483	261.8935	274.2231	-6.5%	-5.3%
Switzerland	SFr	1.5502	1.5486	1.5317	1.2%	1.2%
Mexico	New Peso	8.7947	8.8756	9.8334	-11.0%	-11.8%
USA	\$	0.9392	0.9409	0.9562	-2.2%	-1.8%
India	Rs	42.1325	42.3782	44.6201	-7.0%	-5.9%
Japan	Y	102.523	102.1434	97.736	4.4%	4.7%
Singapore	S\$	1.6285	1.6266	1.5958	1.4%	2.0%

Source: Official site of newspaper *Financial Times* — [www.ft.com](http://www.ft.com).

It means premium for euro, or discount on forint, which is calculated as follows:

$$f = \frac{274.2231 - 260.483}{260.483} \times \frac{360}{360} \times 100\% = -5.3\%.$$

Consequently, the amount (-5.3%) is rigorously premium for euro against forint, but represented with sign “-”, where the last reflects discountness of Hungarian currency. In same time, formally, exact calculation of discount for forint counts 5.01%:

$$f = \frac{(1/274.2231) - (1/260.483)}{(1/260.483)} \times \frac{360}{360} \times 100\% = -5.01\%.$$

It differs from those published in *Financial Times* almost for 0.3% (30 basic points). It is a meaningful error, and it could substantially discourage the estimation of financial results. However, directly for dealing, such rough determination of forward premium (discount) do not establish the barriers, because the market realizes single-meaningly and correct the contents of published exchange rates' figures. Calculation of published 1-month discount for forint counts (-6.5%):

$$f = \frac{261.8935 - 260.483}{260.483} \times \frac{360}{30} \times 100\% = -6.5\%.$$

Yen was quoted to euro as 102.523 in spot market, as 102.1434 (or with premium 4.4%) in 1-month forward, as 97.7360 (4.7%).

“World tables” of International Financial Statistics (statistical edition of International Monetary Fund), devoted to international interest rates, include premiums and discounts for 3-month forward rates of leading countries currencies against US dollar (Table 3.6).

*Table 3.6*

**Discounts (–) / premiums for 3-month forward rates  
against US dollar, end of period, % per annum**

	1993	1995	1998	1999	2000	2005	2009
<b>DEM</b>	–2.66	1.81	1.89	–			
<b>Euro</b>	–			4.22	5.75	...	...
<b>JPY</b>	1.18	4.86	6.25	6.25	5.75	2.78	
<b>SFR</b>	–0.95	3.30	3.34	4.65	3.30	3.13	0.699
<b>GBP</b>	–1.91	–0.72	–0.89	–1.02	1.31	–1.23	...

Symbols of currencies: DEM — Deutsche (German) mark, JPY — Japanese yen, SFR — Swiss frank, GBP — Great Britain pound

*Source:* International Financial Statistics. Yearbook. Washington, 2011.

Forward differencial is formed under the influence of difference in interest rates on mutually converted currencies<sup>48</sup>. Currencies with higher interest rates in interbank market are quoted usually with discount against lower-interest currency, and vice-verse (Table 3.7).

*Table 3.7*

**LIBOR rates on 3-month deposits\*, average for period,  
% per annum**

	1993	1995	1998	1999	2000	2005	2009
<b>USD</b>	3.29	6.04	5.59	5.41	6.53	3.56	0.692
<b>GBP*</b>	6.05	6.73	7.39	5.54	6.19	4.76	1.212

<sup>48</sup> The explanation of this pattern is given by Interest Rates Parity theorem.

Table 3.7 (continuation)

	1993	1995	1998	1999	2000	2005	2009
<b>SFR</b>	4.96	3.09	1.60	1.39	3.10	0.8	0.375
<b>FFR</b>	8.57	6.68	3.64	—			
<b>DEM</b>	7.30	4.53	3.60	—			
<b>Euro</b>	—			2.96	4.41	2.18	1.228
<b>JPY</b>	3.00	1.27	0.71	0.22	0.28	0.06	0.475
Symbols of currencies — like in Table 3.6, and USD — US dollar							
* for British pound, rates of Paris interbank off-shore market are given ( <i>PIBOR</i> )							

Source: International Financial Statistics. Yearbook. Washington, 2011.

Actually, to first type of currencies, British pound is related, and to second type — Deutsche mark (nowadays — euro), Swiss frank.

### 3.4.2. Quotations of forward rates

Forward rates are quoted in clientele (“retail”) market in form outright (up to 4<sup>th</sup> figure after comma). They can be direct or indirect ones (Table 3.8).

Table 3.8

#### “Retail” quotes in forward market, USD against CAD

	Direct quotation	Indirect quotation
<b>Spot</b>	USD 0.8039	CAD 1.2440
<b>180-days forward</b>	USD 0.7940	CAD 1.2595

For comparing with interbank market, return on forward looking deals converts in form of swap rates, recalculated on the annual basis. For Canadian dollar, swap rates count, using direct quote:

$$f_{\frac{\text{USD}}{\text{CAD}}} = \frac{0.794 - 0.8039}{0.8039} \times \frac{360}{180} \times 100\% = -0.053 = -5.3\%.$$

Utilizing indirect quotation — as follows:

$$f_{\frac{\text{CAD}}{\text{USD}}} = \frac{1.2595 - 1.2440}{1.2440} \times \frac{360}{180} \times 100\% = 0.02492 = 2.49\%.$$

Currency is quoted for the clients in forward market also in bilateral form (Table 3.9) — as forward bid rate (*FBR*) and forward ask (offer) rate (*FAR*):

Table 3.9

**Bilateral quotations for forward rates**

<b>Outright quotes</b>	<b>Bid rates (dollars per pound)</b>	<b>Ask rates (dollars per pound)</b>	<b>Spreads (basic points)</b>
<b>Spot rate</b>	1.5060	1.5080	20
<b>30-day forward rate</b>	1.5025	1.5060	35
<b>90-day forward rate</b>	1.4955	1.5055	100

In interbank (“wholesale”) market among currency traders, forward rates are quoted in form of swap points (Table 3.10):

Table 3.10

**Swap quotations of currencies**

	<b>Bid rate</b>	<b>Ask rate</b>
<b>Spot (2 “small figures”)</b>	60*	80
<b>30-days forward</b>	35	20
* “big figure” in this quote — 1.50		

To quote the currency for customer, bank should convert swap quotations in outright ones, and then, should widen the spread (to cover the additional transaction expenses, risks, appearing in clientele market). Substantially, that swap points do not bring a sign — plus or minus. To determine it, you should remember the following rule: if swap bid rate is higher, than swap ask rate, then we operate with discount (it should be deducted from swap quote to extract forward outright), and vice versa. In our case, the bid outright rate counts  $1.5060 - 0.0035 = 1.5025$ , and ask outright forward rate:  $1.5080 - 0.0020 = 1.5060$ .

A rule of swap points’ recalculation in outright quotation is based on 2 assumptions:

- ask rates are over bid rates (for direct quotes) in spot and forward markets;
- exchange rate' spreads are wider in forward market (comparing with spot) due to higher term risk.

In our case, both assumptions are supported. However, if we calculate swap points for premium, then, receiving ciphers (1.5095–1.5100) do not appropriate to 2<sup>nd</sup> supposition, because forward spread (5 basic points) is less than spot spread (20 points). It means, that we made mistake.

For the range of countries (in Europe — for Poland, Romania, Russia, Slovak; in Southern America — Argentina, Brasil; in Asia — Israel, Malasia. Southern Corea), newspaper *Financial Times* did not publish the forward quotes (Table 3.11), because their markets were unsufficiently liquid or even absent at all.

Table 3.11

**Forward rates of currencies against Euro**

		1 month		3 months		1 year	
Country	Currency	Rate	%*	Rate	%*	Rate	%*
<b>Europe</b>							
<b>Czech Rep.</b>	<b>Koruna</b>	35.5874	-0.9	35.6235	-0.7	35.7635	-0.6
<b>Hungaria</b>	<b>Forint</b>	261.8935	-6.5	264.4411	-6.1	274.2231	-5.3
<b>Poland</b>	<b>Zloty</b>	—	—	—	—	—	—
<b>Romania</b>	<b>Leu</b>	—	—	—	—	—	—
<b>Russian</b>	<b>Rouble</b>	—	—	—	—	—	—
<b>Slovakia</b>	<b>Koruna</b>	—	—	—	—	—	—
<b>Swerige</b>	<b>SKr</b>	8.4778	0.5	8.4717	0.4	8.4655	0.2
<b>Switzerland</b>	<b>SFr</b>	1.5486	1.2	1.5454	1.2	1.5317	1.2
<b>England</b>	<b>GBP</b>	0.6206	-1.7	0.6220	-1.5	0.6268	-1.1
<b>America</b>							
<b>Argentina</b>	<b>Peso</b>	—	—	—	—	—	—
<b>Brasil</b>	<b>R\$</b>	—	—	—	—	—	—
<b>Canada</b>	<b>C\$</b>	1.3834	-1.3	1.3859	-1.2	1.3944	-0.9
<b>Mexico</b>	<b>New Peso</b>	8.8756	-11.0	9.0463	-11.4	9.8334	-11.8

Table 3.11 (continuation)

Country	Currency	1 month		3 months		1 year	
		Rate	%*	Rate	%*	Rate	%*
<b>America</b>							
USA	\$	0.9409	-2.2	0.9441	-2.1	0.9562	-1.8
<b>Pacific/Middle East/Africa</b>							
Australia	A\$	1.5959	-1.7	1.5997	-1.5	1.6142	-1.3
Hong Kong	HK\$	7.3323	-1.5	7.3506	-1.5	7.4361	-1.5
India	Rs	42.3782	-7.0	42.8242	-6.6	44.6201	-5.9
Indonesia	Rupiah	8463.89	-8.3	8577.11	-8.1	9119.59	-8.5
Israel	Shk	—	—	—	—	—	—
Japan	Y	102.1434	4.4	101.3732	4.5	97.7360	4.7
Malasia	M\$	—	—	—	—	—	—
N. Zealand	NZ\$	2.0483	-2.2	2.0551	-2.1	2.0821	-1.8
Philippine	Peso	42.3171	-5.1	42.6622	-5.0	44.4098	-5.4
Singapore	S\$	1.6266	1.4	1.6213	1.8	1.5958	2.0
S. Africa	R	6.5462	-6.0	6.6061	-5.7	6.8675	-5.4
S. Korea	Won	—	—	—	—	—	—
Taiwan	T\$	29.1461	-0.5	29.1726	-0.5	29.2735	-0.5
Tailand	Bt	38.4662	-0.9	38.5380	-1.1	38.7922	-0.9

\* quotes of discounts (premiums) are given in percent per annum

Source: official site of news-paper Financial Times — www.ft.com.

In forward market, as in spot one, the currencies are quoted one to another straight and by the method of cross-rates. For example, using forward quotations of US dollar and mexicanian peso against euro in Table 3.18, it is easy to calculate cross-rate of dollar in terms of peso. They count for 1 month — 9.4331, for 3 months — 9.5819, for 1 year — 10.2838. Appropriately, in this market segment, the opportunities for triangular arbitrage appear also periodically (and practically, momentary diappear).

The operations in forward market, as in spot one, are characterized by the currency, default risks. In difference to spot market, these exposures for forward markets' participants are more substantial due to the longer maturiy period between

contract and value date, representing some kind of term financial risk.

**3.4.3. Forward trade: position holding**

Forex trader purchases and sells the currencies for the bank customers on the constant basis. It is voluntary (non-obligatory), but often — useful, for traders in main banks to cover each operation immediately. Such banks hold an active forex trading departments, operating due to general banking policy, established by bank top-management. This general policy arranges maximal level of position, that trader can hold at some currency in dealing day end, calculating as net-balance of sellings and purchasing. Possibly, trader tries to hold his/her position in equilibrium, as it is feasible, defending by this way of substantial exchange rates fluctuations. However, trader can allow the position to be imbalanced, expecting other clients to bring orders for new transactions, which reestablish the position equilibrium. Such decision depends on trader’ opinion about future trends of exchange rates.

After settlements of deals, they are recorded by clerk, holding all accounting entries and reflecting all changes. At the day begininig, bank position in pound sterling can be as follows (Table 3.12).

*Table 3.12*

**Case of open currency position (British pounds)**

<b>Cash balance in correspondent bankat the period begining</b>		200 000
<b>Purchasing, which were not credited on the account</b>		
Electronic transfers	350 000	
Sight (call) drafts	65 000	
Forward contracts	100 000	
<b>Total purchasings</b>		515 000
<b>Total balance and purchasings</b>		715 000
<b>Sales, which were not debited for account</b>		
Electronic transfers	400 000	

*Table 3.12 (continuation)*

<b>Cash balance in correspondent bank at the period beginning</b>		200 000
<b>Sales, which were not debited for account</b>		
Sight (call) drafts	40 000	
Forward contracts	350 000	
Total sellings		(790 000)
Total position		(75 000)

Trader can hold the total position limit of 100 000 pounds. Total bank position is classified as short one (75 000 pounds), despite holding 200 000 pounds on his/her account. Trader can estimate, how many days left before the sold and bought sight drafts will be reflected in the balance sheet. Well knowing, that electronic transfers will be entried into account for the value date, trader holds sufficient funds in account today to cover immediate delivery sales. If other operations do not deal, then trader will hold sufficiently funds in account to close 60-days forward sales. Times of maturity for different forward contracts are shown in Table 3.13.

*Table 3.13*

**Case of maturity dates for forward contracts,  
thousands of pounds**

	<b>Today</b>	<b>30 days</b>	<b>60</b>	<b>90</b>	<b>180</b>
<b>Sellings</b>		(50)	(100)	(100)	(100)
<b>Purchasings</b>			+50		+50
<b>Cash balance in account</b>	175*				
<b>Currency position</b>		+125	+75	(25)	(75)

\* From Table 3.12, beginning cash balance plus electronic transfers, and sight drafts bought, minus electronic transfers, and sight drafts sold

Position clerk should make entries regarding the delivery dates in such manner, that they could be reflected in spot posi-

tion on the date of settlement. For total position balancing, trader can buy 75 000 pounds, but it will only increase the cash supply. Because the forward contracts do not mature immediately, the trader could decide to decrease the large cash position, because it do not get interest incomes through swap-operations.

In this case, trader can sell currency spot, and buy for forward deliveries on the date close to date of delivery for other forward sellings contracts. It does not change the total position, but it decreases cash position. Swaps could be established for maturities between these 2 dates: 1 month against 3 months, 2 months against 6 months, or between spot dates and future date. Appropriate exchange rates are quoted for these different dates. Thus, trader sells the pounds in spot market, getting rate for spot-sell, and he/she purchase forward at the rate for eligible future date.

By this way, trader owns flexibility for adjustment of maturities for the goal to be appropriate to customers' needs, and staying at the same time inside of the limits, established by bank management.

## **Resume**

Forex market is structured on currency, geographical, institutional, derivatives grounds. Trading in foreign currency is carried out mainly by banks through dealing and settlement offices. It is described in terms of the currency position, denoting forex risk. Its value is limited by Central Bank, as well as by banks themselves.

The spot rate is the ratio of currencies exchange with the conditions of immediate delivery. The forward exchange rate is the ratio of currency exchange, delivered in the future (through 30, 90, 180 days). Currency quotations are distinguished in the client and the interbank market. For clients currency quote in a direct or indirect way, in the interbank market — in the American or European terms.

In forex market, a comission for currency exchange is not charged. Market participants receive income in the form of the exchange rate spread, i. e. the difference between bid and ask

rates. It should cover transactional costs and provide a reasonable profit and a premium for currency risk. The level of spread depends on the liquidity and risk in the market.

Quotes between the two currencies, calculated with the use of their exchange rates against a third currency, called the cross-rates (“cross-over” quotations). Arbitrage on the differences between direct and “cross-over” quotes is the triangular (cross-rate) arbitrage.

Forward currency contracts — transactions with the delivery of the currency on a specified future date at a fixed presently exchange rate. Forward currency markets are used for exchange risks hedging purposes, the arbitrage.

*Discounts and premiums* on forward contracts are reductions, allowances against the spot rate. Forward rates are quoted in the form “outright” (full-figure quotation) in the customer market, and in the form of swap rates on the interbank market. Spreads on forward exchange rates are wider (due to higher risk), than on spot rates.

### ***Control questions for discussion***

1. Give the general characteristics of the foreign exchange market. What are the customs concerning currency spot transactions?

2. What types of currency quotations do You know? Explain the difference between direct and indirect quotes. What does the cross-rate represent?

3. Answer the following questions based on the data Table. 3.11. How much dollars can You get for 1 Euro? How many euros you can get for \$ 1? What is the three-month forward exchange rate for the dollar? Whether dollar sells with the forward premium or at a discount? What is the 90-day forward discount or premium for the dollar?

4. Count the indirect quotation for the Forint, the ruble, British pound, yen, peso, the US dollar, the rupee, and Japanese yen. (See Table 3.1).

5. How does the company pay for the foreign exchange services of a commercial bank? Assume, fluctuations of the ex-

change rates increased. What is likely to happen with the spread between bid and ask rates of the currency?

6. What are the forward looking exchange transactions? Make a distinction between the exchange spot and forward rates. Who are the main users of forward market? What are their impetuses?

7. Using the data of Table 3.9, calculate 30-and 90-day forward discounts on the GB pound.

8. Because of the time value of money, forward exchange rates are always higher than the spot rates. Agree or disagree with this idea, and modify the statement to make it acceptable.

9. Explain, what does sale of forward with a discount or with a premium for the currency mean. Spot rate of USD is 25 rubles, while the 180-day forward exchange rate — 27 rubles. What could be the reasons for the differences between these two rates?

10. What risks do the dealers face in the foreign exchange markets? How can they manage them?

### *Problems to solve*

1. Exchange rate of Euro is 1 EURO = 0.92 USD. What is the exchange rate of the dollar?

2. The bank quotes the following spot rates against the dollar — 1.1010 — 20 Euro, 1.4020 — 27 Swiss franc, 104.40 — 50 yen. The client wishes to buy euros. What exchange rate should he/she use? What is the spread for the Swiss franc? At what rate will bank sell Swiss francs? What amount will pay the bank in order to buy 5 mln yen?

3. Suppose, a direct quotation of sterling pound in New-York City is 1.1020 — 1.1025 USD. How much do 250 000 pounds in New-York cost? What is a direct quotation of the dollar in London?

4. Suppose, you observe the following direct spot quotes in New-York and Toronto, respectively: 0.8000-50 and 1.2500-60. What are the arbitrage profits per 1 mln dollars?

5. Let 1 sterling pound = 2.3985 dollars in New-York City, \$ 1 = 1.09 euros in Frankfurt, and 1 Euro = 0.4001 pounds in

London. How could you (assuming the absence of operating expenses) profit from these quotes?

6. On the basis of official quotations of the Bank of Russia on a random date calculate the following cross — rates: US dollar / Australian dollar, US dollar / British pound, Euro / British pound, the New-Zealand dollar / Euro.

7. At the beginning of business day, the British bank had \$100 million of its own funds. In the course of the day, traders of the bank concluded the following transactions:

- a) purchase of 2 million Euro at the rate of 0.9050 USD;
- b) purchase of 5 million pounds at the rate of 1.3015 USD;
- c) sale of 1 million Euro at the rate of 0.9100 USD;
- d) purchase of 3 million euros for pounds sterling at the rate of 1.4205 Euro per pound.

What will be the foreign currency position of the bank at the end of the working day?

8. The investor has an opportunity to purchase in the spot market pounds by quote 1.2010 dollars and to sell them forward for 180 days by 1.2030 USD. What is the premium or discount for the 180-day forward to British pounds?

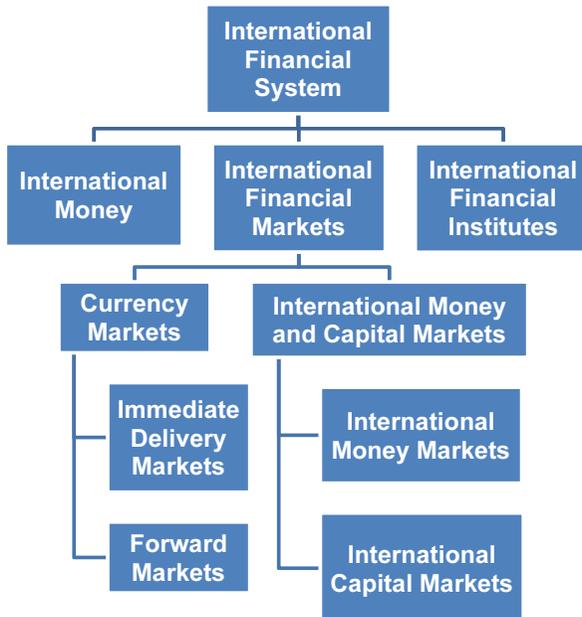
9. Suppose, the Swiss Bank quotes the spot and a 90-day forward on the dollar, respectively, as 0.7957 — 60 and 0.7965 — 72. Determine the size of the premium or discount, when buying a 90-day forward on the Swiss franc. Calculate the difference between the price for the buyer and the seller on the spot and the forward of the Swiss franc.

## Part 2

# INTERNATIONAL MONEY AND CAPITAL MARKETS

*The internationalization* of financial markets strengthened as a result of financial deregulation (in the beginning of 1980s) in the leading countries on the wave of neoclassical “counter-revolution” in economy regulation. Destroying of barriers for capital movement led to *globalization* of financial markets.

In this part instruments and indicators of international (foreign and euro-currency, or on- and off-shore) money and capital markets are considered.



*Exh. II.1. Money and Capital Markets  
in International Financial System*

This section includes the following themes:

- tradable and non-tradable (negotiable and non-negotiable) instruments of international money markets;
- comparison of benefits and costs in domestic and off-shore markets;
- structure of international capital markets;
- instruments of international debt and equity markets.

# Chapter 4

## INTERNATIONAL MONEY MARKET

If you'd know the value of money,  
go and borrow some.

