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International Finance

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Preface

Globalization has turned the world into a small village where companies and people are more mobilized than ever. Wherever you travel, you will be surprised to find the same brands and shops and you may see the same layout. It is a world where Multinational Companies (MNCs) dominate not only the markets but also the politics.

This textbook recognizes this new environment and attempts to bring students closer to the international environment starting from understanding the status of MNCs and foreign exchange market. It introduces students to risks that face MNC and tools that can be used to hedge those risk. It further identifies possible sources of financing of MNCs and how to measure MNCs' cost of capital. Then, it illustrates methods of international expansion and portfolio investment and ends with capital budgeting MNCs' foreign projects.

I hope students will appreciate the value-added in this textbook and use this module as both a revision of their fundamentals of finance in one hand and as a mental exercise on the other hand where imagination goes beyond the narrow boarders to the endless opportunities.

The Author

Chapter 1: Introduction to International Finance

Topic Title: *Introduction to International Finance*

Key Words:

Multinational Companies (MNCs), International business methods, International business theories, MNCs characteristics.

Summary:

This chapter highlights the position of international finance in Finance and the establishment of Multinational Companies (MNCs). In addition, it illustrates different methods of entry to foreign markets and discusses the theories that explain their emergence with special emphasis on their specialties in comparison to local firms.

Outcomes and Learning Objectives:

1. *To differentiate between local and international finance,*
2. *To appreciate the reasons for the emergence of MNCs,*
3. *To critically evaluate the methods of MNCs' entry to foreign markets as well as their special characteristics in comparison with local firms.*

Chapter Outline:

1.1. The position of "international finance" in Finance

1.2. The emergence of international finance and MNCs

1.3. International business methods

1.4. The special characteristics of MNCs

1.1. The position of "international finance" in Finance

Finance, as science, consists of four branches; corporate finance, investment, financial markets and institutions, and international finance. International finance is seen as a specialization within each of the other three branches[1]. Traditionally, corporate finance is concerned with making three decisions. First, evaluating investment opportunities, also known as the Investment or Capital Budgeting Decisions. Second, the acquisition of funds from the global markets to finance those projects, also known as the Financing Decisions, and third, the operation of business by using these resources, also known as the Working Capital Decisions. Certainly, all types of decisions interact and are taken in relation, since only the right combination of the three will lead to a net flow that will ultimately achieve the management goal.

Investment, as the second branch of finance, is concerned with the valuation of financial securities, allocation of funds, and constructing portfolios. Financial markets and institutions are the branch that is related to the operations of financial markets and trading securities as well as the functions of financial institutions. International Finance is the fourth branch of finance and focuses on the same three decisions that financial managers take domestically but adds to them the international dimension that is the center of Multinational Corporations (MNCs) activities.

There are four forms of corporations on the basis of their involvement in international business. First, domestic corporation is a closely-held or public company (usually large) with many shareholders that have limited liability, in which ownership and control are separated. Second, international corporation that has its basis in a single country, though a single or multiple outlets and engages in international trade, financing and investment through global markets. Third, multinational corporation that, apart from its home base, it operates abroad through at least five or six foreign companies, which are subsidiaries of the parent home company[2]. Finally, transnational corporation where the 'home country' becomes less defined as this company appears to have more than one home offices and their ownership is so dispersed internationally.

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[1] *Ross, S. A., Westerfield, R., Jordan, B. D., & Biktimirov, E. N. (2016).* Essentials of Corporate Finance. *9th Edition, McGraw-Hill/Irwin.*
[2] *Shapiro, A. C. (2014) Multinational Financial Management, 10th Edition, John Wiley & Sons, Inc, United States.*

Firms that work in international context face different environment that makes it exposed to different set of conditions and at the same time open to more risks and opportunities. In terms of culture, history, and institutions, each country has a unique case that makes it difficult and sometimes difficult to understand by MNC management. This is very clear when comparing corporate governance rules and regulations between countries that confirms that they are uniquely different. Also, MNCs face foreign exchange risks due to their subsidiaries, as well as, their import and export activities and foreign competition. In addition, political risk is larger in the case of MNCs because of their foreign subsidiaries while domestic firms (in developed countries) face negligible political risks. Table.1.1 summarizes differences between international and domestic environments.

Table 1.1 What is Different about International Finance[3]?

Concept	International	Domestic
Culture, history, and institutions	Each foreign country is unique and not always understood by MNE management	Each country has a known base case
Corporate governance	Foreign countries' regulations and institutional practices are all uniquely different	Regulations and institutions are well known
Foreign exchange risk	MNEs face foreign exchange risks due to their subsidiaries, as well as import/export and foreign competitors	Foreign exchange risks from import/export and foreign competition (no subsidiaries)
Political risk	MNEs face political risks because of their foreign subsidiaries and high profile	Negligible political risks
Modification of domestic finance theories	MNEs must modify finance theories like capital budgeting and cost of capital because of foreign complexities	Traditional financial theory applies
Modification of domestic financial instruments	MNEs utilize modified financial instruments such as options, futures, swaps, and letters of credit	Limited use of financial instruments and derivatives because of fewer foreign exchange and political risks

Source: Eiteman et al. (2016)

The huge differences in international and domestic environments impose modifications to domestic finance theories and financial instruments to accommodate those differences. For example, while arbitrage refers to *the purchase of an asset, liability, commodity, stock, derivative or currency in one market for resale in another market in order to profit from price discrepancies, many other types of arbitrages may arise in the case of MNCs such as tax arbitrage where MNCs shift profits from country to another to avoid paying large taxes.* MNCs must modify finance theories like capital budgeting and cost of capital because of foreign complexities. For example, *most models of Asset Pricing, such as Capital Asset Pricing Model (CAPM), assume that the variability of an asset's return is attributed to two sources; market-specific risk and asset* specific risk. However, the systematic source of risk of a domestic company is aligned to the cyclical nature of that country. However, the systematic risk of a MNC is related to the cyclical phases of all economies in which it operates. Clearly, the phases of diversified economies are not aligned and therefore, the MNC can reduce the systematic risk by successful diversification.

Also, MNCs utilize modified financial instruments such as options, futures, swaps and letter of credit while domestic firms have limited use of financial instruments and derivatives because of fewer foreign exchange and political risks.

1.2. The emergence of international finance and MNCs

It is clear that finance, production and commerce have globalised. Today, companies, consumers, lenders and borrowers can engage in international transactions in order to maximise their utility or wealth function. For example, in 2010, Coca-Cola, 3M, and Caterpillar generated 69.5%, 65.5%, and 67.8% of sales, respectively from overseas[4]. Figure 1.1 shows how Boeing's new 787 Dreamliner sourced its major components globally sharing costs, risks and ultimately profits with global suppliers.

Figure 1.1 Where the Parts of Boeing's 787 Dreamliner Come from
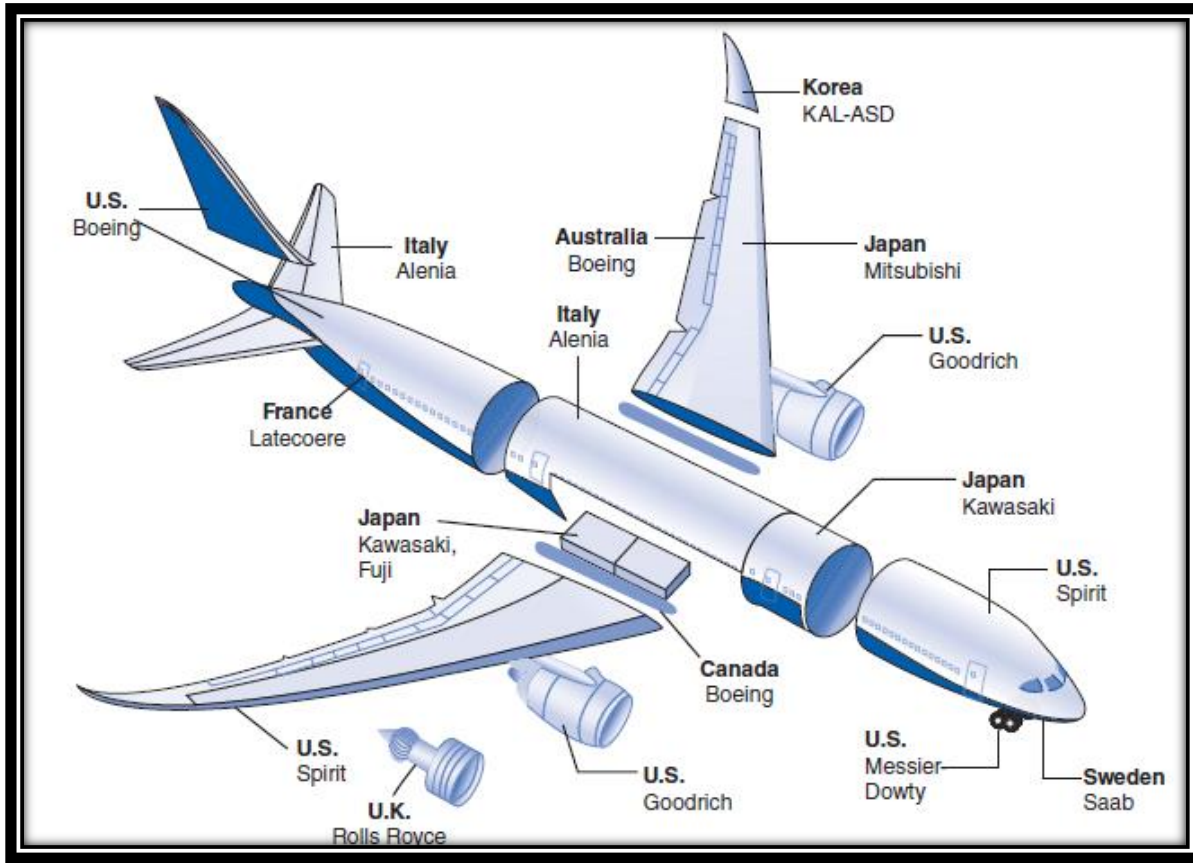
Source: Shapiro et al. (2014)

This globalization comes from three sources; the emergence of global financial markets, trade liberalization and economic integration, as well as privatization. Also, three theories can be proposed to explain why firms evolve into MNCs.

1.2.1 Sources of Globalization of the World Economy

1.2.1.1 Emergence of Globalized Financial Markets

The deregulation of financial markets coupled with advances in technology have greatly reduced information and transactions costs, which has led to financial Innovations, such as currency futures and options, multi-currency bonds, cross-border stock listings, and international mutual funds

1.2.1.2 Economic Integration

Over the past 50 years, international trade increased about twice as fast as world GDP. There has been a dramatic change in the attitudes of many of the world's governments who have abandoned mercantilist views and embraced free trade as the surest route to prosperity for their citizenry. Barriers are removed paving the way for encouraging firms to conduct business internationally.

The General Agreement on Tariffs and Trade (GATT) a multilateral agreement among member countries has reduced many barriers to trade. GATT was then replaced with the World Trade Organization (WTO), who has the power to enforce the rules of international trade. Also, The North American Free Trade Agreement (NAFTA) of 1993 calls for phasing out impediments to trade between Canada, Mexico and the United States over a 25-year period. In addition, The Eurozone encourages more trade among European countries with Lithuania has become the 19th member of the Eurozone area in the beginning of 2015.

1.2.1.3 Privatization

The selling off state-run enterprises to investors is also known as "Denationalization". This privatization was often seen in socialist economies in transition to market economies. By most estimates, this increases the efficiency of the enterprise. However, it often spurs a tremendous increase in cross-border investment.

1.2.2 Theories of International Business

There are three theories that explain why firms evolve into MNCs;

1.2.2.1 Theory of Comparative Advantage

Part of the growth in international business over time is due to the heightened realization that specialization by countries can increase production efficiency. Some countries, such as Japan, China and the United States, have a technology advantage, while other countries, such as India and Malaysia, have an advantage in the cost of labour. Countries tend to use their advantages, which cannot be easily transported, to produce goods with relative efficiency. MNCs such as Microsoft, Apple, Samsung and Sony have grown substantially in foreign countries because of their technology advantage.

When a country specializes in the production of some products, it will need to trade with other countries to get products, which it does not produce. This is the main argument of the comparative advantage theory proposed by David Ricardo in the 19th century. It assumes free trade between nations and that factors of production are

relatively immobile[5].

Comparative advantages enable firms to penetrate foreign markets. Many of the Virgin Islands, for example, specialize in tourism and rely completely on international trade to get most products although they can produce some products. However, they find it more efficient to specialize in tourism and use tourism revenues to import products.

To illustrate the merits of comparative advantage theory, assume two countries; richland and poorland. The richland produces 4 kilos of wheat or 8 meters of clothes with the same amount of resources. On the contrary, the poorland can produce either two kilos of wheat or one meter of clothes with the same amount of resources. Hence, richland will specialize in producing clothes and poorland produces wheat and if they exchange at a rate of 1 meter for 1 kilo of wheat, then they will both better of. Table 1.2 illustrates the production of each country for the same amount of resources.

Table 1.2 Example of comparative advantage theory

	Richland	Poorland
Kilos of Wheat	4	2
Metres of Cloth	8	1
*with a given amount of resources		

Comparative advantage is still a relevant theory to explain why particular countries are most suitable for exports of goods and services that support the global supply chain of both MNEs and domestic firms. The comparative advantage of the 21st century, however, is one based more on services, and their cross-border facilitation by telecommunications and the Internet.

The source of a nations comparative advantage is still created from the mixture of its own labor skills, access to capital, and technology. Many locations for supply chain outsourcing exist today (see Figure 1.2). It takes a relative advantage in costs, not just an absolute advantage, to create comparative advantage. Clearly, the extent of global outsourcing is reaching out to every corner of the globe.

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[5] *Bekaert, G. and Hodrick, R.(2017) International Financial Management, 3th Edition, Cambridge University Press*

Figure 1.2 Global Outsourcing of Comparative Advantages
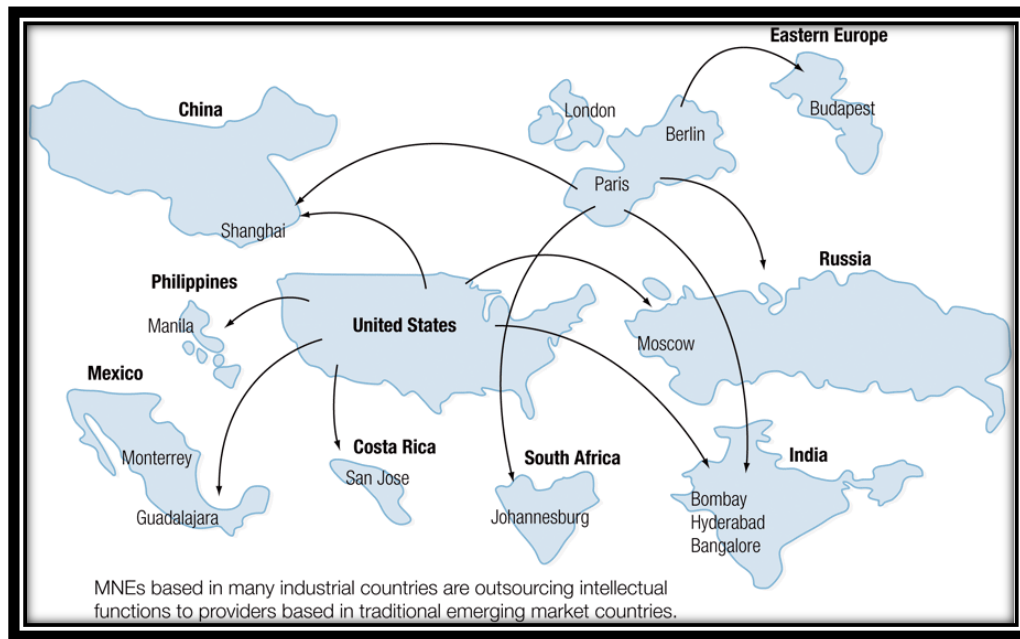
Source: Eiteman et al.,(2016)

1.2.2.2 Imperfect Markets Theory

MNCs strive to take advantage of imperfections in national markets for products, factors of production, and financial assets. Imperfections in the market for products translate into market opportunities for MNCs. Large international firms are better able to exploit such competitive factors as economies of scale, managerial and technological expertise, product differentiation, and financial strength than are their local competitors.

Strategic motives drive the decision to invest abroad and become a MNE and can be summarized under the following categories. These categories are not mutually exclusive[6]:

➢ **Raw-Material Seekers**: to exploit the raw materials that are found overseas: mineral, fuel, fruit etc. For example, Belgium is famous for Belgian chocolate but it is well-known that Belgium cannot produce Chocolate as Cocoa fruits can only be planted in hot areas. Such example illustrates why Belgian companies made investments in Africa.

➢ **Market Seekers**: the original MNC that goes overseas to produce and sell in foreign markets, by using their comparative advantage. Coca Cola, for example, builds filling factories all over

the world to gain more markets.

> **Cost Minimizers**: these companies engage in a variety of transactions internationally, with the sole goal of minimizing their costs (production, marketing, distribution etc), both at home and abroad. For instance, British Airways and mobile operators 3 sat up call centres in India.

> **Knowledge Seekers**: to gain access to technology and/or managerial expertise. For example, German and Japanese companies purchased U.S. firms for their technology after the second world war.

> **Political Safety Seekers**: acquire or establish operations in countries that are unlikely to interfere with private enterprise. For example, Hong Kong companies invested heavily in U.S. , UK, Canada, and Australia in anticipation of the consequences of China's 1997 takeover of the British Colony.

Big Mac index, pioneered and regularly updated by the economist since 1997, proves wages' imperfection around the world. Figure 1.3 shows that the working time needed to buy a Big Mac in 2015 is 35.3 minutes in Shanghai while it takes 172.6 minutes to purchase the same meal in Nairobi (for worker earning average new wage weighted across 14 professions). This example shows how countries differ in terms of labor costs[7].

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[7] Ong, L.L. (2003), *The Big Mac Index: Applications of Purchasing Power Parity*, Palgrave Macmillan, London.

Figure 1.3 Big Mac Index proves wages' imperfection

City	Value
Nairobi	172.6
Manila	87.5
Mexico City	78.4
Jakarta	66.7
Cairo	62.5
Kiev	54.7
New Delhi	49.7
Bucharest	44.1
Budapest	43.8
Beijing	42
Sofia	40.4
Mumbai (Bombay)	39.8
Lima	37.6
Bangkok	37.5
Shanghai	35.3
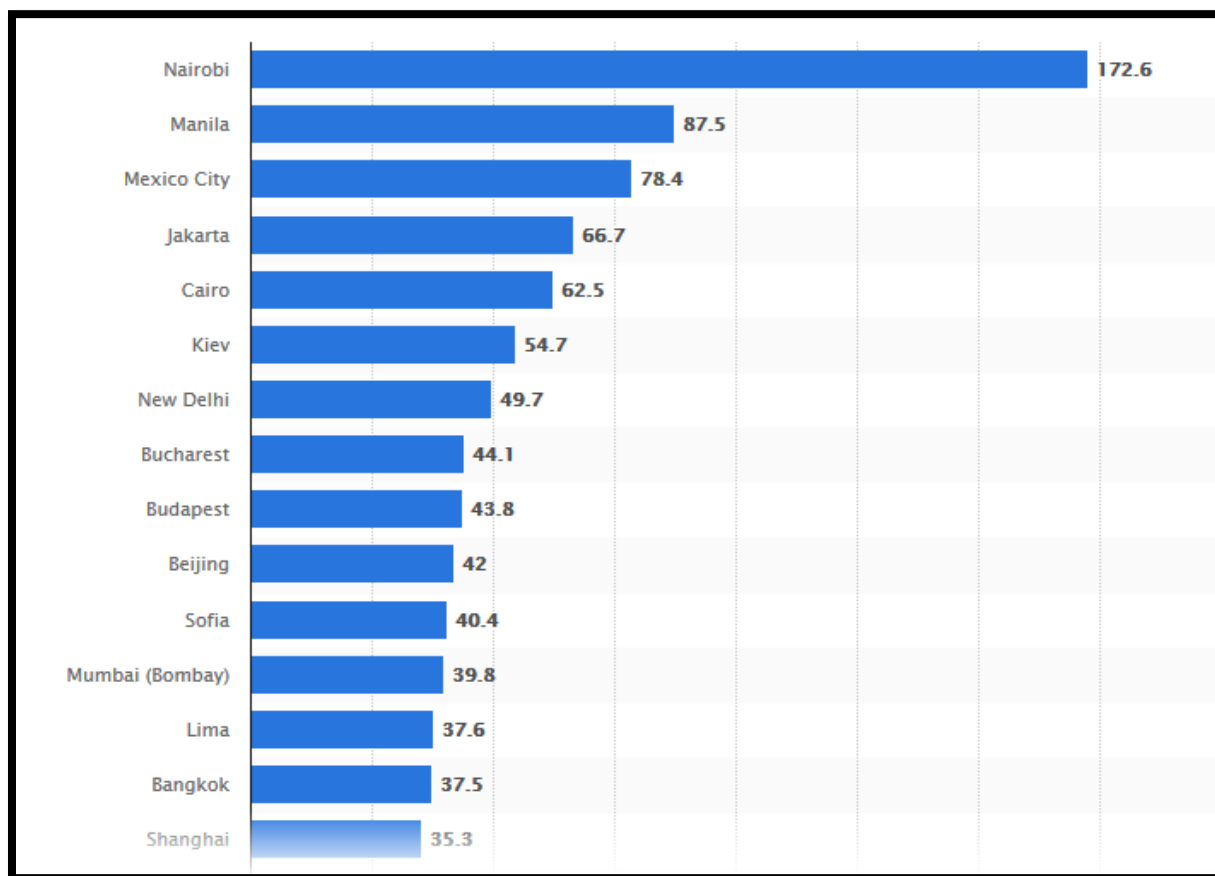
Source: www.statista.com

1.2.2.3 Theory of Product Cycle

According to this theory, a firm is likely to establish itself first in its home country accommodating local demand. Foreign demand on firm's products will be accommodated initially through exporting. As time passes, the firm realizes that the only way to retain its advantages over competitors in foreign markets is through moving its operations to those markets. This can be achieved through establishing subsidiaries to create presence and reduce transportation costs[8]. The competition in foreign markets may increase as competitors become more familiar with foreign markets. Thus, the firm may differentiate its products, introducing new financing approach that reduces costs, or implementing new marketing approach that generates and maintain a strong demand for its products in order to prolong its existence in foreign markets and maintain some advantage over its competitors. If the firm fails to maintain its advantage over its competitors, its business will

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[8] *Madura, J. (2018) International Financial Management, 13th Edition, Cengage Learning, United States.*

decline and the firm loses the foreign market. Figure 1.4 illustrates the phases of product life cycle.

Figure 1.4 International Product Life Cycle
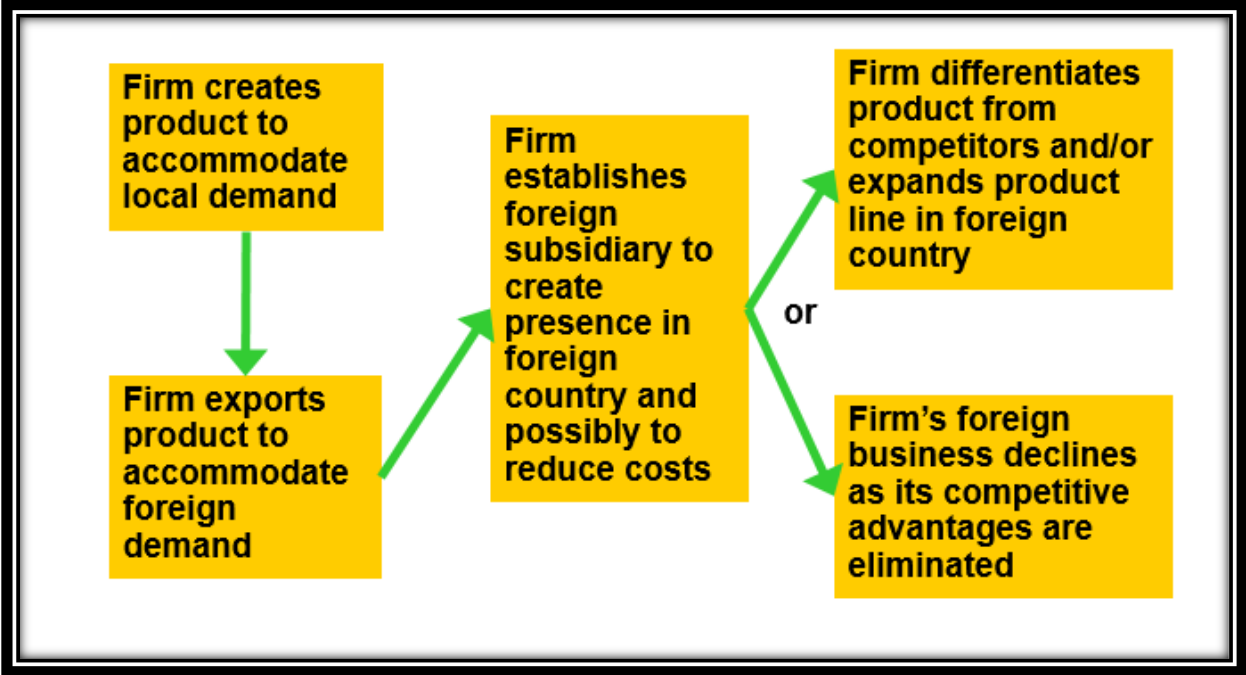
Source: Madura (2018)

1.3 International Business Methods

There are several methods to conduct business internationally. The most common methods are:

- International Trade

It is relatively a conservative approach to conduct international business. It penetrates foreign markets through exporting or obtain supplies at a low cost by importing. This approach entails minimal amount of risk because the firm does not expose its capital to risk. If it experiences a decline in its exports or imports, it can easily reduce or discontinue this part of its business at a low cost. Many large MNCs, including Boeing, General Electric, and IBM depends in exporting as a method for conducting international business. Recently, increasing number of firms is using internet to facilitate trade through listing their products on their websites. Thus, they can easily reach potential importers anywhere in the world and update them on new product lines or price changes. They can also accept order on line and export products from the closest warehouse.

- Licensing

In this method, firms exchange its technology (copyrights, patents, trademarks, or trade names) in return for fees or some other specified benefits. Thus, it allows firms to use their technology in foreign markets without a major investment in foreign countries and with no transportation costs related to exporting. On the contrary, licensing firms receive fees (royalties) in return for this technology. A major disadvantage of licensing, however, is controlling the quality of foreign production process.

The evolution of Nike, Inc., starts when Phil Knight, made a licensing agreement with a Japanese company to produce a shoe that he sold in the United States under the name Blue Ribbon Sports (BRS). Then, He expanded his operations into a number of countries through licensing factories to produce athletic shoes and sold them in Asian countries. In 1978, RBS become Nike, Inc., and began to export shoes to Europe and America. Yet, Nike owns no factories for manufacturing its footwear and apparel. The company's footwear and apparel make up about 96% of Nike's branded revenues. Instead, Nike outsources its manufacturing to third parties with over 525 factories in 40 countries in 2019.