*Benjamin Franklin (1706–1790),  
American politician, diplomat,  
physicist, inventor*

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

**Part two: INTERNATIONAL MONEY  
AND CAPITAL MARKETS**

## Purposes of studying

➤ Structurize the world financial markets, introduce difference between transactions in foreign (on-shore) and euro-currency (off-shore) markets.

➤ Characterize tradable instruments of money markets — treasury bills, commercial and eurocommercial papers, mid-term euronotes, bankers' acceptances, certificates of deposit.

➤ Discuss non-tradable instruments of money markets — interbank credits, clientele loans (deposits).

➤ Study the indicators of matured foreign money markets, published by International Monetary Fund (*IMF*), Wall Street Journal, Financial Times.

➤ Consider the indicators of euro-currency interbank markets, based on the data of British Banking Association (*BBA*), *IMF*.

➤ Represent the indicators of transitive money markets, published by *IMF*, Central Bank of Russia (*CBR*), RF Ministry of finance.

➤ Compare benefits and costs in internal (foreign) and euro-currency (off-shore) markets.

➤ Analyze the interest spreads in domestic and off-shore markets, based on actual data and hypothetical examples.

Let's consider now the 2<sup>nd</sup> sector of international financial markets (after forex), i. e. money and capital markets, upon whom funds (investments, credits) move.

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

### 4.1. Classifications of money and capital markets

Money markets refers to the system of short-term transactions (1 year or less), the capital one — more than 1 year-term. Regardless of maturity, specialists differentiate the mar-

kets of tradable and non-tradable instruments (Exh. 4.1). The first ones are represented by debt securities (i. e. notes, bonds) and equity papers (i. e. stocks — titles of ownership). Securities, placed by the issuer, are directed to the primary market. Thereafter they circulate (are sold, purchased) in secondary market, represented by organized exchanges and distant electronic trade systems.

*Stock exchanges* provide the floors for trading by first-class common stock and convertible bonds, included in listing, i. e. admitted for trading. Thus, the listing of *New York Stock Exchange (NYSE)* covers over 2000 stocks, 800 bonds (convertible in equities). In *OTC (Over The Counter)* market, traders quote the stocks of relatively less-known firms, the majority of corporate bonds and preferred shares, treasury and municipal papers, and instruments of money market (promissory notes, interbank credits) and forex market (spot, derivatives).

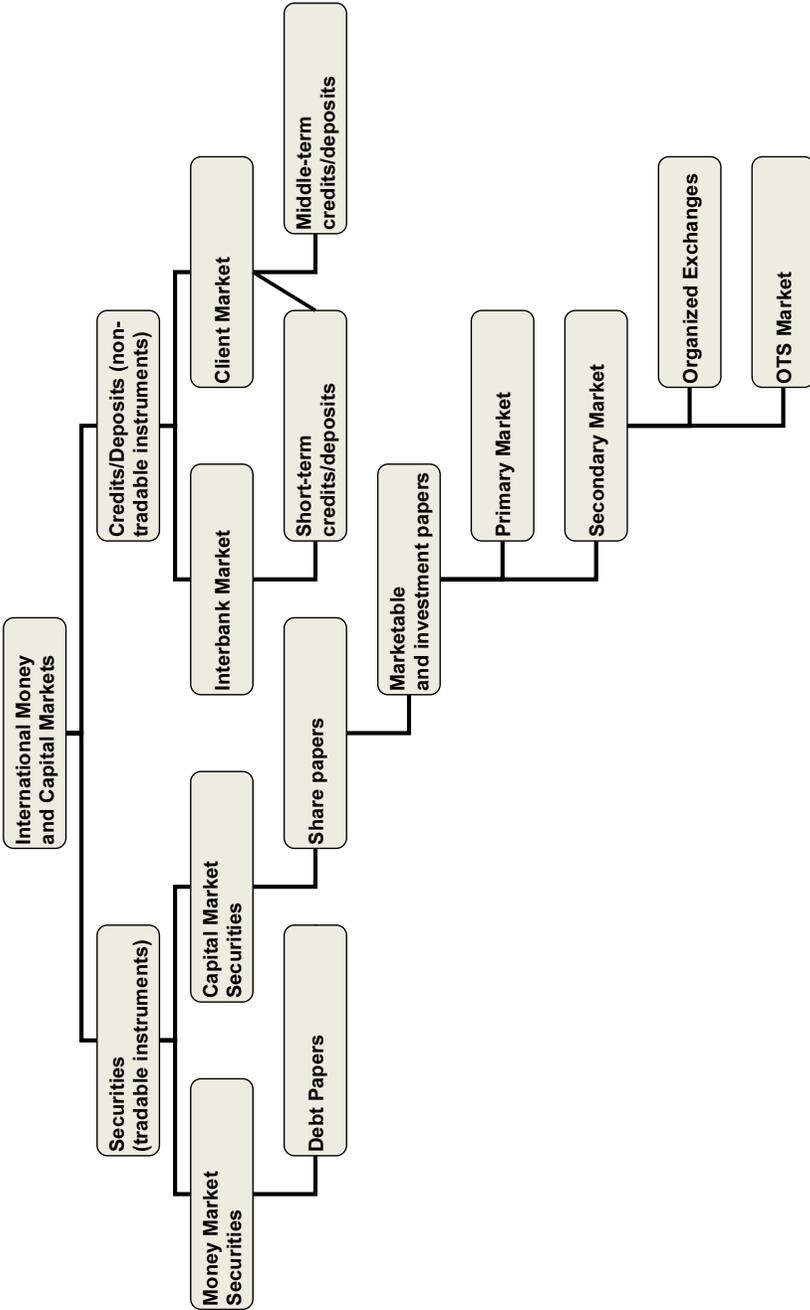
Money market of non-tradable instruments includes inter-bank segment (where the banks operate with each other) and clientele one (where banks service the customers).

### **Domestic, foreign (on-shore) and euro-currency (off-shore) markets**

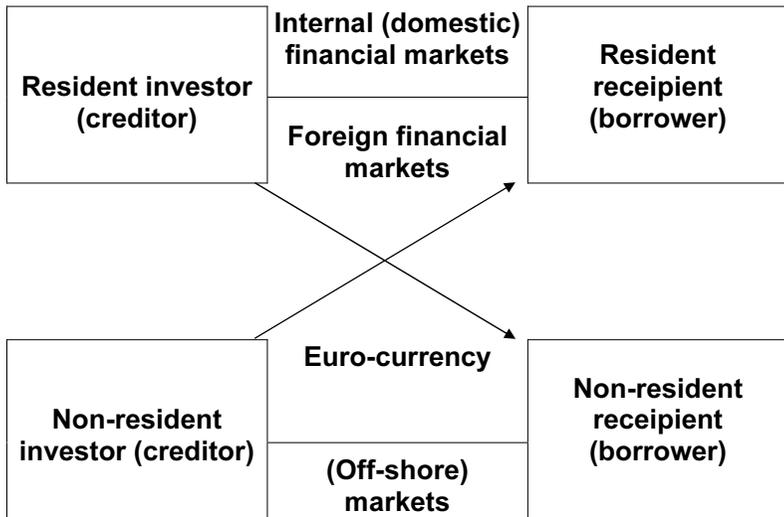
Classifications of international money and capital markets also depend on the currency of deal and the place of registration (“residency”) of transaction counterparties. Three market segments, in this sense, are represented by the following ones:

- “internal currency market” (the term from the Russian financial legislation);
- foreign market;
- euro-currency (off-shore) financial markets (Exh. 4.2).

Thus, as a transaction in “internal currency market” can be recognize, for example, the dollar credit of “First Petersburg bank” in address of the company “Petersburg Import” (both — residents of Russia). Such a deal, realized in accordance with Russian banking, tax legislation, currency control, is dear (expensive). For instance, interest rate on dollar credits in the RF counted 25–30% and more in 1990s.



Exh. 4.1. Structure of international money and capital markets



*Exh. 4.2.* Internal, foreign (on-shore) and eurocurrency (off-shore) markets

Transaction in foreign market can be illustrated by the credit of resident in his/her national currency in favor of non-resident: suppose, placement the dollar bonds by “Main mining corporation” on *NYSE* for selling to non-residents of Russia (primarily, to American residents).

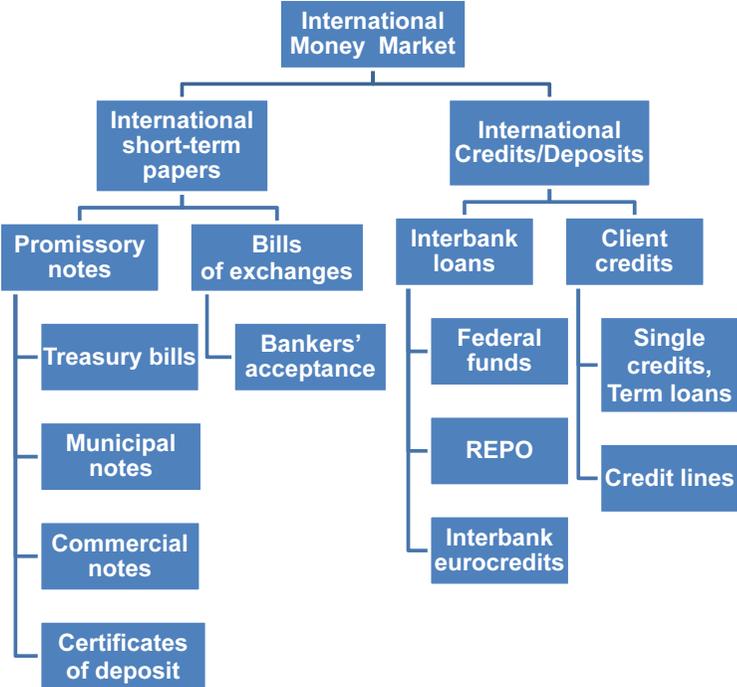
*Euro-currency*<sup>49</sup> (off-shore) market refers to operations between non-residents of the country, where this deal is realized. The currency of transaction should be also foreign one for the country of dealing (for example, placement of dollar bonds by Russian resident in London). Moreover, as the off-shore transaction is recognized the dollar credit, granted by the subsidiary of “First Petersburg bank”, registrated in Cyprus, to subsidiary of the company “Petersburg Import”, located in Poland (for delivering goods, bought in Germany, to Saint-Petersburg).

<sup>49</sup> Don’t be fooled in terminology — do not mix up euro-currency (money or capital) market with currency (foreign exchange) market.

Euro-currency markets give possibilities for economizing on tax, regulatory costs in comparison with the on-shore (foreign, internal currency markets).

### 4.2. Instruments of money markets

*Tradable instruments* of money market are issued in the form of promissory notes and bills of exchange (Exh. 4.3).



Exh. 4.3. Structure of international money markets

*Promissory notes (PN)* refer to the short-term debt of different issuers. Federal Governments issue treasury bills (*TB*), local authorities — municipal bills (*MB*), corporations — commercial papers (*CP*), euro-commercial papers (*ECP*), euro-notes (*EN*),

banks — certificates of Deposit (*CD*), euro-certificates of deposit (*ECD*). Bills of exchange (*BOE*), or negotiable time drafts (*TDr*), are bankers' acceptances (*BA*), issued in framework of sales contracts and accepted (guaranteed) by first-class banks. Ultimately, bonds with a remaining time to maturity of less than 1 year are also considered as instruments of money market.

Money market of tradable instruments has no physical location, vice versa, it is based on the computer and phone contacts between the operators. This is the wholesale *OTC* market.

*Non-tradable* instruments of money market are short-term clientele bank loans and interbank credits (deposits).

#### 4.2.1. Treasury bills and commercial papers

*Promissory notes* of the US federal government (*TB*) have the standard maturity dates of 3, 6, 12 months<sup>50</sup>. Central bank as an agent of government places them weekly at the auction (on Mondays with delivery on Thursday). Also they are bought from dealers and brokers. These discount papers are liquid (with the largest turnover of market — after interbank one), risk-free (because the probability of non-payment for them is close to zero), are not subject to local taxes. By virtue of it, the rate of return for them (Table 4.1) was the least among the instruments of the US money market (4.62% in 1990s and 2.72% in the first decade of current century).

Table 4.1

#### Interest rates, the USA, % per annum

	1993–1999	2000–2009
Federal funds rate	4.88	2.93
Commercial papers rate	5.04	3.00
Treasury bills rate	4.62	2.72
Certificates of deposit rate	5.08	3.20

Source: International Financial Statistics. IMF. Yearbook. Washington, 2010.

<sup>50</sup> Russian *GKO* was constructively the analogue of American treasury bills.

The stake of non-residents in treasury papers the USA holdings (Table 4.2) varied within last 2 decades around 1/3<sup>51</sup>, exceeding often the stakes of separate groups of residents, among which monetary authorities (11% and 39%), commercial banks (7% and 2%), other institutions (51% and 27%) prevailed.

Table 4.2

**Holders of US treasury securitiesbln USD, end of period**

	<b>1994–1999</b>	<b>2010, Sept.</b>
<b>Total</b>	3664	13 561.6
<b>1. Non-residents</b>	1074	4257.1
%	29%	31%
<b>2. Residents</b>	2590	9 304.5
<b>2.1. Monetary authorities</b>	416	5350.5
%	11%	39%
<b>2.2. Commercial banks</b>	257	337.5
%	7%	2%
<b>2.3. Other institutions</b>	1882.5	3616.5
%	51%	27%

*Source:* Economic Report of the President. Washington, 2011.

Commercial papers (*CP*) are the unsecured tradable promissory notes for the term from 2 up to 270 days, issued by non-bank corporations. *CP* are sold, firstly, to the institutional investors — banks, mutual funds, pension funds, other corporations. Papers with maturity of more than 270 days intended for individual investors must be registrated in Security and exchange commission. Non-tradable *CPs* are issued in the form of private placement and provided to predetermined investors, to holdings them to redemption. Often the revolving programs of *CP* with underwriting support, i. e. by a credit line, opened in the bank-organizers of the project (Revolving Underwriting Facilities) are issued.

<sup>51</sup> In Russia, non-resident portion in the market of GKO (“*Russian TB*”) varied in 1996–1998 in diapason 20–40% legally (but up to 80% due to non-official estimations).

### Case 5.1. Corporation XYZ

#### *Announce of issuance*

Corporation XYZ announces by this press-relies of the intention to issue the multicurrency program of Euro-commercial paper facilities, arranged by ABC bank.

Volume of issuance suggests amount of \$200 billions.

Facility program received short-term rating A-1 from *Standard-and-Poor* and P-1 from Moody's.

Dealers of facility program are appointed:

*ABC commercial bank*

*Citibank International*

*Morgan Stanley Capital International*

*XYZ Investment bank*

Funds will be utilized for general corporative goals

Financial institutes (for example, bank holdings) sell CP at the initial placing directly to the investors (*direct papers*), while non-financial corporations place their own papers at the primary market through investment dealers (*dealer papers*). In the USA, about 100 companies place papers straight, occupying more than half of the market (for example, commercial papers are issued by financial company of industrial giant General Motors — “General Motors Acceptance Company”, GMAC). About 1000 of other issuers use dealers.

CP is quoted on the base of *bank discount*, that is attribution of discount income, or difference between the present ( $PV_t$ , *Present value*) and nominal value of paper (NV, *Nominal value*), to the last one:

$$DY_{CP} = \frac{NV - PV_t}{NV}.$$

The rate of return on the paper depends on maturity, volume of emission, credit rating of issuer. The rates of discount on CP are higher, than on TB, reflecting the lower liquidity and the higher risk. In 1990s (Table 4.1), return on CP amounts 5.04%, exceeding the return of treasury bill by 0.42 percent point (on 1/11).

Commercial papers, issued at the internal market, become foreign ones in two cases:

- if they are issued by non-residents for the territory of placing;
- if they are issued by residents, but bought by non-residents.

*Eurocommercial papers* (ECP) are cheaper, than overdrafts, credits; their issuers regulate the term of redemption in their or investors' interests. Papers are placed by the specialized mediators (by dealers), that allows to speed up the emission (to conduct it even for one day), using the market conjuncture (for example, in time of the interest rate decline). They diversify the fundraising sources of the issuer. Their issue is cheaper, faster than euronotes emission (less administrative formalities, underwriting is not required). But for the companies with decreasing rating it is hard to place papers without subscription, and for the holders — to sell such securities before redemption.

A market for eurocommercial papers started in 1985, having increased from 13 to 107 bln doll. (on the outstanding value) by 1991 and to 110 — by 1997. In the middle of 1990s the most part of transactions was conducted by 6 investment firms. Many of the dealers (Merrill Linch, CS First Boston, SG Warburg) abandoned the market in 1989 because of low profitability. In the same year the first defaults have occurred at the market (Wang Laboratories; Integrated Resources).

Unlike the American market of *CP*, where practically all the papers have ratings, before 1990 only 50% of *ECP* have had such ratings. The distinctions are in the standards of accounting, the resistance to disclose the confidential information conducts many issuers to debt issue without rating. They have been selling their papers with a high discount, and mediators have been agreed to place such papers for the high fees (due to risk).

Euro Medium-term Notes (*EMTNs*) are issued via the dealers with the variety of terms to redemption, usually determined by investor. Initial maturity is varied from 9 months to 30 years, and notes are usually non-bearer, having either a fixed or a floating coupon, paid annually. Merrill Linch organized the first program in 1986 for the US firm “First Interstate Bancorp”.

The investors are the insurance companies, central banks, commercial banks, corporations, pension funds, requiring the coverage of their liabilities with a certain maturity. Factors of market growth are the convenience and low costs. From a single set of documentation, an issuer can choose the wide range of currencies, maturities, structures. Thus, the costs of establishing *EMTN* program is approximately the same (50-100 thousands of doll.), as the costs of carrying out of just one custom Eurobond issue. After the program was launched, costs of conduction the underwriting of *EMTN* — became even less (5-10 thousands of doll.).

#### **4.2.2. Bankers' acceptances and certificates of deposit**

*Bankers' acceptance* (*BA*) is the discount bill of exchange (Time draft), issued within the framework of letter of credit on a foreign trade operation and accepted by the first-class bank. They possess features, close to the treasury bills (except risk-free characteristics).

*BA* is unconditional requirements in writing for payment of a certain amount to the bearer in a certain time. A paper is accepted by bank, that means its guarantee of payment. For example, an exporter granted a credit to the importer, delivered goods within the framework of letter of credit and issued a bill of exchange. An importer accepts this draft, making it the *trade acceptance* (*TA*). The acceptance of bank transfer this paper in the form of bankers' acceptance.

*BA* bears lower discount, providing relatively low-cost trade financing. The majority of papers have a maturity from 30 to 180 days. Nominal value of *BA* in 1 mln USD and more is not the exception in the market. Return in tendency is lower, than for the commercial papers, which are guaranted only by the issuer. Buyers of *BA* are investment dealers, money market mutual funds, central banks, other corporations.

*Certificates of deposit*, established in 1961 by Citibank, are interest, large-nominal (above 100000 USD), unsecured, tradable deposits of banks, being the bank analogy of commercial papers, *TB*. Previously, corporate managers have been buying mainly *TB* and *CP* for short-term investments (particularly, because the US

banks can not pay interest on demand deposit due to legislation). Other short-term papers (TB, CP, BA) are discount instruments. *CD* were constructed as a banks' response to market challenges for reorientation of free clients' funds. Initial maturity varies from 2 week to 5 years. Interest rates on *CD* for the first-class banks usually are higher, than returns on *TB* (due to higher risk), but lower, than on time deposits (because of liquidity premium). In dynamics, interests on *CD* increase in periods of higher demand on credits, when banks seek the additional funds.

There are no reserve requirements for *CD* with maturity over 18 months, that decrease interest on it. Investors in *CD* are institutional purchasers, seeking short-term, liquid, low-risky instruments.

In 1966, Citibank constructed *euro-certificates of deposit*. They circulate with maturity of 1 year or less and minimal nominal value equals 25000 USD. Medium-term certificates (3–5 years) usually have the floating rate with quarter or semi-annual basis, as a rule, *LIBID* (London interbank bid rate).

#### **4.2.3. Non-tradable instruments of money markets**

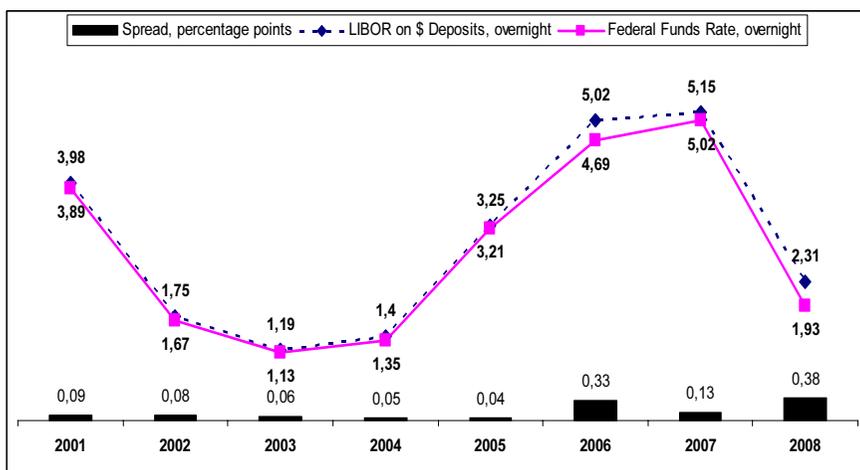
Non-tradable instruments include short-term credits (deposits) interbank — interbank and clientele.

Through the interbank market, banks grant each other. It is the wholesale OTC-market with huge volume of deals and participants number. Transactions maturities are 1–14 days. Interbank interest rates relate to return in markets of discount papers. The first ones are more volatile, than the second. Credits are granted in forms of unsecured on-shore loans, euro-deposits, REPO-deals (*Repurchase Agreements*).