- Franchising

In this form of international business, the franchiser provides specialized sales or service strategy, support assistance and possibly an initial investment in return of periodic fees. Famous examples of franchising is the model of McDonald's, Pizza Hut and Subway Sandwiches which have franchises owned and managed by local residents in many foreign countries. Similar to licensing, franchising does not require major investment in foreign countries.

- Joint Ventures

They are ventures jointly owned and operated by two or more firms, one of them resides in foreign markets. Joint ventures allow two firms to apply their respective competitive advantages in a given project. Joint ventures between automobile manufacturers are numerous and General Motors has ongoing joint ventures with a number of automobile manufacturers in several different countries such as Hyundai.

- Acquisitions

Firms frequently acquire other firms in foreign countries as a means of penetrating foreign markets. Acquisition allow firms to have full control over their businesses and to quickly obtain a large portion of foreign market share. Famous examples of acquisitions are the purchase of the company Whole Foods in the year 2017 by Amazon for $ 13.7 Billion and the purchase of the company Time Warner by company AT&T in the year 2016 for $85.4 billion. This type of penetration of foreign markets is risky and requires large amount of investment.

- Establishing New Foreign Subsidiaries

Establishing new operations in foreign markets to produce and sell products is risky and requires large investment although it could be smaller than the amount required for acquiring existing operations. However, the firm needs to wait until the subsidiary is built and a customer base established before it obtains any reward from its investment. The first two methods cannot be considered as Foreign Direct Investment (FDI) because they do not involve any direct Investment. Franchising and joint venture require some investment in foreign operations but to a limited degree. The remaining two requires substantial investment.

1.4 The Special Characteristics of MNCs

A Multinational Corporation (MNC) is a corporation engaged in transactions (raw material, processing, production, servicing and financing) in more than one country with more than office, and probably in more than one currency. The UN estimated that for 2011, there were at least 100,000 MNC around the world controlling around 900,000 foreign affiliates. Capital raised today in London in the Eurodollar market may be used by a Swiss-based pharmaceutical company to finance the acquisition of German equipment by a subsidiary that is based in Brazil. Also, A Barbie doll is made in 10 countries and sold in another 144 countries, by branches, subsidiaries or franchise firms.

1.4.1 Problems that face MNCs

The main goal of financial management is maximizing the shareholder wealth (Shareholder Wealth Maximization Model, SWM). The key assumptions of SWM model are that markets are efficient and only systematic risk matters. However, there are two main complications that arise and face MNCs while attempting to achieve this goal, namely; agency problem and long-term versus short-term value maximization.

1.4.1.1 The **agency problem**, is created when conflicts occur between shareholders and managers, because; (1) managers do not attempt to maximize shareholder's wealth (2) shareholders incur costs to monitor the managers and influence their actions, (3) there is asymmetry in information (inside information). The separation of ownership and control is essential since it gives permanence to the corporation, and is independent from any shareholder, thus representing all owners with the same manner.

The Agency theory is the study of how shareholders can motivate management to accept the prescriptions of the SWM model. Liberal use of stock options should encourage management to think more like shareholders. If management deviates too extensively from SWM objectives, the board of directors should replace them. If the board of directors is too weak (or not at "arms-length") the discipline of the capital markets could affect the same outcome through a takeover. This outcome is made more possible in Anglo-American markets due to the one-share one-vote rule. Figure 1.5 illustrates potential responses to shareholder dissatisfaction

Figure 1.5 Potential Responses to Shareholder Satisfaction

Potential Responses to Shareholder Dissatisfaction

Possible Action	Popular Term
Remain Quietly Disgruntled	The Past
Sell the Shares	Walk-Away
Change Management	Shareholder Activism
Initiate a Takeover	Maximum Threat

Shareholder Dissatisfaction
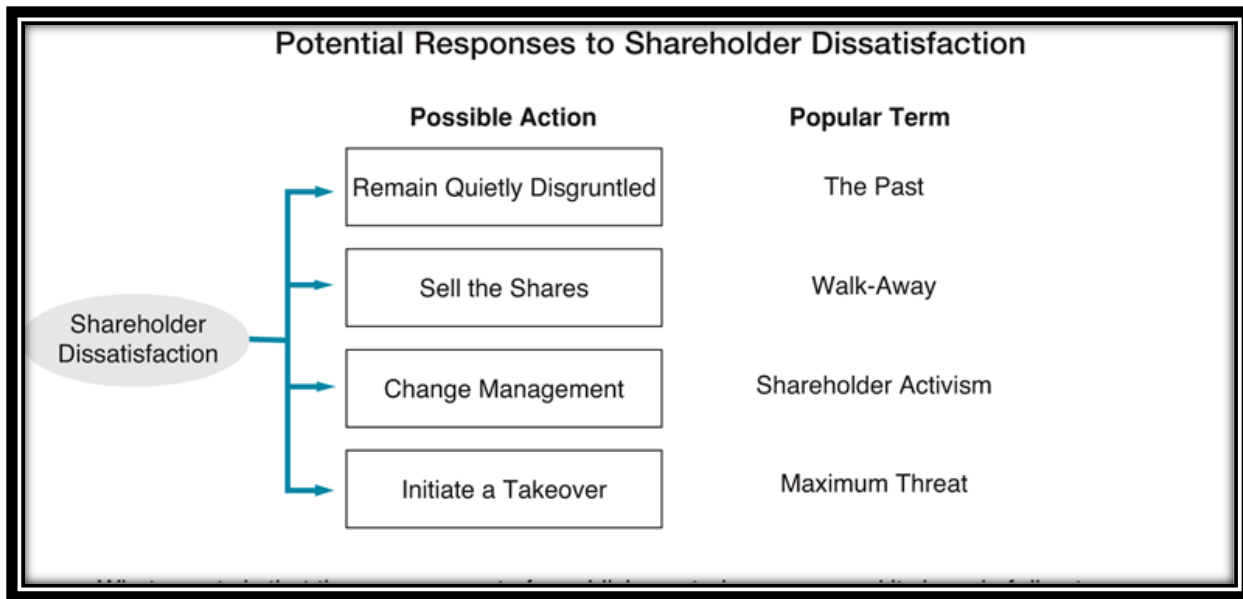
Source: Eiteman et al. (2016)

Usually, MNCs have Larger agency costs than domestic firms, because of: (1) The sheer size of the MNC and its greater number of shareholders (multitude and diversification of owners), (2) The global scattering of distant subsidiaries, (3) The complexity of the management team (multitude of treasurers, controllers, financial officers etc), (4) The culture of foreign managers, (5) Subsidiary value versus overall MNC value

There are two types of management style for MNCs, centralised where all departments in all subsidiaries are directly controlled by parents' managers and consequently reduces agency costs. However, they can make poor decisions for the subsidiary if there are not as informed as subsidiary managers about the situation in the subsidiary, see Figure 1.6. Alternatively, the decentralised management style offers more control on subsidiary operations to local managers who are closer to subsidiary's operations and environment but at the same time is more likely to result in higher agency costs, see Figure 1.7.

Some MNCs attempt to strike a balance as they allow subsidiary managers to make the key decisions for their respective operations, but the decisions are monitored by the parent's management. Electronic networks make it easier for the parent to monitor the actions and performance of foreign subsidiaries. For example, corporate intranet or internet email facilitates communication. Financial reports and other documents can be sent electronically too.

Figure 1.6 Centralized Multinational Financial Management
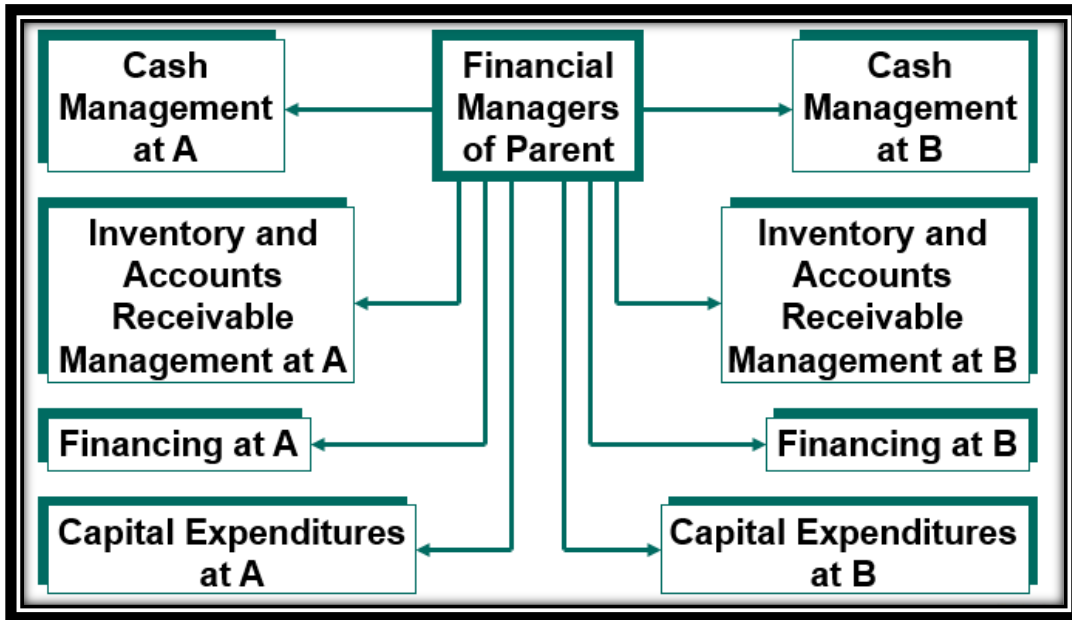
Source: Madura (2018)

Figure 1.7 Decentralized Multinational Financial Management
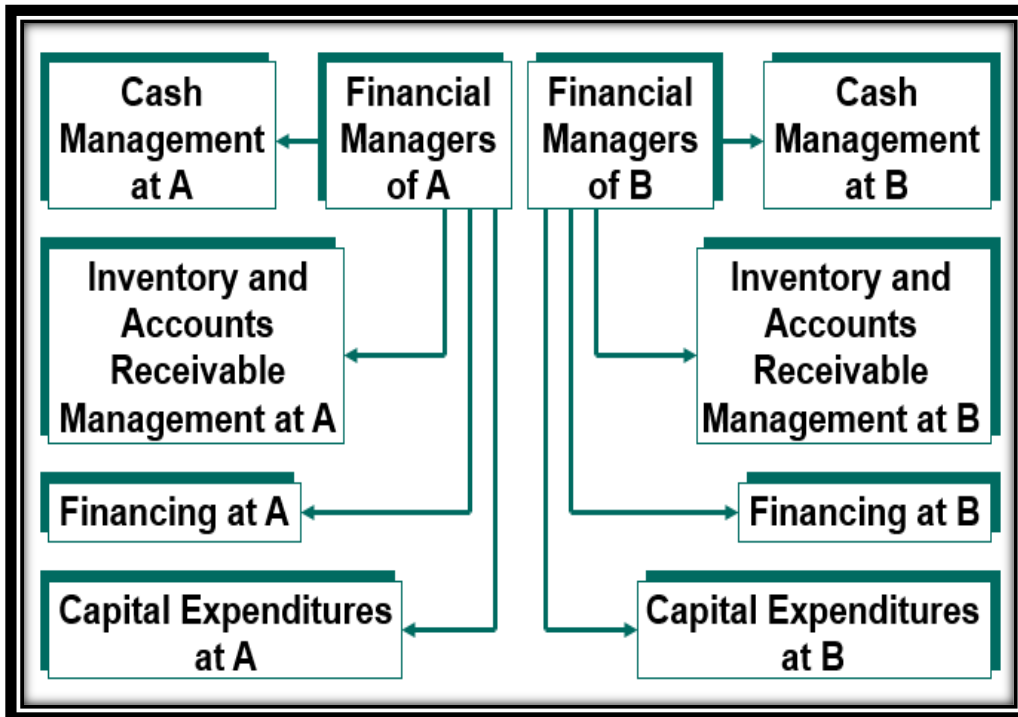
Source: Madura (2018)

1.4.1.2 *Long-term versus short-term value maximization*

Long-term value maximization can conflict with short-term value maximization as a result of compensation systems focused on quarterly or near-term results. Short-term actions taken by management that are destructive over the long-term have been labeled *impatient capitalism*. This point of debate is often referred to a firm's investment horizon (how long it takes for a firm's actions, investments and operations to result in earnings). Lehman Brothers is an example of this impatient capitalism as it substantially exposes itself derivatives market and ended up bankrupt.

In contrast to impatient capitalism is *patient capitalism,* which focuses on long-term shareholder wealth maximization. Warren Buffett, through his investment vehicle Berkshire Hathaway, represents a good example of patient capitalism as he becomes multibillionaire by focusing his portfolio on mainstream firms that grow slowly but steadily with the economy such as Coca Cola. He was not lured into investing in the high growth but risky dot.coms of 2000 or the "high tech" sector that eventually imploded in 2001[9].

1.4.2 Types of risks involved in MNCs

The decision to go international brings the following risks:

- Exposure to foreign exchange (FX) fluctuations: MNCs not only engage in exporting and importing activities but also have subsidiaries in many foreign countries that engage in activities in many currencies. In addition, the potential disequilibrium between exchange rates, interest rates and inflation rates expose MNCs to extra FX risk. To **protect against FX**, a MNC may participate in an option or a forward market, or take some other type of **hedge strategy.**

- Political and macroeconomic risks: MNCs work in many countries and therefore they are exposed to political and macroeconomic risks related to the countries they work in. For example, Oil companies that work in Cuba have been always exposed to nationalization.

- Corporate Governance differences: There are four main corporate governance regimes around the world distinguished on the basis of the level of financial market development, the degree of separation between management and ownership, the level of disclosure and transparency, and the historical development of the legal system. MNCs that work in countries of different corporate governance regimes have to adhere to the requirements of each regime and consider

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[9] *Eiteman et al. 2016*

them in their activates. The following figure (Figure 1.8) compares corporate governance regimes.

Figure 1.8 Comparative Corporate Governance Regimes

Regime Basis	Characteristics	Examples
Market-based	Efficient equity markets; dispersed ownership	United States, United Kingdom, Canada, Australia
Family-based	Management & ownership is combined; family/majority and minority shareholders	Hong Kong, Indonesia, Malaysia, Singapore, Taiwan, France
Bank-based	Government influence in bank lending; lack of transparency; family control	Korea, Germany
Government-affiliated	State ownership of enterprise; lack of transparency; no minority influence	China, Russia

Source: Eiteman et al. (2016)

1.4.3 The valuation of MNCs

The Valuation Principle states that the value of an asset is equal to the net present value of its expected future cash flows. There are three basic elements for measuring the value of a firm:

- The stream of cash flows

- The required rate of return by the investors

- The time period at which each cash flow is expected

The valuation model for a domestic firm can be expressed in the following formula:

$$\text{Firm Value} = \sum_{t=1}^{n} \frac{E\left(CF_{\$,t}\right)}{\left(1+k\right)^{t}} \quad (1)$$

Where:

$E\left(CF_{\$,t}\right) =$ the expected cash flows to be received at the end of period t

$n \quad = \quad$ the number of periods into the future in which cash flows are received

$k \quad = \quad$ the required rate of return by investors

Usually, the value of a MNC is larger than the value of a comparable domestic company for many reasons:

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(1) Studies have shown that MNCs earn more profits, (2) MNCs are larger companies (in terms of MV and Revenue), and earnings of larger companies are capitalised at lower rates. (because they are believed to be less risky), (3) MNCs are better known among the investors, (4) The securities of MNCs are followed by more analysts. These and more lead to lower required rate of returns and higher price-earnings ratios which result in a higher valuation for MNCs. The valuation model of a MNC can be expressed as follow:

$$Value = \sum_{t=1}^{n} \left\{ \frac{\sum_{j=1}^{m} \left[E\left(CF_{j,t}\right) \times E\left(ER_{j,t}\right) \right]}{(1+k)^{t}} \right\}$$

(2)

Where:

E $(CF_{j,t})$ = expected cash flows denominated in currency j to be received by the U.S. parent at the end of period t

E $(ER_{j,t})$ = expected exchange rate at which currency j can be converted to dollars at the end of period t

k = the weighted average cost of capital of the U.S. parent company

A MNC's financial decisions include: how much financing to obtain in each currency, how much investment to do in each currency, and how much business to conduct in each country. These decisions determine its exposure to the international environment, since its Cash Flows are determined by: the stability of the foreign economies, the exchange rate parities and their equilibrium with interest rates and inflation rates, and any other risky factors. Figure 1.9 illustrates the interactions between different exposures and the valuation of MNCs.

Figure 1.9 International Exposure of MNC's Value

$$\text{Value} = \sum_{t=1}^{n} \left\{ \frac{\sum_{j=1}^{m} \left[E\left(CF_{j,t}\right) \times E\left(ER_{j,t}\right) \right]}{\left(1+k\right)^{t}} \right\}$$

Exposure to Foreign Economies

Exchange Rate Risk, Political Risk

Should reflect all risks
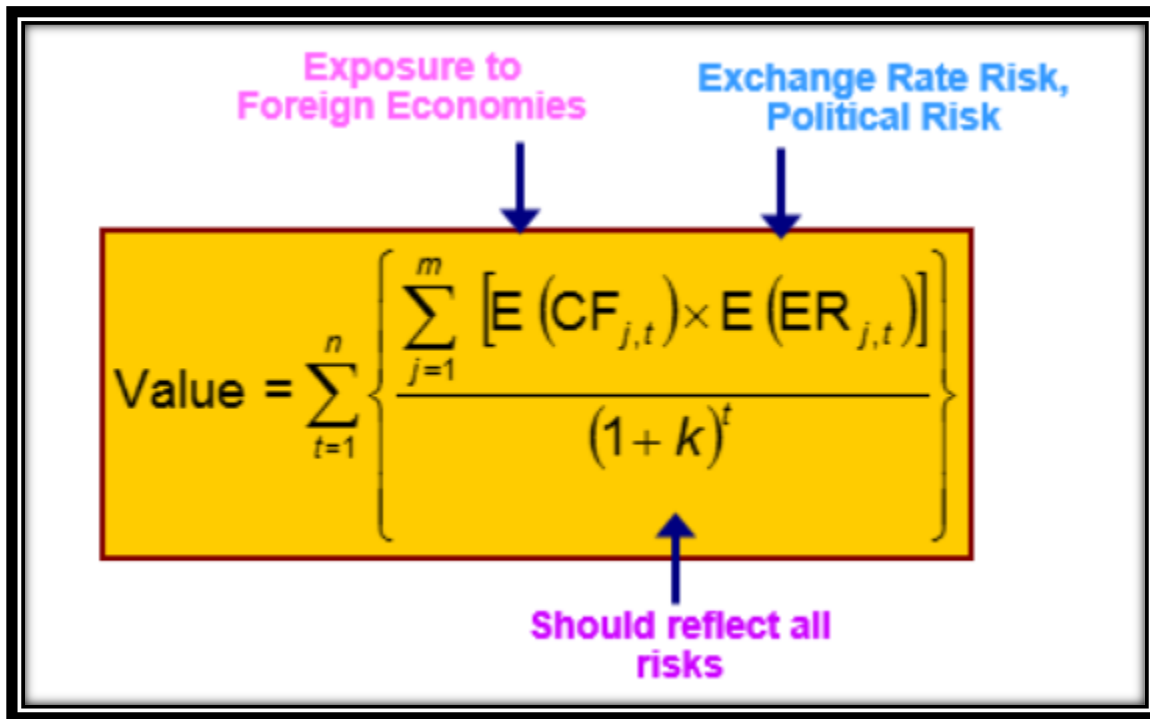
Source: Madura (2018)

Questions and Applications

1. What are the main differences between local and international finance?

   {Guided answer: section 1.1}

2. Explain and evaluate the theory of comparative advantage.

   {Guided answer: section 1.2}

3. Are multinational firms riskier than purely domestic firms? Why?

   {Guided answer: section 1.4.2}

4. How does the valuation of MNCs differ from that for local firm?

   {Guided answer: section 1.4.3}

5. Case Study:

Apple Inc. is an American multinational technology company headquartered in Cupertino, California, that designs, develops, and sells consumer electronics, computer software, and online services. It is considered one of the Big Four technology companies, alongside Amazon, Google, and Microsoft. Conduct an online search to review a recent annual report of the operations of Apple. Write a brief essay in which you describe how Apple penetrates foreign markets and if its cash flows are exposed to the international environment. Is it most exposed to a particular currency? If so, how would depreciation of that currency against the dollar affect the value of Apple Inc.? Is Apple Inc. exposed to economic conditions in a particular foreign country? If so, describe how a change in the conditions of that country could adversely affect Apple's cash flows.

6. Choose the correct answer: The decision of Hong Kong companies to become international and establish subsidiaries in the UK, Australia and the US can be explained by:

a. Theory of Absolute Advantage

b. Theory of Comparative Advantage

c. Imperfect Markets Theory

d. Product Life Cycle Theory

7. True/False Questions

No	Statement	T	F
1	There are no significant differences between international and local finance		✔
2	International Trade entails minimal amount of risk compared to other expansion methods	✔	
3	Acquisition does not require major investment in foreign countries.		✔
4	MNCs are not exposed to Foreign Exchange Fluctuations		✔
5	Shareholders take no action in case of dissatisfaction		✔
6	According to Comparative Advantage Theory, MNCs specialize in products which they have absolute advantage in producing.		✔
7	The value of a MNC is larger than the value of a comparable domestic company	✔	

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Chapter 2: Foreign Exchange Market and International Flow of Funds

Topic Title: *Foreign Exchange Market and Theories*

Key Words: *Foreign exchange market, balance of payments, the law of one price, international parity conditions.*

Summary: *This chapter explains the emergence and status of the foreign exchange market and illustrates the components of the balance of payments. Then, it identifies the factors that affect foreign exchange rates and the five international parity conditions. Next, it discusses the forecasting needs of multinational companies and the five-step procedures for forecasting exchange rates in a fixed exchange rate system. Finally, it illustrates how certain international parity conditions can be used to forecast exchange rates in the floating exchange rate systems.*

Outcomes and Learning Objectives:

1. *To explain the history and status of foreign exchange market*
2. *To distinguish between different accounts of the balance of payments*
3. *To identify the factors that affect foreign exchange rates*
4. *To describe the meaning of the "the law of one price" and its importance in international finance.*
5. *To differentiate between the five international parity conditions*
6. *To assess the five forecasting needs of multinational companies.*
7. *To identify a five-step procedures for forecasting exchange rates in a fixed exchange rate system*
8. *To list and describe how to forecast exchange rates in a floating exchange rate system*

Chapter Outline:

2.1 Introduction

2.2 Foreign Exchange Market

2.3 Factors Affecting Exchange Rates

2.4 Balance of Payments (BoP)

2.5 Exchange Rate Risk

2.6 International Parity Conditions

2.7 Exchange Rate Forecasting

2.1. Introduction

Each country in the world has its own currency although some countries have already went through dollarization. An important exception is the Eurozone, which consists of 19 European countries that adopted the euro as their currency. When MNCs and individuals engage in international transactions, they commonly need to exchange their local currency for a foreign currency, or exchange a foreign currency for their local currency. The foreign exchange market allows for the exchange of one currency for another.

Large commercial banks serve this market by holding inventories of each currency so that they can accommodate requests by individuals or MNCs for currency for various transactions. Individuals rely on the foreign exchange market when they travel to foreign countries. People from the United States exchange dollars for Mexican pesos when they visit Mexico, euros when they visit Italy, or Japanese yen when they visit Japan.

Some MNCs based in the United States exchange dollars for Mexican pesos when they purchase supplies in Mexico that are denominated in pesos, or exchange them for euros when they purchase supplies from Italy that are denominated in euros. Other MNCs based in the United States receive Japanese yen when selling products to Japan and may wish to convert those yen to dollars. In addition, some individuals and financial institutions speculate in the foreign exchange market by exchanging their local currency for a foreign currency that they believe will increase in value over time.

At any point in time, there is an exchange rate between any two currencies that specifies the rate at which one currency can be exchanged for another. In essence, the exchange rate represents the price of one currency in terms of another currency. If the exchange rate of the Euro is SP 1,200, the cost of your spring break hotel in Paris that charges 50 Euros per night would be SP 60,000. If the exchange rate was higher (such as one Euro = SP 1300), your cost in Syrian pounds would be higher. The exchange rate of the dollars will also determine how many Syrian pounds a Syrian importer will need to purchase supplies that are invoiced at 1 million US dollars.

2.2 Foreign Exchange Market

Money is an object that is accepted as payment for goods, services, and in some cases, past debt. There are typically three functions of money: as a unit of account, as a store of value, and as a medium of exchange. The foreign exchange market is the mechanism by which participants transfer purchasing power between countries by exchanging money, obtain or provide credit for international trade transactions, and minimize exposure to the risks of exchange rate changes.

The foreign exchange market spans the globe every hour of every business day. As illustrated in Figure 2.1, the world's trading day starts each morning in Sydney and Tokyo and moves west to the Middle East and then to Europe and ends in Los Angeles. However, there are segments of the 24-hour day that are busier than others. Usually, when two or more centers are functional trading is larger than when one center only is open.

Figure 2.1 Global Currency Trading: The Trading Day
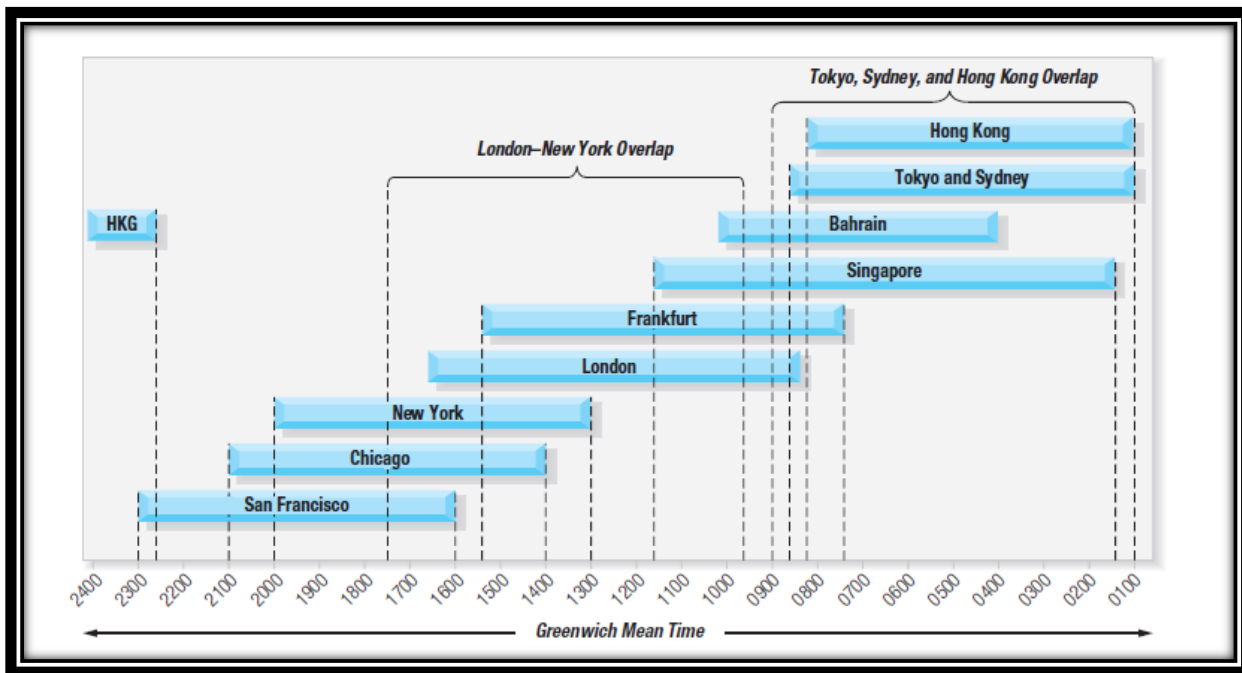
Source: Eiteman et al.(2016)

A FX (currency or forex) market exists wherever one currency is traded for another. It is the largest market in the world, in terms of value traded with an average daily turnover in April 2019 of 6.6 trillion dollar[10]. They are distributed as $2 trillion in spot transactions, $1 trillion in forward contracts, $3.2 trillion in FX swaps, and the rest in options and other products. This indicates that the majority of FX trading is for speculation more than to finance real trade transactions. It is worth noting that in 2018, the global volume of exports of goods and services was estimated 19.5 trillion dollar for the entire year.