*Euro-markets* are categorized into euro-currency (euro-deposit), eurocredit, eurobond segments. The first one refer to interbank markets, the others — primarily clientele ones. Euro-deposits refer to the short-term interbank loans in off-shore markets, where the role of basic interest plays *LIBOR*. Euromarkets regularly quote it with maturity from “overnight” (1 day) to 1 year. *LIBOR* is the best indicator of cost for immediate funds acquiring by banks.

*Interbank on-shore* credits with maturity of 1–3 days utilize electronic systems of central banks (for example, Fedwire in the USA) for settlements. In the USA, such assets are called *Federal funds (FF)*. Commercial banks utilize them for reserve positions management. Among instruments of money market, *FFs* are the most liquid, as market participants know well each other, credit risk has short-term nature and can be easily estimated. Due to the volatility of cash balances in clients' current accounts, the majority of *FF*-transactions mature overnight. Interests on *FF* represent the basic rates for internal money market (like *LIBOR* — for Eurocurrency market). Other instruments are valued, based on *FF*-rates, taking into account liquidity, maturity, default risk.

Eurodollar market is the continuation of the US domestic interbank market. These 2 markets are closely linked. Actually, overnight rates on *FF* and Eurodollars have been moving for a long time in tandem (Exh. 4.4) with spread of 0.14 percentage points — 2.56% and 2.70% during 2001–2009 in average, accordingly.



*Exh. 4.4.* Interest rates and spreads in interbank Eurodollar (off-shore) and internal dollar (on-shore) markets, 2001–2009

*Source:* International Financial Statistics. Yearbook. IMF. Washington, 2010

*REPO*-deals (*repurchasing agreements*) are secured credits. Thus, creditor (investor) purchases securities, issued by the third counterparty (as a rule, TB, CD), from the borrower simultaneously with the conclusion of a contract, binding to buy back these securities in a certain time by a predetermined (higher) price. Income of investor in REPO consists of price spread (exceedance of the sell price over the purchase one).

For example, *General Motors* owns \$1 billion of free cash funds for a one day. To activate them, it could purchase treasury bills in a bank with overnight maturity, at the same time committed to sell these papers tomorrow morning at a predetermined (slightly higher) price. For a bank, such transaction — a direct *REPO*, for the company — reverse *REPO* (resale agreement), it represents an important source of funds for the banks, who utilize them in clientele and inter-bank markets, as well as in deals with Central bank. *REPO* transactions were constructed and entered the market practice in 1969.

These operations are an alternative to the credits, favorable for the cost, ensuring features, giving the chance to avoid some of banking regulations, taxes. *REPO* have maturity from 1 day (“overnight”) up to 2 weeks. Rates in *REPO*-market, are usually lower, than *FF*-rates because of secured character of REPO. The most active buyers of REPO relate to corporations, mutual funds and institutions with free cash for placement overnight or thereabout. Central banks are very active in this market. Minimal amount of deal as a rule counts 5 mln USD.

*Clientele credits* are granted in form of single loans, lines of credit, term loans. They are mobilized in foreign and eurocurrency markets. Bank provides single (simple) loan to the customer (as a rule, in extraordinary situation) for the fixed period with simultaneous repayment of principal and interest in lump sum (for example, in 6 months). Line of credit refers to the regular source of business fundraising. It represents a commitment of bank to grant a certain sum of money for a client within several periods. Credit agreement includes the schedule of debt and interest repayment. Lines of credit may be revolving ones. In this case they provide the medium-term access (usually, during 3–5 years) to the short-term funds (3–6 months) for business.

*Customers' deposits*, i. e. money contributions of business, governments, individuals in banks, are categorized in the following groups:

- demand deposits (or current accounts, perpetual deposits);
- straight time deposits (implying the right to withdraw the principal and interest income accurately in a certain future date);
- saving' deposits (with the right of additional money contributions, and limited withdrawal before the maturity).

Quantatively, among instruments of the largest money market (the USA), TB predominate (around 40% of outstanding debt from the total volume of the market), further, CP (30%), CD (20%) follow, and REPO, FF, BA complete the list.

### **4.3. Benefits and costs of internal and off-shore markets**

Eurocurrency (off-shore) markets provide opportunities for economizing on tax, fiscal and regulative costs.

#### **4.3.1. Actual data: markets of the USA and Germany**

Central banks, for example, require to maintain the obligatory reserves against domestic deposits, while it is not required for euro-currency deposits. Consequently, banks can pay higher interest on them:

$$i_{ED} > i_d,$$

where  $i_{ED}$  — interest rate for euro-currency deposit,  $i_d$  — interest rate for domestic currency deposit.

At the same time, banks support the framework of target interest spread ( $IS$ ), i. e. difference between credit ( $i_c$ ) and deposit ( $i_d$ ) interest rates:

$$IS = i_c - i_d.$$

Vice versa, the lower interest rates for euro-currency credits ( $i_{EC}$ ) in comparison with domestic (foreign) ones ( $i_c$ ) appear:

$$i_{EC} < i_c.$$

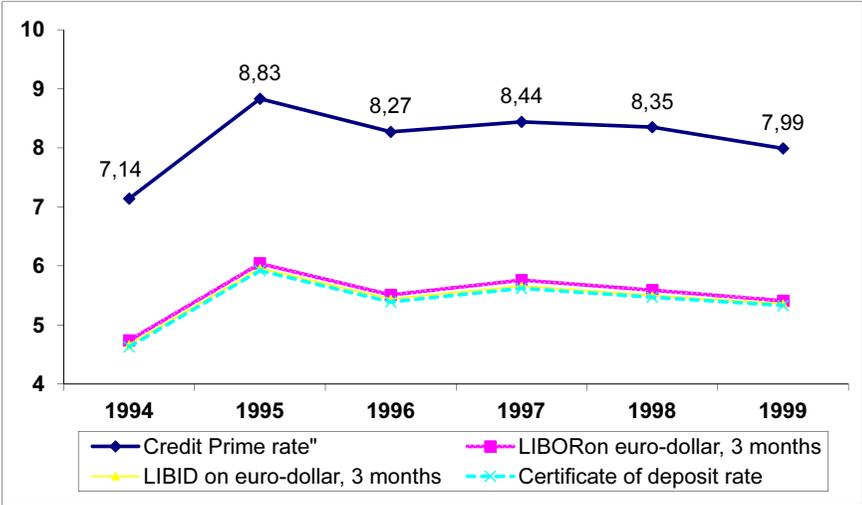
Actually (Table 4.17, Exh. 4.3), in 1994–99, the based rate for clientele credits in the USA (“prime rate”), compiled 8.17% in average, and was by 2.66 percentage points higher, than the offered rate in interbank euro-dollar market (5.51%). Simultaneously, rate for certificates of deposit (5.39%) was lower than bid rate in interbank euro-dollar market (5.43%) by 0.04 percentage points.

Table 4.17

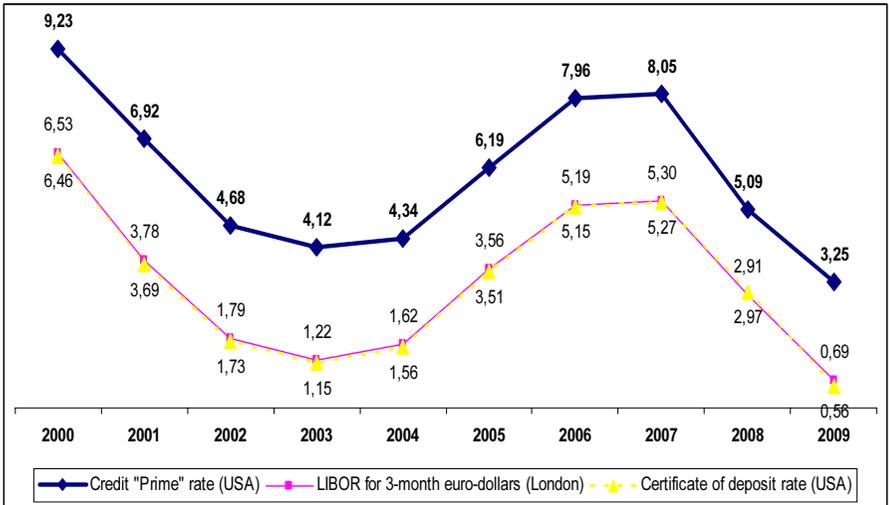
**Interest rates for dollar credits (deposits) in US and euro-dollar market, 1994–1999, % per annum**

	1994	1995	1996	1997	1998	1999	1994–99
Credit Prime rate (USA)	7.14	8.83	8.27	8.44	8.35	7.99	8.17
LIBOR for 3-month euro-dollars	4.74	6.04	5.51	5.76	5.59	5.41	5.51
LIBID for 3-month euro-dollars	4.67	5.96	5.44	5.66	5.50	5.36	5.43
Certificate of deposit rate (USA)	4.63	5.92	5.39	5.62	5.47	5.33	5.39

Source: International Financial Statistics. IMF. 2000. N 7.



Exh. 4.3. Interest rates on dollar and euro-dollar in the USA and in London, % per annum, 1994–1999



*Exh. 4.4.* Interest rates on dollar and euro-dollar in the USA and in London, % per annum, 2000–2009

*Source:* International Financial Statistics. IMF. Yearbook. 2010

In first decade of new century, the dollar and Eurodollar rates demonstrated similar (traditional) mutual dynamics (Exh. 4.4) — being equal in average, appropriately, prime — 6%, 3-month LIBOR — 3.3%, certificate of deposit — 3.2%.

For currencies of other matured countries, the same proportions between the internal credit market and euro-currency market rates were observed.

“Cheapness” of euro-currency credits and the higher return for euro-deposits (comparatively to domestic ones) is illustrated by the following example.

#### 4.3.2. Numerical example: on-shore Citibank in New-York City

Let us suppose,  $i_c^{AAA}$  (“Prime rate”,  $PR^{AAA}$ ) is a basic rate on bank credits to the first-class borrowers with the highest rating

AAA<sup>52</sup>. Then banks grant credits to the customers with a lower ratings at the higher rate, routinely, applying the formula “prime rate plus”, i. e. basic rate plus margin, reflecting the risk premium. For instance, interest for the borrower with rating BB ( $i_c^{BB}$ ) can be written in the following manner:

$$i_c^{BB} = PR^{AAA} + M \arg in^{BB}.$$

Deposit rate can be designate as  $i^d$ . Market deposit rate relates to interest rate on the tradable certificates of deposit of the leading banks<sup>53</sup>. Rate on eurodeposit is symbolized by  $i_{ED}$ , and the one on eurocredits ( $i_{EC}$ ) is determined usually, utilizing formula “LIBOR plus”:

$$i_{EC} = LIBOR + M \arg in_{EC},$$

where  $M \arg in_{EC}$  — margin (“premium”) to basic market rate, reflecting costs, profit, risk premium on clientele credit, denominated in eurocurrency.

Suppose, Citibank in New-York City raised 100 USD in time deposit at 10% from American resident (note: eurocurrencies are

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<sup>52</sup> In International Financial Statistics, credit rate in the USA (Prime rate) is determined as a rate, which the major banks charge on short-term loans for their most creditable (high-rated) business clients. It appears as a base for charging the interest rate on the short-term borrowings for the other business customers (for which higher interest rate is charging). *Prime rate* do not represent sensible (elastic) rate, changing each day in response to short-term fluctuations of demand and supply in the national market. Monthly data on *Prime rate* are based on a daily data.

<sup>53</sup> In International Financial Statistics, we can find out, that deposit rate (line 601) is usually concern to the deposits rates (demand, time, saving deposits) charging for the clients-residents. Time and saving deposits rates are often classified by the periods of maturity and volumes. Moreover, deposit banks and similar institutions, collected deposits, can provide short- and medium-term marketable instruments by determined interest rate for the specific amounts and maturities; these instruments are called “certificates of deposit”. For the US money market, interest rate for certificate of deposit is determined in this source as an average non-weighted offer rate, quoted by 5 dealers in the beginning of the day for the 3-months certificates of deposit in the secondary market. Monthly data is based on daily ciphers.

always time deposit, even for the term “overnight” — 1 day). Being the member of Federal Reserve System, *Citibank* should transfer to non-interest account in FRS as a required reserve, saying, 5%. Consequently, Citi can grant only 95 USD as a credit, based on 100 USD of deposits. Important for our example, consequences of acquiring the deposit by bank are represented with T-account (Table 4.19):

Table 4.19

**Time deposit, required reserves, and credit of on-shore bank**

Assets		Liabilities & Equity Capital	
Reserves in Federal Reserve System	+USD5	Time deposit	+USD100
Granted credit	+USD95		

Let’s say, the analysts of Citibank calculated the target after-tax interest spread (*ATIS*) of 200 *bps* (*basic points*), that is an equivalent of 2 *pps* (*percentage points*). It is necessary for the normal development of banking transaction — for covering *transaction costs* (*TAC*), for providing target after-tax profit ( $P_n$ ), for risk premium (*RP*) compensation. Then, we can rewrite the expression for interest spread as:

$$ATIS = TAC + P_n + RP.$$

To support such level of interest spread, Citibank should install after-tax interest rate on credit ( $i_c^{AT}$ ) at the level of 12.63%:

$$i_c^{AT} = \frac{(i_d + ATIS) \times Q_d}{Q_c} = \frac{(0.10 + 0.02) \times 100 \text{ USD}}{95} = 0.1263, \text{ or } 12.63\%.$$

Internal (domestic) financial markets (in distinction of Euro-markets) are embarrassed not only by regulatory costs, charged by Central bank, but also by tax burden, charged by Ministry of Finance. Credit contracts include before-tax figures. Consequently, we should find before-tax level of interest rate on the credit. Suppose, the total income tax in New-York City ( $T_{NYC}^*$ ) for Citibank — 60%, dividing between the federal income tax rate (34%), municipal tax in “Big Apple” (New-York-city) (13%), tax in New-York State (13%).

Assume, the portion of profit margin ( $PM$ ) in after-tax interest spread equals 20%:

$$PM_{ATIS} = \frac{P}{ATIS} = 20\%.$$

Then, in absolute terms (basic points), after-tax profit ( $ATP$ ) counts 40  $bps$ :

$$ATP_n = ATIS \times PPM = 200bps \times 0,2 = 40bps.$$

Consequently, remainder part of spread ( $TAC$  and  $RP$ ) equals 160 basic points:

$$TAC + RP = ATIS - ATP = 200bps - 40bps = 160bps.$$

$ATP$  is expressed through before-tax profit ( $BTP$ ) and tax rate ( $T'$ ) as follows:

$$ATP = BTP \times (1 - T').$$

Then,  $BTP$  equals 100 basic points (or 1 percentage point):

$$BTP = \frac{ATP}{(1 - T')} = \frac{40bps}{(1 - 0,6)} = \frac{40bps}{0,4} = 100bps, \text{ or } 1pps.$$

In this case, before-tax interest spread of Citibank in New-York City approaches 260 basic points (or 2.6 percentage point):

$$BTIS = (TAC + RP) + BTP = 160bps + 100bps = 260bps, \text{ or } 2,6pps.$$

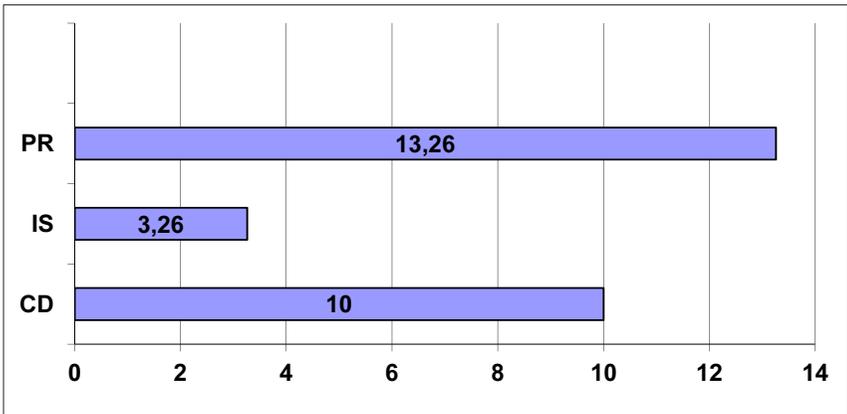
To achieve such target interest spread, basic rate on credit should be equal at least 13.26%:

$$i_c^{BT} = \frac{(i_d + BTIS) \times Q_d}{Q_c} = \frac{(0,10 + 0,026) \times 100 \text{ USD}}{95 \text{ USD}} = 0,1326, \text{ or } 13,26\%.$$

Total interest spread ( $TIS$ ), taking into account the effect of regulative costs (in this case, obligatory reserve requirement), taxes, and determined as a difference between interest rate on credits and on deposits, reaches 3.26 percentage points:

$$TIS = i_c - i_d = 13,26\% - 10\% = 3,26pps.$$

Interest rates and spread in foreign (on-shore) market are represented on Exh. 4.13.



**PR** — credit rate (prime rate), **CD** — certificate of deposit rate,  
**IS** — interest spread (% per annum)

*Exh. 4.13.* Structure of interest rates in foreign (on-shore) markets

#### **4.3.3. Numerical example: off-shore operations of Citibank in London**

Eurocurrency (off-shore) bank (comparatively to the on-shore one) economizes on range of regulatory and tax expenses (in our case, on deductions in obligatory reserves of Central bank, on payments of non-federal (municipal, state) taxes. Consequently, its total costs should be lower. It means, that off-shore bank can grant credits at a lower interest rate (in comparison with the on-shore bank), and raise deposits at a higher interest, while remaining, simultaneously, within the framework of target interest spread.

Thus, subsidiary Citibank in London don't transfer involuntary reserve payments in address of FRS (not being a resident of the USA). Let's say, it doesn't deduct reserve payments to the Bank of England for transactions with non-residents<sup>54</sup>. Tax payments of Citibank in London, associated with euro-dollar operations, consist of 34% federal income tax of the USA<sup>55</sup>, because

<sup>54</sup> Central bank of this country permit to make this for foreign fundraising.

<sup>55</sup> So far as Citibank profit in London appears in the consolidated balance sheet of American holding company *Citicorp*, the obligation to pay this tax

the competence of New-York authorities (place of bank head-quarter registration) doesn't apply to London<sup>56</sup>.

Then, in the case of raising the same time deposit of 100 USD, "T-account" for *Citibank* in London can be represented as follows (Table 4.20).

Table 4.20

**Time deposits and credits of off-shore bank**

A		L&C	
Granted credit	+USD 100	Time deposit	+USD 100

This bank can offer the higher interest rate for raising the dollar deposits of non-residents in England (for instance, 10.5%). Then, interest rate on eurocredits (maintaining the target "all-corporate" *ATIS* at 200 basic points) may be determined after calculation of before-tax spread and profit. The last one (taking into account initial assumptions) equals 0.6 percentage points:

$$BTP_{e\$} = \frac{ATP}{(1 - T'_{e\$})} = \frac{40 \cdot bps}{(1 - 0.34)} = \frac{40bps}{0.66} = \frac{40bps}{2/3} = \frac{40 \times 3}{2} = 60bps, \text{ or } 6pps.$$

Consequently, before-tax spread (*BTIS<sub>E\$</sub>*) approaches 220 basic points, or 2.2 percentage points:

$$BTIS_{e\$} = (TAC + RP) + BTP_{e\$} = 160bps + 60bps = 220bps, \text{ or } 2.2pps.$$

Eurocredit rate for the fist-class fundraiser compiles 12.7%:

$$i_{e\$} = \frac{(i_{ed} + BTIS_{e\$}) \times Q_{ed}}{Q_{ec}} = \frac{(0.105 + 0.022) \times 100 \text{ USD}}{100 \text{ USD}} = 0.127, \text{ or } 12.7\%.$$

General interest spread for eurodollar clientele operations (*TIS<sub>E\$</sub>*), determined by the difference between rates on customers'

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inside the corporation will be re-addressed to the London banking department (subsidiary), obtained this profit.

<sup>56</sup> Let's consider, that all the levels of Britain authorities also don't tax the profits from operations with non-residents in foreign currency (for attracting business to the country as well).

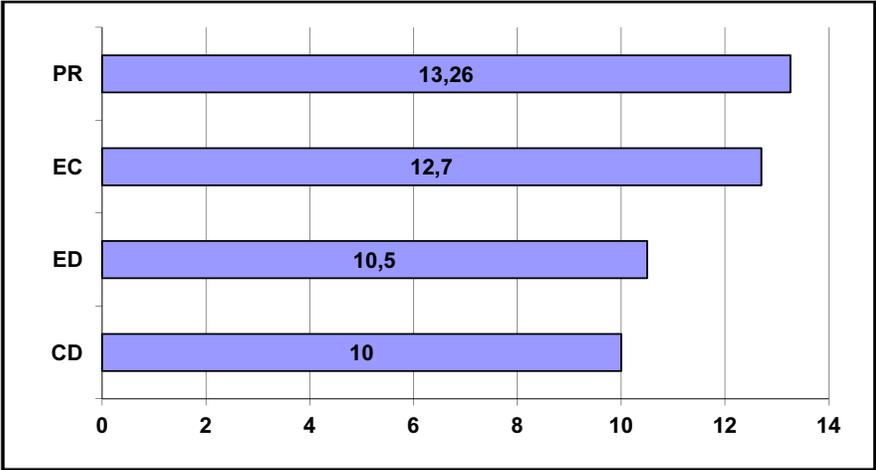
eurocredits and eurodeposits, achieves 2.2 percentage points, that is by 1.06 pps less, than the on-shore spread (3.26%):

$$TIS_{ES} = i_{EC} - i_{ED} = 12.7\% - 10.5\% = 2,2 pps.$$

**4.3.4. Interest spreads in internal (domestic) and off-shore markets**

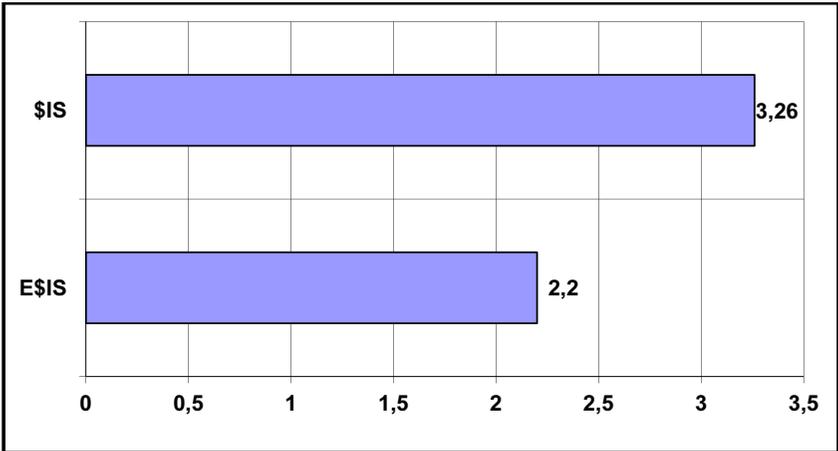
Interest rates and spreads in foreign (on-shore) and eurocurrency (off-shore) markets are presented in Exh. 4.14 and 4.15.

Overall, eurocurrency credits are cheaper, and eurodeposits are more profitable, because, primarily, there is no need to pay reserve requirements, secondly, the larger portion of deposits can be provided for credit granting, thirdly, incomes of euro-market transactions claim cause less tax payments for banks.



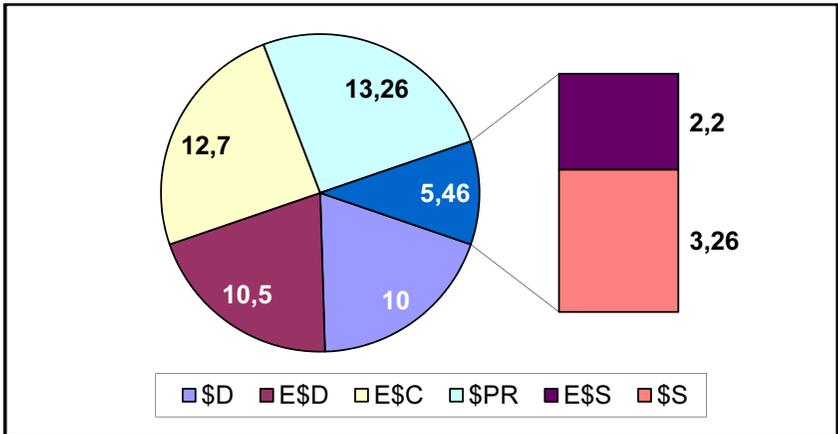
**PR** — credit rate (prime rate), **CD** — certificates of deposit rate (% per annum), **EC** — rate on clientele eurocredits, **ED** — rate on clientele eurocredits (% per annum)

*Exh. 4.14.* Structure of interest rates in foreign (on-shore) and eurocurrency (off-shore) markets



**\$IS** — dollar interest spread, **E\$ISS** — Euro-dollar interest spread

*Exh. 4.15.* Structure of interest spreads in foreign and off-shore markets



**\$D** — dollar deposit rate, **E\$D** — eurodollar deposit rate,  
**E\$C** — eurodollar credit rate, **\$PR** — dollar credit (prime) rate,  
**\$S** — eurodollar interest spread, **\$S** — dollar interest spread

*Exh. 4.16.* Structure of interest rates and spreads in dollar' and eurodollar' markets

As a result, interest spreads in euro-market are narrower, than spreads in the foreign market, that proves a greater comparative effectiveness, and liquidity of off-shore deals (Exh. 4.16).

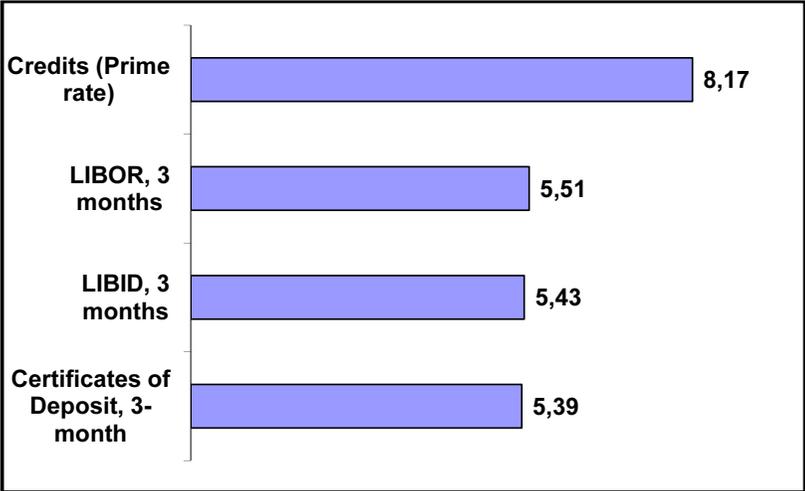
Eurocredit rate, as usual, is structurized, utilizing the formula “base market rate plus”, where the role of basis (let us remind You) fullfils *LIBOR*:

$$i_{ES} = LIBOR + Margin_{ES}.$$

The spread between LIBOR and London interbank bid rate (*LIBID*) — *Eurointerbank spread (EIBS)* — amounts, as a rule, around 0.10 percentage points:

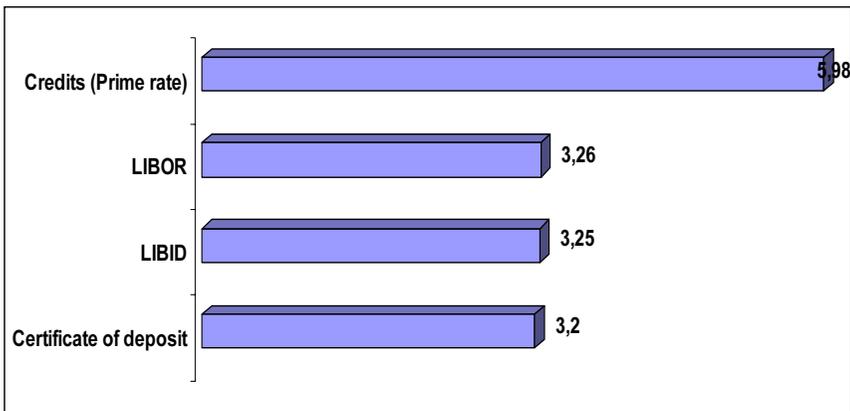
$$EIBS = LIBOR - LIBID \cong 0.10 pps = 10bps.$$

Actual interest spread in American clientele credit-deposit market in 1990s made up 2.78 percentage points, while in euro-currency market — 0.08% (Exh. 4.17). It is almost numerically consistent with our hypothetical example.

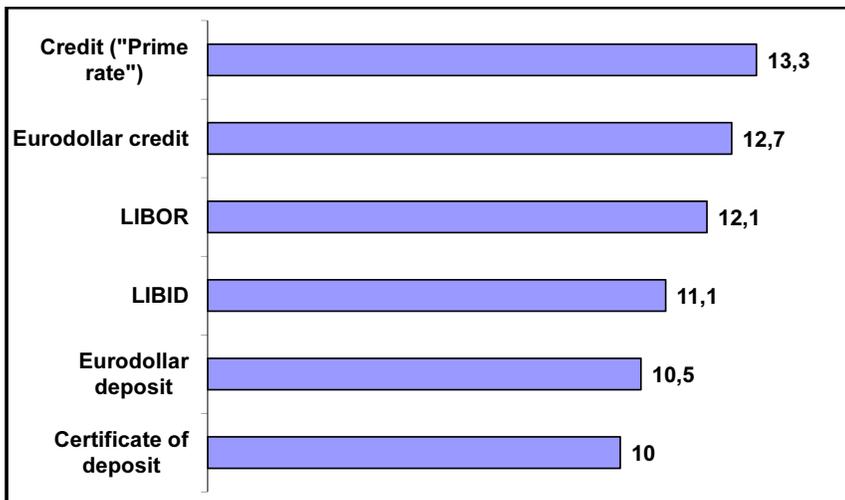


Exh. 4.17. Actual interest rates on dollar and euro-dollar, % per annum, 1994–1999

In first decade of current century, the appropriate figures demonstrated the following levels (Exh. 4.18):



*Exh. 4.18.* Actual interest rates on dollar and euro-dollar, % per annum, 2001–2009



*Exh. 4.19.* Structure of interest rates in foreign and off-shore markets (hypothetical example), % per annum

For our hypothetical case, the average interbank euro-rate (*LIMEAN*) equals 11.6%, and LIBID and LIBOR — 11.1 and

12.1%. Then, margin over LIBOR for the borrower of Eurodollars in London Citibank counts 0.6 percentage points<sup>57</sup>:

$$\text{Margin}_{es} = i_{es} - \text{LIBOR} = 12.7 - 12.1 = 0.6 \text{ pps, or } 60\text{bps.}$$

In general, structure of interest rates and spreads in international money markets in the framework of foreign (on-shore) and euro-currency (off-shore) ones can be represented, utilizing numerical results of our “hypothetically-realistic” example, in the following diagram (Exh. 4.19).

## Resume

*World financial markets* consist of foreign exchange (forex) and money and capital sectors. The last one deals with credits and investments movement. Also financial markets are divided into internal (domestic), external (foreign), euro-currency segments. *Internal* market deals with resident-to-resident operations in the foreign currency. In the *foreign* market, transactions between residents and non-residents in the currency of creditors (investors) are concluded. Eurocurrency (*off-shore*) markets service, as a rule, operations of non-residents with non-residents in the currency of third country.

*International money market* deals with short-term credits and investments. *Marketable* instruments are represented by *promissory notes* (treasury, municipal bills; commercial papers, certificates of deposit) and by *bills of exchange* (time drafts) — banker’s acceptance.

*Non-marketable* instruments of money markets include interbank and clientele credits (deposits). *Interbank* market is a wholesale electronic (computer, telephone) market *OTC* (over-the-counter) with minimal volume of deals equal to the 1 mln USD, at the least, closely linked with the forex market, where the same dealers trade. Clients’ credits are granted in the form of single (simple), term loans, and lines of credit. Clientele deposits represent by demand, time, saving (accumulation-made) ones.

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<sup>57</sup> Interest rates on euro-loans for the Russian borrowers (federal and local governments, corporations, banks), estimated by *Standard-and-Poors* with rating nearly *BB* — (contrary to the first-class rating *AAA*), in 1996–97 have been establishing with margin 5–6% over *LIBOR*.

The *behaviour* of financial markets manifests itself in the quotations volatility on them. The key indicators of international and Russian money markets reflect the fluctuations of returns and values of different instruments in time and in space. London interbank offered rate (*LIBOR*) is a based rate for evaluation the eurocurrency clientele credits. The indicators of onshore market can be represented by interest rates for marketable and non-marketable assets in matured economy of the USA and in emerging economy of Russia.

The comparison of benefits and costs for transactions in the internal and offshore markets is realized in the context of interest rate spreads analysis. Hypothetical examples, illustrating interest rates on credits and deposits for American bank in New-York City and London, as well as actual data of the markets of the USA and Germany demonstrate these benefits. Eurocurrency market represents as an opportunity to domestic and foreign assets and to the sources of fundraising.

***Control questions for discussion***

- 1. What kinds of the operations can be considered as ones in internal, foreign and euro-currency financial markets?
- 2. What kinds of instruments are traded in the world money markets? Describe their basic characteristics. What are the marketable and non-marketable financial instruments?
- 3. There are instruments — treasury bills, *REPO* deals, reverse *PEPO*, Eurodollars. Their definitions — (a) “short-term obligations of the US government”, (b) “purchase of instruments with simlutenious deal to resell them later”; (c) “sale the instrument with simlutenious deal to buy it back later”; (c) “deposit in dollars in the banks outside the USA”. Which of the definitions is suitable for each of the financial instruments?

a) =

б) =

c) =

d) =

4. Which instruments of international money markets are absent in Russia now? How could You explain it?

5. Adduce the basic indicators of the world onshore money markets, published in official, governmental sources, financial mass media, at the Internet-sites.

6. Why do treasury bills quote at the lower interest rates, than certificates of deposit, issued by major banks? How do treasury bills and certificates of deposit are quoted (with a discount, premium, as a percentage asset)?

7. What influence can income tax rate reduction have for the interest rate on the municipal bonds? Will the rates on treasury bills be affected? If yes, than in what way?

8. Present the most known indicators of the world offshore money markets, published in the official sources, financial press, at the Internet-sites.

9. Specify the leading indicators of the Russian money markets, published in the official and authorities sources, financial press, at the Internet-sites.

10. In the eurocurrency market, credits are evaluated against American regulated banking rate of supply (*ARBOR*). Agree or disagree, and modify to make the statement acceptable.

11. In the integrated world market, will the low interest rates in Japan mean the low interest rates, let's say, in the USA? If the yield curve become suddenly more sloping, than how will you change your forecasts concerning interest rates in future?

### ***Problems to solve***

1. Current interest rate for 180-days interbank eurodollars equals 9% on annual basis. If interest rate for the next period is 9.5, than how eurocurrency loan should be evaluate due to "*LIBOR+1%*" formula?

2. Calculate yield to maturity of discount security with nominal value USD 1000 and time of redemption in 1 year, that was purchased for USD 800?

3. You received offer of the 1-year securities — treasury bond with yield to maturity 9% and treasury bill with discount return 8.9%. Which of them would you prefer?

*Appendix 5.1***Returns in the US money market for 80 years***Table A5.1-1***Rates of return of the US money market instruments,  
1929–2010, % per annum**

Years	Treasury bills (new issuances)*		Com- mercial papers*	Credit (prime) rate	Discount rate of New-York City Federal reserve bank	Federal funds rate
	3 months	6 months	6 months	3 months		
<b>1929</b>	...	...	5.85	5.50–6.00	5.16	...
<b>1933</b>	0.515	...	1.73	1.50–4.00	2.56	...
<b>1940</b>	0.014	...	0.56	1.50	1.00	...
<b>1950</b>	1.218	...	1.45	2.07	1.59	...
<b>1960</b>	2.928	3.247	3.85	4.82	3.53	3.22
<b>1973</b>	7.041	7.178	8.15	8.03	6.44	8.73
<b>1980</b>	11.506	11.374	12.29	15.27	11.77	13.36
<b>1990</b>	7.51	7.47	7.95	10.01	6.98	8.10
<b>1995</b>	5.51	5.59	5.93	8.83	5.21	5.83
<b>2000</b>	5.85	5.92	6.305	9.23	5.73	6.24
<b>2010</b>	0.20	1.11	1.524	3.25	0.72	0.18

\* Rates are quoted on the basis of bank discount

*Source:* Economic report of the president. Washington, 2011.

## Chapter 5

### INTERNATIONAL CAPITAL MARKET

October. This is one of the peculiarly dangerous months to speculate in stocks.

The others are July, January, September, April, November, May, March, December, August, and February.

*Mark Twain (1835–1910),  
American writer*

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

**Part two: INTERNATIONAL MONEY  
AND CAPITAL MARKETS**

## Purposes of studying

- Structurize the international capital markets.
- Characterize the instruments of foreign bond markets — federal, municipal, corporate (including “junk” obligations).
- Consider the Eurocurrency (off-shore) markets of debt securities, including eurobonds of developed and developing countries, euro syndicated loans.
- Discuss the instruments of international stock markets — foreign shares (Yankee, Bulldog, Samurai, ADR), euroequity.
- Study the indicators of matured foreign capital markets (including debt markets, organized exchanges, OTC).
- Analyze composite global, multicountry indexes of stock market.
- Represent the indicators of emerging stock markets (in first turn, Russian one).

### 5.1. Overview of capital market

International capital markets are represented by sectors of marketable long-term papers (bonds, stocks) and nonmarketable medium-term bank credits for its clients (Exh. 6.1).

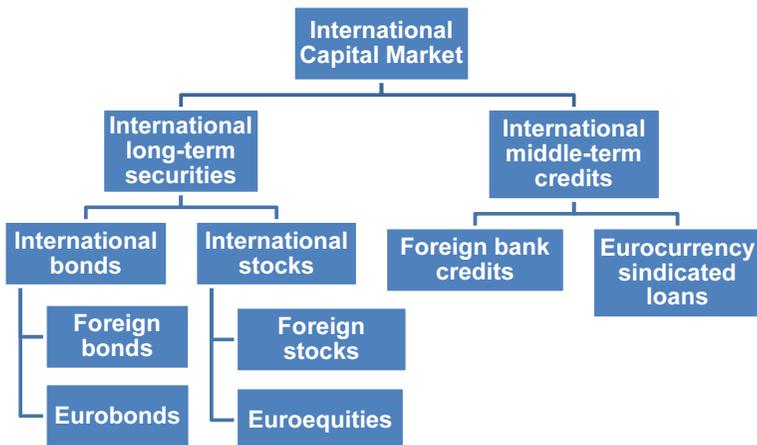
Bonds (obligations) are debt securities, more exactly, they are long-term promissory notes of different issuers. Stocks (shares) are equity papers, i. e. the titles of ownership, or termless (permanent, eternal) assets. Capital markets include on-shore (domestic, foreign) and off-shore (euro-currency) segments.

Bonds (Exh. 6.2) encompass around 2/5 of international capital markets volume, eurocommercial papers and euronotes — 30%, euro-currency syndicated loans — 1/4, stocks — 5%.

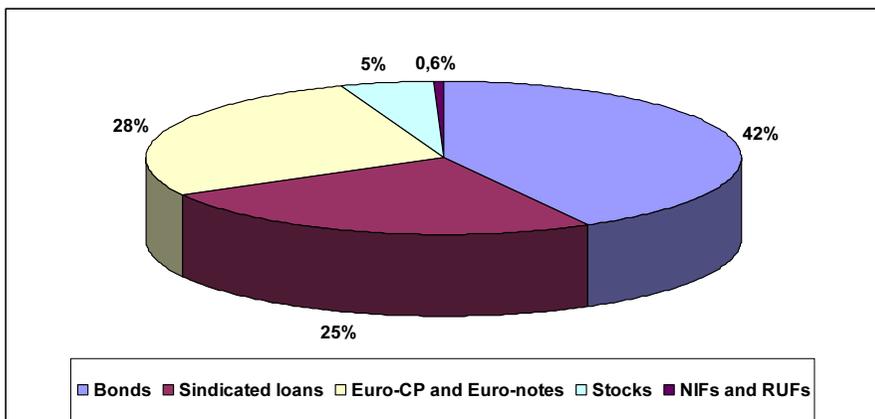
International bonds are categorized on euro-bonds, foreign and global bonds (Table 6.1). Among them, in 1990s, for instance, the first type of bonds prevailed (77% of turnover), second one covered 1/5 of market<sup>58</sup>.

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<sup>58</sup> Global bonds are the Eurobonds with issue in several markets simultaneously [Institutional Investor (various issues) International bond and equity data, Annual Report, Vol. 62].



*Exh. 6.1.* Instruments of international capital markets



*Exh. 6.2.* Instruments of international capital markets, %

*Source:* Financial Market Trends, OECD, Paris, various issues

International medium-term bank credits for the clients are generally also euro-currency syndicated loans. Foreign credits are represented by substantially less portion. Vice versa, international stocks include primarily foreign shares (equity).

## 5.2. Instruments of international debt markets

Below an overview of tradable bonds and non-tradable credits will be given.

### 5.2.1. Foreign bonds: governmental, corporate papers.

#### Public issue and private placement. Junk bonds

*Foreign bonds* are issued outside the borrower country and in a currency of placement country. For example, American company can mobilize the capital for plant construction in France, selling bonds in euro there. It is known, that a majority of Russian industrial giants issued dollar bonds in the USA.

Governments usually make juridical difference between bonds of residents and non-residents regarding registration, tax regime, requirements on information disclosure, and also various groups of investors. Non-resident bonds in the USA, obeying the American laws, as a rule, should receive a credit rating in the special agencies, primarily, in *Standard and Poor (SP)* or in *Moodies Investor's Service (MIS)*, pay interest each semi-year, register in Security and exchange commission (*SEC*), subordinating to American laws. The underwriting of foreign bonds is arranged by the investment bank (syndicate) from the country of debt issue. These bonds are usually called by special “nicknames” — *Yankee bonds* in the USA, *Samurai* in Japan, *Bulldog* in England.

The largest country market for non-resident bonds for a long time was Switzerland (around 40% of issues), then followed the USA, Japan, Luxemburg. These 4 countries accounted for about 95% of the market. *Institutionally*, debt papers are classified (Exh. 6.3) into governmental and corporate ones.

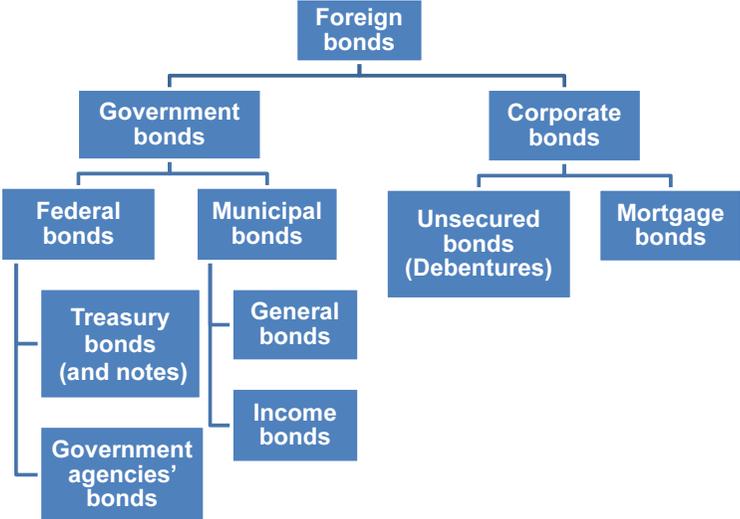
#### Types of foreign bonds

*Federal* papers are of the most liquidity among instruments of capital markets. Treasury notes are issued on 1–10 years<sup>59</sup>, trea-

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<sup>59</sup> To the interest rate for 5-years notes of the US government was “tied” the coupon rate for eurobonds of Saint-Petersburg in June 1997 (making up 9.5% with 3.125 margin).

sury bonds — with initial maturity in more than 10 years. The main investors in “treasuries” — central, commercial banks, individuals, non-residents.