Figure 2.2 illustrates the development of average daily turnover in April over the period 1989 to 2013 reported by the Bank of International Settlements (BIS). The FX market has grown at an average annual rate of 9.6% per year.

Currency trading takes a variety of forms including individual-to-individual personal transactions and increasingly by electronic platforms. Currency traders are connected through highly sophisticated telecommunication networks, with which dealers and brokers exchange currency quotes instantaneously. Although some of the largest currency transactions are still handled by humans via telephone, the use of computer trading has grown dramatically in recent years. Reuters and Bloomberg are still the largest traditional providers of FX rate information.

Figure 2.2 Average daily turnover in April over the period 1989 to 2013
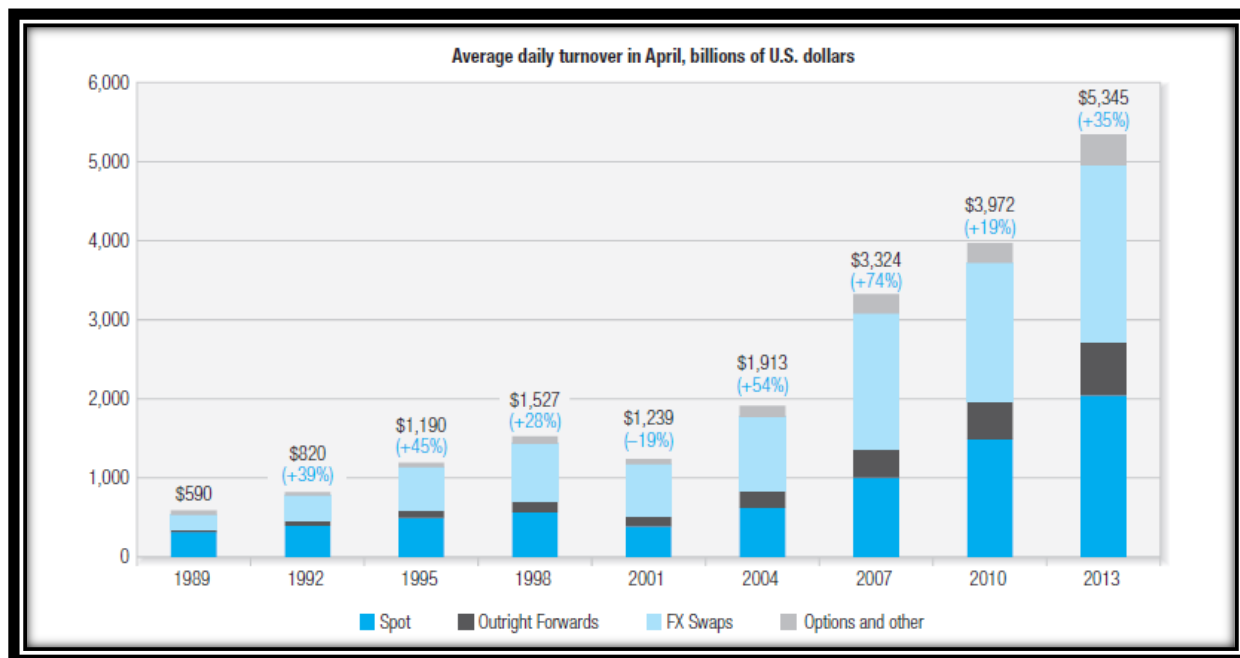
Source: Eiteman et al.(2016)

Participants in the foreign exchange market can be simplistically divided into two major groups, those trading currency for commercial purposes, *liquidity seekers*, and those trading for profit, *profit seekers*. Although the foreign exchange market began as a market for liquidity purposes, facilitating the exchange of currency for the conduct of commercial trade and investment purposes, the exceptional growth in the market has been largely based on the expansion of profit-seeking agents. As might be expected, the profit seekers are typically much better informed about the market, looking to profit from its future movements, while liquidity seekers simply wish to secure currency for transactions. As a result, the profit seekers generally profit from the liquidity seekers. Five broad categories of institutional participants operate in the market: (1) bank and nonbank foreign exchange dealers; (2) individuals and firms conducting commercial or investment transactions; (3) speculators and arbitragers; (4) central banks and treasuries; and (5) foreign exchange brokers.

The FX market is usually fully efficient with little or no inside information. Major news are released publicly, often on scheduled dates, so many people have access to the same news at the same time. Exchange rate fluctuations are commonly caused by Actual monetary flows and Expectations (large scale speculation) of changes in monetary flows. Monetary flows are controlled by changes in GDP growth, inflation, interest rates,

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budget and trade deficits or surpluses.

Terminology:

- *Devaluation of a Currency* – refers to a drop in foreign exchange value of a currency that is pegged to gold or another currency. The opposite is *revaluation*
- *Weakening, deterioration, or depreciation* of a Currency – refers to a drop in the foreign exchange value of a floating currency. The opposite is *strengthening* or *appreciation*
- *Foreign Currency Exchange Rate* – the price of one country's currency in units of another currency. It can be fixed or floating.
- *Direct quotations vs. indirect quotations*: When exchange rate is expressed in terms of units of the home currency, then this is a direct quotation. However, when exchange rate is expressed in terms of units of the foreign currency, then it is called indirect quotation.

To measure changes in spot exchange rates for quotations expressed in home currency terms (Direct quotations) the formula is:

$$Change\ \% = \frac{Ending\ rate - Begining\ rate}{Begining\ rate} \times 100 \quad (1)$$

For quotations expressed in foreign currency terms (indirect quotations), the formula becomes:

$$Change\ \% = \frac{Begining\ rate - Ending\ rate}{Ending\ rate} \times 100 \quad (2)$$

Example: Assume that the Swiss franc, recently quoted at SF1.6351/$ (the same as $0.61158/SF), suddenly strengthen SF 1.5000/$ (the same as $0.66667/SF). What is the percentage increase in the dollar value of the Swiss Franc. The designation of the home country is important to the proper calculations:

$$Direct: Change\ \% = \frac{0.66667 - 0.61158}{0.61158} \times 100 = +9.008\%$$

$$Indirect: Change \% = \frac{1.6351 - 1.5}{1.5} \times 100 = +9.008\%$$

- *Spot Exchange Rate:* A FX rate paid for delivery within 2 days from the date of the trade.
- *Forward Exchange Rate:* A FX rate for a currency to be paid for delivery in future but specified date, usually quoted for 30, 60, 90, 180 or 360 days from the day of the contract, where the **forward contract** is an agreement between a company and a commercial bank to exchange a specified amount of a currency at a specified exchange rate (forward rate) on a specified date in the future.
- *Future Spot Exchange Rate:* A forecasted spot FX rate.
- *Forward Premium or Discount :* the percentage difference between the spot and forward exchange rate. For quotations expressed in home currency terms (Direct quotations) the formula becomes:

$$Premium \ or \ Discount = \frac{Forward - Spot}{Spot} \times \frac{360}{n} \times 100 \quad (3)$$

However, for quotations expressed in foreign currency terms (Indirect quotations) the formula becomes:

$$Premium \ or \ Discount = \frac{Spot - Forward}{Forward} \times \frac{360}{n} \times 100 \quad (4)$$

Example: If you have the following quotation of the Japanese yen against the US dollar: Spot rate: ¥105.65/$ or $0.009465215/¥, the 3-month forward rate is ¥105.04/$ or 0.009520183/¥. The forward premium on the yen against the dollar is 2.32%.

- *Soft* or *Weak* – describes a currency that is expected to devalue or depreciate relative to major currencies. Also refers to currencies being artificially sustained by their governments
- *Hard* or *Strong* – describes a currency that is expected to revalue or appreciate relative to major trading currencies.
- E*urocurrencies* – are domestic currencies of one country on deposit in a bank in a second country.

Table 2.1 illustrates FX spot and forward rates against major currencies as it appears in the Financial Times (FT) journal.

Feb 2	Currency	DOLLAR Closing Mid	Day's Change	EURO Closing Mid	Day's Change	POUND Closing Mid	Day's Change
Argentina	(Peso)	3.8288	-0.0125	5.3417	0.0041	6.1142	0.0054
Australia	(A$)	1.1312	0.0022	1.5782	0.0095	1.8064	0.0110
Bahrain	(Dinar)	0.3770	-	0.5260	0.0021	0.6021	0.0025
Bolivia	(Boliviano)	7.0200	-	9.7940	0.0393	11.2103	0.0463
Brazil	(R$)	1.8390	-0.0295	2.5657	-0.0307	2.9367	-0.0347
Canada	(C$)	1.0601	-0.0063	1.4790	-0.0028	1.6929	-0.0029
Chile	(Peso)	528.950	0.4000	737.965	3.5179	844.680	4.1272
China	(Yuan)	6.8269	-0.0005	9.5246	0.0375	10.9019	0.0442
Colombia	(Peso)	1959.30	-14.8250	2733.52	-9.6280	3128.81	-10.6449
Costa Rica	(Colon)	559.095	-9.6000	780.022	1.7969	892.820	2.1634
Czech Rep.	(Koruna)	18.5591	-0.0980	25.9485	-0.0320	29.7009	-0.0331
Denmark	(DKr)	5.3365	-0.0219	7.4452	-0.0006	8.5218	0.0003
Egypt	(Egypt £)	5.4683	-0.0028	7.6291	0.0267	8.7323	0.0316
Estonia	(Kroon)	11.2149	-0.0452	15.6465	-	17.9091	0.0021
Hong Kong	(HK$)	7.7672	0.0004	10.8364	0.0441	12.4034	0.0519
Hungary	(Forint)	193.707	-0.6907	270.250	0.1250	309.330	0.1800
India	(Rs)	46.2150	-0.1600	64.4769	0.0365	73.8808	0.0506
Indonesia	(Rupiah)	9360.00	-25.0000	13058.6	17.6773	14947.0	22.0185
Iran	(Rial)	9900.00	-	13812.0	55.4400	15809.3	65.3400
Israel	(Shk)	3.7080	-0.0075	5.1733	0.0104	5.9213	0.0126
Japan	(Y)	90.3500	-0.4250	126.052	-0.0845	144.280	-0.0796
One Month		90.3411	0.0003	126.031	0.0006	144.236	0.0012
Three Month		90.3143	0.0009	125.974	0.0010	144.131	0.0028
One Year		89.9725	0.0075	125.218	0.0113	143.256	0.0132
Kenya	(Shilling)	76.0000	0.1000	106.031	0.5646	121.364	0.6607
Kuwait	(Dinar)	0.2875	-0.0002	0.4011	0.0013	0.4591	0.0016
Malaysia	(M$)	3.4155	0.0045	4.7651	0.0253	5.4542	0.0297
Mexico	(New Peso)	12.8741	-0.0932	17.9613	-0.0574	20.5586	-0.0632
New Zealand	(NZ$)	1.4076	-0.0110	1.9638	-0.0073	2.2478	-0.0081
Nigeria	(Naira)	151.850	0.3500	211.854	1.3368	242.489	1.5589
Norway	(NKr)	5.8403	-0.0488	8.1482	-0.0351	9.3265	-0.0391
Pakistan	(Rupee)	84.9000	-0.1150	118.448	0.3157	135.577	0.3775
Peru	(New Sol)	2.8495	-0.0025	3.9755	0.0125	4.5504	0.0148
Philippines	(Peso)	46.3800	-0.2500	64.7071	-0.0876	74.0643	-0.0914

	Currency	DOLLAR Closing Mid	Day's Change	EURO Closing Mid	Day's Change	POUND Closing Mid	Day's Change
Poland	(Zloty)	2.8542	-0.0174	3.9820	-0.0082	4.5578	-0.0090
Romania	(New Leu)	2.9294	-0.0084	4.0870	0.0048	4.6780	0.0060
Russia	(Rouble)	30.1195	-0.2755	42.0212	-0.2142	48.0978	-0.2394
Saudi Arabia	(SR)	3.7503	0.0002	5.2323	0.0212	5.9889	0.0250
Singapore	(S$)	1.4096	-0.0033	1.9666	0.0033	2.2510	0.0040
South Africa	(R)	7.4758	-0.0599	10.4298	-0.0413	11.9381	-0.0459
South Korea	(Won)	1159.80	-10.1250	1618.10	-7.5743	1852.08	-8.4472
Sweden	(SKr)	7.2479	-0.0376	10.1119	-0.0116	11.5742	-0.0119
Switzerland	(SFr)	1.0566	-0.0030	1.4740	0.0016	1.6872	0.0021
Taiwan	(T$)	32.0480	-0.0600	44.7118	0.2490	51.1775	0.2911
Thailand	(Bt)	33.1350	-0.0800	46.2283	0.0744	52.9133	0.0915
Tunisia	(Dinar)	1.3556	-0.0019	1.8913	0.0050	2.1648	0.0060
Turkey	(Lira)	1.4892	0.0000	2.0776	0.0082	2.3781	0.0098
UAE	(Dirham)	3.6729	-0.0001	5.1243	0.0204	5.8653	0.0241
UK (0.6262)*	(£)	1.5969	0.0066	0.8737	-0.0001	-	-
One Month		1.5966		0.8738	0.0000	-	-
Three Month		1.5959		0.8741	0.0000	-	-
One Year		1.5922		0.8741	-0.0001	-	-
Ukraine	(Hryvnia)	8.0780	0.0415	11.2700	0.0000	12.8898	0.1194
Uruguay	(Peso)	19.5500		27.2752	27.2752	31.2194	0.1290
USA	($)	-		1.3952	0.0056	1.5969	0.0066
One Month				1.3951	0.0000	1.5966	0.0056
Three Month				1.3948		1.5959	0.0000
One Year				1.3917	0.0000	1.5922	0.0000
Venezuela †(Bolivar Fuerte)		4.2947		5.9917	0.0241	6.8581	0.0283
Vietnam	(Dong)	18474.5	0.5000	25774.7	104.152	29501.9	122.727

	Currency	DOLLAR Closing Mid	Day's Change	EURO Closing Mid	Day's Change	POUND Closing Mid	Day's Change
Euro (0.7168)*	(Euro)	1.3952	0.0056	-	-	1.1446	0.0001
One Month		1.3951	0.0000	-	-	1.1444	0.0000
Three Month		1.3948	-	-	-	1.1441	0.0000
One Year		1.3917	0.0000	-	-	1.1441	-
SDR	-	0.6444	-0.0016	0.8990	0.0013	1.0290	0.0017

Rates are derived from WM/Reuters at 4pm (London time). * The closing mid-point rates for the Euro and £ against the $ are shown in brackets. The other figures in the dollar column of both the Euro and Sterling rows are in the reciprocal form in line with market convention. † Rate shown is 'petro-dollar' rate, preferential rate is fixed at 2.6 to the US Dollar. Some values are rounded by the F.T. The exchange rates printed in this table are also available on the internet at **http://www.FT.com/marketsdata**

Euro Locking Rates: Austrian Schilling 13.7603, Belgium/Luxembourg Franc 40.3399, Cyprus 0.585274, Finnish Markka 5.94572, French Franc 6.55957, German Mark 1.95583, Greek Drachma 340.75, Irish Punt 0.787564, Italian Lira1936.27, Malta 0.4293, Netherlands Guilder 2.20371, Portuguese Escudo 200.482, Slovenia Tolar 239.64, Spanish Peseta 166.386

2.3 Factors Affecting Exchange Rates

An exchange rate represents the price of a currency, which is determined by the demand for that currency relative to the supply for that currency. Figure 2.3 illustrates the exchange rate equilibrium between US dollar and Sterling pound at $1.95 for one Sterling pound.

Figure 2.3 Exchange Rate Equilibrium
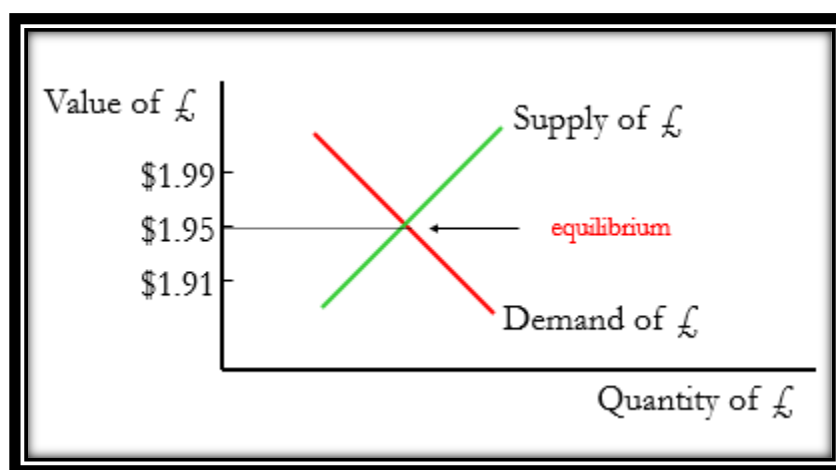
2.3.1 Relative Inflation Rates: If the inflation rate increases in the United States compared to the United Kingdom, the demand for British goods will increase and hence the demand for the Sterling pounds. At the same time, the British demand for US goods will decrease and this will reduce the supply of Sterling pounds. As a result, the demand line will move to the right while the supply line will move to the left. This will imply an increase in exchange rate from r_0 to r_1. Figure 2.4 shows the shift in supply and demand lines and the movement to new equilibrium exchange rate.

Figure 2.4 The Impact of Relative Inflation Rates

U.S. inflation ↑

⇒ ↑ U.S. demand for British goods, and hence the demand of £.

⇒ ↓ British desire for U.S. goods, and hence the supply of £.
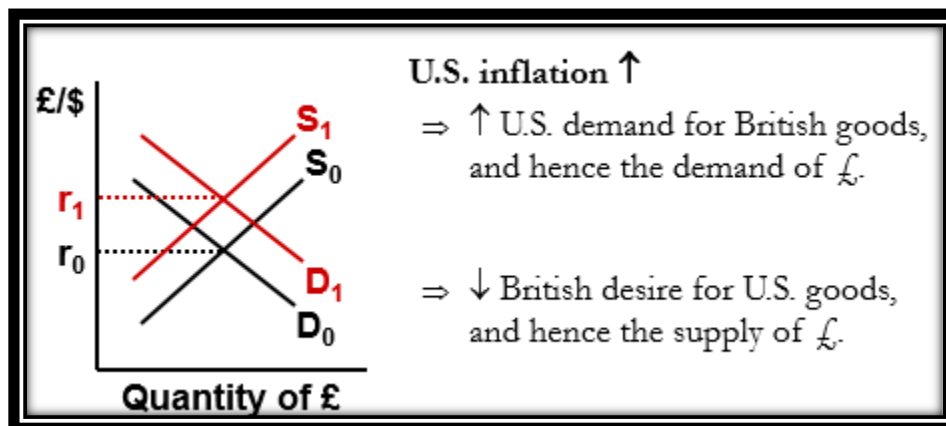
2.3.2 Relative Interest Rates:

When US interest rates increases relative to the British interest rates, the US demand for British bank deposits will decrease and hence the demand of Sterling pounds. At the same time, the British desire for US bank deposits will increase and hence the supply of Sterling pounds. This will shift the demand line to the left and the supply line to the right and consequently decreases the exchange rate from r_0 to r_1. Figure 2.5 illustrates this relationship.

Figure 2.5 The Impact of Relative Interest Rates

U.S. interest rates ↑

⇒ ↓ U.S. demand for British bank deposits, and hence the demand of £.

⇒ ↑ British desire for U.S. bank deposits, and hence the supply of £.
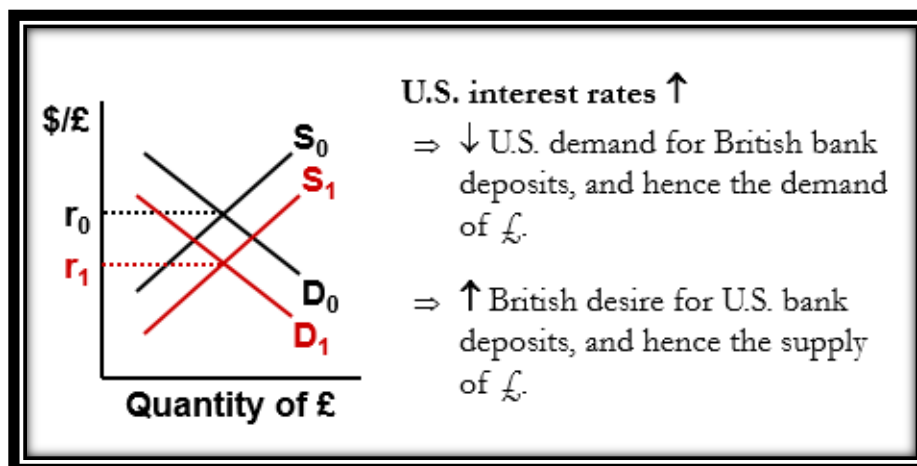
2.3.3 Relative Income Levels

When US income level improves in comparison to the British income level, the US demand for British goods will increase and this will result in a movement of the demand line to the right. However, no expected change will occur in the supply of Sterling pound. This will result in an increase in exchange rate from r_0 to r_1. Figure 2.6 shows the increase in the value of Sterling pound as a result of this change in income level.

Figure 2.6 The Impact of Relative Income Levels
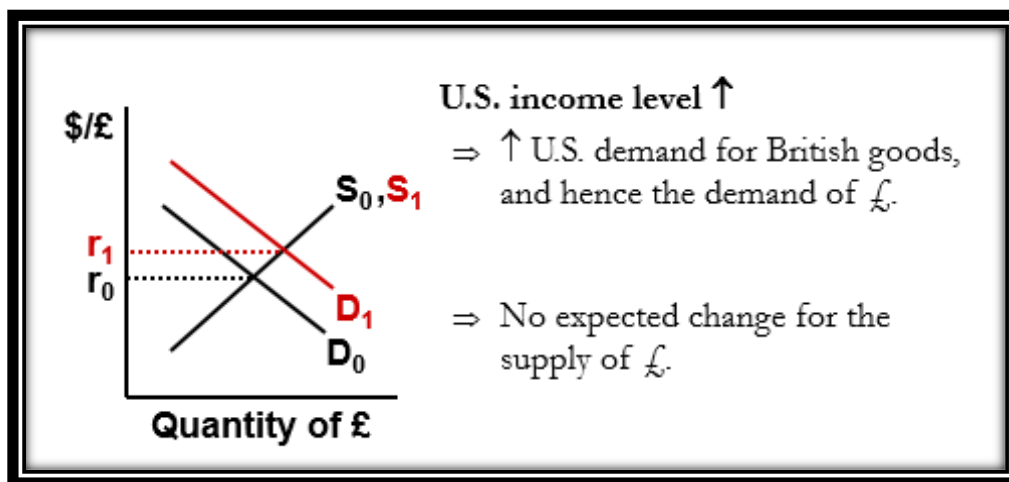
2.3.4 Government Trade restrictions

If a country (e.g., US) imposes trade restrictions on imports from another country (e.g., China), the US demand for Chinese goods will decline and consequently the US demand for the Chinese Yuan will decline which causes a decrease in the value of the Chinese currency against the US dollar and vice versa.

2.3.5 Capital Flow Restrictions

If a country (e.g., US) imposes capital flow restrictions from other countries, then the foreign demand for US securities will decline and thus the supply of the foreign currency for sale will also decline. As a result, the exchange rate between of the dollar will decline against those currencies and vice versa. Figure 2.7 explains the interaction between factors that affect exchange rates between one country and other.

Figure 2.7 Interaction of Factors that affect Exchange Rates
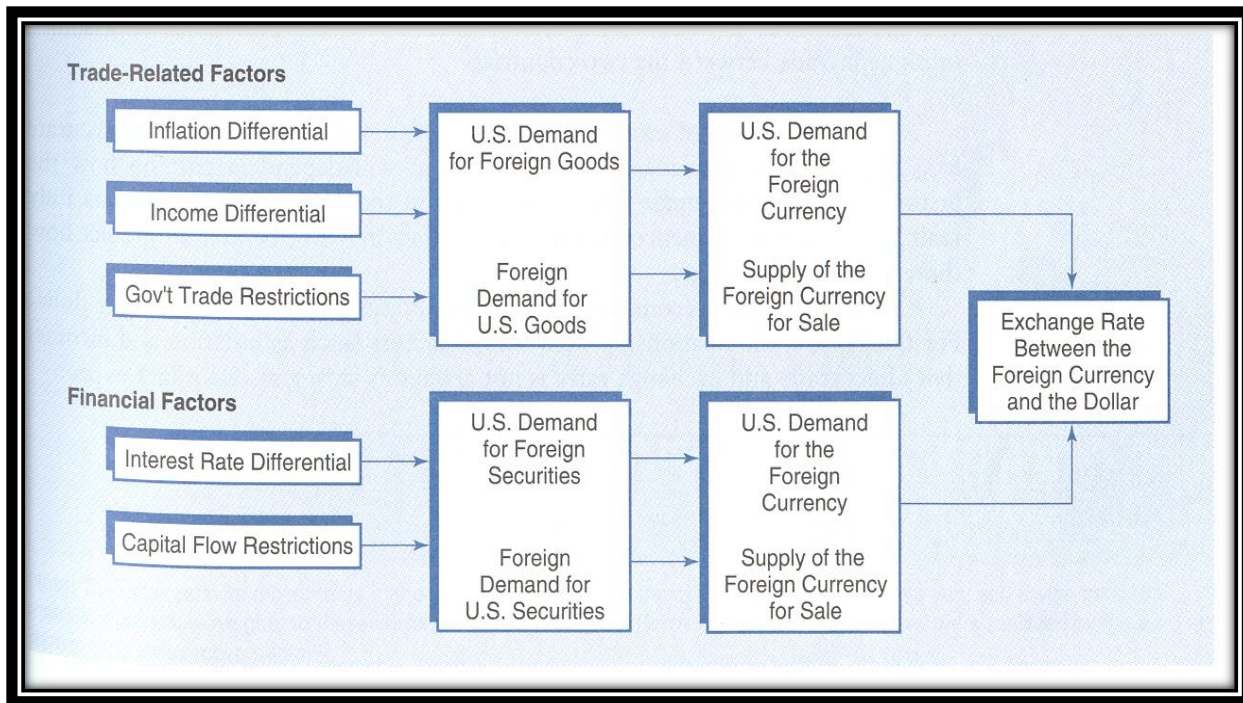
Source: Madura (2010)

2.4 Balance of Payments (BoP)

The balance of payments is a measurement of all transactions between domestic and foreign residents over a specified period of time. Each transaction is recorded as both a credit and a debit, i.e. double-entry bookkeeping. The BOP is composed of two primary sub accounts, the Current Account and the Capital/Financial Account. In addition, the Official Reserves account tracks government currency transactions. A fourth account, the Net Errors and Omissions account is produced to preserve the balance of the BOP.