Exh. 6.3. Foreign bonds markets

Bonds of government agencies have been represented before the crisis of 2007 primarily by *mortgage backed securities (MBS)*. The leading agencies in this US market segment were the follows:

- Government National Mortgage Association (*GNMA*);
- Federal National Mortgage Association (*FNMA*);
- Federal Home Loan Mortgage Corporation (*FHLMC*).

*GNMA* issued certificates *Ginnie Mae*, secured by standardized mortgage credits, granted by commercial banks in the framework of Veteran and Federal housing administrations’ programs. *FNMA*, *FHLMC* make placements of *Fannie Mae* and *Freddie Mac* certificates, secured by mortgages, repurchased from banks and loan-saving associations, and under these agencies’ guaranties. The two last institutions are subsidized by federal government. All these securities had before 2007 the wide secondary market.

*Mortgages* — the largest segment of the US debt market. Thus, among debt instruments, which accounted for 60% of the capital market, housing and commercial mortgages took up 20% (or more than 1/3).

*Municipal bonds* include unsecured *general obligations (GO)*, and secured *revenue bonds (RB)*. The first ones are supported by reputation and all the budget of a certain local authority, collecting taxes. Revenue bonds are backed by separate projects of local authorities. In case of project bankruptcy, holders of the last bonds bear losses. “Munies” (*Municipal bonds*) give the higher income comparatively “treasuries” (due to default risk). However, the absence of federal taxation for the munies makes return on them lower against than the federal ones.

*Corporate bonds* are categorized in unsecured *debentures* and secured *mortgage bonds*. The first ones are supported by the trust to the company as a whole. Mortgage bonds are based on the defined assets. *Subordinated* bonds have lower status against senior debt of issuer. In case of bankruptcy, they are paid in the second turn, having increased risk and return. They may have no credit rating, belonging to the group of “*junk securities*”.

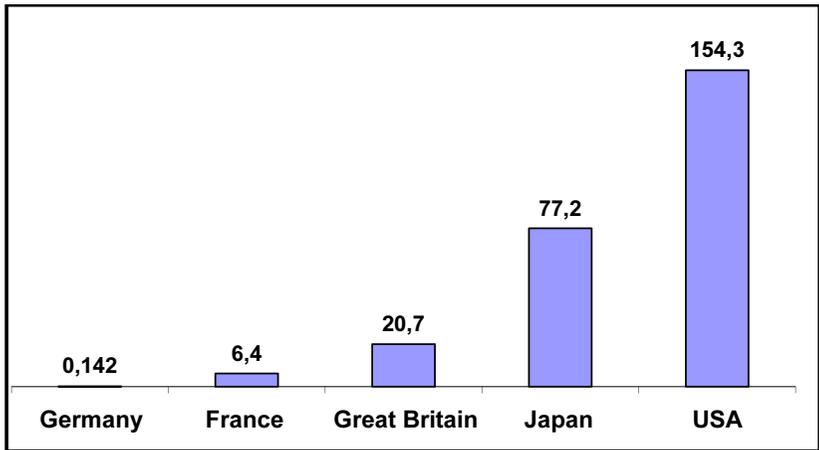
The USA possesses the largest market of corporate bonds — the volume of primary issues there surpasses the Japanese level approximately in two times, the British one — in seven times.

### **Bond placement**

Bonds are issued by 2 basic methods — *public issue*, when bonds are sold to all interested persons in primary and secondary markets, and *private placement*, when they are placed between the predetermined investors and do not fall into the secondary market.

The role of investors in public corporate bonds play insurance companies, pension funds, individuals. Non-marketable papers holders are, as a rule, the institutional investors — clients of investment banks, which service the placement (to insurance companies, pension funds, mutual funds, other banks, corporations).

*Private placement* includes the elements of credit and investment.



*Exh. 6.4.* Issuances of corporate bonds: domestic markets: indicative historical data, 1995, USD bln

Bonds as *interest bearing tools* have traditionally the fixed coupon income. Corporations issue also *zero coupon bonds (ZCB)* because of tax advantages or marketing considerations.

After the Great Depression till recently, corporate bonds and mortgages showed risk premium relatively “treasuries” on the level of 1.5–2 percentage points.

*Table 6.1*

**Rate of return on bonds in the USA, 1929–1999, % per annum**

Year	Treasury bonds			Corporate bonds (Moody's)		High-grade municipal bonds	New home mortgages
	3 year	10 years	30 years	Aaa	Baa		
1929	...	...	...	4.73	5.90	4.27	...
1933	...	...	...	4.49	7.76	4.71	...
1940	...	...	...	2.84	4.75	2.50	...
1950	...	...	...	2.62	3.24	1.98	...
1960	3.98	4.12	...	4.41	5.19	3.73	...
1973	6.95	6.84	...	7.44	8.24	5.18	7.96
1980	11.55	11.46	11.27	11.94	13.67	8.51	12.66

Table 6.1 (continuation)

Year	Treasury bonds			Corporate bonds (Moody's)		High-grade municipal bonds	New home mortgages
	3 year	10 years	30 years	Aaa	Baa		
1990	8.26	8.55	8.61	9.32	10.36	7.25	10.05
2000	6.22	6.03	5.94	7.62	8.36	5.77	7.52
2005	3.93	4.29	...	5.24	6.06	4.29	5.94
2010	1.11	3.22	4.25	4.94	6.04	4.16	4.80

Source: Economic Report of the President. Washington, 2011.

### Junk bonds

These highly profitable papers are issued for internal expansion or corporate acquisitions by companies with weaker financial positions, i. e. with highly leveraged balance sheet<sup>60</sup> and lower profits. Such debt get usually rating *BB*<sup>61</sup> and lower in *Standard-and-Poor's*, bringing more than 3–4% of the windfall over the interest on the corporate debts of the highest quality (with rating *AAA*).

Junk bonds have been the fastest growing among the corporate debts in 1980s. However, in 1990s their new issues became unsubstantial, and the circulating bonds have been repurchasing intensively by the issuers due to cranches of several banks-investors, collapse of the largest underwriter of such bonds (investment banking firm *Drexel Burnham Lambert*), financial difficulties of some firms, utilizing junks for restructuring, including financing of mergers and aquisitions in form of *Leveraged buyouts (LBO)*.

### 5.2.2. Eurobonds: fixed interest papers, floating rate notes, zero-coupon bonds, cocktail issues

The prevailing part of international bonds (round 80%) is Eurobonds. They are issued, for instance, by the US corporations in

<sup>60</sup> High financial *leverage* (arm, level) of the company means the higher level of its debt coefficients (like debt-capital).

<sup>61</sup> Until Russia gets the investment grade rating (2005), beginning with *BBB*.

dollars, which sell them outside the USA. Suppose, *IBM* sells dollar bonds in Europe or in Japan, and government of Saint-Petersburg — to Korean, German investors, operating in London market (like in 1997).

Expenses, related with the issue, include fee to the bank-managers and participants of underwriters syndicate, interest payments, and sum of debt. The full costs for Eurobonds is less, than for on-shore (domestic, foreign) issues, because of decreased requirements in documentation, absence of necessity to register bonds in the institutions like American *Security and exchange comission (SEC)*, due to tax and regulative advantages.

The first issue of Eurobonds (1963) was organized by American investment bank *Warburg*, denominated in dollars, placed in London for Italian government firm “*Autostrada*”. From that time Eurobond market grew in several thousands times. Papers were denominated in dollars (about 50%), marks (15%), pounds (10%), French francs (7%), yen (3%). Since 1999, place of marks, francs, huldens is occupied by euro.

Eurobond market is the 2<sup>nd</sup> one (after American) in terms of turnover, and the 3<sup>d</sup> (after American and Japanese) by the value of outstanding debt.

Issuers of Eurobonds — the famous giant corporations, financial institutions, governments, supranational units (like IMF, the World bank, EBRD).

### **Forms of Eurobond issues**

Eurobonds are issued with fixed interest (around 72% of turnover), with floating rate ( $\approx 13\%$ ), equity-related ( $\approx 15\%$ )<sup>62</sup>.

*Fixed rate eurobonds (FREB)* are of especial popularity in the periods of expected interest rates decrease. Coupons on *Floating rate notes (FRN)*<sup>63</sup> are paid once in 3, 6 months at margin above reference rate, as a rule, *LIBOR*. It weakens the treat of instrument value fall because of interest rate volatility. Their average ini-

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<sup>62</sup> Institutional Investor (various issues), International bond and equity data, Annual Report, Vol. 62.

<sup>63</sup> They were constructed to decrease interest rate risk of financial intermediaries, borrowing for short run and granting loans for long periods.

tial maturity — 15 years. Firstly, they were applied by Italian government electric company in 1970.

Zero coupon eurobonds (*ZCEB*)<sup>64</sup> are placed with discount, and repaid on nominal value. Investors in “zeros” were primarily Japanese companies, because the tax on capital return was lower, than income tax.

*Dual currency bonds (DCB)* are issued in one currency, but coupon and/or principal in time of maturity are repaid in another one. Practically, they combine straight bonds with forward currency contract. It allows to hedge exchange risks. Maturity of *DCB* is 10–20 years, it is substantially longer, than the standard term for currency derivatives (1–9 months).

Ultimately, *equity linked eurobonds (ELEB)* include convertible bonds and bonds with equity-warrants. The first ones are debts, exchanged for stocks of issuers in fixed proportion with conversion premium (i. e. in comparison with the conversion of bonds and stocks at market prices). For example, in the USA this premium equals 15–20%. Bonds with equity-warrants provide the right to buy fixed number of issuer stocks at firm price before predetermined date. *Warrants* are the right to buy or sell fixed amount of financial instruments (in this case, stocks) during the certain time period. Warrants are often separated from bonds, and can be sold independently in secondary market. Japanese corporations issued 75% of these papers. The main investors were managers of discretionary accounts<sup>65</sup> (like pension funds).

### **5.2.3. Market of non-tradable credits: securitization, euro-syndicated loans. Costs of Euro-currency credits**

Now let us consider the medium-term credits of bank syndicates in a form of Eurocurrency lines for the customers (corpora-

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<sup>64</sup> For capital growth bonds, price of placement equals nominal value, and redemption is realized with the higher price.

<sup>65</sup> *Discretionary account* is an account of customer, giving to broker or trust-manager the right to buy or sell the security without clientele accept (due to predetermined agreement with customer in a framework of the contract).

tions, governments, non-first-class banks). There are no secondary markets for these instruments. However, in process of securitization of non-liquid loans, the creditors rearrange the indebtedness in promissory notes with deep discount, selling them in the market. Thus, “bad credits” are converted in bonds (of “junk” type).

In the largest on-shore market (the USA), bank credits count about 7% of total volume of debts, consumer loans — 3%, that is substantially less, than amount of corporate and foreign bonds (25%), mortgages (24%), federal and municipal bonds (25%) in the end of XX century. In period of financial crisis (2009), the amount of US credit market has been squeezed at all.

Table 6.7

**Loans in US debt market (Credit market borrowing), 1998–2009**

Item	1998 (USD bln)	Share (%)	2009 (USD bln)
Total	2 127	100	−643.9
Open market paper	193	9	−461.3
Governmental papers	418	20	1 383.5
Municipal papers	97	5	130.9
Corporate and foreign bonds	536	25	−78.6
Bank loans	145	7	−774.3
Other credits and advances	159	7	−436.3
Mortgages	511	24	−292.5
Consumer credits	68	3	−115.3

Source: Economic Report of the President. Washington, 2011.

**Euro-currency syndicated loans**

Euro-currency syndicated loans (*ECSL*) refers to bank credits, underwritten by the leading manager and then syndicated among banks-participants. Only in 1990s, before the Asian financial crisis of 1997, the volume of eurocredits increased 6 times.

**Syndication of Eurocurrency loan**

Syndicated credits imply the participation of bank group. The roles of separate banks are distributed unequal. There are the following levels of participation in the syndicate:

- *lead-manager* is a bank, receiving from the borrower the mandate for loan organization;
- *managerial group* is represented by several large banks;
- *banks-participants* grant money funds (the number of them can counts up to 50–70, and even 100);
- *agent bank* — bank-intermediary carrying out payments between the borrower and syndicate, organizers and participants (payments etc.).

Counterparties (borrower and syndicate) provide the offers (memorandums) to each other, formate the text of agreement, and sign it. Trade, project, lease financing, loans for general purposes, credit lines, letters of credit (documentary credit) can be syndicated. Terms of eurosyndicated agreement play the role of “patterns” for the other credit contacts.

Usually the loan is granted in the form of *revolving* line of credit, i. e. the total limit of financing for all life of the loan, as well as amounts of sublimits for separate shares in predetermined subperiods are installed in the agreement. Time to maturity vary from 3 up to 10 years, with average term of 7–8 years for first-class borrowers. For example, 5-years loan in 500 mln USD may include 10 semi-year subperiods. Customer can borrow 50 mln USD tranche within the each subperiod.

Counterparties are agreed about schedule of debt repayment for each sublimit. Also, clauses, defending creditors, is included in loan agreement. For example, defended clause can imply, that the next tranche may be postponed, if the financial conditions of the borrower deteriorate below the predetermined level (measured, for example, by financial ratios).

Credit agreement may include several convenient characteristics for the fundraiser as well. Particularly, *multicurrency clause* allows him/her to raise money in several currencies, diversifying exchange risks. Interest spreads on eurocredits are characterized by lower volatility in comparison with the Eurobonds. In addition, syndication of loans occurs with lower organizational, overhead expenses, and don’t require the advertising company, that is nessesary for Eurobonds. Rates of interest on euroloans are lower, than on foreign bank credits.

## Costs of Eurocurrency loans

Expenses of borrower are divided into recurrent and lump-sum. The *first* ones include interest payments, charged on actually withdrawn amount of credit line. They are formed on the basis of floating interest rates, as a rule, according to the formula “*LIBOR plus*”. Thus, when providing the recurrent tranche, interest rate for the next period is calculated as the predetermined margin over new *LIBOR*. For example, if the margin equals 1%, and *LIBOR* for 6-month funds — 6%, then cost of credit compiles 7% on annual basis for the next 6 months.

The margin varies from 0.5% up to 3% dependig on credit-worthiness (rating) of the borrower, market conditions. In general, interest rates on euro-currency credits reflect the cost of funds in interbank euro-market, operational expenses, normal bank profit, risk premium.

In addition, commission (fee) for non-withdrawn portion of credit line (*commitment fee*) is established, for instance, 0.25% or 0.75%, paid with a certain frequency. Also, agent fee is paid to the bank, acting as the issuing and paying agent, for settlements under the loan implementation. They form the small part of total expenses for credit service and established in firm amount, paid the each interest payment period. Thus, aggregatively, *periodical expences (PE)* for euro-syndicated credit consist of the following components:

$$PE = C(LIBOR + Margin) + (LOC - C) \cdot CFee + AC,$$

where  $C$  — withdrawn amount of credit;  $LOC$  — amount of recurrent tranche of credit line,  $(LOC - C)$  — non-withdrawn amount of credit,  $CFee$  — commission (fee) for non-withdrawn amount of credit,  $AC$  — agent fee.

*Simultaneous (once-and-for-all) expenses* equal the fee for the all amount of credit in the size from 0.5% up to 2.5%, paid from the first withdrawing of credit to the managing banks. The last re-transfer the part of commission to banks-participants, i. e. once-and-for-all expenses are divided in managerial commission and participation fees.

For example, “**Leningradskaja oblast**” raised euro-currency syndicated loan at *LIBOR*+425 basic points. In spite of the fact, that syndication is realized in the period of political instability, the organizers of credit (*West Merchant Bank* and *Moskovsky Narodny Bank*) mobilized USD 50 mln for 3 years, exceeded the plan of underwriting for USD 20 mln.

#### **Case 6.1. Syndicated credit of “Leningradskaja oblast” government**

Credit agreement for amount of USD 50 mln between “**Leningradskaja oblast**” as a Borrower and *WEST MERCHANT BANK LIMITED* and *MOSKOVSKY NARODNY BANK LIMITED* as an Organizers, *BANKERS TRUST COMPANY* as an Agent, *WEST MERCHANT BANK LIMITED* as a Bank.

Financial consultant is *PRICE WATERHOUSE*.

In the granting of this credit line on the basis of the agreement on the participation banks and credit institutions named the subcontractors can take part.

The maturity of the credit is 3 years.

The conditions of credit repayment:

- *LIBOR* + margin;
- *LIBOR* rate means the annual interest rate, that is determined by the agent, and it equals the rate, published on the page 3750 of “Telerate” screen, for appropriate interest period at 11.00 of London time in quotation day, (in the page 3750 of “Telerate” screen, interest rates for euro-dollars, calculated by the British Banking Association, are specified);

- margin equals 4.25% per annum;
- interest payment period compiles 6 months;
- borrower should make interest payments in the last day of each interest period.

Bank can require its share and/or shares of subcontractors of credit line to be fully repaid in any of the dates after 12 or 24 months after the date of the principal amount of borrowings redemption (put option).

Date of loan issue is May 5, 1998.

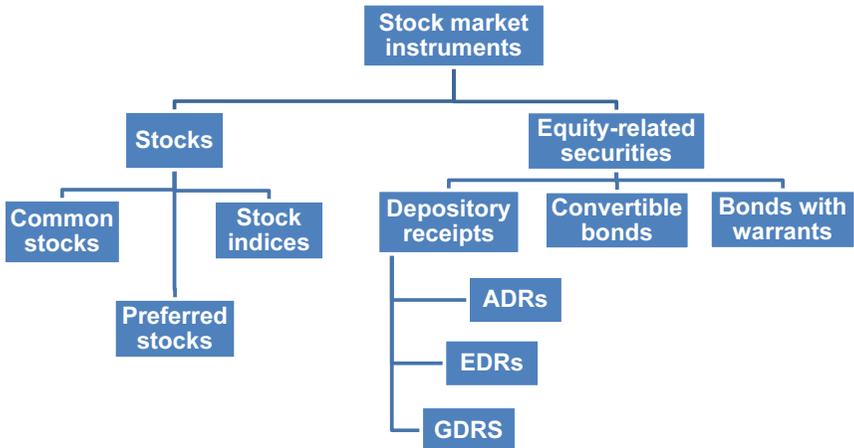
*Source:* official site of Saint-Petersburg — [www.spb.ru](http://www.spb.ru)

### 5.3. Instruments of international equity markets

Stocks are the ownership titles (on oil company, phone network, restaurant chain). Their portion among the sources of international long-term financing remains stable (5%), and the majority of international equity is foreign stocks.

#### 5.3.1. Foreign stocks, euro-equity

Stocks appear as *common and preferred* ones. The first type refers to the timeless (permanent) claims of investor on equity capital of certain corporation, providing income to the owner in form of dividend and giving him/her the voting power at the shareholders' meetings. Owners bear the heightened risk of investment nulification, pretending on the remaining value of business (after other fundgranters' claims satisfaction) in the case of its bancruptcy. That is why stockholders' income should be higher, than income of the other beneficiaries — company' stakeholders (preferred stocks investors, creditors, hired workers, managers).



Exh. 6.5. Instruments of stock market

Preferred stocks bear the features of debt, increasing financial leverage and risk of issuer. Dividends on them are lower, than on common stocks, but higher, than interest on bonds. They are paid out of profits, increasing after-tax expenses. “Prefs” have several advantages against “ordinaries” relatively claims on corporation’ incomes and assets in a case of bankruptcy.

### **American depository receipts (ADR)**

*ADR* are tradable instruments, offering foreign stocks in American market. Dividends on them are paid in dollars. *ADR* was established in 1927 as an response of business and banking community on the restriction of English legislation to register resident’ shares abroad, and the prohibition to export certificates on domestic equity.

Since 1950s, *ADR* appear as an important investment method of the US residents in foreign stocks on American domestic market. *ADR* are issued by 4 different ways depending on way of emission (public issue or private placement), and trading (through OTC or in organized exchanges).

Non-sponsored *ADR* are placed by American bank at its own account without involving the non-american issuer. Sponsored *ADR* of level 1 are launched by non-american issuer and they are backed by the US bank-depositor due to formal agreement between them. Issue implies the minimum of regulatory and accounting requirements. These types of ADR are traded in OTC-market.

Sponsored ADR of levels 2 and 3 should be included in listings of different organized exchanges. Around 1/4 of ADRs appear in listings of NYSE, AMSE, NASDAQ. The other ADRs are traded in OTC-market outside NASDAQ and on other organized exchanges.

Ultimately, *Rule 144A* allows the resale of the securities in the USA (like ADRs), issued in order of private placement for qualified (certified) institutional investor without special disclosure of information and registration.

## **Euro-equity**

*Euroequity* (EE) are equity papers in foreign currencies for the countries of placement (as a rule, without listing in organized exchanges). For example, the largest issuers in 1990s have been governments of England, France, and also Argentina, Mexico, which placed the stocks of privatizing companies.

If international markets are segmented (or not fully integrated in the sense, that papers with equivalent risk may have different prices in different market segments), then trans-border diversification can decrease the systematic risk of investment portfolio comparatively with the pure domestic portfolio<sup>66</sup>. Issuers of international stock are motivated also by lower costs of them. Other incentives for euroequity issues include following ones:

- insufficient liquidity of domestic market (it's important for small and developing countries);
- dispersion of ownership (reducing of potential takeover threats);
- preventing of nationalization (renationalization after privatization) threat;
- lower regulatory burden and disclosure requirements;
- chance to visualize the firm's products (their brands) in host country market.

*The disadvantages* of euroequity include the potential problem of flowback (or the tendency for the stock to be resold in home markets), particularly during bear spells; different clientele expectations on matters such as reporting, management, and investors relations; and having to subscribe to reports in different languages and different accounting standards.

### **5.3.2. Primary and secondary stock markets**

Stock markets are categorized in primary and secondary ones. *Primary* market refers to the system of new issues placement, where the initial transfer of funds from investors (buyers) to issuers (sellers) are realized. Inasmuch as stocks don't have a time to maturity, then issuer receives actually the perpetual loan.

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<sup>66</sup> The international portfolio diversification is considered in Chapter 6.

When a company firstly raises capital in the market, such an issue is called *Initial Public Offering (IPO)*. The portion of new domestic stocks in the USA was usually not substantial — around 3% in TSE and 12% in NASDAQ. But the weight of new issues among foreign stocks, was as a rule, a little bit higher — 17% in NASDAQ, 18% in NYSE.

If organization are intended to issue the security, it must meet certain financial criteria, particularly, for issue of papers in organized exchange, the company should be introduced in its listing<sup>67</sup>. Some of trade systems appear as the markets for new and small firms, mobilizing capital publicly, but not fulfilling the organized exchanges requirements (in England that is AIM, in the USA — NASDAQ).

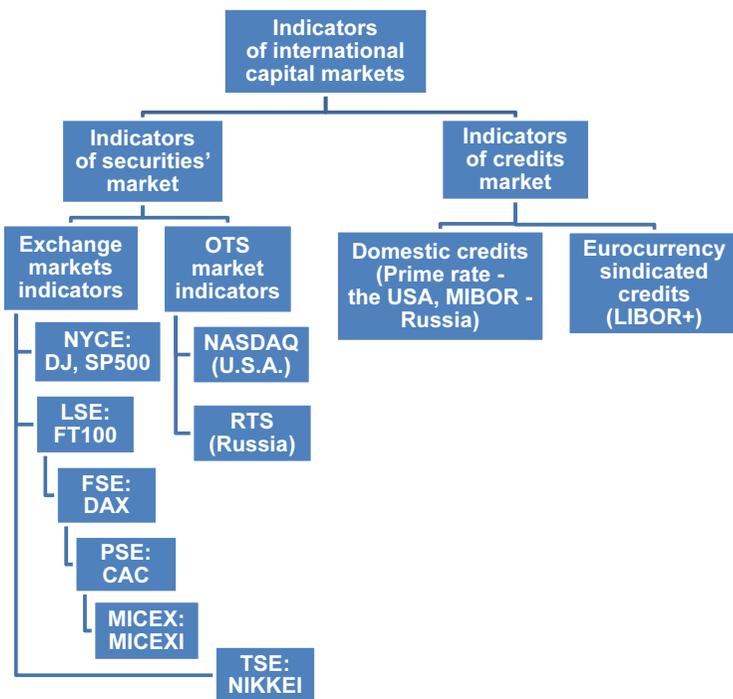
*Secondary stock markets* include the stock trading after their primary placement. It is classified on the organized exchanges and OTC (over-the-counter). Organized exchange refers to a place for trading with different securities, including in listing. This type of deals is highly concentrated in the four largest floors — in New-York City (*NYSE*), London (*LSE*), Tokyo (*TSE*), Osaka (*OSE*). Their capitalization separately exceed the capitalization of European (continental) organized exchanges (in Francfurt, Zurich, Paris) in 10–15 times, exchanges of South-East Asia (Taivan, Hong Kong) — in 30–40 times.

*OTC (Over the counter)* market refer to electronic networks, linked through communication systems and allowing the dealers to offer prices, at which he/she (“s/he”) wishes to sell or buy different assets. Shares of small and relatively unknown firms, of many banks and insurance companies, corporate bonds and preferred stocks, treasury and municipal securities, commercial papers and certificates of deposit, bankers’ acceptances, interbank credits, foreign currency are traded in this market.

The behavior of capital markets is reflected in fluctuations of their indicators (Exh. 6.6).

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<sup>67</sup> Including in “listing” means the admission to trade on the organized exchange.



Exh. 6.6. Indicators of international capital markets

## Resume

In international capital markets, the long-term assets (with maturity above 1 year) are traded. They are presented by sectors of long-term marketable securities (bonds, stocks) and non-marketable medium-term clientele loans from banks.

International bonds are divided into 3 groups — eurobonds (77% of the turnover), foreign, global bonds. *Foreign* bonds include governmental, corporate debts, issued in a form of *public* issue or *private* placement. Offshore markets are represented by *eurobonds* emissions — with a fixed coupon, with a floating interest rate, with a discount. Non-marketable medium-term loans are predominantly eurocurrency credits, provided by a syndicates of banks. The volume of foreign banking credits is very small.

*International stocks* include foreign shares, the certificates for the shares like American (global, European) depository receipts (*ADR, GDR, EDR*), euroequity. Stocks are placed in the *primary* market, resold on the *secondary* market (on organized exchanges or in the trade systems like “over-the-counter” — *OTC*). Holders of shares in the matured markets are represented by 2 aggregated groups — individual and institutional investors.

Indicators of capital markets are presented by quotations of debt and stock assets. The first ones are the *quotes (yields, prices)* of treasury bonds, notes, corporate bonds, and interest rates on non-marketable instruments. The second ones are the quotations of organized exchanges and trade systems. “*Benchmarks*” (indicators) of the US organized exchanges include indices Standard&Poor’s (*S&P500*), Dow Jones (*DJ30*); of British market — indices Financial times (*FT100*). Indicators of *over-the-counter (OTC)* stock markets are indices like *NASDAQ* in the United States or *RTS* in Russia. Indicators of *emerging* markets and global indices are published by the international official institutions, government agencies.

### ***Control questions for discussion***

1. What kinds of instruments are traded in the world capital markets? Describe their main characteristic.

2. What types of long-term debt securities do You know? What is the difference between corporate securities and the treasury ones? What are the securities of the Federal agencies?

3. What is the difference between euro-currency loans and eurobonds? What is the difference between foreign bonds and Eurobonds?

4. Why are large MNCs, located in small countries (like Sweden, Holland, Switzerland), interested in the development of the global investors’ base? List the several reasons, why may the corporation based in the USA issue debt, denominated in a foreign currency?

5. The issue of secured debt is called a mortgage bond; unsecured bonds are called “indentures”. Whether this statement is true, false, uncertain?

6. What instruments traded on Western financial markets, are absent in Russia at the moment? How, in your opinion, this fact could be explained?

7. The speculator from the United States says: “I feel myself more comfortable investing in Western Europe and Canada. I could not invest in the regions with non-payment and debt restructuring. Underwriters of new ADR issues of these regions assure that now everything is different. But who can say, that the government, hasn’t paid once for the debts, can’t break the rules again?” Please comment this statement.

8. Give examples of the most well-known indicators of the global financial markets. What are the basic principles of stock indices calculation?

9. Value of an asset is the present value of the expected future flow of net income on it, discounted at a reasonable interest rate. Though the market value of the asset may be higher or lower, than the accounting value in the short-term period, but in average the book value is equal to the market value. Whether these statements are true, false, or uncertain?

10. If interest rates in financial markets fall, then what bond would You prefer — long- or short-term? Why? What type of bonds has the higher interest rate risk?

11. How will the decline of stock prices effect the business investment activity; the economic growth — the consumer’ decisions about spending expenditure?

12. Please comment the following statement: “In October 19, 1987 the US stock market crashed. The next day, the crisis spreaded to Tokyo, Hong Kong, Sydney, Singapore, as well as to the Frankfurt, Paris and London, and then back to New-York. The spread of collapse from one market to the others was accelerated by international investors, attempting (on the wave of panic) to sell from Tokyo to London and again in New-York. They tried to reduce the risks by investing in different markets, whereas in fact their risks multiplied, as one market followed another to the recession”.

13. What are the characteristics of the securities, placed by Russian issuers in the Western markets? How do they differ from the similar securities, suppose, of American issuers?

### ***Problems to solve***

1. The company owns \$ 20 million of 12% “debentures” in circulation. After-tax net income amounts \$ 3 million. The bond contract requires, that *times-interest-earned (TIE)*, measured as the ratio of net profit to the interest payment (*EBIT/Interest*), should be maintained at a level of 2.5 at least. The tax rate is 40%. What is the *TIE* ratio? How much additional debt under 10% the company could get without violation of that restrictive covenant (*protection clause*)?

2. If the interest rate is 10%, then what is the present value of a security, on which \$1100 next year is paid, 1210 dollars the year after, 1331 dollars in two years?

3. Suppose, the Company has two issuances of preferred stocks in circulation. One is 3.75 dollars of dividends paid, the other — \$5 per year. If the first share is sold for 35.5 dollars, and the second one — for 47.5 dollars, then what is the yield for each of them? Two years later, 3.75-dollars preferred share is sold for USD 41.75, and 5-dollars — for 56.5 dollars. What are the new yields?

4. The company issued common stocks, paying for them taxable dividend, and also bearer shares (enabling to avoid taxation) with the same dividend<sup>68</sup>. Suppose, taxable dividends are taxed at the rate of 10%. What is the proportion between the market price of the ordinary and bearer shares? If the new issue is planned, then taxable or bearer shares should be placed better? Suppose, in addition, the cost of taxable shares issue is 10% of the revenue, while 20% of the revenue should be invested in bearer shares issuing due to the expenditure on distribution and printing of coupons. What type of shares will the Corporation prefer to issue? Suppose, individuals pay 10% tax on dividends, and corporations do not pay taxes, but bear the administrative expenses in 10% of the value of bearer dividends. Determine the relative market prices of these two types of shares?

5. The index of the Russian stock market increased for the year by 20% in terms of roubles, while the ruble devalued by 10%

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<sup>68</sup> Bearer shares are sold with a large number of coupons, which may be presented anonymously to the banks for the current value of dividends.

against the dollar. What was the expected dollar income on the Russian stock market over the year?

6. According to the data of stock markets and exchange rates against the USD changes, determine the dollar income in each of these markets.

Countries	Yeild in the local currency (%)*	Units of currency against dollar	
		01/01	31/12
Canada	10.9	1.29	1.17
Europe	27.9	1.08	1.11
Japan	44.8	129.0	128.0
Switzerland	31.9	1.37	1.58
England	9.1	0.56	0.57
* calculated as the growth rate of the stock index (%)			

## Chapter 6

### MULTICURRENCY INVESTMENTS

There are one hundred men seeking security  
to one able man who is willing to risk his fortune.

*John Paul Getty (1892–1976),  
American industrialist, oilman*

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

***Part two: INTERNATIONAL MONEY  
AND CAPITAL MARKETS***

## Purposes of studying

- Describe the principles of international investments.
- Analyze rate of return on special types of international assets.
- Consider approaches to risk exposure evaluation for investments in different international instruments.
  - International short term portfolio investments.
  - International investments in matured stock market: “world portfolio”.
  - International investments in matured and emerging stock market: “global portfolio”.
  - International investments in bond market.

One of the leading basic ideas, determining the activity of financial institutions, is portfolio investment management so far as they rule the portfolios of liabilities and assets. In this section, conceptual basics foundations of portfolio investing, and currency placements are considered.

## 6.1. Principles of international investments

Investments are managed by principle *RRTO* (*Risk-Return Trade Off*), or *RRA* (*Risk-Return Analysis*).

### 6.1.1. Rate of return on financial assets

Rate of return (or market profitability) is measured by means of rigorous and approximate methods.

Rigorous measuring of return: YTM (Yield to maturity)

*Yield to Maturity* (*YTM*) is the rate of discounting ( $i$ ), equalizing expected discounting cash flows ( $DCF^a$ ), generated by asset within the period of its life-time, and its present value, consequently, making asset' net present value ( $NPV$ ) equal zero:

$$PV_0 = DCF^a \Rightarrow NPV_0^a = PV_0 - DCF^a = 0,$$

where

$$DCF^a = \sum_{t=1}^n \frac{NCF_t^a}{(1+i)^t}, \quad i = YTM.$$

In other words, *YTM* refers to efficient return on asset, equalizing its nominal yield (taking into account risk) with market average one, and consequently, its present price with equilibrium one.

### Return on debt instruments

Consider one-year deposit with single-time receiving of initial investments (100 000 USD) and interest payments (with 10% rate) in time of maturity<sup>69</sup>. To find the rate of return, let's us apply *YTM* concept, equalizing discounted inflows and investment ( $I_0$ ):

$$I_0 = \frac{I_0 + IP}{(1+i)^1},$$

where *IP* — interest payment on deposit.

Then, *i* on single deposit ( $er_{SD}$ ,  $YTM_{SD}$ <sup>70</sup>) will be equal nominal interest rate on it ( $i^n_{SD}$ ):

$$i = er_{SD} = YTM_{SD} = \frac{I_0 + IP}{I_0} - 1 = 1 - \frac{IP}{I_0} - 1 = \frac{IP}{I_0} = i^n_{SD}.$$

Numerically,  $YTM_{SD}$  equals 10%:

$$i = er_{SD} = YTM_{SD} = \frac{IP}{I_0} = \frac{\$10\,000}{\$100\,000} = 0,1, \text{ or } 10\%.$$

Return on discount security with one-year maturity, nominal value (*NV*, *Nominal Value*) 100 USD, and initial price ( $p_0$ ) 90 USD equals 11.1%:

$$i = \frac{\$100 - \$90}{\$90} = \frac{\$10}{\$90} = 0.111, \text{ or } 11.1\%.$$

Or in general form:

$$YTM_{DS} = \frac{NV - p_0}{p_0} = \frac{\Delta p}{p_0} = \Delta p_{DS} = c_{DS}.$$

<sup>69</sup> Clearly, such deposit for the client is simple (single) credit.

<sup>70</sup> Effective return on single deposit, yield to maturity on it.

Thus, rate of return on discount paper equals growth rate of its price (capital return). So, if its market price — 80 USD, then yield — 25%. In other words, prices and return on discount paper are negatively correlated. Thus, interest rate increase in the market leads to result to following result: owners of such securities begin to sell them, placing received funds in interest assets (for instance, deposits). That will decrease the prices of discount bonds to the level, where their return will be equal to market interest rate.

Present value of coupon bond with nominal value 1000 USD, interest rate 10%, time to maturity 10 years could be calculated as follows in the following way:

$$P_0 = PV_0 = \frac{\$100}{(1+i)} + \frac{\$100}{(1+i)^2} + \frac{\$100}{(1+i)^3} + \dots + \frac{\$100}{(1+i)^{10}} + \frac{\$1000}{(1+i)^{10}}.$$

Or in general case:

$$PV_0 = \sum_{t=1}^n \frac{IP}{(1+i)^t} + \frac{NV}{(1+i)^n}.$$

Solving this equation relatively  $i$ , we could get  $YTM_{SD}$ . By the way,  $PV_0$  could be found in financial mass media, electronic internet sources;  $IP$ ,  $n$ ,  $NV$  — in bond's issue indenture. In this case, if market price of the bond equals its nominal value ( $PV = NV$ ), then yield to maturity and *coupon rate* ( $CR$ ) are the same:

$$PV_0 = NV \Rightarrow YTM_{Cbd} = \frac{IP}{NV} = CR.$$

Sometimes, return on bonds could be higher than coupon rate, if they are sold in market cheaper than nominal value. It is happened in the periods of market interest rate increasing, when demand on fixed-income assets decrease. Otherwise, if the level of interest rates is fall in the market, then bonds will be purchased intensively, that will lead to their price increase, and decrease their yield lower than coupon rate. In both situations, price (capital) return of bonds appears as the balancing indicator between coupon income and market interest rate. In both situations, return on bonds appears as the balancing indicator of cou-

pon income and market interest rate. For instance, when Russian government issued its first Eurobonds in November 1996 (with 5-years maturity), then YTM in the moment of their placement was 9.325%, or higher than coupon rate (9.25%) by 0.75%. It was evidence of bonds undervaluation relatively nominal value.

Eurobonds of Saint-Petersburg, issued in June 1997 with coupon 9.5%, was sold by the price, equal 99.536% of nominal value. As a result, efficient yield for investor approached 9.63%. In August 2000 yield to maturity for them counted 18%, i. e. market undervaluation relatively to the nominal value appeared as to be more substantial.

In general, rate of return on coupon bond refers to its coupon income and growth rate of its capital value (price) during the period, when investor holds it.

$$YTM_{CBd} = \frac{IP}{p_0} + \frac{p_1 - p_0}{p_0} = i_{CBd} + \Delta p_{CBd}.$$

### **Return on stock (share)**

Preferred stock catches take up the intermediate place between common stock (ordinary shares), i. e. equity capital, and bonds (debt). It is called often perpetuity, or permanent (timeless) papers with fixed income. Their value equals discounted dividend flow.

$$P_{PS} = \sum_{t=1}^{\infty} \frac{D}{(1+i)^t},$$

where  $D_p$  — fixed dividend for one period,  $i$  — required rate of return.

Or more detailed:

$$P_{PS} = \frac{D}{1+i} + \frac{D}{(1+i)^2} + \dots + \frac{D}{(1+i)^n} = D \left( \frac{1}{1+i} + \dots + \frac{1}{(1+i)^n} \right).$$

Let's designate  $(1+i)^{-1}$  as  $x$ , and write the following equation:

$$P_{PS} = D \cdot (x + x^2 + \dots + x^n).$$

From the school algebra discipline, everybody should know, that expression  $(1 + x + x^2 + \dots)$  describes infinite progression, that's equal  $1/(1 - x)$ . Then,  $P_{PS}$  will have the following form:

$$P_{PS} = D \cdot \left( \frac{1}{1-x} - 1 \right) = D \cdot \left[ \frac{1}{1 - \frac{1}{1+i}} - 1 \right] = D \cdot \frac{1-1+\frac{1}{1+i}}{\frac{1+i-1}{1+i}} = D \cdot \frac{\frac{1}{1+i}}{\frac{i}{1+i}} = \frac{D}{i}.$$

Yield to maturity for this instrument ( $YTM_{PS}$ ) looks like follows this:

$$i = YTM_{PS} = \frac{D}{P_{PS}}.$$

Model for common stock price could be represented as:

$$P_{CS} = \sum_{t=1}^n \frac{D_t}{(1+i)^t} + \frac{P_n}{(1+i)^n},$$

where  $i$  — required rate of return,  $D$  — expected dividends in different time periods,  $P_n$  — anticipated selling price of stock in certain time moment.

Selling price of stock ( $P_n$ ) depends on dividend flows after  $n$  time periods. Consequently, value of common share in current period ( $P_{CS}$ ) relates to dividends in investment period, and also to dividends after one. As result, price of common stock is defined usually as present value of anticipated dividends.

$$P_0 = \sum_{t=1}^{\infty} \frac{D_t}{(1+i)^t}.$$

This expression is called as General Dividend Valuation Model (GDVM).

There are 3 patterns of dividend' behavior — zero, constant, and variable dividend rate of growth. Price of common stock with zero dividend growth (ZDG) is the value of perpetuity:

$$P_{CS}^{ZDG} = \sum_{t=1}^{\infty} \frac{D_t}{(1+i)^t} = \frac{D}{i}.$$

Its rate of return is determined in the same manner, like the yield of preferred share:

$$YTM_{CS}^{ZDG} = \frac{D}{P_0}.$$

Stock with the *constant dividend growth (CDG)*, that's equal  $g$ , has the dividend in the period  $t$  ( $D_t$ ) as follows has the following dividend in the period  $t$  ( $D_t$ ):

$$D_t^{CDG} = D_0(1+g)^t = D_0(1+g)^t.$$

General model of its valuation is expressed as a rule in following form:

$$P_{CS}^{CDG} = \sum_{t=1}^{\infty} \frac{D_0 \times (1+g)^t}{(1+i)^t}.$$

Net profit (earnings after tax), shared on undivided profit and dividends, is more, than the last one, and consequently —  $i > g$ . Thus, this model could be represented as:

$$P_{CS}^{CDG} = \frac{D_1}{(i-g)},$$

where  $D_1$  — dividend of next period.

Rate of return on this type of common stock is determined as follows like this:

$$YTM_{CS}^{CDG} = \frac{D_1}{P_0} + g.$$

Pattern of non-constant dividend growth suppose their different behavior in different periods of “company life cycle” — (a) variable one in initial period, (b) increasing with constant rate in the period of maturity. Value of such stock equals:

$$P_0 = PV_1 + PV_2,$$

where  $PV_1$  — present value of dividends, expected in the period of non-constant growth,  $PV_2$  — present value of expected stock price after the period of non-constant growth.

If the dividend fluctuates with growth rate  $g_1$  in initial  $m$  years of share' circulation, and then it grows with constant rate  $g_2$  in the period of  $(m+1)$  and further, thus, value of stock can be expressed as:

$$P_0 = \sum_{t=1}^m \frac{D_0 \times (1+g)^t}{(1+i)^t} + \frac{P_m}{(1+i)^m}.$$

The price of stock is represented as the present value of dividends within initial  $m$  years plus present value of stock price in the end of year  $m$  ( $P_m$ ). To find the value of stock in year  $m$  ( $P_m$ ), we should utilize the model of stock price with constant dividend growth:

$$P_m = \frac{D_{m+1}}{(i-g_2)}.$$

Inserting this expression in previous equation, we extract:

$$P_0 = \sum_{t=1}^m \frac{D_0 \times (1+g)^t}{(1+i)^t} + \frac{1}{(1+i)^m} \times \frac{D_{m+1}}{(i-g_2)}.$$

In general case, yield to maturity for common stock ( $YTM_{CS}$ ) equals expected dividend ( $D_1/P_0$ ) and capital ( $g$ ) return:

$$YTM_{CS} = \frac{D_1}{P_0} + g.$$

For unification with equation for bond yield, we should rewrite equation for  $YTM_{CS}$  in following manner:

$$YTM_{CS} = \frac{D_1}{P_0} + \frac{P_1 - P_0}{P_0} = d_{CS}^a + \Delta p_{CS}^a.$$

### **Approximate measuring: current, discount return**

For information about direction of return changes, approximate measuring of return are utilized — the current and discount ones.