2.4.1 Current Account

The **Current Account** summarizes the flow of funds between one specified country and all other countries due to the purchases of goods or services, and the provision of income on financial assets. It consists of:

   a. **The Balance of trade**: the difference between merchandise exports and merchandise imports,
   b. **Service exports and imports**,
   c. **Income**: represents difference between income (interest and dividend payments) received by resident

investors on their foreign investments in financial assets (i.e. stocks etc) and income paid to foreign investors on their investments in financial assets in the home country,

d. **Current transfers:** represent aid, grants, and gifts from one country to another

The deficits in the Balance of Trade of the United States of the past decade have been an area of considerable concern for the United States, in both the public and private sectors. The goods trade deficit saw the decline of heavy traditional industries in the U.S. (steel, automobiles, automotive parts, textiles), see Figure 2.8.

Figure 2.8 The United States Current Account, 1998–2007 (billions of U.S. dollars)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Goods exports	672	686	775	722	686	717	811	898	1027	1153
Goods imports	−917	−1030	−1227	−1148	−1167	−1264	−1477	−1682	−1861	−1968
Goods trade balance (BOT)	−245	−344	−452	−426	−481	−548	−666	−783	−835	−815
Services trade credits	261	280	296	283	289	301	350	385	430	493
Services trade debits	−181	−199	−224	−222	−231	−250	−291	−314	−349	−378
Services trade balance	80	80	72	61	58	51	58	72	81	115
Income receipts	262	294	351	291	281	320	414	535	685	818
Income payments	−258	−280	−330	−259	−254	−275	−347	−463	−628	−736
Income balance	4	14	21	32	27	45	67	72	57	82
Current transfers, credits	10	9	11	9	12	15	20	19	25	22
Current transfers, debits	−63	−59	−69	−60	−77	−87	−105	−109	−117	−135
Net transfers	−53	−50	−59	−51	−65	−72	−84	−90	−92	−113
Current Account Balance	**−213**	**−300**	**−417**	**−385**	**−461**	**−523**	**−625**	**−729**	**−788**	**−731**

Totals may not add due to rounding.
Source : Derived from International Monetary Fund, *Balance of Payments Statistics Yearbook 2008*, p. 1054.

Source: Eiteman et al.(2016)

2.4.2 The Financial Account

Financial assets can be classified in a number of different ways including the length of the life of the asset (maturity) and the nature of the ownership (public or private). The Financial Account, however, uses a third method, that focuses on the degree of investor control over the assets or operations:

1. *Direct Investment*: represents investment in which the investor exerts some explicit degree of control over the assets. This is the net balance of capital dispersed from and into the country for the purpose of exerting control over assets. Foreign direct investment arises from 10% ownership of voting shares in a domestic firm by foreign investors.

2. *Portfolio Investment*: represents investment in which the investor has no control over the assets. This is the net balance of capital that flows in and out of the country but does not reach the 10% threshold of direct investment. *The purchase of debt securities across borders is classified as portfolio investment because debt securities by definition do not provide the buyer with ownership or control.* Portfolio investment is motivated by a search for returns rather than to control or manage the investment.

3. Other Investment – consists of various short-term and long-term trade credits, cross-border loans, currency deposits, bank deposits and other A/R and A/P related to cross-border trade.

2.4.3 The Capital Account

The capital account measures the flow of funds between one country and all other countries due to financial assets transferred across country borders by people who move to a different country, or due to sales of patents and trademarks[11]. The sale of patent rights by a U.S. firm to a Canadian firm is recorded as a positive amount (a credit) to the U.S. capital account because funds are being received by the United States as a result of the transaction. Conversely, a U.S. firm's purchase of patent rights from a Canadian firm is recorded as a negative amount (a debit) to the U.S. capital account because funds are being sent from the United States to another country.

In general, the financial account items represent very large cash flows between countries, whereas the capital account items are relatively minor (in terms of dollar amounts) when compared with the financial account items. Thus, the financial account is given much more attention than the capital account when attempting to understand how a country's investment behavior has affected its flow of funds with other countries during a particular period.

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[11] *Madura , J. (2010) International Corporate Finance, 10th Edition, Cengage Learning, China.*

2.4.4 Errors and Omissions and Reserves

The balance-of-payments account also includes a category of errors and omissions, because measurement errors commonly occur when attempting to measure the value of funds transferred between two countries.

A deficit in the BOP implies an excess supply of the country's currency on world markets, and the government should then either devalue the currency or expend its official reserves to support its value. A surplus in the BOP implies that the demand for the country's currency exceeded the supply and that the government should allow the currency value to increase – in value – or intervene and accumulate additional foreign currency reserves in the Official Reserves Account.

Figure 2.9 maps the generic components of balance of payments

Figure 2.9 Generic Balance of Payments

Source: Eiteman at al.(2016)

2.5 Exchange Rate Risk

Risk in exchange market is defined as the **fluctuations of the spot rate** at a given time. Even if the present spot rate is stable, the future spot rate is sensitive to **fluctuations** and these **are reflected in the forward market.** Why the future spot rates are unstable?. It could be the uncertainty of macroeconomic market conditions, volatile political environments, or large scale speculations etc. Thus, the **further in the future** is

the forward rate, the **less secure** is its future expected spot rate, and the larger spreads are asked for compensating the risk of taking a forward contract.

Example: A US firm buys machinery through its UK branch for GBP10,000 with terms of 90 days. The spot rate today for pounds is $1.7000/£ and the 90-day forward rate is $1.8000/£. Payment is due at the 90th day in GBP.

The firm has the following Alternative payment methods: (1) Buy GBP 10,000 in the spot market 90 days from the day of shipment to pay the credit. If the spot rate rises to $2.0000/£ during this time, the US firm must spend USD 20,000 to buy the sum of GBP10,000, or (2) Buy GBP10,000 in the forward market for USD18,000 to pay the credit on the due date. If the spot rate rises then the firm is protected (hedging). However, if the spot rate declines to $1.5000/£, then it loses 15,000–18,000=–3,000$.

Example: At present, the spot rate of the US dollar against the Sterling Pounds is $1.9600/£. Someone speculates that in 90 days the spot rate will be $1.8000/£. What would it be her profits from speculating GBP 10,000 in the spot market?

The firm has the following alternative Scenarios: (1) If she proves correct, then GBP 10,000 buy today USD 19,600 in the spot market. After 90 days, the speculator resells the cash at $1.8000/£. for a gross of GBP 10,889 (19,600/1.8000)to earn a net of GBP 889. (2) If the spot rate increases to GBP/USD 2.0000 and the sum of USD 19,600 is worth GBP 9,800 (19,600/2.0000), then she incurs a net loss of GBP 200.

2.6 International Parity Conditions

The concept of Arbitrage and the Law of One Price gives rise to the following International Parity Conditions:

- Purchasing Power Parity (PPP)
- Fisher Effect (FE)
- International Fisher Effect (IFE)
- Interest Rate Parity (IRP)
- Forwards Rates as Unbiased Predictors of Future Spot Rates (UFR)

The theories underlying these relationships depends on the direct association between the money market and the FX market, in the absence of governmental intervention and access to full information. That is, markets are free and efficient.

2.6.1 Purchasing Power Parity

Monetary policy has a direct impact in the formation of all rates. An increase in the money supply in excess of real output growth (revenues) causes inflation. In other words, if the supply of money increases with a steeper rate than the actual supply of goods and services, then the purchasing power of money must decline. More money in the economy brings more spending and if the amount of available money is greater than the actual commodities that can be bought, then prices will rise (supply and demand). Following the increase in prices (inflation), the same currency unit can now buy less commodities, thus the value of that currency has depreciated.

A greater inflation in the UK in comparison to Japan, results into a depreciation of the £ in relation to the ¥. This effect has a direct impact on the goods produced in the UK in relation to similar goods produced in Japan. An **International Arbitrage** enforces **Law of One Price.** Absolute PPP states that price levels should be equal worldwide when expressed in a common currency. Thus, the purchasing power of £1 must be the same in both countries – this is called **Purchasing Power Parity** (**PPP**).

Absolute PPP states that in the long-run, the exchange rates between two currencies should move towards the rate that would equalize the prices for buying **an identical basket of goods. Big Mac Standard**: the simplified index of Big Mac (MacDonald's meal) cost around the world, gives an indication to whether a currency is undervalued or overvalued in relation to the US dollar. It is calculated by comparing the prices of Big Macs worldwide. According to the absolute PPP, when the local currency is expressed in terms of US dollar, then **the cost for buying a Big Mac should be the same.**

However, Big Mac standard has some flaws[12]. When you buy a Big Mac you do not pay only for the value of bread, meat, service and brand, *You also pay for the **location at which you eat the Big Mac** !. The location*

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[12] Ong, L.L. (2003), The Big Mac Index: Applications of Purchasing Power Parity, Palgrave Macmillan, London.

implies the following costs: cost of real estate, local taxes, stamp duties and municipal services, local competition, transportation costs, tariffs etc. Therefore, the "Big Mac" valuation standard could be misleading!

Figure 2.10 Undervaluation or Overvaluation based on Big Mac
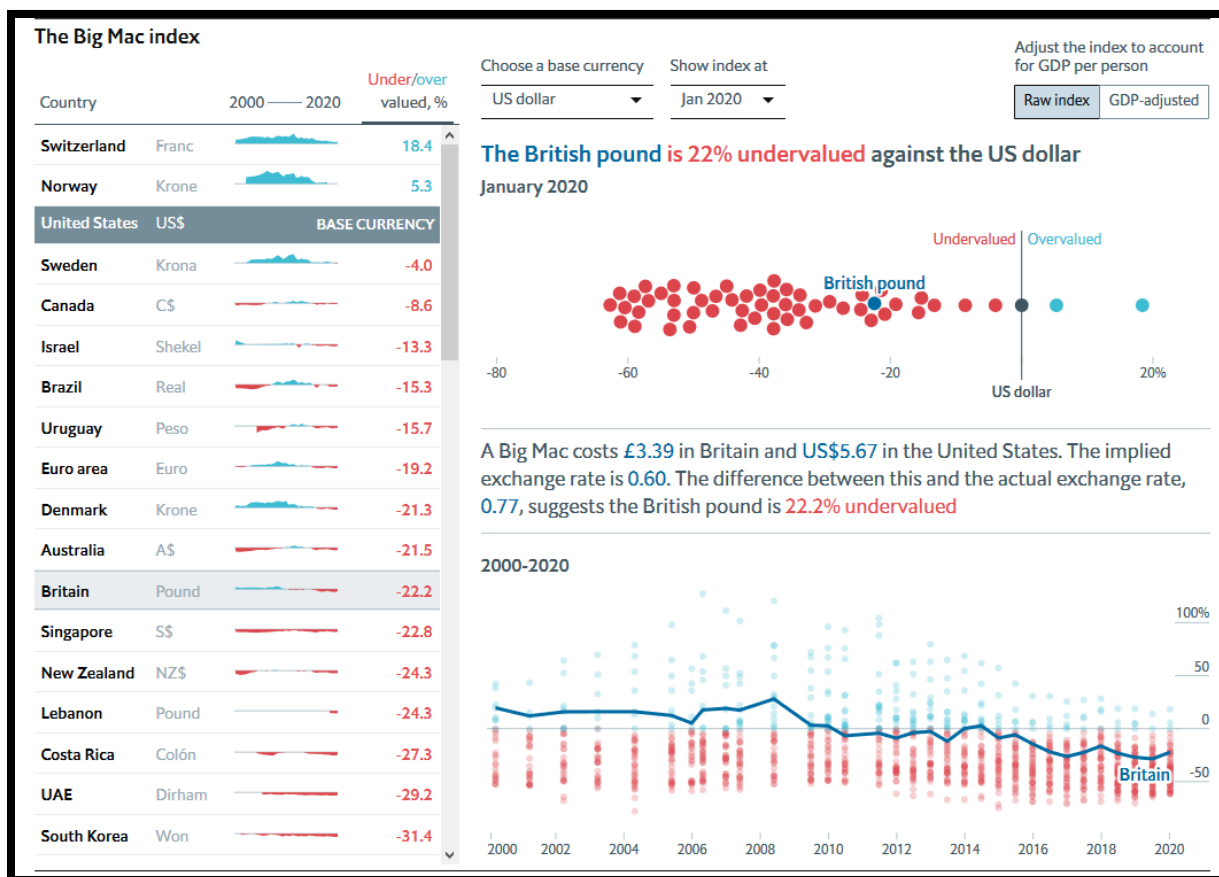
Source: www.economist.com (retrieved on 28 April 2020)

Against the critiques that faced the absolute PPP, a new version of PPP is advanced to rectify the theory, which is the relative PPP. The **Relative PPP** states that the exchange rate between the home currency and any foreign currency will adjust to reflect changes in the price levels of the two countries. Thus, it relates equilibrium changes in the exchange rate to changes in the ratio of domestic and foreign prices, as such:

$$e_t/e_0 = (1 + i_d)^t/(1 + i_f)^t$$

where e_0, e_t indicate the exchange rates at time **0** and **t**

i_d and i_f indicate the domestic **d** and the foreign **f** inflation rates

$$e_t = e_0 \times [(1 + i_d)^t/(1 + i_f)^t]$$

Example: Consider the exchange rate of $ 2.0000/£ and assume that the US is expecting a 10% inflation rate for the coming year, whereas the UK expects a 20% inflation rate. What is the new exchange rate GBP/USD based on this information and the PPP relationship?

$$e_t = 2.000 \times [(1 + 0.1)^1/(1 + 0.2)^1] = \$1.8333/£1$$

If arbitrage does not help to correct to the new exchange rate, then British exports will become less competitive in comparison to similar imported US products that will be lower-priced.

Appraisal of the PPP Relationship:

The PPP theory explains how the relative inflation rates between two countries **affect their future expected exchange rate.** However, empirical studies show that the relationship between **inflation differentials** and **exchange rates** is not aligned even in the long-run. The PPP may not apply because:

- Exchange rates are also affected by differentials in interest rates, income levels, risk, governmental control etc.
- Lack of substitutes for traded goods across the globe. Hence, despite the increase of prices of such goods, consumers will keep purchasing them.
- It relies on the CPI to evaluate change in prices which is sometimes misleading because it does not cover all goods and services.

2.6.2 Fisher Effect (FE)

Fisher Effect states that nominal interest rate in each country should be equal to a real interest rate plus an expected rate of inflation:

(1 + Nominal Rate) = (1 + Real Rate) (1 + Inflation Rate)

If interest rate represents the rate of exchange between current and future £, nominal Interest Rate r is the rate you read in the newspapers. However, Real Interest Rate α is the rate at which current goods are being converted to future goods. In other words, the real rate tells you whether the money that you will receive in the future on the basis of the nominal rate can buy the same goods or more than those you can buy today. Fisher Effect can be rewritten as follows:

$$(1 + r) = (1 + \alpha)(1 + i), \qquad \text{or}$$

$$r = \alpha + i + \alpha i$$

Consider a **domestic** and a **foreign** *r* and subtract the two equations, as follows:

$$(r_d - r_f) = (\alpha_d - \alpha_f) + (i_d - i_f) + (\alpha_d i_d - \alpha_f i_f)$$

However, real interest rate remains relatively stable across time and that real returns α are identical across countries through arbitrage which implies that:

$$\alpha_d = \alpha_f = \alpha \quad \rightarrow$$

$$(r_d - r_f) = (1 + \alpha)(i_d - i_f)$$

The final equation states that currencies with high i should have higher r than currencies with lower i.

2.6.3 International Fisher Effect (IFE)

This theory is based on combining FE and the PPP relationships as follows:

- FE: inflation rate differentials are equal to nominal interest rate differentials
- PPP: exchange rate movements are caused by inflation rate differentials

IFE suggests that currencies with higher interest rates will depreciate because the higher rates reflect higher expected inflation;

$$e_t/e_0 = (1 + r_d)^t/(1 + r_f)^t$$

Thus, the expected return from investing domestically $(1 + r_d)$ must equal the expected return from investing the home currency abroad, $(1 + r_f) \, e_t \,/e_0$

IFE implies that the future spot rate of a currency with a higher interest rate would depreciate in the long run and that the future spot rate of a currency with a lower interest rate would appreciate in the long run.

Example: For the next year, we expect that $r_{US} = 0.04$ and $r_{UK} = 0.10$. The IFE implies that the GBP will depreciate (in the next year) by 6%. IFE implies that the interest rate differential is an unbiased predictor of the future change in the spot rate.

The empirical evidence of the IFE shows that Countries with high inflation rates generally have higher interest rates. Recent evidence has shown that currencies of countries with high interest rates tend to depreciate while those with low interest rates to appreciate with relation to some other hard currency. The IFE works in practice up to a certain degree, but yet, fails to incorporate the potential of short term speculation. That is, while IFE explains how the high interest rates will force the future expected spot rate to be depreciated, those high interest rates attract investment capital. Results show that indeed, the IFE works and the exchange rate changes offset interest rate differentials.

2.6.4 Interest Rate Parity (IRP)

Interest differentials motivate the movement of capital between countries, i.e. invest at higher interest rates.This movement of capital causes the fluctuation of spot rates and in effect, the spread between the forward market and the spot market prices. As a result, the forward discount or premium is closely related to the interest differential between two currencies through the process of Arbitrage. According to the IRP, the spread between a forward rate and a spot rate should be equal but opposite in sign to the difference in interest rates between two countries.

Recall that:

- **Forward Premium** exists when Forward Rate > Spot Rate

- **Forward Discount** exists when Forward Rate < Spot Rate

The **IRP** states that, in a **Free and Efficient world market** (no transaction costs, no frictions etc), the currency with the higher interest rate will be sold at a discount in the forward market, while the currency with the lower interest rate would be sold at a premium. Hence, according to the **IRP** ,the discount and the premium in these two currencies will have the same magnitude equal to the interest differential between the two currencies but will have opposite signs;

$$(1 + r_d) = \frac{(1 + r_f) \times n - day\ F}{S}$$

where r_d, r_f indicate interest rates at domestic d and foreign f.

If r_d and r_f are the prevailing interest rates in domestic and foreign, then a unit of currency invested in home will be worth $(1+r_d)$, while the same unit invested in foreign will be worth $(1+r_f)F/S$ at maturity. IRP ensures that return on a hedged foreign investment will just equal the domestic interest rate on investments of identical risk which eliminates the possibility of arbitrage opportunities.

Example: A US investor has \$100, faces the following information: interest rates on GBP is 12%, and comparable USD is 7%, spot rate GBP/USD 1.75 and one year forward rate is 1.68. What is the forward discount on GBP?, and what is the covered yield on GBP?. How can she capitalise on this using \$100?

The Forward discount = ((1.68-1.75)/1.75) x 100=4%

From the IRP equation: the covered yield =(1+0.12)(1.68/1.75)=0.0752

The investor can capitalise on this information to make money through:

Step 1: on day 1; \$100 are converted into £ at \$1.75/£ which gives 100/1.75=£57.143

Step 2: on the first day, She also sells £ one year forward. The number of pounds to be sold is the anticipated accumulation of £ over the one-year period, which is estimated at: 57.143 x 1.12=£64

Step 3:After one year, She withdraws the initial deposit of £ with the accumulated interest (total of £64). She converts them into dollars according to the forward contract agreed upon a year earlier: £64 x 1.68=\$107.52

Arbitrage opportunities motivates the movements of funds from one country to another. **Funds will flow from home to foreign** if and only if:

$$(1 + r_d) < \frac{(1 + r_f) \times n - day\ F}{S}$$

and funds will flow from foreign to home if and only if:

$$(1 + r_d) > \frac{(1 + r_f) \times n - day\ F}{S}$$

The IRP holds when there are no more arbitrage opportunities:

$$\frac{1 + R_d}{1 + R_f} = \frac{n - day\ F}{S}$$

Example on using IRP to compute forward rates: Assume the following parameters: (£ is the home currency) UK interest rate $r_d = 7\%$, Swiss interest rate $r_f = 9\%$, Spot rate for 1 Swiss franc: is £0.4000. According to IRP, what is the one year forward rate for 1 Swiss franc?

$$n - day\ F = S\frac{(1 + r_d)}{(1 + r_f)} = 0.4000\ \frac{1 + 0.07}{1 + 0.09} = 0.3927$$

The equilibrium of IRP is brought by speculators who enter into forward contracts to avoid the exchange rate risk, as follows: Higher interest rates in Switzerland in relation to the UK will attract more investments since they offer higher future returns. However, the Fisher Effect (FE) states that higher interest rates come with higher inflation differentials, which in turn cause the currency with the higher inflation to depreciate. For this reason, international investors that consider Switzerland as a prospect market, seek to avoid the FX risk at maturity, by selling francs and by buying British pounds forward today. As a result, the forward rate for the SFR will depreciate, and the forward rate for the GBP will appreciate until IRP is achieved. This implies a decline in the rate for 1 Swiss franc to £0.3927 from £0.4000 in the forward market.

Interest rate parity works great in international finance. Studies have shown that deviations from the interest parity occur only in very small percentages and that they corrected very quickly by instant arbitrage activities. The deviations from the interest parity are mostly results of actual capital controls, announced and expected capital controls, imposition of taxes on interest payments, transaction costs etc.

2.6.5 Unbiased Forward Rates (UFR)

UFR states that, the forward rate should reflect the expected future spot rate on the date of settlement for the forward contract. For example: If the 90-day forward rate on the JPY/GBP parity is sold with a discount of 5%, then the future spot of JPY/GBP is expected to depreciate by 5% after 90 days. If the 90-day forward rate on the JPY/GBP parity is sold with a premium of 5%, then the future spot of JPY/GBP is expected to appreciate by 5% after 90 days.

In effect, if speculators think that a forward rate is higher than their prediction of a future spot rate (F>expected

S), they will sell the foreign currency *forward*. This will cause the forward rate to bid down until it equals the expected future spot rate. However, if speculators believe that a forward rate is lower than the expected future spot rate (F<expected S), they will buy the foreign currency *forward*. This speculative transactions will bid up the forward rate until it reaches the expected future spot rate. Under the **UFR**, there are **no incentives to buy or sell a foreign currency forward** because forward rates are unbiased predictors of future spot rates.

What happens if there is **disequilibrium between the future spot rate and the forward rate**?. For example, if the future spot of JPY is expected after 90 days to depreciate by 5%, and at the same time, the 90-day forward rate GBP/ JPY sells with a discount of 3%. Speculator will sell JPY 90-days forward for GBP and take a 3% discount. After 90 days, she will cover her commitment with fewer JPY units sacrificed. She can capitalise by selling her GBP (buying JPY) instantaneously in the FX market and vice versa.

Mathematically, UFR can be easily proven as the combination of IRP and IFE. International Fisher Effect (**IFE**) formally states;

$$\frac{e_t}{e_0} = \frac{(1 + r_d)}{(1 + r_f)}$$

The Interest Rate Parity (**IRP**) is formally stated as:

$$\frac{(1 + r_d)}{(1 + r_f)} = \frac{n - day \ F}{S}$$

If we combine IRP with IFE, the result will be the UFR:

$$\frac{e_t}{e_0} = \frac{F_t}{e_0}$$

In other words, forwards rates are unbiased predictors of future spot rates:

$$e_t = F_t$$

However, there are arguments that it is not possible for UFR to hold precisely. Future expectations cannot foresee the actual events precisely. Thus, whatever is expected today in the spot market and consequently reflected in the forward market, is disturbed by unforeseen events during the period until maturity. That is, the longer we attempt to foresee the future spot, the more biased will be the forward rate.

More studies show that the forward rate is a biased predictor because it contains a risk premium. The risk premium provides a positive expected returns to those who buy a more risky currency forward. If the GBP is considered more risky than the Euro, a positive expected returns would be expected for those who are buying GBP forward[13]. Generally, evidence shows that speculators profit, on average, by buying currencies at a forward discount (currencies with higher interest rates), and by selling currencies at a forward premium (currencies with lower interest rates).

Up to this point, we have examined three theories of exchange rate determination, which may be used to forecast the future expected spot rate, in the following way:

- **PPP**: by using inflation rate differentials

- **IFE**: by using interest rate differentials

- **UFR**: by using the forward rate discount or premium

Now, A financial manager of a MNC seeks to forecast exchange rates that relate to its foreign subsidiaries. Which parity condition should be used to forecast FX rates?

If and only if, markets are **Free and Efficient** with **no governmental intervention**, then the expected rate of change in a spot rate, the differential rates of inflation and interest and forward premiums/discounts are proportional to each other. **Free and Efficient markets**, **Arbitraging** and the **Law of One Price** all work towards offsetting any discrepancies in the FX market. Therefore, if indeed markets obey these conditions, then **the forward rate is the best possible forecaster of the future spot rate.**

Example: A financial manager of a German home multinational with subsidiaries in Switzerland is faced with the following parameters: Expected inflation rates after one year: $i_d = 5\%$, $i_f = 10\%$, $e_0 = €0.5000/SFR$, one-year $f_t = €0.4750/SFR$, Interest rates on governmental securities: $r_d = 7\%$, $r_f = 12\%$. Assuming free and efficient markets between Germany and Switzerland, the manager forecasts that the future expected spot rate in one year from now is going to be equal to € 0.4750/SFR. The following Figure (Figure 2.11) illustrates the relationships between the five discussed international FX theories.

Figure 2.11 The Interaction Between FX Theories

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[13] Hansen, L. P., & Hodrick, R. J. (1980). Forward exchange rates as optimal predictors of future spot rates: An econometric analysis. Journal of Political Economy, 88(5), 829-853.
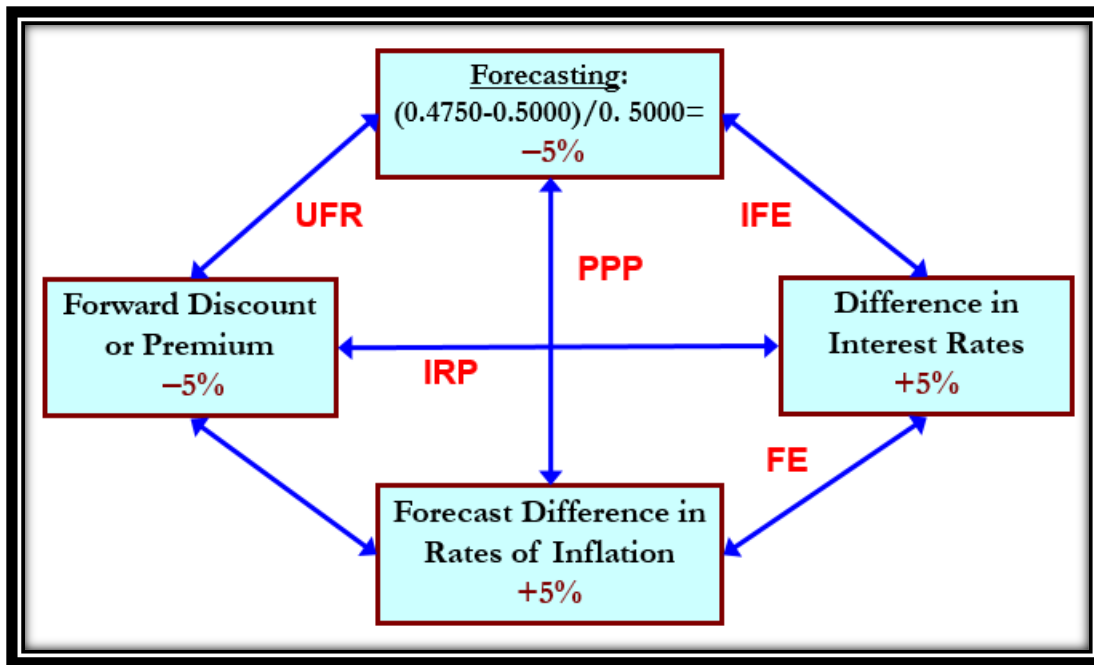
2.7 Exchange Rate Forecasting

Future exchange rates are uncertain. The further in the future you would like to forecast exchange rates, the more the uncertainty. The effectiveness of international financing, the rates of returns from international investment and successfulness of international operations are all based on whether the financial manager of an MNC can forecast the FX market.

2.7.1 The Forecasting Needs of MNCs

There are a plenty of needs that lead MNCs to forecast future exchange rate:

A. Hedging

MNCs have a great variety and great volume of foreign currency denominated assets, liabilities, payments and receipts. The value of all these is directly linked to the exchange rate between the home currency and the denominated currency. The decision to hedge against the risk of exchange rate fluctuation depends on the forecasting of future exchange rates with the ultimate aim of increasing its cash flows. For instance, a MNC based in the US, plans to pay for clothing imported from Mexico in 90 days. If the forecasted value of the peso

in 90 days is sufficiently below the 90-day forward rate, the MNC may decide not to hedge and vise versa[14].

B. Working Capital Management

Working Capital Management consists of decisions that concern short-term financing and short-term investment. MNCs look for borrowing opportunities in currencies with (1) low interest rates and (2) which tend to depreciate over the life of the loan and therefore be cheaper to repay. On the other hand, since MNCs tend to hold large amounts of short-term funds, they seek for short-term investments in currencies with (1) high interest rates and (2) which tend to appreciate over the life of the short-term investment

C. Capital Budgeting Decisions

Foreign projects may periodically require the exchange of currencies. The capital budgeting analysis can be completed only when all estimated cash flows are measured in the parent's local currency. Good exchange rate forecasts will improve the estimates of the cash inflows and thus give a more accurate internal rate of return which improves decision-making. Long-term investments are generally riskier in comparison to short-term investments (working capital) since they involve more uncertainty. MNCs Seek for currencies with high rates of return, which will appreciate during the life of investment.

D. Long-Term Financing

Long-term financing involves the issue of equities (equity-financing) and/or the issue of bonds (debt-financing). The equity financing issue of a MNC will be examined in more detail in a future lecture. However, when MNCs issue bonds (long-term debt financing), they try to denominate the bonds in a currency that will depreciate until maturity. Therefore, forecasting exchange rates is essential to estimate the cost of issuing such bonds.

Harold Plc, a UK-based company needs long-term financing to support its UK business. It can issue ten-year bonds denominated in Japanese yen at 1% coupon rate, which is 5% less than the coupon rate on British pound denominated bonds. However, Harold will need to convert pounds to yen to make the coupon or principal payments on the yen-denominated bond. If the yan's value rises, the yen-denominated bond could be more costly to Harold than a pound-denominated bond. Harold's decision to issue yen-denominated bonds vs. pound-denominated bonds will be dependent on its forecast of the yen's exchange rate over the ten-year

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[14] *Madura, J. (2018)*

period[15].

E. Earnings Assessment

Good forecasts of exchange rates help estimate foreign subsidiary earnings and hence the MNC's earnings. Most MNCs are required to consolidate the earnings of subsidiaries into those of the parent company, if the parent owns more than a certain percentage of the subsidiary's voting shares. More importantly, the parent's decision about whether a foreign subsidiary should reinvest earnings in a foreign country or remit earnings back to the parent may be influenced by exchange rate forecasts. If a strong currency is expected to weaken substantially against the parent's currency, the parent may prefer to remit earlier.

2.7.2 Forecasting Exchange Rates in Fixed-rate Systems

A fixed-exchange rate system is an exchange rate system at which the value of one currency is attached to gold or currency of some other country. The 'gold standard' is a type of a fixed-rate system where participating countries ere committed to fix the prices of their domestic currencies in terms of a specified amount of gold[16]. Under the Bretton Woods system, all currencies maintained a fixed exchange rate for its currency with the US dollar or gold. The developed countries broke free from the Bretton Woods system in 1971. Yet, many countries still use some type of fixed-rate system. IMF estimated that in 2003, 50% of the world currencies were using fixed exchange rates. However, whether a **currency** is to be **devalued or revalued** is a solely **political decision.**

Under a fixed-rate system, the forecaster must focus on the **governmental decision-making.** A financial manager that can forecast fixed exchange rates can greatly improve the MNC's international positions. Therefore, the initial approach to fixed exchange rate forecasting is to ascertain whether there is any pressure to devalue the foreign currency and the determined whether this type of strategy will continue and for how long – political leaders determine these factors. The literature identifies a series of steps to take for forecasting exchange rates in a fixed-rate regime[17]:

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[15] Madura, J. and Fox, R.P (2017) *International Financial Management*, 4th Edition, Cengage Learning, United States.
[16] Shapiro, A. C.(2014)
[17] Shapiro, A. C.(2014)

A. Assess the Balance-of-Payments:

By evaluating the national balance-of-payments, the forecaster gets a first feeling of whether the currency is likely to be adjusted, as currencies normally build up the tension prior to devaluation (last resort). A balance-of-payments provides information about:

- **International Monetary Reserves**: the monetary deficit or surplus defines the solvency of a country, i.e. its ability to meet international obligations. Much and continues deficit reduces reserves and questions the value of the currency

- **Balance of Trade**: If a country imports more than it exports (spends more than it receives), then the likelihood of devaluation increases

B. Assess Other Information:

Other important information that need to be considered by forecasters and MNCs are:

- Money Supply: It measures the amount of money that is available in the country. If monetary authorities throw more money in the economy and cause greater consumption than the capacity of producing, this will lead to inflation

- Inflation: The PPP condition explicates the relationship between the two rates (higher relative inflation causes devaluation)

- Official Exchange Rates: The government states the pegged parities that define the fixed-rate system. The spread between these official rates and the rates set by the free market (outsiders) indicate the validity of the fixed-rates

C. Measure the Required Adjustment:

Following the assessment of the present state of a country's economic statements, the forecaster can tell whether a fixed-rate is likely to move away from its pegged value. If this is true, then in what magnitude will the adjustment take place, so that the balance-of-payments disequilibrium will be corrected ?

Generally, there are three ways to do that:

- **Apply the general principle of PPP**: The percentage change in the exchange rate between any two currencies can be estimated by the differential inflation rate between the two countries.

However, if one of the countries imposes controls on prices, then the PPP collapses.

- **Use the Forward Premium/Discount**: the forward market tends to be a market unbiased estimator of the future expected spot rates. Speculators who think that a forward rate is higher than their prediction of the future spot, they will sell (always **sell high**) the currency forward, and vice versa. Large and frequent speculative transactions will correct the discounts/premiums

- **Use the Free Market Rate**: In the absence of a forward market rate, use the free market rate as an indicator of the future spot. In the absence of a free market rate, use the black market rate as a proxy estimate. However, free market and black market rates tend to overestimate the magnitude of the required adjustment

D. Find the Timing of Adjustment

If indeed, the currency is under pressure, and the monetary and fiscal authorities are incapable of restoring equilibrium without devaluation, then when will the correction take place?

The ability to resist market forces and delay devaluation depends on two factors:

- Ability to borrow Hard Currencies: countries with good credit ratings can borrow more money and this information is accessible from transnational banks and international institutions

- International Reserves: The more reserves (and borrowed funds), the more support of the trade deficit and more delay of devaluation

E. Estimate the Type of Correction

The choice of fiscal and monetary intervention (correction) is entirely a political decision. Normally, countries with weak currencies and large deficits would take some or all of the following corrective policies:

- Deflate the Economy by imposing austerity measures: Reduce Money Supply, Restrict Salaries, Impose Price Controls → Reduce Domestic Demand for Local & Foreign Commodities → Demand for Imports Falls → Relative Supply of Exports Rises → Improve Trade Balance

- Impose Strict Exchange Controls: Repurchase its own Currency → Restrict Imports to the amount equal to Exports → Equilibrium

However, major drawbacks of those corrective policies are that they will Lower FDIs and increase unemployment.

F. Evaluate devaluation

The country's authorities will proceed to devaluation only if all corrective policies have proven ineffective or political unacceptable. There are two types of adjustment, (i) Fixed-Rate Devaluation and (ii) let the currency Float (downwards). Again, the choice between the two is ultimately a political one. Therefore, the last step in forecasting exchange rate adjustments in a fixed-rate system is to evaluate the political process of debating whether a devaluation is the right choice or not. Evaluate for how much longer the authorities can delay devaluation.

2.7.3 Forecasting Exchange Rates in Floating-rate Systems

In a floating rate system, the market forces determine the value of exchange rates. Governmental intervention is sparse and sporadic with little effect. The basic assumption in this system is that FX markets are efficient. That is, (1) spot rates reflect all current information, (2) no one can consistently 'beat the market', (3) currencies are fairly priced under market conditions. If markets were perfectly efficient, then why pay for FX forecasting services offered by banks, freelancers? Or even why pay for an in-house forecasting department?

In contrast to forecasting in a fixed-rate system, the forecaster who attempts to evaluate the future expected value of a floating exchange rate must use one or all of the following techniques:

A. **Fundamental Forecasting**: is based on fundamental relationships between economic variables and exchange rates (PPP, IRP). That is, Currencies' values are forecasted on the basis of fundamental relationships between exchange rates and economic variablesEconomic Variables: inflation rates, national income growth, changes in money supply, other macroeconomic variables. The basic assumption is that changes in certain economic indicators may trigger changes in exchange rates in a similar way to changes that incurred in the past.

Regression analysis and other econometric tools are frequently used in fundamental analysis. For example, the future value of the British pound in relation to the US dollar can be estimated through the following regression:

$$P = \alpha_0 + \beta_1 I + \beta_2 N + error\ term$$

If I is the inflation rate deferential (US inflation rate minus British inflation rate), *N* is the income growth differential then we expect a positive β_1 because when US inflation increases relative to inflation in the UK, the pound's value goes up and vise versa. The same logic applies for *N* because the US with higher income

they will ask for more products (imports) from the UK and will supply more dollars.

B. Technical Forecasting: relies heavily on historical exchange rate data to predict future values. This type of forecasting is being applied to commodity and stock prices for a long time now, but its application to the FX market is recent. However, exchange rates are forecastable only if price patterns repeat themselves

Technical Analysis uses charting and mechanical rules: **Charting**: identify peaks, anti-peaks, trends, levels etc and consequently it is totally subjective, and **Mechanical Rules** which avoid subjectivity when are uniformly and consistently applied. Commonly, these are based on mathematical functions of historical and current prices, AR, MA or ARMA.

C. Market-Based Forecasting: develops forecasts from market indicators which is usually based on either (1) spot rate or (2) the forward rate (UFR). The main assumption of this method is that foreign exchange markets are efficient in incorporating expected currency changes in the spot market and the forward market. That is, current spot prices reflect the expectations of the near future and current forward rates reflect a consensus forecast (and unbiased) of the future expected spot rate. However, for forecasts beyond a fiscal year, use long-term forward rates.

D. Mixed Forecasting: Some MNCs prefer to use a combination of forecasting techniques. Sometimes MNCs assign one technique a lower weight when forecasting in one period, but a higher weight in a later period. The actual forecasts of the currency are the weighted average of the various forecasts developed. However, each forecasting method has its pros and cons.

Questions and Applications

1. The website address of the Central Bureau of Statistics is: http://cbssyr.sy/

Use the website to assess recent trends in exporting and importing by Syrian firms. How the balance of trade changed over the last 10 years?

2. Based on the information available on Big Mac Index on the following link,

https://www.economist.com/news/2020/01/15/the-big-mac-index

Is the euro undervalued or overvalued against the dollar?

3. Look at the FX table available from FT.com and answer the following questions;

    a) How many US dollars do you get for your Sterling pound?

    b) What is the one-year forward rate for the dollar?

    c) Is the Sterling pound at a forward discount or premium on the dollar?

    d) Calculate the annual percentage discount or premium on the Sterling pound ?

    e) If the one-year interest rate on the pound is 5.25 percent annually, what do you think is the one-year interest rate on the dollar?

    f) According to the Fisher Effect, what then is the expected difference in the rate of inflation in the UK and US?

4. Mini-case: "The Man Who Broke the Bank of England".

Prior to 1990, Britain used the fixed exchange rate system where they pegged the value of the pound sterling. This fixed exchange regime meant below market interest rates and resulted in gradually rising inflation.

In 1990, Britain decided to abandon this practice of fixing its currency and adopted policies of the European Exchange Rate Mechanism. (ERM). The European Exchange Rate Mechanism was a build up to a unified currency (i.e the EURO). The Sterling Pound entered the market at 1 Pound: 2.95 Deutshe Mark. This rate was despite that British inflation levels that were three times higher than that of Germany. Forex speculators naturally picked this up, and anticipated an eventual devaluation of the British pound against the Deutsche Mark. During the fortnight leading to 16 September 1992 speculators sold billions of Pounds hoping to buy

them back at a depreciated rate hence pocket the difference. Among them was George Soros. The Bank of England decided to intervene by hiking interests rates to 12%. Government authorized expenditure of Billions of Pounds to buy back the pounds that were being frantically sold. In effect, the government was pumping out massive wealth to speculators. The intervention had little or no effect.

During the evening of September 16, 1992 the British government announced its exit from ERM and reverted back to the pegged Pound sterling. Interest rates however remained at 12%.As early as spring 1992, Mr. Soros had decided that the pound would have to be devalued because it had been pushed into the ERM at too high a rate. He knew that the Bundesbank favored a devaluation of both sterling and the Italian lira and believed it would have to happen because of the disastrous impact that high British interest rates were having on asset prices. Mr. Soros spent the next few months building up a position from which he would profit from that devaluation. He borrowed Sterling heavily, reportedly to the tune of £6.5 billion, and converted that into a mixture of Deutschmarks and French francs.

On Black Wednesday, Mr Soros's bet paid off. In the following days, he unwound his positions, paying back his original borrowings and ending with a profit of around £1 billion.

What are the lessons learnt from this case!

This episode shows that the Free Market Forces that drive exchange rates are indeed 'Free'. The traders of that time continued relentlessly shorting the Pound despite government measures because they knew that at the end of the day market forces would prevail. Once these forces push a currency one way it is almost impossible to intervene via central bank mechanisms, government directives or otherwise.

5. Read the following article of Rogoff, K. "The Purchasing Power Parity Puzzle", Journal of Economic Literature, 34 (2), pp. 647-68. Evaluate the attempts to explain why exchange rates can be very volatile and PPP adjustment very slow.

6. A UK investor has GBP100, faces the following information: interest rates on GBP is 4%, and comparable USD is 1%, spot rate GBP/USD 1.35 and one-year forward rate is 1.30.

- What is the forward discount/premium on GBP? It is

$$Discount = \frac{1.30-1.35}{1.35} = -0.037 = -3.7\%$$

- What is the covered yield on USD?

$$1 + Covered\ Yield = (1 + rf)\frac{S}{F} = (1 + 0.01)\frac{1.35}{1.30} \rightarrow \text{Covered yield=4.88\%}$$

- How can she capitalise on this using GBP100?

GBP100 can be exchanged for \$135 that will be then invested for a year at 1% which will yield \$136.35 that can be sold forward to give GBP104.88

7. Tauchen, G, (2001), "The bias of tests for a risk premium in forward exchange rates", Journal of Empirical Finance, (8), pp. 695-704.

1. What are Fama's (1984) findings regarding the expectations theory of unbiased forward rates?

2. How did Tauchen(2001) test the validity of the expectations theory of unbiased forward rates?

3. Did Tauchen's (2001) regression results for the US dollar /UK pound exchange rate confirm or contradict Fama's findings?

8. Choose the correct answer:

MNCs who seek to predict future spot exchange rate can use the following theory:

a. Fisher effect

b. Interest rate parity

c. Purchasing power parity

d. Imperfect markets theory

9. True/False Questions

No	Statement	T	F
1	Speculation is one of the forecasting needs of MNCs		✔
2	Interest Rate Parity can be used to forecast exchange rates		✔
3	If a country's exports are more than its imports then the likelihood of devaluation increases		✔
4	Using mechanical rules such as AR, MA, ARMA is part of Market-Based Forecasting		✔

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Chapter 3: Foreign Exchange Exposures

Topic Title: *Types of foreign exchange exposures and management*

Key Words:

Economic exposure, transaction exposure, operating exposure, translation exposure

Summary:

This chapter define foreign exchange risk that faces MNCs and differentiates between foreign exchange exposures and introduces the sources of each type of exposure and discusses different methods to hedge different foreign exchange exposures. Finally, it compares different types of foreign exchange exposures.

Outcomes and Learning Objectives:

1. *To distinguish between different types of economic exposures*
2. *To identify management methods of transaction exposures*
3. *To select the suitable financial contract to hedge transaction exposure*
4. *To identify sources of operation exposure*
5. *To list management methods of operation exposure*
6. *To recognize determinants of translation exposure*
7. *To identify methods to hedge translation exposure*

Chapter Outline:

    3.1 Introduction

    3.2 Economic Exposure

    3.2.1 Transaction Exposure

    3.2.1.1 Management of Transaction Exposure

    3.2.2 Operation Exposure

    3.2.2.1 Management of Operation Exposure

    2.3 Translation Exposure

    3.3.1 Determinants of MNC's Translation Exposure

    3.3.2 Management of Translation Exposure

3.1. Introduction

Exchange rates are very volatile. Therefore, the value of a MNC's future payables or receivables denominated in foreign currency can change dramatically as a result of exchange rate movements. Exchange rate risk is the risk that exchange rate movements will affect company's performance[18]. Exchange rate movements affect MNCs cash flows and consequently affect MNC's performance and value, which clearly explained in Chapter 1. Financial managers of MNCs closely monitor their operations to determine the level of MNCs' exposures to exchange rate risk. Hence, it is important to understand different types of foreign exchange exposure and measure the level of MNC exposure to each type of exposures to determine whether and how to protect their operations from that exposure. Hence, they can reduce the sensitivity of MNCs' values to exchange rate movements.

3.2 Economic Exposure

The value of a firm's cash flows can be affected by exchange rate movements if it engages in transactions in foreign currencies, receive revenues from foreign customers, or is subject to foreign competition. The sensitivity of the firm's cash flows to exchange rate movements is referred to as economic exposure. Economic exposure includes two components; transaction exposure and operating exposure.

Transaction exposure is the changes in the value of outstanding foreign currency-denominated contracts due to FX rate change. However, operating exposure is the changes in the amount of future operating cash flows caused by exchange rate changes. It arises because currency fluctuations can alter a company's future revenues and costs. The firm faces operating exposure the moment it invests in servicing a market subject to foreign competition or in sourcing goods or inputs abroad. Transaction exposure arises later on and only if the company's commitments lead it to engage in foreign currency-denominated sales or purchases.

3.2.1 Transaction Exposure

Transaction Exposure is the degree at which the value of outstanding foreign currency-denominated contracts can be affected by exchange rate fluctuations. For example, the U.S. exporter that sold products to Asian

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[18] *Madura,J. (2010)*

countries during the 1997-1998 Asian crisis when Asian currencies depreciated by 80%. If products are invoiced in Asian currencies, then he should have received 80% less cash flows. However, if products are invoiced in Dollars, then there is no transaction exposure. Transaction exposure can be devastating to a firm that relies heavily on international trade for its business.

One example of operation exposure is when a UK multinational sells €1m worth of product to its French client on 3-month credit terms. Therefore, the invoice was issued in EURO and cost only €1m at the time of the transaction. After 3 months, the UK company receives €1m and must convert the cash flow into British pounds. Unless the firm made provisions for hedging the value of the money as it stood the time of transaction, then it will have to convert the €1m in the spot rate 3 months following the transaction. If the euro has appreciated against the Sterling pound, then the firm will receive more pounds, if it depreciated it will receive less pounds (Transaction Risk). This example implies that if the firm does nothing about the exposure, it either fails to recognize the risk, or (more logically) it speculates that the € will appreciate against the £ in 3-month time.

Operating exposure can be manifested in loan transactions too. If a Japanese firm enters into a loan contract with a Swiss bank that calls for the payment of SFR100m for principal including interest in one year. Based on the fluctuation of the exchange rate JPY/SFR during the year and the final spot rate a year from now, the Japanese firm must spend an amount of yens to the equivalent of SFR100m to fulfill its covenant. If the yen appreciates against the Swiss franc, then the firm will spend less yens to fulfill its obligation. If the yen depreciates against the Swiss Franc, then it will spend more yens to buy the amount of SFR100m. If it takes no action to hedge against this risk, then in effect, the Japanese firm speculates that the yen will appreciate against the Swiss francs.

3.2.1.1 Management of Transaction Exposure

MNCs rarely expose themselves to transaction risk and always take actions towards hedging against exchange risk using either Financial Contracts or Operational Techniques.

Before selecting a hedging method, MNCs normally compare the cash flows that would be expected from each method. The proper hedging method can vary over time, as the relative merits of each method can change over time. The above-mentioned two main categories will be discussed in turn, with examples provides.

A. Financial Contracts

There are a number of financial contracts that can be used by firms to hedge against transaction exposure. The following example will be used to uncover how financial contracts can be implemented:

Example 1: A US firm sells to a UK firm £10m invoiced worth of equipment, payable in one-year from now. Assume interest rates r_{US}=0.061 per year, r_{UK}=0.09 per year, the spot rate S_0=$1.50/£ and 360-day forward rate F_T=$1.46/£.

1. Forward Market Hedge:

A forward contract is a contract between a bank and a customer (which could be another bank) calls for delivery, at a fixed future date, of a specified amount of one currency against another, where the exchange rate is fixed at the time the contract is entered into[19]. This is the most widely-used and direct way of hedging against transaction exposure. The firm sells its foreign currency receivables and buys its foreign currency payables forward to eliminate Foreign exchange risk.

In our example, the US firm will **sell the £10m receivables forward for delivery in one year**. On maturity, the US firm will pay the bank £10m (received from the UK firm) and receive in return, £10m × $1.46/£ = $14.6m regardless of the spot rate S_T. The US firm's net pound exposure will now be zero, since the amount received a year from now is fixed and equal to $14.6m.

Certainly, if the pound appreciates during this year, then the US firm has lost the opportunity to benefit from a higher cash flow. If the future spot rate after a year is larger than the bought forward contract, then the U.S.

[19] *Shapiro, A. C. (2014)*

firm losses. If the future spot is lower than the forward rate, then the firm gains:

$$\textbf{Loss/Gain} = (\ F_T - S_T\ ) \times \textbf{£10m}$$

Clearly, this analysis takes place *ex post*, while the firm must make the decision to hedge or not *ex ante*, and the only way to do that is by **Exchange Rate Forecasting**. However, if the markets are efficient and the risk premium (set by the banks) is not great, then the forward rate is an unbiased predictor of the future spot rate (UFR parity condition)

2. Money Market Hedge

The firm may borrow foreign currency to hedge its foreign currency receivables, or lend in foreign currency to hedge its foreign payables. By doing this, the firm **matches in value its foreign-denominated assets with its foreign-denominated liabilities.** Therefore, in the case of currency depreciation, both assets and liabilities will fall in value and the balance sheet equilibrium will remain as before

In our example, the US firm was offered the following parameters: r_{US}=0.061p.a., r_{UK}=0.09p.a., S_0=\$1.50/£, and 360-day F_T=\$1.46/£. To hedge using money market, the firm should follow the following steps:

1.Borrow £ 9,174,312 from the UK at 9%p.a. since £ 9,174,312 x 1.09 = £10,000,000
2.Covert £ 9,174,312 into \$13,761,468 by using the spot rate of S_0=\$1.50/£
3. Invest \$13,761,468 in the US at 6.1%p.a. and receive at maturity \$13,761,468 x1.061 = \$14,600,918
4. Collect £10,000,000 from the UK firm and use it to repay the pound loan
5. Receive the maturity value of the dollar investment, which is the guaranteed dollar proceeds from the British sale. The following Table 3.1 illustrates how the US firm can hedge using the money market:

Table 3.1 Money market hedge of firm's receivables

Transaction	Cash Flow $t=0$	Cash Flow $t=T$
1. Borrow pounds at 9% p.a.	£ 9,174,312	–£10,000,000
2. Convert into dollars	$13,761,468	
	–£ 9,174,312	
3. Invest in the US at 6.1% p.a.	–$13,761,468	$14,600,918
4. Collect pounds receivable		£10,000,000
Net Cash Flows	0	$14,600,918

Notice that the cash flow at maturity date is almost equal to the cash flow generated from the 360-day forward rate. This is no coincidence since for this example, the Interest Rate Parity approximately holds, so that the dollar proceeds from money hedging will be the same as those from forward hedging. Arbitrage opportunities between forward hedging and money hedging exist but only for a very short time because both forward and money markets are very efficient and transparent markets.

3. Option Market Hedge

Forward and Money market hedging eliminates completely the exchange exposure!. This is ideal for the firm that wants to be utterly risk-free. Yet, this is a limitation for the firm that wants to benefit from exchange rate fluctuations. **Currency Options** provide a more flexible 'optional' hedge against exchange exposure because options give holders the choice to exercise (or not) to sell or to buy currencies. Unlike a future or forward contract, the currency call option does not obligate its owner to buy the currency at the price.

How can a firm **option-hedge against currency risk** ?
- Buy a currency call option to hedge its foreign payables. A **call** option gives the holder the right to purchase the currency at a specified price

- Buy a currency put option to hedge its foreign receivables. A **Put** option gives the right to sell the currency at a specified price

For our example, we have a US issuing a pound invoice of £10m to a UK customer for delivery after one year. The known parameters are r_{US}=0.061p.a., r_{UK}=0.09p.a., S_0=\$1.50/£, and 360-day F_T=\$1.46/£. Assume also that the US firm can **buy a put option** with an exercise price of \$1.46/£ and option premium \$0.02 per £.

The US firm makes the decision to buy the equivalent of £10m in a put option with an exercise price of \$1.46/£ , thus paying

- Option premium \$0.02 × £10m = \$200,000
- Opportunity cost \$200,000 × 0.061 = \$12,200
- Total Cost = \$212,200

Scenario A: The spot changes to \$1.30 at the expiration date. Since the US firm has the right to exercise its put option at \$1.46/£, it certainly does so and covert £10m into \$14.6m, with a net receivable \$14,387,800. This is the minimum that the US firm will receive after a year. Not less than that. To ensure this minimum, the firm paid a premium of \$212,200.

Scenario B: The spot changes to \$1.60 at the expiration date. The US has no incentive to exercise the put option at \$1.46/£, and coverts £10m into \$16m, with a net receivable \$15,787,800. There is no upper limit for gains.