*Current yield (CY)* is defined as proportion of annual interest payment ( $IP$ ) to current asset price ( $P_0$ ):

$$CY = \frac{IP}{P_0}.$$

Thus, if market price of the bond equals its nominal value, then current yield equals coupon rate. The more deviation of se-

curity price from out its nominal value, the stronger the difference between current yield and yield to maturity. These values are related to each other in direct proportion, then growth (fall) of first variable could shows the same direction of second variable changes. So, current yield is lower, than yield to maturity for coupon paper, if its current price is higher, than nominal value. For example,  $NV = 100$ ,  $IP = 10$ , consequently,  $YTM = 10\%$ , and if the current price is 102, then  $CY = 10/102 = 9.8\%$ . Vice versa, current yield is higher, than yield to maturity for coupon paper, if its price is lower, than nominal value. For instance, if  $P_0 = 98$ , then  $CY = 10/98 = 10.2\%$ .

*Discount Yield (DY)* shows the proportion of security return and nominal value:

$$DY = \frac{NV - PV}{NV} \times \frac{360}{t}.$$

Market price of discount paper always is lower, than nominal value, before the time to maturity. Consequently, discount yield always is lower, than yield to maturity:

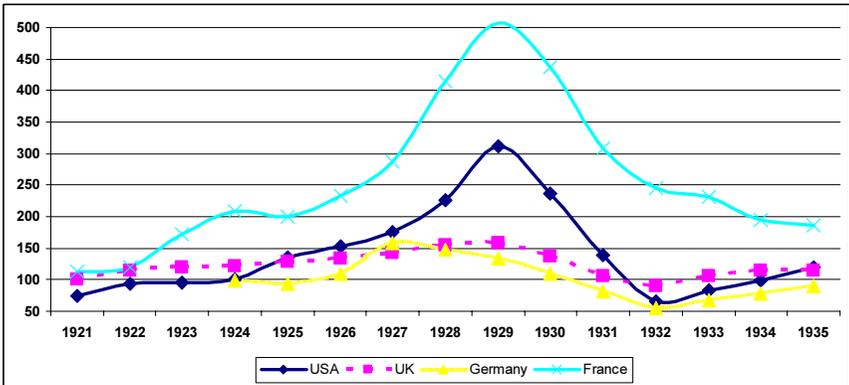
$$PV_{DS} < NV \Rightarrow DY < YTM_{DS}.$$

We considered here the nominal rate of return. The real (inflation-adjusted) return has been analyzed previously.

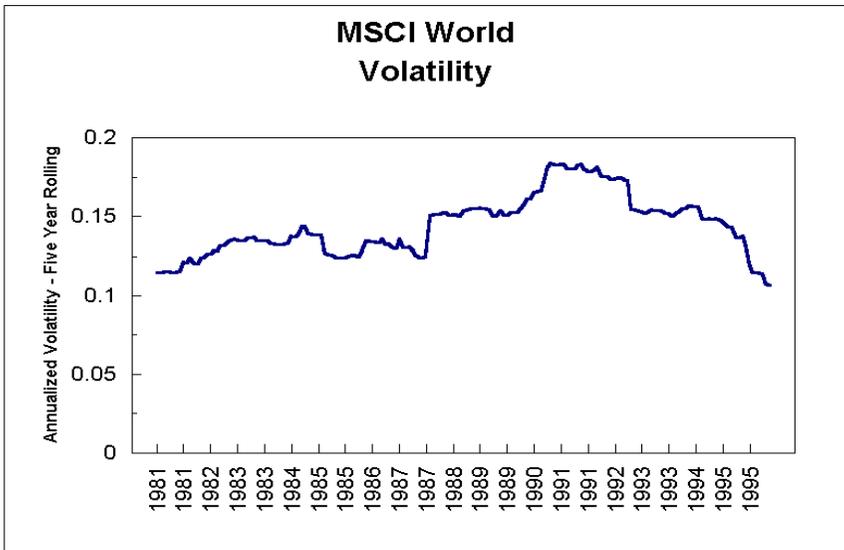
### **6.1.2 Risk for international financial instruments**

Risk refers to the threat of losses (or missing benefits), measuring it with the expected *volatility* of return (price) for instrument. Historically, stock market was often highly volatile. Periods of prosperity in 1920s and next Great Depression were characterized by the following picture (Exh. 5.1).

Stock index *MSCI (Morgan Stanley Capital International)* had been demonstrate the world volatility of shares' prices in 1980s and 1990s (Exh. 5.2).



Exh. 5.1. Stock price' indexes, 1921–1935 (1913 = 100)



Exh. 5.2. World stock index MSCI (Morgan Stanley Capital International): indicative historical example

### General risk of financial asset

General risk of an asset is measured by several indicators. Thus, in absolute terms, risk is estimated with *Standard Deviation*

(SD) of return, which is calculated as squared root of weighted average quadratic deviations of each observation from out average value.

$$\sigma = \sqrt{\sum_{j=1}^n [r_j - \bar{r}]^2 \times \omega_j},$$

where  $\sigma$  — standard deviation,  $\bar{r}$  — average return,  $r_j$  — return for case  $j$  among  $n$  possible outcomes,  $\omega_j$  — probability (“weight”) of outcome  $j$ .

Suppose, probability distribution (PD) of each expected levels of return for investment is represented as follows:

Table 5.1

**Calculation of weighted average return**

Scenarios	$r_j^a$	PD ( $\omega_j$ )	Weighted forecasts	Deviation from average
<b>1</b>	10%	30%	3%	-5%
<b>2</b>	15%	40%	6%	0%
<b>3</b>	20%	30%	6%	+5%
<b>Sum</b>	—	100%	15%	0%

Then, average expected return ( $\bar{r}^a$ ) will be 15%:

$$\bar{r}^a = 0.10 \cdot 0.3 + 0.15 \cdot 0.4 + 0.20 \cdot 0.30 = 0.15.$$

Standard deviation of possible returns from the average one will be 390 *bps* (basic points), or 3.9 *pps* (interest points):

$$\sigma = \sqrt{\sum (r_j^a - \bar{r}^a)^2 \cdot \omega_j} = \sqrt{(-5)^2 \cdot 0.3 + (0)^2 \cdot 0.4 + 5^2 \cdot 0.3} = \sqrt{15} = 3.9 \text{ pps}.$$

It means, that *absolute* standard “corridor” (*SC*) of deviations from average return is expected from 11.1% to 18.9%:

$$SC \in [15\% \pm 3.9 \text{ pps}], \text{ or } SC \in [11.1\%; 18.9\%].$$

Extremal (“mini-max”) corridor (*XC*) — wider (from 10% to 20%):

$$XC \in [10\%; 20\%], \text{ or } XC \in [15\% + 5 \text{ pps}].$$

*Relative measuring* of risk is the *coefficient of variation (COV)*, comparing standard deviation with average return:

$$COV = \frac{\sigma^a}{\bar{r}^a}.$$

In our example, expected *COV* equals 0.26 (26%):

$$COV^a = \frac{\sigma^a}{\bar{r}^a} = \frac{0.039}{0.15} = 0.26, \text{ or } 26\%.$$

It means, that *relative standard corridor (RSC)* of deviations is anticipated in interval  $\pm 26\%$  to average level:

$$RSC \in [0.15 \pm 26\%].$$

Rate of return and risk in the greatest financial market — USA — within 73 years (Table 5.2) were different for different groups of security issuers. Thus, “risk-free” securities of Treasury (Ministry of Finance) had lowest returns (3.7%, 5.4%) and volatility (3.3; 5.6; 8.7). These instruments are considered as “risk-free” in sense of default risk absence for them. However, general risk in sense of uncertainty (future volatility) of returns for treasury papers exists. Stocks were the highest risky (20.5; 34.8), and, consequently, the most profitable negotiable assets, especially, stocks of small companies (12.3%, 17.7%). Corporate bonds occupied intermediate place — with return 5.9% and volatility 8.4.

*Table 6.2*

**Annual rates of return and risk: USA, 1926–1999**  
**(historical long run trend)**

	Arithmetical averages	Standard deviations
Stocks of large corporations	12.3	20.5
Stocks of small companies	17.6	34.8
Long term corporate bonds	5.9	8.4
Long term treasury bonds	5.4	8.7
Medium term treasury bonds	5.4	5.6
Treasury bills of USA	3.7	3.3

*Source:* Stocks, Bonds, Bills and Inflation. 1994 Yearbook // Chicago: Ibbotson Associates Inc., 1999. P. 31.

General risk could be divided on systematic (non-diversifiable) and non-systematic (diversifiable) ones. First type of risk is the volatility of returns, stipulated by factors, influencing the market in a whole (for example, fluctuations of quotations due to changes of interest rates, currency purchasing power, investors' macro-economic expectations)

Non-systematic risk refers to variability of returns, stipulated by unique nature of certain asset (by managerial decisions of institution, introduction in the market of new company' product, governmental regulation, foreign competition). Investors decrease this type of risk by mean of investments diversification (by formation of assets portfolio). Systematic risk could not be decrease by mean of diversification — its value should be included in price (return) of asset in form of risk premium. Thus, in the USA stocks (see Table 6.2) had risk premium 7–12 percentage points relatively long term treasury bonds, while corporate bonds — only 0.5 percentage points.

### **Systematic risk: *CAMP***

Traditionally, systematic risk is analyzed by using *Capital Asset Pricing Model (CAMP)*. According to it, return of asset  $j$  ( $r_j$ ) is determined as risk-free return ( $r_f$ ) plus premium on systematic risk ( $RP_j$ ):

$$r_j = r_f + RP_j.$$

*Risk-free return* equals the real return ( $r_r$ ) plus premium on expected inflation ( $\Delta p^e$ )<sup>71</sup>. Risk premium consists of *premiums* on risks of default (*DRP*), liquidity (*LRP*), term (*TRP*), senior (*SRP*). First one compensates possible losses on instruments with threat of debt non-repayment. Liquidity risk is linked with ability of investor to buy (sell) an asset fast and without substantial transaction expenses. Thus, securities of large corporations with higher rating are of high liquidity, while papers of small companies, as a rule, are of lower liquidity, and consequently, they require the additional expenses for transactions. Term risk premium

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<sup>71</sup> *Real return* — expected income of investments in asset without default risk during period, when anticipated inflation is estimated as a zero.

depends on time to maturity for the asset (i. e. the longer time to maturity for the instrument, the higher risk on it). Senior risk premium falls decreases for the liabilities from higher to lower hierarchy (common stocks, preferred shares, income bonds, non-secured, mortgage bonds). Decoding risk-free return and risk premium, we could extract more detailed expression for *CAPM*:

$$r_i = r_f + RP = (r^r + \Delta p^a) + (DRP + LqRP + SRP + TRP).$$

The measure of systematic exposure is *beta coefficient* ( $\beta_j$ ), reflecting the sensitivity of an asset to the changes of market average return ( $r_m$ ) — the stronger security quotation reacts on market-general changes, the higher this coefficient is:

$$\beta_j = \frac{\Delta r_j}{\Delta r_m}.$$

Market-average return ( $r_m$ ) refers to return of representative selection of assets (for example, in US stock market — indexes *SP500*, *DJ30*, in Great Britain — *FT100*, in Russia — *RTS*). Beta depends on the standard deviation of certain asset return ( $\sigma_j$ ), of market portfolio ( $\sigma_m$ ), and correlation between these returns ( $\rho_{jm}$ ). It equals co-variation of returns on certain asset and market portfolio ( $Cov_{jm}$ ), divided on the variation (dispersion) of return on market portfolio ( $\sigma_m$ ):

$$\beta_j = \frac{Cov_{jm}}{\sigma_m^2} = \frac{\sigma_j \cdot \sigma_m \cdot \rho_{jm}}{\sigma_m^2} = \frac{\sigma_j}{\sigma_m} \cdot \rho_{jm}.$$

Utilizing beta as an indicator of the systematic risk, and difference between market-average and risk-free return as an indicator of the market risk, we can determine risk premium for a certain asset as follows:

$$RP_j = \beta_j \cdot [r_m - r_f].$$

Then, required rate of return for the single asset has the following framework:

$$r_j = r_f + \beta_j \cdot [r_m - r_f].$$

Beta, equaled 2, means, that the price (return) of selected asset moves in the same direction with the market, but in two

times faster (thus, if market index increase by 10%, than price of given security spring jump up to 20%). Beta is negative (for instance,  $-2$ ), if price of security falls on to 20%, when the growth of market index  $-10\%$ . Beta less than 1 means, that the price of security fluctuates less substantially, than the market as a whole.

In the USA, companies with the stable returns were local natural monopolies (*American Electric Power, Wisconsin Public Service, San Diego Gas & Electric*), petroleum giant *Exxon* (Table 6.3), have had the lowest betas — from 0.55 to 0.7. Volatility on the level of market-average one was demonstrated by *Dupont* (1.0), *ATT* (0.95), *Boeing* (1.1). Returns of companies in the markets with higher competition (*Merrill Lynch, WalMart, K-Mart*) and faster technological changes (*Apple Computer, Intel, Harley-Davidson*) are estimated as the less determined (more risky) — with betas since 1.25 to 1.75.

Table 6.3

**Betas for prices of selected stocks:  
the beginning of XXI century**

<b>Companies</b>	<b>Betas</b>
<i>San Diego Gas &amp; Electric</i>	0.55
<i>Wisconsin Public Service</i>	0.65
<i>Exxon</i>	0.65
<i>American Electric Power</i>	0.70
<i>AT&amp;T</i>	0.95
<i>Dupont</i>	1.00
<i>Boeing</i>	1.10
<i>Coca-Cola</i>	1.15
<i>Delta Air Lines</i>	1.15
<i>General Electric</i>	1.15
<i>Apple Computer</i>	1.25
<i>Wal-Mart Stores</i>	1.30
<i>K-Mart</i>	1.30
<i>Intel</i>	1.35
<i>Harley-Davidson</i>	1.60
<i>Merrill Lynch</i>	1.75

Sources: Value Line Investment Survey. N. Y., 10.01.2000.

In addition to security valuation, model *CAPM* is utilized also for estimation (a) of business company worth, (b) of required rate of return on investment projects, (c) of interest rate for credit lines, promissory notes, bonds issues.

### **Non-systematic risk: portfolio analysis**

Investor, while purchasing the set of assets, strives for diversification effect, based on an idea, that dispersion of money placements in assets with different price trends are compensated each other, avoiding risk. For instance, investments in asset, which returns are weakly (negatively) correlated with the cash flows for other company investments, will decrease general risk of the portfolio.

Return and risk of portfolio depend on characteristics of included assets, on weight of each asset in portfolio ( $\omega_j$ ). For  $n$  assets, portfolio return ( $r_p$ ) could be represented as follows:

$$r_p = \sum_{j=1}^n r_j \cdot \omega_j.$$

Clearly, the sum of weights of all assets in portfolio equals one unit, and the weight of each asset is in the diapason from 0 to 1.

$$\sum_{j=1}^n \omega_j = 1, \text{ when } 0 \leq \omega_j \leq 1.$$

Portfolio risk is measured by standard deviation of portfolio return ( $\sigma_p$ ). In the case of two-assets portfolio, it equals:

$$\sigma_p = \sqrt{\sigma_A^2 \cdot \omega_A^2 + \sigma_B^2 \cdot \omega_B^2 + 2\sigma_A \sigma_B \omega_A \omega_B \cdot \rho_{AB}},$$

where  $\sigma_A^2$ ,  $\sigma_B^2$  — variation (dispersion) of returns for assets A and B,  $\sigma_A$ ,  $\sigma_B$  — their standard deviations,  $\rho_{AB}$  — correlation coefficient of returns for assets A and B.

Consequently, the lower correlation coefficient ( $\rho_{ab}$ ), the higher decrease of risk, related to the diversification of investments in assets A and B.

Let's consider the example with the stocks of 3 companies, among which A and C produce the first necessity goods, and com-

pany *B* — luxury goods. Suppose, demand for stock *B* grows during cyclical booms and falls in time of recessions of business activity (Table 5.4). Demand for *A* and *C* is relatively higher during recessions (because inhabitants continue to purchase the first necessity goods, and these companies extract the earnings), and lower within cyclical booms (when increasing incomes of population are expensed in increasing volumes on the luxuries).

Table 5.4

**Rates of return on stocks of companies *A*, *B*, *C*  
on different phases of business cycle: hypothetical case**

Phases of business cycle (period)	Company <i>A</i>	Company <i>B</i>	Company <i>C</i>
Boom	5%	15%	5%
Recession	15%	5%	15%
Boom	5%	15%	5%
Recession	15%	5%	15%
Average return	10%	10%	10%

Cyclical average return for each of 3 assets (*A*, *B*, *C*) counts 10%. Volatility (risk) of investments in each asset, expressed as standard deviation, equals 5 percentage points:

$$\begin{aligned} \sigma &= \sqrt{(-5)^2 \cdot 0.25 + 5^2 \cdot 0.25 + (-5)^2 \cdot 0.25 + 5^2 \cdot 0.25} = \\ &= \sqrt{0.25 \cdot 4 \cdot 25} = 5 \text{ pps.} \end{aligned}$$

Relative risk (coefficient of variation) counts 0.5 ( $\pm 50\%$ ):

$$COV = \frac{0.05}{0.10} = 0.5, \text{ or } 50\%.$$

The goal of asset portfolio formation is risk minimization at given return (or return maximization at given risk), i. e. minimization of risk on one unit of return. Thus, portfolio return, including stocks *A* and *B* in same portions, equals 10%:

$$r_{AB} = 0.10 \cdot 0.5 + 0.10 \cdot 0.5 = 0.10, \text{ or } 10\%.$$

Portfolio risk (the standard deviation of return) — 0, taking to account, that coefficient of variation equals ( $-1.0$ ), because the returns for both assets move in perfect counter-phase:

$$\sigma_{AB} = \sqrt{0.05^2 \cdot 0.5^2 + 0.05^2 \cdot 0.5^2 + 2 \cdot 0.05 \cdot 0.05 \cdot 0.5^2 \cdot 0.5^2 \cdot (-1.0)} = 0.$$

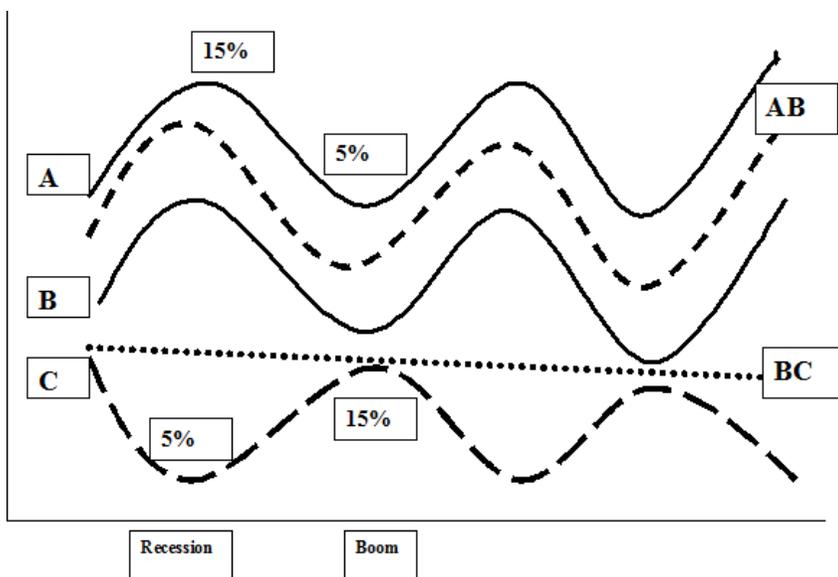
Consequently, investment portfolio, consisting of assets *A* and *B*, minimizes risk at constant rate of return.

However, portfolio of assets *A* and *C*, which returns move in the same direction, don't have a sense, because it counts the same risk (5 percentage points), as each single investment in each separate asset, at the same rate of return (10%).

$$r_{AC} = 0.10 \cdot 0.5 + 0.10 \cdot 0.5 = 0.10, \text{ or } 10\%.$$

$$\begin{aligned} \sigma_{AC} &= \sqrt{0.05^2 \cdot 0.5^2 + 0.05^2 \cdot 0.5^2 + 2 \cdot 0.05 \cdot 0.05 \cdot 0.5^2 \cdot 0.5^2 \cdot 1.0} = \\ &= 0.05, \text{ or } 5pps. \end{aligned}$$

In this situation, portfolio formation bears additional transaction costs.



*Exh. 6.2.* Rates of return on stocks and portfolios of companies *A*, *B*, *C* on different phases of business cycle: hypothetical case

## 6.2. International short term investments

Let's apply the principles of risk-return analysis to the short term assets, denominated in different currencies.

### 6.2.1. Efficient return on currency instruments of money market

For example, we could consider the calculation of efficient return on a single deposit in foreign currency.

#### Logical determination of efficient currency return

Let us we begin with numerical example. Financial institution should replace 100 000 USD in equivalent for 1 year. Obviously, there are 2 (as a minimum, at least) alternatives for investment:

- to buy buying a dollar asset (deposit);
- to invest investing in ruble asset.

Suppose, the only criteria for choice is interest rate. Currently, the later on dollar deposit ( $i^d$ ) counts 20%, on ruble one ( $i^r$ ) — 50%. In this form they are not comparable. It is necessary to transfer them to the sole currency basis (to recalculate in same one currency). As our hypothetical investor is a resident of Russia, the basis for comparison reasonably should be ruble one. Herewith, we should not forget, that Russia actually continues to be bi-currency space, where dollar fulfills practically all money functions, and its economic institution have a habit to evaluate the financial results of business transactions, utilizing, in 1<sup>st</sup> turn, dollar estimations, especially concerning time horizon of 1 year forward.