The option hedge strategy is characterised by the advantage of *"limiting the downside risk while preserving the upside potential"*. The upfront cost of option premium can be regarded as an **insurance premium** for securing at least the '*floor*' of \$14,387,800 receivables with no upper limit.

In the case of payables, the firm can buy a call option and set a '*ceiling*' for the future dollar cost of buying the foreign currency. The **Break-Even Spot Rate for call option**: \$(10m)×S_T − \$0.2122m = \$14.6m ➔ S_T=\$1.48122

If the firm's management team expects a future spot rate less (greater) than the break-even, then the firm is better off considering an option hedge strategy to protect its receivables (payables).

Payables or Receivables denominated in **hard currencies** (US dollar, British pound, Japanese Yen, EURO etc) are easily hedged against currency exposure by using the forward, money or option market. Those assets and liabilities that are **denominated in 'minor' currencies** (of developing or emerging markets) are more difficult to hedge (constrains, higher risk premiums etc). **Cross-hedging** identifies **strong correlations** between traditionally linked currencies, and instead of hedging against the depreciation of the 'minor' currency the firm hedges against a 'hard' currency closely linked to that.

Suppose a UK firm has an **account receivables in Korean won** and wishes to forward hedge its won position (sell the won receivable forward). There is a limited and constrained forward market involving the won and for this reason, the firm seeks instead to **find closely linked hard currency.** For the past 50 years, the **Japanese yen** has shown to be the dominant currency of this part of the world, and it is traditionally highly correlated with the won. Hence, since the **GBP/KRW** exchange rate **moves in proportional manner** to the **GBP/JPY** rate, the UK firm sells a yen amount (equivalent to the won amount) forward.

4. Back-to-Back loans

Back-to-back loans occur when two firms in separate countries arrange to borrow each other's currency for a specific period of time[20]. At an agreed terminal date, they return the borrowed currencies. This operation is conducted outside the foreign exchange markets, although spot quotations may be used as the reference point for determining the amount of funds to be swapped. Such a swap creates a covered hedge against exchange loss, because each company, on its own books, borrows the same currency it repays. They are also used at a time of actual or anticipated legal limitations on the transfer of investment funds to or from either country.

Example 2: A British parent firm wants to invest funds in its Dutch subsidiary identifies a Dutch parent firm that wants to invest funds in the U.K. Avoiding the exchange markets entirely, the British parent lends pounds

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[20] *Eiteman et al. (2016)*

to the Dutch subsidiary in the U.K, while the Dutch parent lends euros to the British subsidiary in the Netherlands. The two loans would be for equal values at the current spot rate and for a specified maturity. At maturity, the two separate loans would each be repaid to the original lender, again without any need to use the foreign exchange markets. Figure 3.1 illustrates the above example.

Figure 3.1 Back-to-back loans to hedge transaction exposure
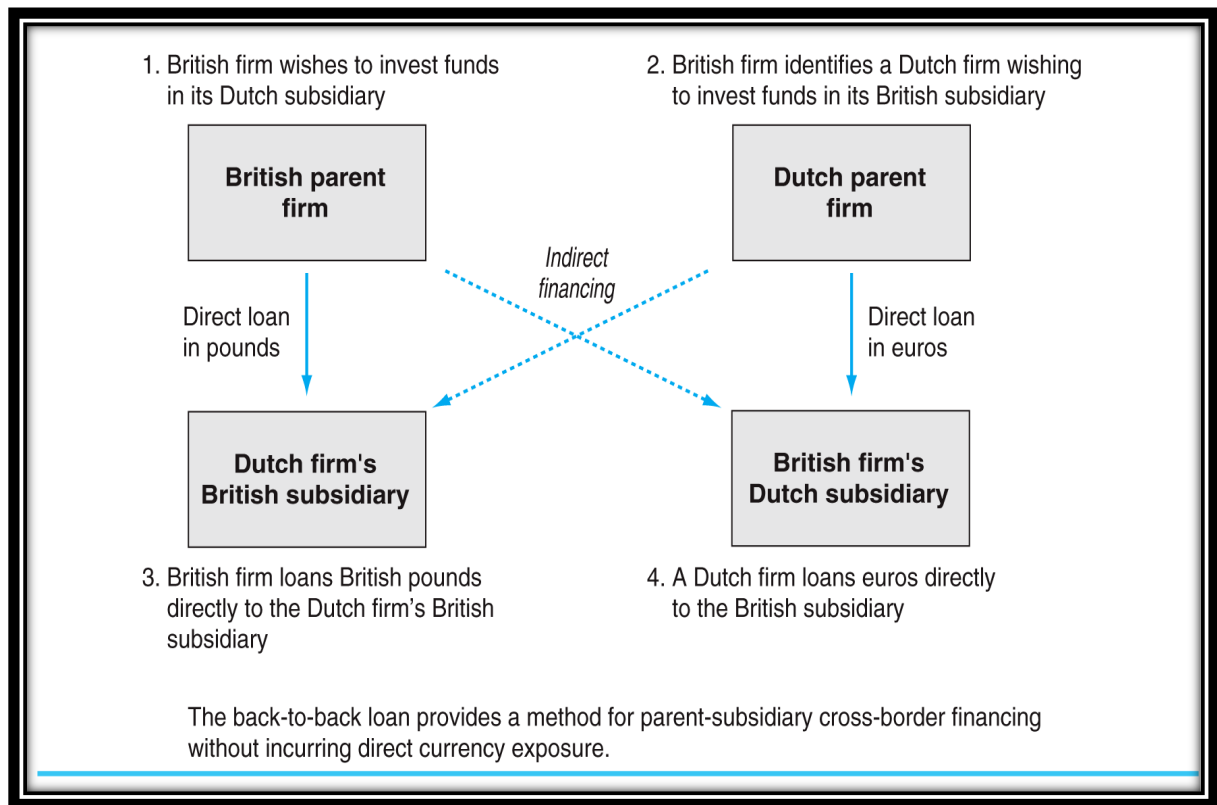
Source: Eiteman et al. (2010)

Back-to-back loans have a number of advantages and disadvantages. Regarding advantages, the first advantage is that neither loan carries FX risk or needs governmental approval. Also, parent company guarantees are not needed on the back-to back loans, because each loan carries the right of offset in the event of default of the other loan. However, it is difficult for a firm to find a partner for the currency, amount, and timing desired. Moreover, a risk exists that one of the parties will fail to return the borrowed funds at the designated maturity-although the risk is minimized because each party to the loan has 100% collateral, although in a different currency.

5. *Currency Swap Hedging*

Firms often have several periodical cash receivables and cash payables denominated in foreign currencies. If the periodic cash flows are highly frequent, then it might be more efficient and less costly to hedge by using currency swaps. A currency swap is an agreement to exchange one currency for another at a predetermined exchange rate (the swap rate) on a sequence of future dates (within a defined period of time) and, after a period of time, to give back the original amount swapped. A currency swap resembles a back-to-back loan, except that it does not appear on a firm's balance sheet[21]. Firms rely on financial intermediaries (bank or dealer) to create a currency swap. Swap dealers arrange most swaps on a blind basis, which means that the initiating firm does not know who is on the other side of the swap arrangements.

A typical currency swap first requires firms to borrow funds in the markets and currencies in which they are best known.

Example 3:
1. A Japanese firm would typically borrow yen on a regular basis in its home market. If, however, the Japanese firm was exporting to the U.S and earning U.S dollars, it might wish to construct a matching cash flow hedge.
2. This would allow it to use U.S dollars earned to make regular debt-service payments on U.S dollar debt.
3. The Japanese firm could swap its yen-debt service payment with another firm that has U.S. dollar-debt service payment.
4. This swap would have the Japanese firm "paying dollars" and "receiving yen".

The Japanese firm would then have dollar-debt service without actually borrowing U.S. dollars. Simultaneously, a U.S. corporation could actually be entering into a cross-currency swap in the opposite direction –paying yen and receiving dollars. Figure 3.2 illustrates how currency swap hedging works.

Figure 3.2 Currency swap hedging of transaction exposure

[21]*Eiteman et al.(2016)*

Both the Japanese corporation and the U.S. corporation would like to enter into a cross-currency swap that would allow them to use foreign currency cash inflows to service debt.
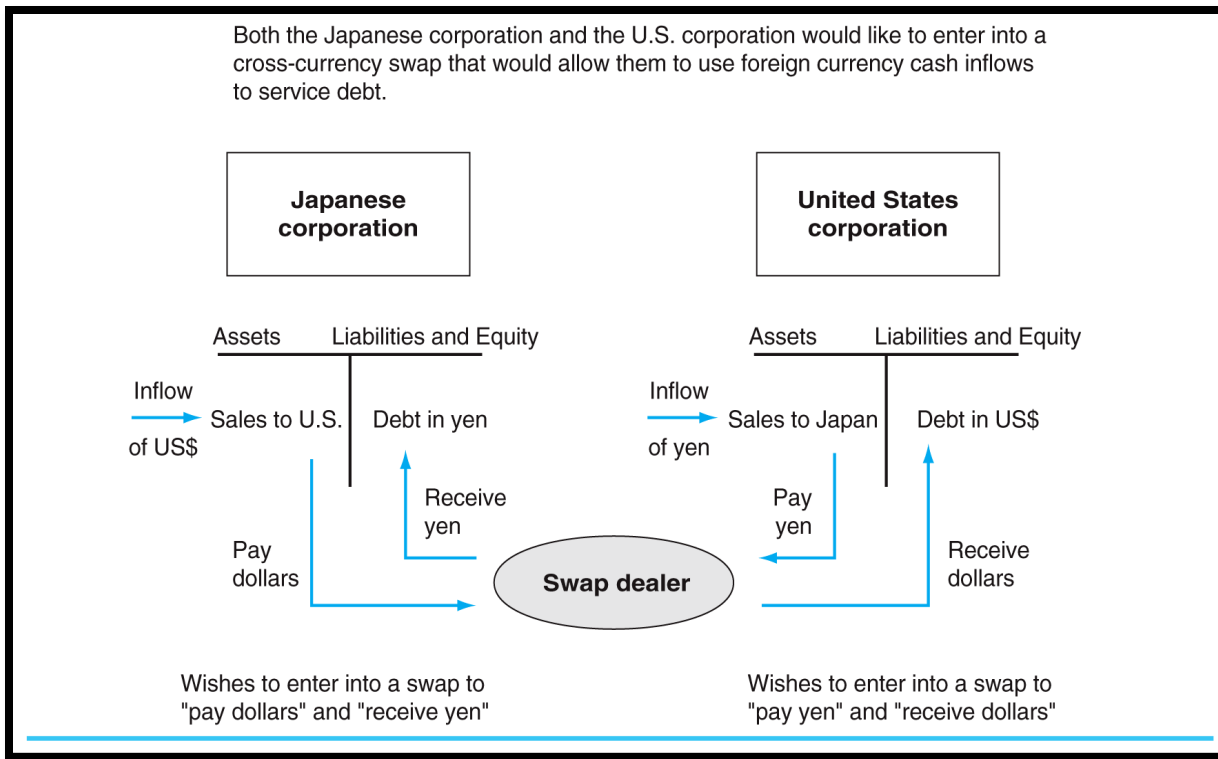
Source: Eiteman et al. (2010)

B. *Operational Techniques*

Apart from the use of financial contracts, a firm may consider some endogenously managerial hedging strategies, the so-called **Operational Techniques**:

1. Choice of the Invoice Currency

The manager of a MNC can *shift*, *share* or *diversify* the exchange rate exposure by **choosing the currency of invoice**. In our example, if the US firm chooses to invoice its UK customer with $15m then the exchange risk will be transferred to the British firm, while an invoice of £10m exposes the US firm to currency fluctuations. A more logical and frequently used approach is to split the risk in half, thus issuing an invoice of $7.5m + £5m, based on the current spot rate of USD/GBP. Now, both the US and the UK firm share 50% exchange rate exposure. (Risk-sharing agreement).

Alternatively, the MNC can chose to issue an invoice denominated in **Special Drawing Rights** (**SDR**). SDR is an artificial international reserve unit created by the **IMF** and it comprises of a weighted basket of hard currencies, currently represented by four major currencies: USD, GBP, JPY, EURO. Because the SDR comprises of the four stronger currencies in the world economy, it is more stable than any of the four taken individually which proves excellent tools for long-term hedge!. Given that SDR is an artificial currency, no payment will be made using SDR but through its equivalent of foreign currencies. For example, the Egyptian government charges for the use of the Suez Canal using the SDR.

2. *Hedging via Lead and Lag*

If the manager anticipates a depreciation of the foreign currency, then he leads (collect early) the receivables and lags (pay late) the payables. On the contrary, If the manager anticipates an appreciation of the foreign currency, then it lags (collect late) the receivables and leads (pay early) the payables[22]. Clearly, it takes two parties to strike a transaction, and both parties would like to benefit from a potential currency devaluation by using leads and lags **which requires and assumes global information asymmetry.** The most wise and efficient use of the lead/lag strategy is during the remittance of profits to the parent firm and the payment of foreign rents, raw materials, royalties, interests, dividends etc

3. *Hedging the Net Exposure*
A MNC is naturally exposed to exchange rate fluctuations in many ways, having both receivables and payables denominated in a variety of currencies. This normally requires companies to **calculate the Net Exposure!**
Sometimes it is unnecessary to take any action to hedge a foreign currency contract since, the firm is already hedged against that currency through its usual business. For instance, in 1984, **Lufthansa** signed a contract to buy $3b worth of aircraft from Boeing and entered into a $1.5b forward contract for hedging against the expected dollar appreciation. But, a major portion of Lufthansa's cash flows **were already dollar-denominated!** It just happened that the dollar depreciated against the mark, and Lufthansa experienced a major exchange rate loss from settling the forward contract

[22]*Buckley,A.(2004) Multinational Finance, 5th Ed, Pearson Education Inc.United States.*

4. *Reinvoicing Centers*

A reinvoicing center is a separate corporate subsidiary that serves as a type of "middleman" between the parent or related unit in one location and all subsidiaries in a geographic region[23]. Manufacturing subsidiaries sell goods to distribution subsidiaries of the same firm only by selling to reinvoicing center, which in turn resells to the distribution subsidiary. In this case, title passes to the reinvoicing center, but the physical movement of goods is direct from the manufacturing plant to the distribution subsidiary. Thus, the reinvoicing center handles paperwork but has no inventory.

Example 4: The U.S manufacturing unit of Carlton, Inc., invoices the firm's reinvoicing center- located within the corporate headquarters facilities in California, in U.S dollars. However, the actual goods are shipped directly to Carlton Brazil. The reinvoicing center in turns resells to Carlton Brazil in Brazilian reais. Consequently, all operating units deal only in their own currency, and all transaction exposure lies with the reinvoicing center. This method is accused of profit shifting through pricing. However, most reinvoicing centers resell at cost plus a small commission for their services to cover their costs. Figure 3.3 illustrates how reinvoicing centers re used to hedge transaction exposure.

There are five basic benefits from reinvoicing centers. First, it allows the management of all foreign exchange transaction exposure for intracompany sales to be located in one place. Second, reinvoicing center personnel can develop a specialized expertise in choosing which hedging technique is best at any moment. Third, reinvoicing center personnel are likely to obtain more competitive foreign exchange quotations from banks, because they are dealing in large transactions. Forth, guaranteeing the exchange rate for future orders: the reinvoicing center can set firm local currency costs in advance which enables distribution affiliates to make firm bids to unrelated final customers and to protect from the risk of unfilled orders. Fifth, reinvoicing centers help in managing intrasubsidiary cash flows as all affiliates settle intracompany accounts in their local currencies. The reinvoicing center needs only hedge residual foreign exchange exposure.

AVON (beauty products) produces and sells its own products in 10 Asian countries. In 1996, 16% of its total revenue were denominated in Asian currencies

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[23] *Eiteman et al. (2016)*

How did Avon protect against the forthcoming risk?

- **Balance-Sheet hedge**: the same amount of assets and liabilities were denominated in Asian currencies, so that devaluation affected the value of both assets and liabilities in the same way
- **Leads/Lags hedge**: It remitted its earrings weekly (leads) and delayed its payments to some Asian suppliers (lags)
- **Forward hedge**: When the crisis begun, just before other Asian countries began devaluation, AVON sold $50m worth of five Asian currencies forward against the dollar.

5. *Currency Diversification*

If all the inflows of US MN firm are denominated in one or two foreign currencies, substantial decline of one of these currencies would severely affect the dollar value of the firm's inflows. Some MNC's, such as Coca Cola, PepsiCo, and Philip Morris reduce their transaction exposure by diversifying their business among numerous countries. The dollar value of future inflows in foreign currencies will be more stable if the foreign currencies received are not highly positively correlated. If they are, there will be no point in diversifying among them.

Figure 3.3 Reinvoicing Centers to hedge transaction exposure
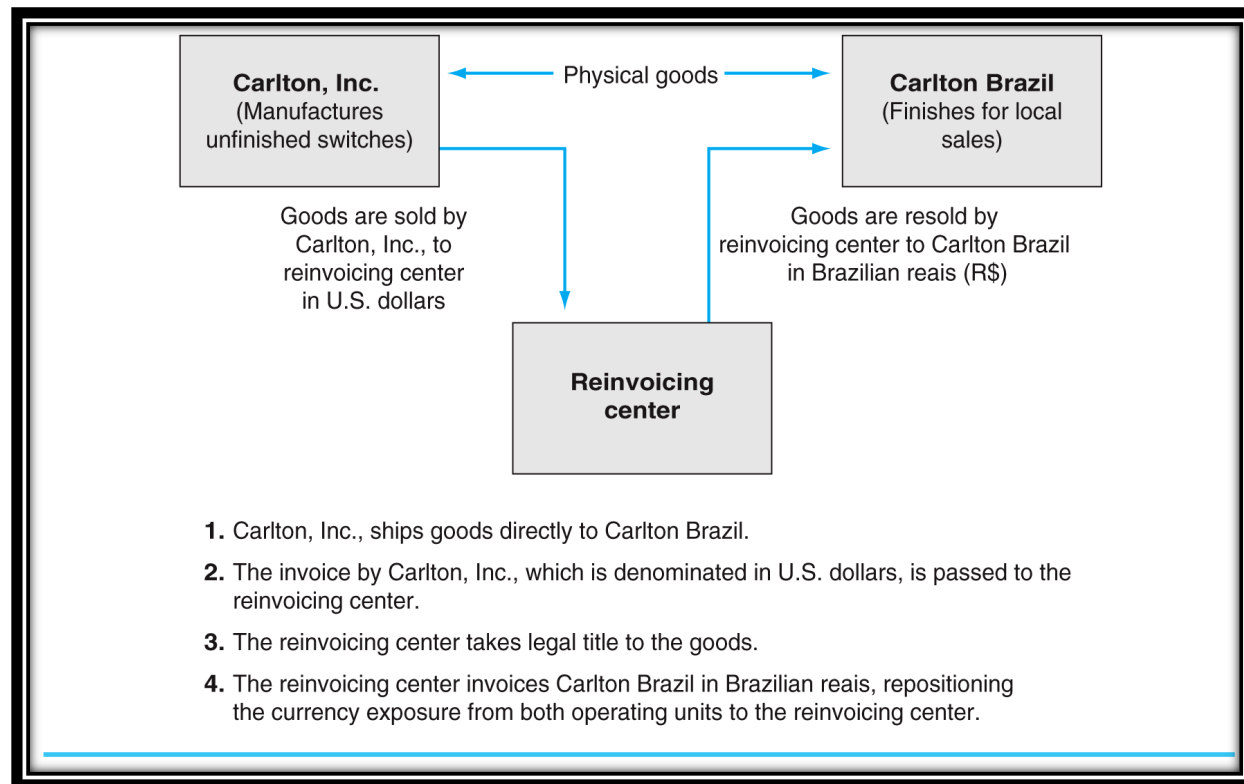
Source: Eiteman at al. (2010)

So, Should the MNC Hedge ? If there were perfect and fully efficient markets, then the firm should not hedge against exchange rate risk because stockholders already do that themselves sufficiently. Yet, there are several market 'imperfections', which calls for an active and efficient risk management from the firm and not the individual stockholder. Those imperfections are (1) Information Asymmetry as the management knows more, (2) Differential Hedging Costs as the firm can bargain low-cost hedges and specialises on hedging (3) Progressive Taxes: stable before-taxes earnings lead to lower corporate taxes and less volatile earnings and a firm can hedge toward lower taxes payables and other imperfections.

3.2.2 Operating Exposure

Operating exposure is a major part of economic exposure. Currency fluctuations can alter the company's future revenues and future costs, that is to say, its future operating cash inflows and outflows. Therefore, when the manager tries to measure operating exposure, he must look at the long-term position of the firm, with a broader economic perspective. The firm is operating exposed to currency changes if it invests in servicing a market subject to foreign competition or in sourcing goods or inputs abroad. The main sources of Operating Exposure are (1) competition, or potential competition, from foreign firms, (2) potential later exports or imports, (3)prices of local purchases may depend on imported inputs.

3.2.2.1 Management of Operation Exposure
Operating Managers must develop marketing and production initiatives to ensure profitability and competition in the long-run:

A. Marketing Management of Exchange Risk: adjust pricing and product policies on potential currency changes.

1. *Market Selection*: It can be summarized as selecting which market to sell at; domestically or abroad. *In the early 1980s, Japanese and European companies find that a strong U.S. dollar as a golden opportunity to gain market share at the expense of their U.S. rivals. However, the subsequent drop in the dollar helped US firms to come back*[24].

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[24] *Shapiro A. C. (2014)*

2. *Pricing Strategy*: Firms usually respond to operating exposure through deciding whether to emphasize market share or profit margin. *following dollar depreciation, U.S. exports will gain a competitive advantage on the world market. A U.S. exporter has the option of raising its dollar price and boosting its profit margins or keeping its dollar price constant and expanding its market share*

3. *Product Strategy*: Firms decide when to release a new product or innovation on the basis of foreign exchange exposure. *the period after a home currency depreciation may be the ideal time to introduce new products.* Exchange rate fluctuations affect product line decisions. Following home currency depreciation, a firm will potentially be able to expand its product line and cover a wide spectrum of consumers both at home and abroad. Conversely, home currency appreciation may force a firm to reorient its product line and target it to a higher-income, more quality-conscious, less price-sensitive customers. For example, Volkswagen revise its product line in the late 1970s following DM appreciation (as VW was unable to compete on the basis of low prices) to sell relatively high-priced cars to middle income customers on the basis of high quality and styling rather low-price, low-maintenance cars.

When it comes to Product Innovation, Japanese exporters responded to the rising yen by shifting production from commodity-type goods to more sophisticated, high-value products which embody advanced technology, high-quality standards which is less sensitive to price increases caused by yen appreciation[25].

B. **Production Management of Exchange Risk**: Sometimes exchange rates move so much that pricing or other marketing strategies cannot save the product. This was the case for U.S. firms in the early 1980s and for Japanese firms in the early 1990s.

1. **Input Mix:** Following the rise in the U.S. dollar in the early 1980's, most U.S. companies increased their global sourcing. Caterpillar import more than 50% of the engines from a Brazilian company.
2. **Production Shifting**: MNCs can allocate production among their several plants in line with the changing dollar cost of production, increasing production in a nation whose currency has devalued and

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[25] *Shapiro A. C. (2014)*

decreasing production in a country where there has been a revaluation. Ford reallocate various stages of production among their several plants in line with relative production and transportation costs. For example, Ford can shift production among the U.S., Spain, Germany, GB, Brazil, and Mexico.

3. **Plant location:** the economic response of the Japanese to the strong yan was to build new plants in the US instead of expanding in Japan. Likewise, German automakers such as BMW and Mercedes-Benz have built plants in the US to protect themselves from currency fluctuations.

4. **Raising Productivity:** close inefficient plants, automating heavily, negotiating wage and benefit cutbacks with unions, heighten productivity, and improve product quality.

In summary, the main implications of operating exposure is that (1) **Domestic firms** are also economically exposed to exchange rate changes, yet there is not much they can do to protect against this risk, in contrast to their competitive MNCs, (2) **International Diversification** in marketing, sourcing, production etc, neutralizes the impact of unexpected and uncertain currency fluctuations on the operational cash flows, (3) **Exchange rates under conditions of disequilibrium** (arbitraging and speculative opportunities) are likely to increase competitiveness in some markets and reduce it in others (4) Operating exposure **cannot be measured in exact terms** as transaction exposure, but it can still be dealt with in good terms (approximately).

Exchange rates under conditions of disequilibrium (arbitraging and speculative opportunities) are likely to increase competitiveness in some markets and reduce it in others. That is, firms become able to access some markets if their prices decline and prevent other firms from entering markets where prices are high because of the appreciation of its own home currency.

3.3 Translation Exposure

Translation Exposure, also called **Accounting Exposure**, which is the exposure of the MNC's **consolidated financial statements** to exchange rate fluctuations[26]. The parent firm wishes to translate all **subsidiary financial statements** that are **denominated in a foreign currency**, to the reporting currency of the home

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[26] *Madura, J. (2018)*

office. Translation exposure is the potential for an increase or decrease in the parent's net worth and reported net income caused by a change in exchange rates since the last translation.

The International Accounting Standards (IAS) 27 states that: "An enterprise should consolidate another entity when in substance the enterprise controls that entity". Control is defined as the power to govern the operating and financial policies. In this case, the controlling enterprise is called **parent** and the controlled entity is called **subsidiary.** Consolidated statements are financial statements of a group (parent and subsidiaries) **presented as those of a single economic entity**, and they must include all subsidiaries. All entities in the same group must use the same accounting policies and their reporting dates cannot be more than three months different from the group reporting date.

The financial statements of the parent and its subsidiaries used in preparing the consolidated financial statements should all be prepared as of the same reporting date, unless it is impracticable to do so. [IAS 27.26] If it is impracticable a particular subsidiary to prepare its financial statements as of the same date as its parent, adjustments must be made for the effects of significant transactions or events that occur between the dates of the subsidiary's and the parent's financial statements. Also, in no case may the difference be more than three months. [IAS 27.27]. Consolidated financial statements must be prepared using uniform accounting policies for like transactions and other events in similar circumstances. [IAS 27.28].

Translation in principle is simple. Foreign currency financial statements must be restated in the parent company's reporting currency. If the same exchange rate were used to premeasure each and every line item on the individual statement (I/S and B/S), there would be no imbalances resulting from the remeasurement. What if a different exchange rate were used for different line items on an individual statement (I/S and B/S)?. An imbalance would result!

Why would we use a different exchange rate in remeasuring different line items? In fact, translation principles in many countries are often a complex compromise between historical and current market valuation. Historical exchange rates can be used for certain equity accounts, fixed assets, and inventory items, while current exchange rates can be used for current assets, current liabilities, income, and expense items.

Most countries today specify the translation method used by a foreign subsidiary based on the subsidiary's business operations (subsidiary characterization).A foreign subsidiary can be classified as either (1) **Integrated Foreign Entity** – one which operates as an extension of the parent company, with cash flows and line items that are highly integrated with the parent. (typically remeasured using the *temporal method, or (2) Self-sustaining Foreign Entity* – one which operates in the local economy independent of its parent. (typically are translated at the *current rate method)*. The foreign subsidiary should be valued in terms of the currency that is the basis of its economic viability.

A foreign subsidiary's *functional currency* is the currency of the primary economic environment in which the subsidiary operates and in which it generates cash flows. In other words, it is the dominant currency used by that foreign subsidiary in its day-to-day operations. The geographic location of a subsidiary and its functional currency can be different. For example: a US subsidiary located in Singapore may find that its functional currency could be: (1) US dollars (integrated subsidiary), or (2) Singapore dollars (self-sustaining subsidiary), or (3) British pounds (self-sustaining subsidiary). However, the US, requires that the functional currency of the foreign subsidiary be determined based on the nature and purpose of the subsidiary.

Why Translate to the Home Currency?. The value of a company is measured on the basis of the entity as a whole. If the home office is doing extremely well, but a major foreign subsidiary (or more) is performing really bad, then the real value of the company is measured on the combination of the two (or more). Clearly, the performance of foreign subsidiaries does not only depend on the percentage of market share, total revenues etc, but also on how much those revenues and foreign assets are worth in home currency value. This net worth, is measured in effect of the current, historical or averaged exchange rates between the home currency and the foreign (functional) currency.

Does Translation Exposure Matter?. Some analysts suggest that it is irrelevant since it does not affect the MNC's cash flows. However, the consolidated earnings of MNCs with foreign subsidiaries are affected as a result or translation exposure. For instance, in 1996, the chief financial officer of IBM announced a decline in the second quarter's earnings of $0.25 per share because of loss from foreign earnings translation. Investors reacted by selling their shares of IBM stocks.

Example 5: A UK company has a single wholly owned subsidiary in France. The subsidiary has exposed assets of €100m and liabilities of €50m. Consider now that the EURO depreciates from €1.5 per pound to €1.7 per pound. What is the potential foreign-exchange loss on the company's net exposure?

Exposed Assets	€ 100m
Exposed Liabilities	€ –50m
Net Exposure	€ 50m
Pre-devaluation rate (€1.5=£1)	€ 50m = £ 33.33m
Post-devaluation rate (€1.7=£1)	€ 50m = £29.41m
Potential Exchange Loss	£ 3.92m

3.3.1 Determinants of MNC's Translation Exposure

A. The proportion of its business conducted by foreign subsidiaries:

The greater this proportion, the larger the translation exposure. If there are *two MNCs both generates about 30% of their sales from foreign countries. However, the first generates all its international business by exporting.* While the second has a large Mexican subsidiary that generates all of its international business. Which has more translation exposure?. The first MNC has no translation exposure although it is subject to economic exposure while the second MNC has substantial translation exposure

B. The location of its foreign subsidiaries:

The financial statement items of each subsidiary are typically measured by the home currency of the subsidiary's country if it is self-sustaining entity. If there are *two MNC's each have one large foreign subsidiary that generates about 30% of their sales. However, the first has a subsidiary located in Mexico while.* The other has a subsidiary located in Canada. Which MNC has higher degree of translation exposure? In fact, the MNC which has subsidiary in Mexico has more translation exposure because the peso's value fluctuates more than the Canadian dollar.

C. The accounting methods that it uses to translate when consolidating financial statements:

There are four widely used methods used for translating foreign currency financial statements: (a) Current/Non-Current method, (b) Monetary/Non-Monetary method, (c) Temporal method (d) Current method. The choice of translation method will possibly result in different amounts of translation exposures and to lead to different types of decision-making. The possible extent of foreign-exchange gains and losses often depends on the rules that govern translation and the choice of translation method will possibly result in different amounts of translation exposures and will lead to different types of decision-making. Table 3.2 compares between the above mentioned four translation methods in terms of how main balance sheet and income statement items are translated.

Table 3.2 Comparison of Translation Methods

Balance Sheet A/Cs	Cur/NonCur	Mon/NonMon	Temporal	Current
Cash	C	C	C	C
Receivables	C	C	C	C
Payables	C	C	C	C
Inventory	C	H	H or C	C
Fixed Assets	H	H	H	C
Long-Term Debt	H	C	C	C
Net Worth	H	H	H	H

Note: C denotes the Current exchange rate and H the historical rate.

3.3.2 Management of Translation Exposure

There are two commonly used methods for dealing with translation exposure:

A. **Balance Sheet Hedge:** It requires an equal amount of exposed foreign currency assets and liabilities on a firm's consolidated balance sheet. If this can be achieved for each foreign currency, net translation exposure

will be zero. Complete monetary balance cannot be achieved under the current rate method. The cost of a balance sheet hedge depends on relative borrowing costs. However, balance sheet hedging for managing translation exposure may give rise to transaction exposure, e.g. a firm may attempt to even up net assets exposed with more foreign-denominated borrowing, which may lead to major foreign exchange risk.

B. Derivatives Hedge: This type of hedging involves the purchase of financial derivatives, such as a forward or an option. Thus, it needs **speculation** about the future movement of exchange rates. For example, consider a US MNC that has one subsidiary in the UK. As of the beginning of its fiscal year, it forecasts its annual earnings to be £20 million. The subsidiary decides to reinvest the entire earnings within the UK and does not want to remit any earnings to its US parent. There is no foreseeable transaction exposure in the near future from the future earnings but translation exposure exists. If the £1=$1.5 now and remains constant, the forecasted translation of British earnings into U.S. dollars would be $30 million.

In the consolidated profit and loss account, the British earnings will be translated at the weighted average value of the pound over the course of the year (current method). To hedge against the decline in the £ value (translation exposure), It can sell £20 million one year forward at $1.5. At the end of the year, if the spot rate has fallen to $1.2/£, the company will have received the difference of 0.3 multiplied by £20m or $6m through daily settlement. If the pound appreciates during the fiscal year, the company will have to pay the difference between $1.5 and the higher rate. In this case the company will have incurred a real loss in a failed attempt to save a potential paper loss.

3.3.3 Limitations of Hedging Translation Exposure

1. *Inaccurate earnings forecasts:* recall the last example, if the actual earnings turned to be much higher than £20 m, the translation loss will exceed the hedging gains,

2. *Inadequate forward contracts for some currencies:* forward contracts are not available for all currencies.

3. *Accounting distortions:* translation losses are not tax deductible while gains from forward contracts used in hedging are taxed

4. *Increased transaction exposure:* recall the last example, if GBP appreciates against the dollar, forward hedging will generate a transaction loss that will offset the translation gain.

In conclusion, some items that are source to translation exposure are also sometimes source to transaction exposure. Those cases occur when the subsidiary has **receivables and payables** (short-term) **denominated in a foreign currency**. Then, these amounts give rise to both transaction and translation exposure (if they are not exactly matched). The management of this sort of exposure can take place through the means described in the last lecture (forwards, money hedge, futures, options, lead/lag etc). However, we must be careful since **the hedging of transaction exposure can create translation exposure**, and the hedging of translation exposure can create transaction exposure. **It is difficult to eliminate both exposures.**

Managers rarely create transaction exposure in the expense of eliminating translation exposure. Most MNCs practitioners place as most significant type of exposure the transaction exposure, then the translation exposure, and finally the operating exposure. This is because **transaction exposure involves real future cash flows**, whereas translation exposure has no real effect in generating future cash flows, but only on the translation of recorded cash flows (not their conversion.

To sum up, **minimizing translation exposure** concentrates on the book value of foreign currency denominated assets and liabilities. Be careful though since the hedging for translation and transaction exposure sometimes overlap. However, **minimizing transaction exposure** concentrates on managing firm's real future cash flows by hedging against the firm's foreign currency denominated receivables and payables. Finally, **minimizing operating exposure** ignores accounting earnings and concentrates on the economic value of the firm by taking into account the foreign-currency denominated opportunity costs, competition, market shares etc, in addition to all future expected cash flows.

Problems and Questions:

1. Explain the main differences between transaction, operating and translation exposures?

{Guided answer: Section 3.2 and 3.3}

2. Differentiate between a currency call option and a currency put option.

{Guided answer: Section 3.2 }

3. Compare and contrast forward and option contracts.

{Guided answer: Section 3.2}

4. Mexico is a major exporter of oil (5% of world oil supply). Thus, oil prices are highly linked to the Mexican peso. How can a firm hedge against the (historically) volatile nature of the Mexican peso?

Buy oil futures to hedge the peso payables

Sell oil futures to hedge the peso receivables

In the same sense, one can use coffee futures to hedge against a Brazilian reais exposure?

Buy coffee futures to hedge the reais payables

Sell coffee futures to hedge the reais receivables

5. Robert Gordon buys a call option on U.S. dollars for £0.01 per U.S. dollar. The strike price was $1.25/£ and the spot price at the time the option was excercised was $1.30/£. Assume that there are $50,000 dollars in the Sterling pound contract. What was Robert's net profit on the call option?

Robert Gordon's Net profit = 50,000*(1.30-1.26) = $2,000

6. A UK firm plans to use a money market to hedge its payment of 3,000,000 Australian dollars for Australian goods in one year. r_{AD}=0.12p.a., r_{UK}=0.07p.a., S_0=£0.45/A$, and 360-day F_T= £0.44/A$. Which hedging method (Forward market, option market, or money market) should the UK firm use if the option exercise price is £ 0.43/A$ and the option premium is £0.01/A$?

Money Market cost 1289732, Forward market cost 1320000, option market cost 1322100. This indicates that Money market is most suitable as it costs less than other markets.

7. Nicholas reduced the value of Baring Brothers Bank from roughly $500 million to $1.60. Nicholas traded futures and options on the Nikkei 225:

    a. He was long Nikkei 225 futures

    b. He was short Japanese government bond futures

    c. He short both put and call options on the Nikkei index.

What was the logic behind each position? And what was wrong to incur a the total loss of $1.39 billion.

Regarding long Nikkei 225 futures, he expected an improvement in the market conditions where the Nikkei 225 index will go up that will be accompanied with an increase in interest rate. He also speculates that such improvements will not very huge and wanted to capitalise from the premium of the put and call options on the index. Unfortinately, a catastrophic earthquick happened that caused a huge decline in the index and the premium were not enough to cover his losses.

8. True/Loss Questions

No	Statement	T	F
1	Translation exposure is more important than transaction exposure		✔
2	MNCs cannot hedge operating exposures		✔
3	Even if a company is not exporting or importing, it may still be exposed to operating exposure	✔	
4	Using options to hedge transaction exposure limit the downside risk but keeps the upside potential	✔	

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Chapter 4: Financing the Multinational Firm

Topic Title: *Sourcing equity and debt globally*

Key Words:

Intermediation, securitization, Eurobond, Eurocurrency loans, cross-listing, depository receipt, global shares

Summary:

This chapter highlights the main sources of corporate financing. Then, it distinguish between intermediation and securitization. Next, It illustrates different methods of international debt sourcing. After that, it compares between Eurobonds and Eurocurrency loans. Finally, it explores different instruments of equity financing

Outcomes and Learning Objectives:

1. *To explain the main sources of corporate financing*
2. *To distinguish between intermediation and securitization*
3. *To illustrate different methods of international debt sourcing*
4. *To compare between Eurobonds and Eurocurrency loans*
5. *To differentiate between available instruments of equity financing*

Chapter Outline:

4.1 Introduction

4.2 Corporate Sources of Funds

4.3 International Debt Markets

4.3.1 Bank Loans and Syndications

4.3.2 Euronote Market

4.3.3 International Bond Markets

4.4 International Equity Markets

4.4.1 Cross-listing

4.4.2 Depositary Receipts

4.4.3 Euroequities and Global Shares

4.1. Introduction

The increasing globalization of financial markets and the growing complexity of companies work means that the sourcing of capital would no longer stops at the boarder's edge. MNCs are no longer multinational in terms of their operations but also on the basis of their capital structure. They know that by sourcing capital globally; will bring them a wide spectrum of opportunities. It will enable them overcome domestic illiquid domestic markets and broader the international participation in their capital. In addition, sourcing capital globally enable MNCs access global securities markets that price shares according to international standards.

4.2 Corporate Sources of Funds

Generally, financing may take the form of internally generated cash, external short-term funds and external long-term funds. Internal financing is about the degree of liquidity and levels of turnover within the operational activities of the firm. MNCs strategy involves using this wide range of external sources of funds for their operations. External financing includes debt financing and equity financing.

Debt financing is the preferred and overwhelming source of external funding while equity financing is in the decline. Regardless of the source, MNCs require large amount of funds (loans, bond or equity) which usually obtained through public offering. In public issues (bond or equity) the issuer will work with an investment bank to assist in designing and marketing the issue. Usually this process involves underwriting – purchasing the securities and then selling/distributing them. However, Private issues are bank loans or privately placed bonds. Privately placed bonds are directly sold to the investors and have complex and customized loan agreements – called covenants.

External debt financing is becoming increasingly important in all countries, in contrast to equity financing whose role is steadily declining. External financing differs from country to country. For example, German, French and Japanese firm rely heavily on debt while UK and US firms raise more funds from issuing equity. Yet, bank borrowing is on decline and MNCs prefer to issue bonds (debt) directly by themselves. This process is called securitisation, which emerged largely due to massive financial de-regulations (US in 1981, Japan in 1986). This allowed firms to compete and equally attract low-cost borrowing in comparison to financial intermediaries (such as investment banks).

Financial innovation has dramatically increased international capital mobility and presents opportunities for value creation. This mobility can take place through international securitization or international financial intermediation. Figure 4.1 highlights the distinction between these two mechanisms for international fund flows.

Figure 4.1 Securitization versus Intermediation
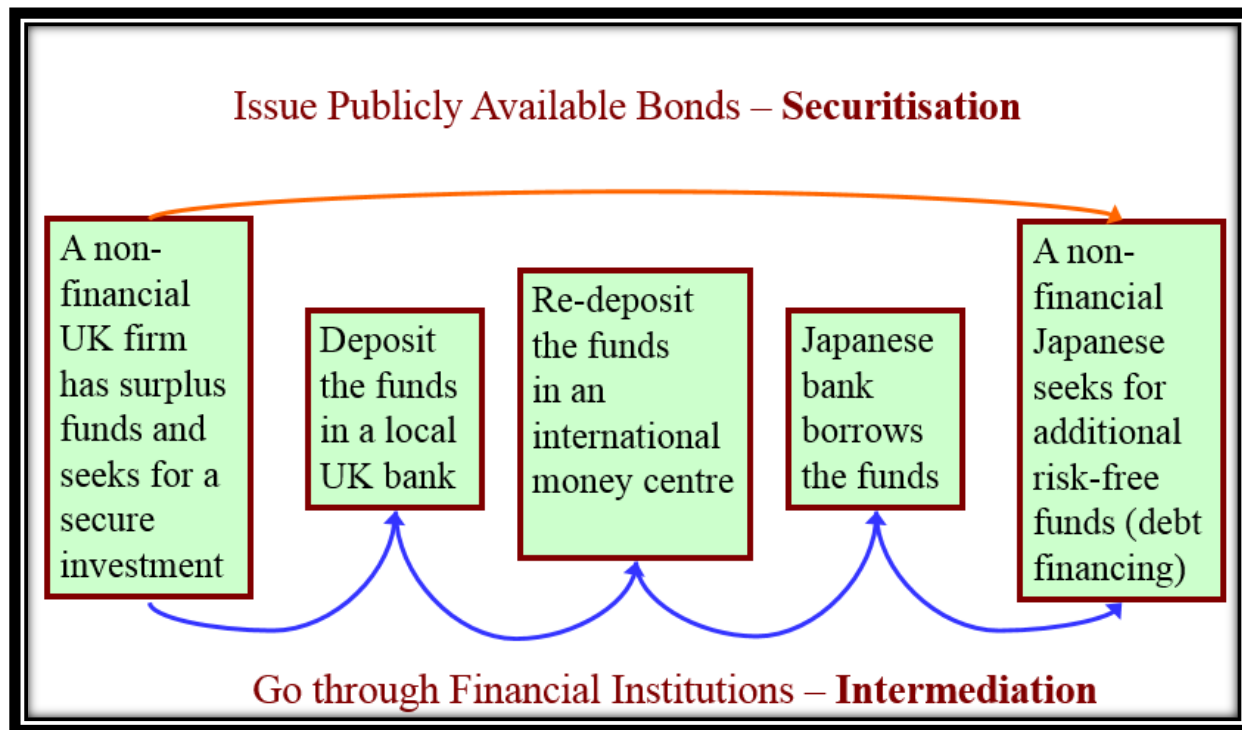
4.3 International Debt Markets

The debate on the optimal capital structure between the so-called traditionalists and the Modigliani and Miller school reaches to the conclusion that an optimal of debt and equity exists for every firm that minimizes its cost of capital for a given level of business risk. The interest payments on debt are tax deductible. However, as interest expenses increase, the probability of bankruptcy will increase too. Hence, it is favourable to increase the use of debt financing until the point at which the bankruptcy probability becomes large enough to offset the tax advantage of using debt. Figure 4.2 shows how the cost of capital varies with the debt ratio.

Figure 4.2 The Cost of Capital and Financial Structure
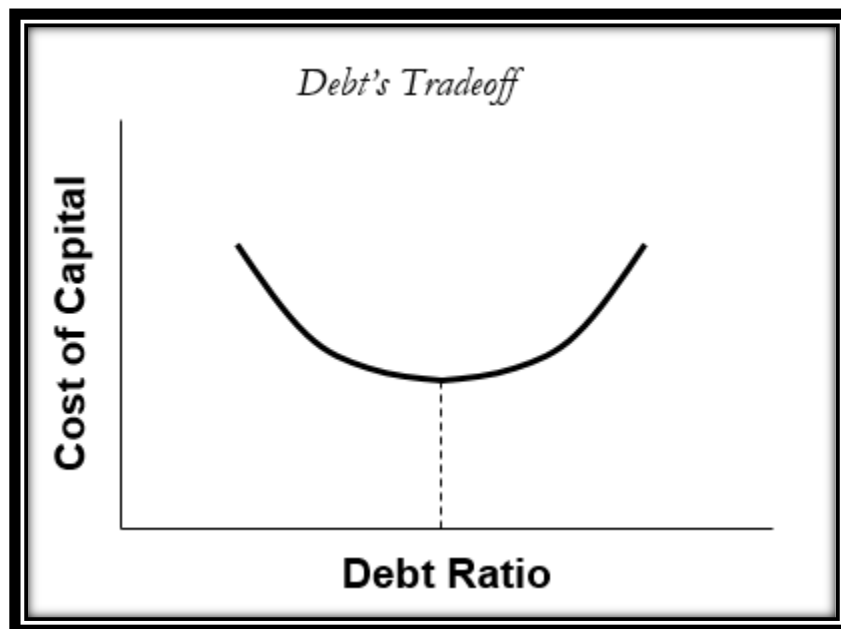
Source: Madura (2018)

A MNC will normally need debt in a variety of maturities, payment structures and currencies of denomination. The international debt markets have different instruments that vary according to the source of funding, pricing structure, maturity and subordination to other debts or link to equity instruments. Therefore, MNCs often use all three major sources of debt financing: international bank loans and syndications, Euronote market, and the international bond market[27]. Figure 4.3 illustrates those three international debt markets and their instruments.

4.3.1 Bank Loans and Syndications

International bank loans are short to medium-term floating rates loans offered by international banks. However, **Eurocredits** are bank loans to MNCs, sovereign governments, and banks denominated in Eurocurrencies and offered by banks in countries other than the country in whose currency the loan is denominated.

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[27] *Eiteman et al. (2016)*

Eurocurrency is a freely convertible foreign currency deposited in a bank outside its country of origin. Hence, U.S. dollars deposited in Paris is called **Eurodollars**. These deposits can be placed in a foreign bank or in the foreign branch of a U.S. bank-called **Eurobanks**-that accept deposits and make loans in foreign currencies. **The Eurocurrency market** consists of those Eurobanks.

Increasingly, Eurodollar loans have a **Multicurrency Clause** which gives the borrower the right to switch from one currency to another on any rollover (or reset) date. This clause enables the borrower to match currencies on cash inflows and outflows (exposure management techniques!) and to take advantage from own expectations of currency changes.

Interest rate differential between domestic and Eurocurrency money markets exist because of additional costs, controls, sovereign risk. However, **arbitrage** activities eliminate most of the differential between the two. **Eurocurrency Spread** is the margin between lending and deposit rate (Libor-Libid). This spread is narrower in Eurocurrency money markets than in domestic money markets because the lending rates can be lower for the following reasons:

1-The absence of regulatory expenses that raise costs and lower returns on domestic transactions.

2-Most borrowers are well-known, reducing the cost of information gathering and credit analysis.

3-Eurocurrency lending is characterised by high volume, allowing for lower margins.

4-Eurocurrency lending can and does take place out of tax-heaven countries, providing far higher after-tax returns.

In addition, Eurocurrency deposit rates are higher than domestic rates because (1) They must be higher to attract domestic deposits, (2) Eurobanks can afford to pay higher rates based on lower regulatory costs, (3)Eurobanks are not subject to the interest rate ceilings that prevail in many countries, (4) A large percentage of deposits can be lent out. Recently, LIBOR started to fade as a benchmark for lending money and more borrowers can borrow at **LIBID** (rate paid by one bank to another for a deposit) which is 12.5 basis point below LIBOR

Syndicated credits are loans offered by a number of banks to spread the risk of every large loans among the syndicated banks. A syndicated bank credit is arranged by a lead bank on behalf of its client, where each participant bank provides a portion of the total needed funds. The lead bank will agree with the borrower to determine the loan conditions.

Example 1:A San Miguel has arranged a $250 million, five-year, dollar-denominated Eurocurrency (Eurodollar) loan with a syndicate of banks led by Credit Suisse and Deutsche Bank. With an up-front syndication fee of 2.0%, net proceeds to the MNC are:

$$\$250,000,000-(0.02 \times \$250,000,000)=\$245,000,000$$

The interest rate is set at Libor+1.75%, with Libor reset every six months. Assuming an initial Libor6 rate for dollar of 5.5%, the first semi-annual debt service payment is:

$$((0.055+0.0175)/2) \times \$250,000,000=\$9,062,500$$

The MNC effective annual interest rate for the first six months is therefore,

$$(\$9,062,500/\$245,000,000) \times 2 \times 100 = 7.40\%$$

Every six month the effective annual cost will change with Libor6.

Figure 4.3 International Debt Markets and Instruments
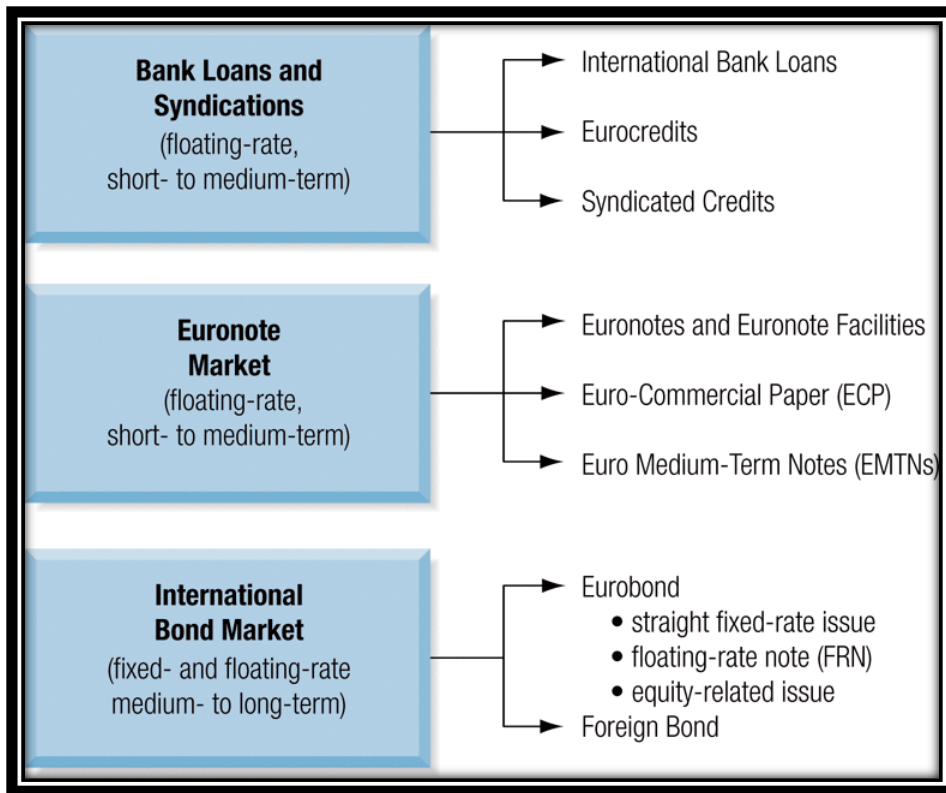
Source: Eiteman at al. (2016)

4.3.2 Euronote Market

It is the market of short to medium-term debt instruments sourced in the Eurocurrency markets. Those instruments can be categorised into two main groups[28]: underwritten facilities (Euronotes and Euronote facilities) and non-underwritten facilities (Euro-Commercial Paper and Euro Medium-Term Notes).

Euronotes are short-term notes issued by the borrowers, which are then placed or distributed by the financial institutions (facility). A client-borrower makes an agreement with a facility to issue Euronotes in its own name and underwritten by the facility. The maturities of the notes are from 3 to 6 months. Euronotes are more attractive to MNCs than syndicate Eurobank loans because of the low short-term risk involved, i.e. a lower premium cost (typically LIBOR plus 1/8 percent). Banks also find themselves attractive because they earn an

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[28] *Eiteman et al. (2016)*

underwriting fee, and the interest premium. Euro-Commercial Paper (ECP) is a non-underwritten short-term Euronote.

Euro-medium-term notes are fixed- or floating- rate notes issued continuously by MNCs with maturities ranging from less than a year to about 30 years although most are under 5 years. An Euro-MTN issue is partially sold on a continuous basis rather than all at once like a bond issue. Euro-MTN are not underwritten but usually sold through agents. The key advantages of Euro-MTN are their Flexibility (no strict registration regulations and Euro-MTN's give issuers the flexibility to take advantage of changes in the shape and level of the yield curve), speed, and cost (The issue of Euro-MTN is cheaper than Euro-bond issue. The cost of sitting up a Euro-MTN program are estimated, in 1996, to be $131,500. However, the total cost of Eurobond issue (excluding the underwritten fees) is $100,000). The main disadvantage, however, is that issuers are unable to rollover its existing notes or place additional notes when necessary.

4.3.3 International Bond Market

International bonds are **long-term debt** financial products that are issued by foreign companies or governments and **denominated in local currencies** and subject to local laws. International bond market is a portion of the domestic bond market. The US and Switzerland are the most important foreign bond markets. An international bond issue is a **public offering of loan**, where the bond bears similar features as the domestic bond and come in different flavours: (1) **Fixed-rate issues**: fixed coupon, full repayment at maturity, (2) **Floating-rate notes**: variable coupons, reset payments at fixed intervals with reset coupons according to Treasury bill rates, (3) **Equity-related bonds**: combined features of debt and common equity. These can be Convertible Bonds (into shares before maturity) or Equity Warrants (the right to buy common stock at a specified price within a set period).