Current dollar quotation ( $S_0$ ) is 25 ruble, and spot rate, expected in 1 year, ( $S_1^e$ ) — 35 rubles per dollar<sup>72</sup>. Then, initial

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<sup>72</sup> We remind, that official expectations of Russian government (Ministry of finance) for exchange rates, utilized as control ciphers for federal budget development, were in summer 1999 (at actual current rate — 25) — 32 ruble per dollar in average for 2000, in august 2000 (at actual current rate — 27.7) — 30 ruble per dollar in average for 2001, in august 2001 (at actual current rate — 29.3) — 31.5 ruble per dollar in average for 2002. The actual values compiled amounted in first 2 cases around 28 and 29 ruble per dol-

dollar investments ( $I_0^f$ ) in ruble equivalent counts 2.8 mln rubles:

$$I_0^{fh} = I_0^f \cdot S_0 = \$ 100\,000 \cdot \frac{\text{RUB } 25}{\text{USD } 1} = \text{RUB } 2\,500\,000.$$

In the end of the year, financial institution will withdraw from deposit its initial investment plus interest payments, that, in ruble denomination, is expected to make up 4.2 mln rubles.

$$I_1^{fh(a)} = I_0^f (1 + i^f) \cdot S_1^a = \$ 100\,000(1 + 0.20) \cdot \frac{\text{RUB } 35}{\$ 1} = \text{RUB } 4\,200\,000.$$

Then, ruble rate of return on dollar investment (expected efficient return of currency investment —  $ei_f^a$ ) counts 68%:

$$ei_f^a = \frac{I_1^{fh(a)} - I_0^{fh}}{I_0^{fh}} = \frac{4\,200\,000 - 2\,500\,000}{2\,500\,000} = 0.68, \text{ or } 68\%.$$

Efficient return of ruble deposit equals nominal ruble interest rate — 50%:

$$ei_h = \frac{I_1^h - I_0^h}{I_0^h} = \frac{I_0^h(1 + i^h) - I_0^h}{I_0^h} = 1 + i^h - 1 = i^h.$$

In this case, reasonable decision will be the investment in dollar deposit, because it is expected to be more profitable, than the ruble one (on 18 percentage points):

$$ei_{fh}^a - ei_h = ei_{fh}^a - i_h = 68\% - 50\% = 18\text{ pps}.$$

### **Efficient return and international Fisher effect**

Let's formalize our considerations, utilizing well-known concepts. In this case, we applied the yield to maturity theory (*YTM*) and international Fisher effect, more exactly, the concept of spot market speculation (*SMS*).

From the standpoint of *YTM* concept, current ruble equivalent of dollar investment ( $I_0^{fh}$ ) equals the future ruble cash flow at

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lar. Thus, government proceeded from the cautious (pessimistic) forecast, probably, hoping for better (optimistic) outcome, that appeared in fact.

money withdrawing from dollar deposit ( $I_1^{fh}$ ), discounted at unknown search efficient rate of return on dollar ( $ei_{fh}^a$ ):

$$I_0^{fh} = \frac{I_1^{fh}}{(1 + ei_{fh}^a)}.$$

Solving this equation, we could find efficient rate on dollar:

$$ei_{fh}^a = \frac{I_1^{fh}}{I_0^{fh}} - 1 = \frac{I_0^f (1 + i_f) \cdot S_1^a}{I_0^f \cdot S_0} - 1 = \frac{S_1^a}{S_0} (1 + i_f) - 1.$$

Remind,  $S_1^a/S_0$  is an expected spot coefficient (the ratio of dollar rate growth)/ Expressing it through spot differential ( $e^a$ ), we could get:

$$\frac{S_1^a}{S_0} = 1 + e^a.$$

Actually, it is so. It is really so, because:

$$e^a = \frac{S_1^a - S_0}{S_0} = \frac{S_1^a}{S_0} - 1.$$

In our case:

$$e^a = \frac{S_1^a - S_0}{S_0} = \frac{35 - 25}{25} = \frac{10}{25} = 0.4, \text{ or } 40\%.$$

Then,

$$ei_{fh}^a = (1 + i_f)(1 + e^a) - 1.$$

In numerical form:

$$ei_{fh}^a = (1 + 0.2)(1 + 0.4) - 1 = 1.68 - 1 = 0.68, \text{ or } 68\%.$$

In approximation, efficient rate of return equals<sup>73</sup>:

$$ei_{fh}^a \cong i_f + e^a.$$

It will give us numerically:

$$ei_{fh}^a \cong 0.2 + 0.4 = 0.6, \text{ or } 60\%.$$

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<sup>73</sup> It is extracted from the disclosure of brackets in rigorous equation for efficient return —  $ei_{fh}^a \cong i_f + e^a + i_f \cdot e^a$ .

As a result, rate of return on currency investment ( $ei_{fh}^a$ ) depends on interest rate on foreign currency ( $i_f$ ) and expected change of spot rate ( $e^a$ ).

Utilizing extracted formula and remembering, that ruble rate in ruble denomination always equal 1 (and change of such “exchange rate” is always zero), we could get the efficient rate on domestic investments, that equals nominal rate:

$$ei_h = (1 + i_h)(1 + 0.0) - 1 = 1 + i^h - 1 = i^h.$$

Consequently, when efficient currency rate of return is higher, than nominal domestic rate, then, it is more profitable to invest in foreign currency assets:

$$ei_{fh}^a > i_h \Rightarrow I^f.$$

It is right and vice verse:

$$ei_{fh}^a < i_h \Rightarrow I^h.$$

In the situation of equality of these values, it is indifferent, in what currency investments should be denominated:

$$ei_{fh}^a = i_h \Rightarrow I^h, I^f.$$

In detail it means:

$$i_h = (1 + e^a)(1 + i_f) - 1.$$

Expected exchange rate, consistent with this level of rates, is called as *Break Even Rate (BER)*, or as parity (equilibrium) due to international Fisher effect ( $S_1^{(IFE)}$ ):

$$S_1^{BE} = S_1^{(IFE)} = S_0 \cdot \frac{1 + i^h}{1 + i^f}.$$

In our example, it equals 31.25 rubles per dollar:

$$S_1^{BE} = 25 \cdot \frac{1 + 0,50}{1 + 0,20} = 25 \cdot 1.25 = 31.25.$$

Correspondently, break-even spot differential will have the following level:

$$e^{BE} = e^{IFE} = \frac{1+i^h}{1+i^f} - 1 = \frac{i^h - i^f}{1+i^f} = \hat{i}.$$

Its numerical level value is represented below:

$$e^{BE} = \frac{0.50 - 0.20}{1 + 0.20} = 0.25, \text{ or } 25\%.$$

Consequently, investment in currency asset is reasonable, if future spot rate is expected higher, than “break-even” one (31.25 ruble per dollar), and in domestic asset, if it is lower:

$$S_1^a < S^{BE} \Rightarrow F^f \text{ or } S_1^a > S^{BE} \Rightarrow F^h.$$

For example, at expected rate of 30 ruble per dollar, efficient return on currency investments is equal to 44%, or lower, than the ruble one (50%):

$$ei_{fh}^a = \frac{S_1^a}{S_0} \cdot (1 + i_f) - 1 = \frac{30}{25} \cdot (1 + 0.20) - 1 = 1.2 \cdot 1.2 - 1 = 0.44, \text{ or } 44\%.$$

When these values equal, it is indifferent, in what currency investor should replace money:

$$S_1^a = S^{BE} \Rightarrow I^f, I^h.$$

In such a situation, efficient rate on dollar is 50%:

$$ei_{fh}^a = \frac{S_1^a}{S_0} \cdot (1 + i_f) - 1 = \frac{31.25}{25} \cdot (1 + 0.20) - 1 = 1.25 \cdot 1.2 - 1 = 0.5, \text{ or } 50\%.$$

### 6.2.2. Currency investment as a portfolio of 2 assets

We could consider the international investments as a portfolio of 2 assets, where first one is the foreign asset with return  $r_f$  and the second is a currency deposit with return  $e^a$  (for “uncovered” transaction) and  $f$  (for “covered” investment).

Consequently, the rate of return on currency investment, expressed in domestic money units, take the following form:

$$\bar{r} = r_1 \cdot \omega_j + r_2 \cdot \omega_2, \text{ or } \bar{r}_f^a = r^f \cdot \omega_1 + e^a \cdot \omega_2.$$

It is an analog to rate of return on currency asset for uncovered investment, utilizing *YTM* and *IFE*.

$$er_f^a = (1 + r^f)(1 + e^a) - 1.$$

Clearly, that exchange rates fluctuations lead to uncertainty (risk) of expected return on currency investment. Then, absolute risk of such type of investments looks as follows:

$$\sigma_p = \sqrt{\sigma_{r^f}^2 \cdot \omega_{r^f}^2 + \sigma_e^2 \cdot \omega_e^2 + 2\sigma_{r^f} \cdot \sigma_e \cdot \omega_{r^f} \omega_e \cdot \rho_{r^f e}}.$$

Suppose, the standard deviation of return on currency deposit is 20%, and the one of exchange rate — 10%. Let's say, the correlation coefficient between return on currency asset and exchange rate is 33%, and the weights of both assets in portfolio — 50%, then:

$$\sigma_p = \sqrt{0,20^2 \cdot 0,5^2 + 0,10 \cdot 0,5^2 + 2 \cdot 0,2 \cdot 0,1 \cdot 0,5 \cdot 0,5 \cdot 0,33},$$

or:

$$\sigma_p = \sqrt{0.01 + 0.025 + 0.0033} = \sqrt{0.0383} = 0.1957, \text{ or } 19,57pps.$$

As a result, we find that risk of currency portfolio (20%) is lower, than risk of return on currency deposit plus return due to spot rate change:

$$\sigma_p(0.2) < [\sigma_{r^f}(0.2) + \sigma_e(0.1)].$$

We see that exchange risk is non-additive, and we can get the synergetic effect of investments in foreign assets.

### **Principles of short term portfolio investing**

Forming the short-term investment *portfolio* economic institutions are guided by the following principles:

- diversify portfolio to maximize profit at established risk, investing into instruments of money market;
- reconsider portfolio, if marginal return seems to exceed additional costs (price, interest spread, broker commission);
- estimate the liquidity (availability of active secondary markets) for instruments in portfolio, if fast conversion into cash is important;
- adjust the sale date of less liquid assets to planning needs of institution in appropriating currency;
- consider opportunities for covered interest arbitrage or for “uncovered” (speculative) operations.

However, investments in short-term portfolios are firstly limited by rather high transaction costs. For example, cross-country interest differential (adjusted for risk) seldom equals 3% a year. For 30-days investments, it is only 0.25% (for 90-days — 0.75%), that can be lower, than the costs of currency operations (bid-ask spread, transfer commissions). Thus, even big interest spreads (on annual basis), adjusted for risk, can not justify short-term funds movement.

Ultimately, the main factors for investing of temporary free current forex funds in short term papers and deposits are future needs of institution in certain currencies for payments (money transfers), debt repayments, investments, risk hedging, and also the comparative rate of return (on after-tax basis) of different instruments, adjusted for the risk.

### 6.3. International long term investments

Long term tradable assets are debt papers (bonds) and equity securities (stocks).

#### Efficient return on currency stocks, bonds

The rate of return on coupon bond ( $YTM_{CBd}$ ) equals coupon (interest) return ( $i_{CBd}$ ) plus growth rate of its capital (price) value ( $\Delta p_{CBd}$ ) within the period of holding it by investor:

$$YTM_{CBd} = i_{CBd} + \Delta p_{CBd}.$$

Rate of return on common stock ( $YTM_{CS}$ ) equals the expected dividend return ( $d_{CS}$ ) and capital (price) one ( $\Delta p_{CS}$ ):

$$YTM_{CS} = d_{CS} + \Delta p_{CS}.$$

Efficient return ( $er_{Bd}^{fh}$ ) on investments in foreign bonds, denominated in currency of investor, has 3 components:

- interest (coupon) —  $i_{Bd}$ ;
- capital (price) —  $c_{Bd}$ ;
- currency (exchange) —  $e^a$  (for uncovered investing),  $f$  (for covered investing).

Suppose, Russian investor purchased dollar bond for 1000 USD, extract coupon yield of 100 USD, then sold it on the market in 1 year for 1050 USD. If dollar in Russia initially costs 25 rubles, and at the end of year — 32 rubles, then, ruble return of investor is 47.2%:

$$\begin{aligned} er_{Bd}^{fh} &= \left(1 + \frac{\$100 + \$1050 - \$1000}{\$1000}\right) \left(1 + \frac{32 - 25}{25}\right) - 1 = \\ &= 1.15 \cdot 1.28 - 1 = 0.472, \text{ or } 47,2\%. \end{aligned}$$

In general form, this expression will look like the follows:

$$er_{Bd}^{fh} = \left(1 + \frac{IP + P_1 - P_0}{P_0}\right) \left(1 + \frac{S_1^a - S_0}{S_0}\right) - 1,$$

or alternatively:

$$er_{Bd}^{fh} = (1 + i_{Bd} + \Delta p_{Bd})(1 + e^a) - 1.$$

Approximation of return on currency bond gives us the following format:

$$\begin{aligned} er_{Bd}^{fh} &\cong i_{Bd} + \Delta p_{Bd} + e^a; \\ er_{Bd}^{fh} &\cong 10\% + 5\% + 28\% = 43\%. \end{aligned}$$

It is the application of yield to maturity (*YTM*) concept and international Fisher effect (*IFE*) for determination of efficient rate of return. Let's remind, efficient uncovered return on currency deposit:

$$er_{SD}^{fh} = (1 + i_{SD}^f)(1 + e^a) - 1.$$

Accordingly,  $i_{SD}^f$  for simple (single) deposit are reconstructed in  $r_{CBd}^f$ :

$$r_{CBd}^f = \frac{P_1 - P_0 + IP}{P_0} = \frac{IP}{P_0} + \frac{\Delta P}{P_0} = i_{Bd}^f + \Delta p_{Bd}^f.$$

Consequently

$$er_{Bd}^{fh} = (1 + r_{Bd}^f)(1 + e^a) - 1 = (1 + i_{Bd}^f + \Delta p_{Bd}^f)(1 + e^a) - 1.$$

In other terms:

$$er_{Bd}^{fh} = \left(1 + \frac{IP + P_1 - P_0}{P_0}\right) \left(1 + \frac{S_1^a - S_0}{S_0}\right) - 1.$$

Efficient return on investment in foreign stocks, denominated in currency of investor, ( $er_{St}^{fh}$ ) will also have 3 components:

- dividend return;
- growth rate of capital value (difference between selling and buying prices);
- growth rate of stock currency value (change of foreign currency rate in the units of domestic money).

$$er_{St}^{fh} = \left(1 + \frac{D + P_1 - P_0}{P_0}\right) \left(1 + \frac{S_1^a - S_0}{S_0}\right) - 1,$$

or alternatively:

$$er_{St}^{fh} = (1 + r_{St}^f)(1 + e^a) - 1 = (1 + d_{St}^f + \Delta p_{St}^f)(1 + e^a) - 1.$$

Approximation of return on currency stocks gives us the following format:

$$er_{St}^{fh} \cong d_{St}^f + \Delta p_{St}^f + e^a.$$

For example, for previous year, American investor in Polish shares extracted 14 500 zlotys as dividends. Investor acquired stocks at 90 000 zlotys and sold them for 110 000 zlotys. If initial exchange rate of dollar was 2.2 zlotys, and in the end of the period — 2.0, then rate of return in dollars will be 25.75%:

$$er_{Bd}^{fh} = \left(1 + \frac{Z14.5t + Z110t - Z90t}{Z90t}\right) \left(1 + \frac{2.0 - 2.2}{2.2}\right) - 1 = 0.2575,$$

or 25.75%.

In other terms:

$$\begin{aligned} er_{St}^{fh} &= (1 + d_{St}^f + \Delta p_{St}^f)(1 + e^a) - 1 = \\ &= (1 + 0.1611 + 0.2222)(1 - 0.0909) - 1 = 25.75\%. \end{aligned}$$

In approximation, dollar return on investment in Polish stocks reaches a larger value — 29.2%:

$$er_{St}^{fh} \cong d_{St}^f + \Delta p_{St}^f + e^a = 16.1\% + 22.2\% - 9.1\% = 29.2\%.$$

## Resume

The reasonability of international investment is estimated on the basis of risk-return trade-off. Exact determination of return rate implies the application of yield to maturity concept. Simple (single) deposits; discount, coupon, equity securities have the specifics of return defining for them.

Risk on investments is divided into systematic and nonsystematic ones. Premium on first type of risk is included in the level of return on a certain asset, and second risk is neutralized by means of portfolio diversification.

Determination of efficient return on international short term investment is founded on concepts of yield to maturity and covered (uncovered) interest parity. Exchange risk is measured by volatility of foreign currency rates.

Investments in currency assets may be considered as the purchasing of 2 assets — (a) instrument of money market (promissory note, time deposit), and (b) demand deposit in foreign currency. Formation of the international short term portfolios aims rather to improve the liquidity position of the economic institution, than to return maximization.

As because the barriers for international flows of capital are lowered, and improved communications and technologies offer the low-cost information relatively concerning foreign securities all around the globe, then, investors try to realize abnormal potential in the international markets.

International diversification in stocks and bonds could represent substantially higher returns with lower risk, than investing only in single market. The main reason lies in the fact that international investment supplies wider row of opportunities, than only domestic investing.

While even passive international portfolio (invested only in index of funds, based on weights of market capitalization) improves incomes, however, the active strategy could make sufficiently more. Last strategy bases portfolio proportions of domestic and foreign investments on expected returns and their correlations with the total portfolio.

### *Control questions for discussion*

1. Yield to maturity is discount rate, equalizing of present value of expected cash flows on bond and present price of it. Is this consideration true, false, indefinite?

2. Select 5 treasury bonds from bond page in financial newspaper, and calculate current yield. Indicate, when current yield will be a good approximation of yield to maturity.

3. Risk premiums on corporate bonds are usually anti-cyclical, i. e. they fall during cyclical expansion, and spring during recession. Why is it so? What kind of bond should bear higher risk premium in coupon rate — with *SP* rating *BB* or *C*?

4. Risk-averse investor don't purchase security, that give expected lower return, higher risk, and lower liquidity, than other securities. Is this consideration true, false, indefinite?

5. If yield curve in average is flat, than what can it say about term risk premium? How would yield curve change, if investors prefer short-term bonds to long-term ones?

6. The higher  $\beta$  on the security, the lower risk premium. Demand on assets is lower, if  $\beta$  for them is higher, other things being equal. Are those statements true, false or uncertain?

7. Hong Kong securities with standard deviation 45.5% (see Table 11.9) are more volatile 2.5 times, than US security (18.9%). Does it mean that American non-risky investors should avoid Hong Kong capital market?

8. What characteristics of foreign securities lead to diversification of investor's benefits? Will the growing integration of national capital markets decrease the benefits of international diversification?

8. Researches find out, that the correlation between home securities is higher, than the correlation between home and foreign securities. Explain why is it so, probably. To what consequences leads this fact for international investments?

9. The opportunity for investing in foreign securities is investing in the securities of home international companies. Could international firms, probably, reasonably substitute the international portfolio investments?

10. Who would, probably, take more from investing abroad — resident of the USA or resident of Russia? Can we expect, that emerging markets will function better, than matured ones?

11. Russia receives almost all incomes from oil and gas trade revenue, denominated in US dollars. At the same time, the RF buys the huge amount of goods and services from Europe and China. Russian investment portfolio includes American treasury bills and other instruments of dollar market. Comment the situation.

### *Problems to solve*

1. Calculate yield to maturity for the single loan of 1 mln USD, sum for repayment 2 mln USD in 5 years.

2. Zero coupon bond with USD 480.3 market value has maturity payment of 1000 USD in 6 years. Calculate yield to maturity.

3. Which bond with current nominal price USD 1000 has higher yield to maturity — 20-years bond with market price of USD 800 and current rate of return of 15% or 1-year bond with USD 800 market price with current rate of return 5%?

4. The bond should be redeemed in 10 years by USD 1000 of nominal price. Coupon rate is 12%. The issuer can repurchase bonds over 5 years with withdraw premium 12% above nominal value. If you expect the withdrawal in 5 years, then calculate the present value of bond, discounted with 9% rate.

5. If expected return on market portfolio equals 8% and risk-free rate is 5%, then what can we suppose concerning expected return on security with  $\beta$  equals 3.0?

6. During a year *Toyota Motor* shares increased in the price from ¥9000 to ¥11 200, while dividend paid made up ¥60. At the same time, exchange rate decreased from ¥145 to ¥120 for \$1. Calculate the total percentage annual income in dollars for *Toyota* shares.

7. Let's assume, that dollar costs 1.08 euro. If 1-year German bonds (“bunds”) brings 3%, and American treasury bills — 5%, then what exchange rate in the end of the year would make dollar return on both securities equal? What increase (decrease) of the euro should stipulate such an equalizing exchange rate?

8. Let's suppose, that annual return in rubles on Russian bonds for 10 years was 12%, and comparable dollar bonds bring return of 8%. Which cumulative devaluation of ruble is necessary to make ruble return on American bonds higher, than return on Russian bonds?

9. Standard deviations for the market of Russia and the USA are 44% and 22%, correlation between them is 0.47. Which is the  $\beta$  of American market from Russian investor point of view?

## *Appendix 6.1*

Calculation method for analytical parameters of Russian governmental securities market statement (treasury bills and bonds — *GKO*, *OFZ*).

### **1. Simple yield to maturity of GKO (Russian treasury bills):**

$$y = \left( \frac{N}{P} - 1 \right) \times \frac{365}{t} \times 100\%,$$

where  $N$  — nominal value,  $P$  — price (in percent of nominal value),  $t$  — time to maturity.

### **2. Efficient yield to maturity of GKO:**

$$y = \left[ \left( \frac{N}{P} \right)^{\frac{365}{t}} - 1 \right] \times 100\%,$$

**3. Efficient yield to maturity of OFZ (Russian treasury bonds)** is calculated with approximate methods from following equation:

$$P + A = \sum_{i=1}^n \frac{C_i}{(1+y)^{\frac{t_i}{365}}} + \frac{N}{(1+y)^{\frac{T}{365}}},$$

where  $P$  — price (in percent of nominal value),  $A$  — accumulated coupon income (in the moment of issuance buying),  $t_i$  — time to maturity of “ $i$ ” coupon payment,  $C_i$  — volume of “ $i$ ” coupon payment (in percent of nominal value),  $N$  — nominal value of issuance,  $T$  — time to maturity of bond,  $y$  — efficient annual yield to maturity of *OFZ*, expressed in decimal points.

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САНКТ-ПЕТЕРБУРГСКИЙ УНИВЕРСИТЕТ  
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