Dual-currency bonds are fixed-rate bonds that issued in one currency and pay coupons in the currency at which it was issued (say Euro). However, the principal at maturity is paid in another predetermined currency (say GBP). Coupon interest payments are usually higher than fixed-rate coupons. From the investor point of view, it includes a long-term forward contract, i.e. if the pound appreciated over the life of the bond, the bearer receives more (the principal payment is worth more)

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A **Foreign bond** is one offered by a foreign borrower to the investors in a national capital market and denominated in that country's currency. For example, a German MNC issuing yen-denominated bonds to Japanese investors. Foreign bonds must meet the security regulations on the country at which they are issued which raise **regulatory and tax arbitrage.** For example, prior to 1984 the US had a 30% withholding tax on interest income paid to non-residents who buy US bonds. Due to rising competition, the tax law was repealed.

A **Eurobond** is one denominated in a particular currency but sold to investors in national capital markets other than the country that issued the denominated currency. For example, A Dutch borrower issuing dollar-denominated bonds to investors in the UK and the Netherlands. *Eurobonds are usually **bearer bonds** where possession is evidence of ownership.*

Example 2. In 1984, Exxon arbitrages using Eurobonds through selling $1.8 billion principal amount of zero-coupon Eurobonds due November 2004 at an annual compounded yield of 11.65%, realising net proceeds of about $199 million:

Bond value= $1,800,000,00/(1.1165)^{20}=\$199,000,000$

It then used part of the proceeds to buy $1.8 billion principal amount of Treasury bonds maturing in November 2004 from which coupons had been removed and sold separately. The yield on the stripped Treasurys, was around 12.20%.

At this yield it would have cost Exxon $180 million to purchase the $1.8 billion in stripped Treasury bonds:

Bond value=$1,800,000,000/(1.1220)^{20}=\$180,000,000$

- At this price, Exxon earned the difference of about $19 million.

There are a number of differences between Eurobonds and Eurocurrency loans:

1. *Cost of borrowing:* Eurobonds are issued in both fixed-rate and floating-rate forms while interest rate on a Eurocurrency loan is variable. Fixed-rate bonds are an attractive exposure-management tool because known long-term currency inflows can be offset with known long-term outflows in the same currency. In contrast, Eurocurrency loans better hedge non-contractual currency exposures because the

interest rate on a Eurocurrency loan is variable (*implications for exposure management*). However, Borrowers benefit when rates decline, but hurt when rate rise.

2. *Maturity:* Eurobonds still have longer maturities.

3. *Size of issue:* historically Eurocurrency loans were larger than Eurobonds but the opposite is true now.

4. *Flexibility:* Eurocurrency loans are more flexible than Eurobonds in both drawdown and repayment periods. *In the case of a Eurobond issue, the funds must be drawn down in one sum on a fixed date and repaid according to a fixed schedule unless the borrower pays a substantial prepayment penalty.* However, the drawdown in a floating-rate loan can be tailored to suit borrower's needs with a fee of about 0.5% per annum (cheaper than drawing down and re-depositing) paid on the unused portion. This loan can be prepaid in whole or in part at any time.

5. *Speed:* Eurobond financing generally takes more time to arrange than Eurocurrency loans.

A **Global bond** is a very large international bond offering that is simultaneously issued in many parts of the world usually in a single currency. Global bonds enlarge the financing opportunities of the MNC since they address multiple markets simultaneously. MNCs becomes better known overseas, broaden their investor base, and often save on financing costs.

4.4 International Equity Markets

There are a number of methods at which MNCs can use to source equity globally:

4.4.1 Cross-Listing

If the home capital market is segmented, a firm could theoretically benefit from cross-listing in a foreign market. Cross boarder listing refers to the issuing of stock in foreign markets. A firm must choose one or more stock markets on which to cross-list its shares and sell new equity. Just where to go depends mainly on the firm's specific motives and the willingness of the host stock market to accept the firm.

Generally, an MNC may benefit from cross-border listing of its shares in the following ways: (1)the diversification of equity funding risk which increase its stock price and lower its costs, (2) Greater market

which enable the company to raise more financing capital, (3)Enhance the liquidity of the company's stock, (4) Enhance the visibility of the company's name and products, (5)Cross-listed shares may be used as the 'acquisition currency' for taking over a foreign company, (6) Improve the company's corporate governance and transparency.

Foreign equity may prove a key instrument for expanding the size of the company and gathering operational funds since most of the MNCs have more than 50% of their revenues, assets or liabilities abroad. Therefore, foreign equity financing provides a direct opportunity to the local stakeholder to hold part of the foreign MNC which thrives in the particular country. KLM issued 50m shares to raise $304m by placing 7m shares in Europe, 7m in the US and 1m in Japan because they say that "the domestic market is far too small for such an operation"

In addition, international stock offerings spread the firm's name in local markets and establishes the firm as a world player. It is financing accompanied with cheap marketing. For example, Apple's Computers investor relations manager explains that one of the main reasons Apple chose to list its shares in Tokyo and Frankfurt was "to raise the profile of Apple in those countries to help us sell computers". The US and the UK markets attract a great number of foreign stock issuances denominated in US$ and GBP, because according to studies, they get better prices for IPOs and SEOs and offer a sophisticated shareholder base

In 1993, Daimler-Benz (now DaimlerChrysler) became the first German company to cross-list on the NYSE. To qualify for the listing, Daimler-Benz had to translate its German financial statements to conform with the US GAAP. The differences in translation between the two GAAPs' was apparent in the firm's published results for fiscal 1994. Although the firm showed a profit of $636m under German GAAP, it reported a loss of $748m under US GAAP!.

Why Daimler-Benz exposed itself intentionally to such costly translation exposure? The manager of Daimler-Benz prioritizes in minimizing economic exposure and not translation exposure. In anticipation of the listing, Daimler-Benz's shares rose more than 30%, which means that investors value economic expansion.

There are certain disadvantages associated with cross-boarder listing. (1)The firm allows for more foreign investors to become shareholders (less centralised control, (2) The firm will be more exposed to unfriendly

takeover, subject to local laws and local market pressure and trends, (3) The firm will need to pay more attention to short-term goals. **Also,** the most serious of the barriers of cross-boarder listing includes the future commitment to providing full and transparent disclosure of operating results and balance sheets as well as a continuous program of investor relations.

However, trends seem to be reversing in recent years as many MNCs (mostly large) **chose to delist** from many foreign exchange markets. On the LSE, foreign share listing drop to 351 in 2004 from 419 in 2002, where on the NYSE they drop to 460 from 473. Tokyo's foreign listings drop to 29 in 2005 from 125 in 1990!. MNCs realise that, **due to technological and telecommunication developments** (internet, cheap international calls etc), the investor is now able to reach and buy the foreign stock wherever in the world.

Also, like MNCs, investors prefer to trade shares in the **market at which they will get the best price**. Thus, MNCs are becoming very selective and now chose very carefully countries for listing. By doing that, only then they truly take advantage of globalisation. For example, in 2005 IBM delisted from Tokyo, Vienna, Frankfurt and Zurich and listed in Euronext (traded in Euros).Also, foreign cross-listing does **not require an initial home listing** so that the firm goes public. Thus, many firms choose not to list at home and go directly to a foreign market

4.4.2 Depositary Receipts

Depositary receipts (depositary shares) are negotiable certificates issued by a bank to represent the underlying shares of stock, which are held in trust at a foreign custodian bank. *American depository receipts* (ADRs) are certificates traded in the United States and denominated in US dollars. ADRs are sold, registered, and transferred in the US in the same manner as any share of stock with each ADR representing some multiple of the underlying foreign share (allowing for ADR pricing to resemble conventional US share pricing between $20 and $50 per share).

ADRs can be exchanged for the underlying foreign shares, or vice versa, so arbitrage keeps foreign and US prices of any given share the same after adjusting for transfer costs (see Figure 4.4). ADRs also convey certain technical advantages to US shareholders. While ADRs are quoted only in US dollars and traded only in the US, Global Registered Shares (GRSs) can be traded on equity exchanges around the globe in a variety of currencies.

Figure 4.4 Mechanics of American Depositary Receipts (ARDs)
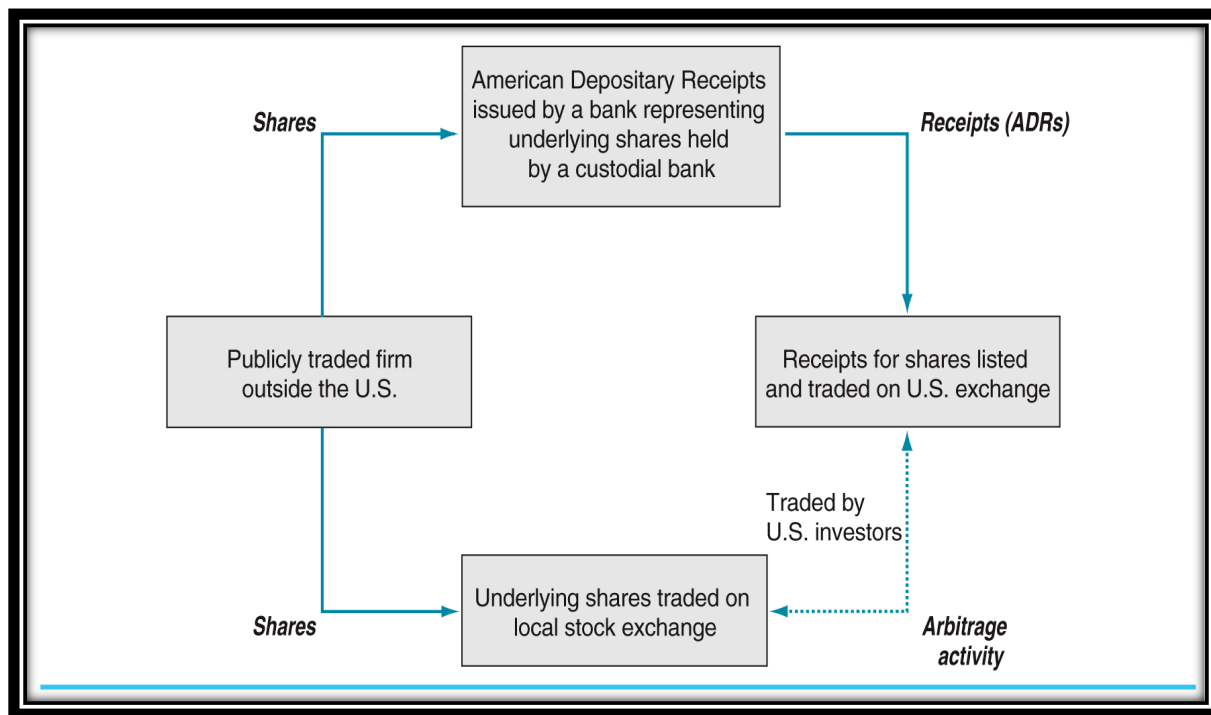
Source: Eiteman at al.(2016)

4.4.3 Euroequities and Global Shares

Similar to Like the rest of the Euromarkets, Euroequities are issuances of foreign equity denominated in a currency other than the one of the country of the MNC. To the extreme, there exist the Global Share (like global bond). Global Shares are listed and traded at the local currency in the same form on any market in the world. The first Global Share issuance arose in late 1998 when the newly merged DaimlerChrysler was formed. However, as of August 2005, global shares had been issued by only three other companies (Swiss financial services UBS, German chemical Celanese, and Deutsche Bank) (Figure 4.5).

Figure 4.5 Global registered Shares (GRS)
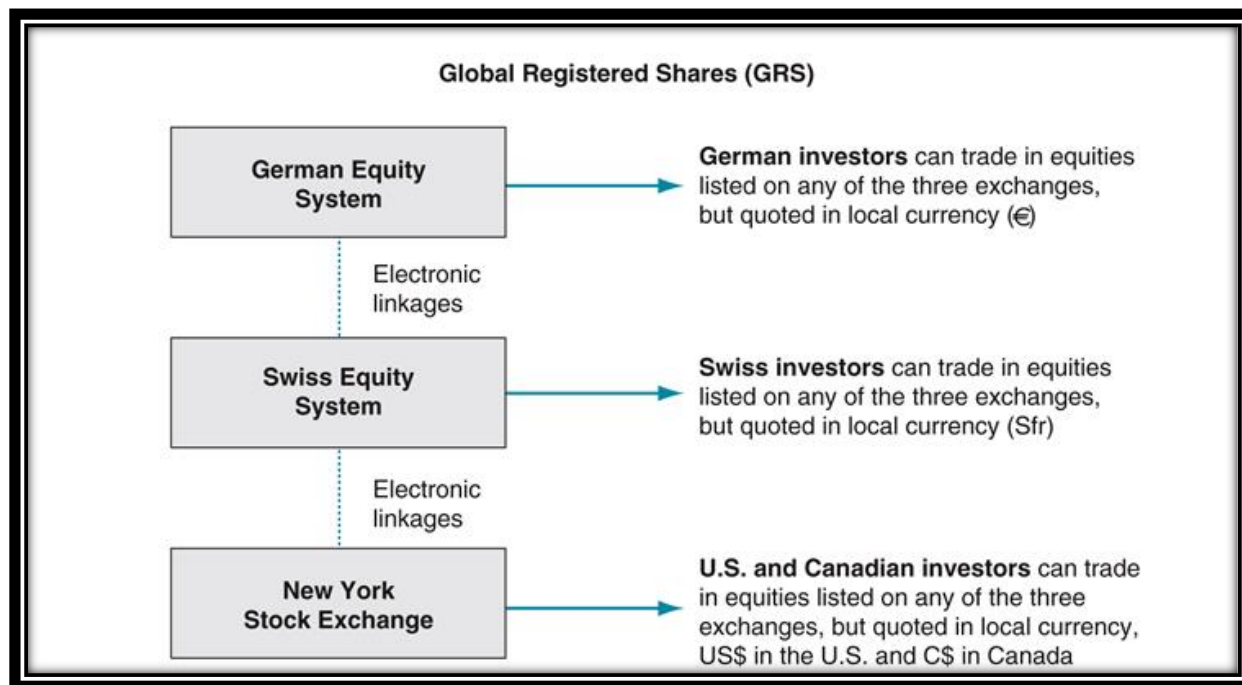
Source: Eiteman at al.(2016)

Although there are significant differences among countries in their methods and sources of finance, corporate practices appear to be converging. Firms find that it pays to **seek for capital on a global basis** rather than restricting to any one national market. Also, firms are **bypassing financial intermediaries** and go directly to the financial markets to search for funds. In addition, **equity financing is on the rise**, but institutional attributes, tradition and culture seem to play an important role when choosing debt financing. Competition for more equity capital forces the firms to be **more investor-oriented**, with more transparency, timelier recognition of news and improved corporate governance.

Figure 5.5 illustrates that most firms should start sourcing funds abroad through international bond issue which could be in less prestigious markets. Then, it could issue bonds in a target market or in the Eurobond market. Next, it will cross-list and issue stocks in one of the less prestigious markets. After that, it will cross-list in a highly liquid prestigious market. Last, it could issue in a prestigious target market or issue Euroequities in global equity market.

Figure 5.5 Alternative Paths to Globalize the Cost and Availability of Capital

Domestic Financial Market Operations

International Bond Issue — Less Liquid Markets

International Bond Issue — Target Market or Eurobond Market

Equity Listings — Less Liquid Markets

Equity Issue — Less Liquid Markets

Equity Listing and Issue — Target Market

Euroequity Issue — Global Markets

Source: Oxelheim, Stonehill, Randøy, Vikkula, Dullum, and Modén, *Corporate Strategies to Internationalise the Cost of Capital,* Copenhagen: Copenhagen Business School Press, 1998, p. 119.

Source: Eiteman at al.(2016)

Questions and Applications

1. What are the main reasons causing U.S. firms to cross-list abroad? and what are the barriers?

{Guided answer Section: 4.4.1}

2. What are the alternative instruments that can be used to source equity in global markets?

{Guided answer Section: 4.4}

3. What are the main differences between a Eurobond and a foreign bond?

{Guided answer Section: 4.3}

4. Choose the correct answer:

When Daimler-Benz merged with Chrysler, It exposed itself intentionally to

a. Translation exposure to minimize economic exposure

b. Transaction exposure to minimize translation exposure

c. Economic exposure to maximize translation exposure

d. Translation exposure to maximize operating exposure

5. True/False Questions

No	Statement	T	F
1	Foreign bond is denominated in a particular currency but sold to investors in national capital markets other than the country that issued the denominated currency		✔
2	Eurocurrency spread is wider in Eurocurrency money markets than in domestic money markets		✔
3	Cross-listing is more expensive and demanding than depositary receipts	✔	
4	Global Registered Shares (GRS) can be traded simultaneously in more than one stock exchange	✔	

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Chapter 5: The Global Cost of Capital

Topic Title: *Estimating cost of capital of MNCs*

Key Words:

Cost of equity capital, cost of debt capital, weighted average cost of capital, pricing-to-market

Summary:

This chapter reviews the basic concepts regarding estimating the cost of capital. Then, it highlights how estimating the cost of equity capital differs in MNCs from their domestic counterparts. Next, it explains the calculations of the cost of debt in the case of MNCs. It illustrates the phenomenon of pricing-to-market and gives real examples of the impact of cross-listing on the cost of equity capital of MNCs.

Outcomes and Learning Objectives:

1. *To explore the alignment between corporate strategy and financial globalization*
2. *To examine how the cost of equity capital changes in MNCs from domestic firms*
3. *To show how cost of debt would change to accommodate MNCs.*
4. *To explore if the cost of capital of MNCs is cheaper from that for domestic firms.*
5. *To compare the weighted average cost of capital for a MNC with its domestic counterpart*
6. *To illustrate the meaning of "pricing-to-market" phenomenon*
7. *To explain the impact of cross-listing on the cost of equity capital*

Chapter Outline:

5.1 Introduction

5.2 Cost of Capital: Review

5.3 Cost of Capital for MNCs

5.3.1 Cost of Equity Capital

5.3.2 Cost of Debt Capital

5.1. Introduction

Local firms used to raise funds from their local markets regardless of the cost and availability of capital. Global integration of capital markets has given many firms access to new and cheaper sources of funds, beyond those available in their home markets. Firms that source long-term debt and equity in a highly illiquid domestic market will probably suffer form a relatively high cost of capital, which in turn will lower their competitiveness both locally and globally.

MNCs are no longer multinational in terms of their operations but also on the basis of their capital structure. They know that by sourcing capital globally, they will attract the attention of international portfolio investors. Also, they overcome domestic illiquid domestic markets and broader the international participation in their capital. In addition, sourcing capital globally enable MNCs access global securities markets that price shares according to international standards.

5.2 Cost of Capital: Review

Capital structure is interrelated to cost of capital. Capital Structure is a **mix of Debt and Equity** used to finance or capitalize a business enterprise. This may include long-term debt, stock, warrants, and retained earnings. A capital structure that is said to be leveraged more, it has a greater proportion of debt over equity, i.e. **Debt/Equity** > 1. Capital structure is about **how firms' assets are financed.** Firms estimate their cost of capital before they conduct capital budgeting because the NPV is dependent on the cost of capital.

$$NPV = -initial\ outlay + \sum_{t=1}^{n} \frac{cash\ flows\ in\ period\ t}{(1+k)^t} + \frac{salvage\ value}{(1+k)^t}$$

Where k is the required rate of return on the project and n is the project lifetime in terms of periods.

Firms attempt to use a specific capital structure or a mix of capital components, that will minimize their cost of capital. The lower the firm's cost of capital, the lower its required rate of return on a given proposed project. If NPV is more than zero, then the project can be accepted.

The firm's cost of retained earnings reflects an opportunity cost of what the existing shareholders could have earned if they had received the earnings as dividends and invested the funds themselves. The firm's cost of new common equity (issuing new stocks) also reflects an opportunity cost as it indicates what the new shareholders could have earned if they had invested their funds elsewhere instead of in the stock. Clearly, the cost of stocks will be higher than the cost of retained earnings because the firm needs to pay for floatation expenses.

The Cost of Capital is the minimum return required by shareholders of the firm for undertaking that investment. It is the required rate of return must compensate for the **time value of money** plus a **risk premium** (depending on the firm). If the expected rate of return is equal to the cost of capital, then the project will leave the firm's value unaffected. If the expected rate of return is higher to the cost of capital, then the firm's value will increase; otherwise, it will decrease.

The Cost of Debt Capital is the actual cost of issuing debt, i.e. loans and bonds. Measuring the cost of debt requires:

1. A forecast of interest rates for the next few years, the proportions of various classes of debt the firm expects to use and the corporate income tax rate.
2. Averaging the interest costs of the different debt components according to their proportion in the debt structure.
3. The before-tax average, k_d , is then adjusted for corporate income taxes by multiplying it by the expression (1- tax rate), to obtain k_d ($1 - t$), the weighted average after-tax cost of debt.

The Cost of Equity Capital is the minimum rate of return necessary to induce investors to buy or hold the firm's stock. It can also be defined as a weighted average of the required rates of return on the firm's individual activities. Hence, the corporation is viewed as a 'mutual fund' of specified projects, whose **stock is a compound product** that reflects the average risk and expected rates of returns **involved in all projects**.

Defining the cost of equity as a weighted average of the required rates of return on the firm's individual activities, is preferred from a conceptual standpoint because it means that the firm is not risky *per se* (for being a firm), but it is risky because it is **a function of the combined riskiness from all activities** in which it engages. That is, if none activity is risky, then the firm's value should not reflect any risk and its required rate of return should only reflect the compensation for the time value of the money. Also, the riskier projects undertaken, then the higher rate of return is required in addition to the time value of money, i.e. plus a weighted average risk premium for all risky projects.

If the firm is financed only by equity, the cost of equity capital (CoEC) can be used to value (discount) the stream of future expected cash flows from all projects and determine the value of the firm and consequently **set the price of the firm's equity shares.** However, it cannot be used as a measure of the required return on equity investments in future projects unless these projects are of a similar nature (risk) to the average of those already being undertaken by the firm.

When the firm has both debt and equity in its capital structure, its financing cost can be represented by the **Weighted Average Cost of Capital** (**WACC**). The WACC represents the minimum weighted rate of return necessary to induce investors to buy or hold the firm's stock. It reflects the **weighted risk** and **weighted return** involved by including both debt and equity funds.

The CoEC k_e and the CoDC k_d are combined to yield a WACC k for financing the firm:

$$WACC = W_e \cdot k_e + W_d \, k_d \, (\, 1 - t \,)$$

where W_d is the debt ratio for the firm (Total Debt to Total Assets), and t the marginal corporate income tax rate.

The WACC can then be used as a discount rate to evaluate a specific foreign investment for the firm, since it is measured in terms of the capital structure of the specific firm. However, when employing the WACC you must make sure that the weights of equity and debt must be based on the proportion of the firm's capital structure accounted for by each source of capital using market values, and not book values, and the firm's

historical debt-equity mixture is irrelevant. The weights must reflect the firm's target capital structure. That is, the future planned capital structure.

Example: suppose that a firm is financed by 60% **common stock** and 40% **debt**, with respective after-tax cost of capitals k_e =14% and k_d = 6%. Then, the WACC for the firm is equal to:
$$(0.6 \times 0.14 + 0.4 \times 0.06) = 0.108 \text{ or } \textbf{10.8\%}$$

If the firm considers to invest in a particular project, it needs to compute the project's NPV on the basis of the WACC. If the project's NPV that is discounted at 10.8% is positive, assuming that the candidate project bears the same risk as the firm as a whole, then the project should be undertaken. If NPV is negative on the basis of this WACC then the project is rejected.

If the debt and equity parameters of the project are known in advance and are different from those that describe the firm as a whole, then **the WACC must be estimated on the investment's particular parameters.** Suppose that now the firm is planning an investment whose debt capacity cannot exceed 30%. Also, the project is evaluated with a higher degree of risk, with CoEC estimated at k_e =16% and the after-tax CoDC estimated at k_d = 8%. The WACC for the candidate investment is now equal to:

$$(0.7 \times 0.16 + 0.3 \times 0.08) = \textbf{13.6\%}$$

Which in comparison to 10.8%, this is now a more expensive WACC and it is more difficult to accept the project since the firm requires a higher rate of return from it.

Generally, it is shown that both CoEC and CoDC for the firm increase as the proportion of the debt in the firm's capital structure increases. This seems reasonable since for **Debt/Equity>1**, the firm depends more on foreign capital, which further binds the firm with strict and inflexible covenants and higher i-rates expense. Usually, the firm commits its assets to the amount of debt bought, which means that in case that the firm fails to pay off its debt on time, the institutional lender bears the right to liquidate the firm's assets or penalise the firm through more expensive interest payments.

In contrast, the firm that uses more equity than debt (**Debt/Equity<1**), it bears less risk since it uses retained earnings and reserves to finance its operations and investments. However, **just equity is not enough for the firm to expand**. It needs **extra financing**, which must take the form of either short-term or long-term debt through either loans or issuing of bonds (e.g. Eurobonds). Regardless of the risk that comes with loans, debt financing comes also with some **immediate advantages**. (**interest payments are tax-deductible amounts)**, unlike dividend payments which in some places are double-taxed. The firm **optimal amount of debt**, must balance the benefit of tax deductibility with the risk of potential failure.

The firm that seeks to maximize its shareholder's wealth must **lower its cost of capital.** To do that, the firm must choose an **optimal capital structure.** When the CoC is lower, then the firm can choose to invest in more projects that come from a greatest range. In addition, if the management of the firm manages to lower the cost of capital through a more successful capital structure, then not only it can invest in more and more diversified projects, but also **it can increase the firm's existing value** through revaluating its existing cash flows (cheapest discounting). Also, Firms choose investments whose internal rate of return (IRR) is higher than the firm's CoC.

5.3 Cost of Capital for MNCs

A MNC may internationalise its capital structure by sourcing **debt** from **international bond and money markets**, and **equity** from **cross-listing** in international stock markets. As a result, these firms are becoming *multinational* not only in the scope of their operations, but also in their capital structure. **International Capital Structure** is a conscious effort from the MNCs **to lower their cost of capital.**

The NPV of the foreign project depends on the project's capital structure for two reasons[29]. First, the capital structure of the project determines the cost of capital which consequently affects the discount rate in the NPV valuation formula. Second, the capital structure affects the interest that should be paid to creditors before

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[29] *Madura, J. (2010)*

imposing taxes and remitting funds to the parent company. Hence, affecting the cash flows ultimately received by the parent, which are the main component of NPV formula.

The cost of capital for MNCs may differ from that for domestic firms because of the following differences[30]:

A. *Firm Size.* Because of MNCs' size, they often borrow large amounts and therefore are given preferential treatment by creditors. They can usually achieve smaller per unit flotation costs too.

B. *Access to International Capital Markets.* MNCs are normally able to obtain funds through international capital markets, where the cost of funds may be lower.

C. *International Diversification.* MNCs may have more stable cash inflows due to international diversification, such that their probability of bankruptcy may be lower.

D. *Exposure to Exchange Rate Risk.* MNCs may be more exposed to exchange rate fluctuations, such that their cash flows may be more uncertain and their probability of bankruptcy higher. This could force creditors and shareholders to require a higher return, which increases the MNCs cost of capital.

E. *Exposure to Country Risk.* the higher percentage of an MNC 's assets invested in foreign countries and the higher the overall country risk of operating in these countries, the more the MNC is exposed to country risk and the higher the MNC's probability of bankruptcy (and hence its cost of capital)

Figure 5.1 clearly shows that the first three factors have a favourable effect on MNC's cost of capital while the last two have unfavourable effect.

Figure 5.1 Cost of Capital for MNCs

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[30] *Madura, J. (2018)*
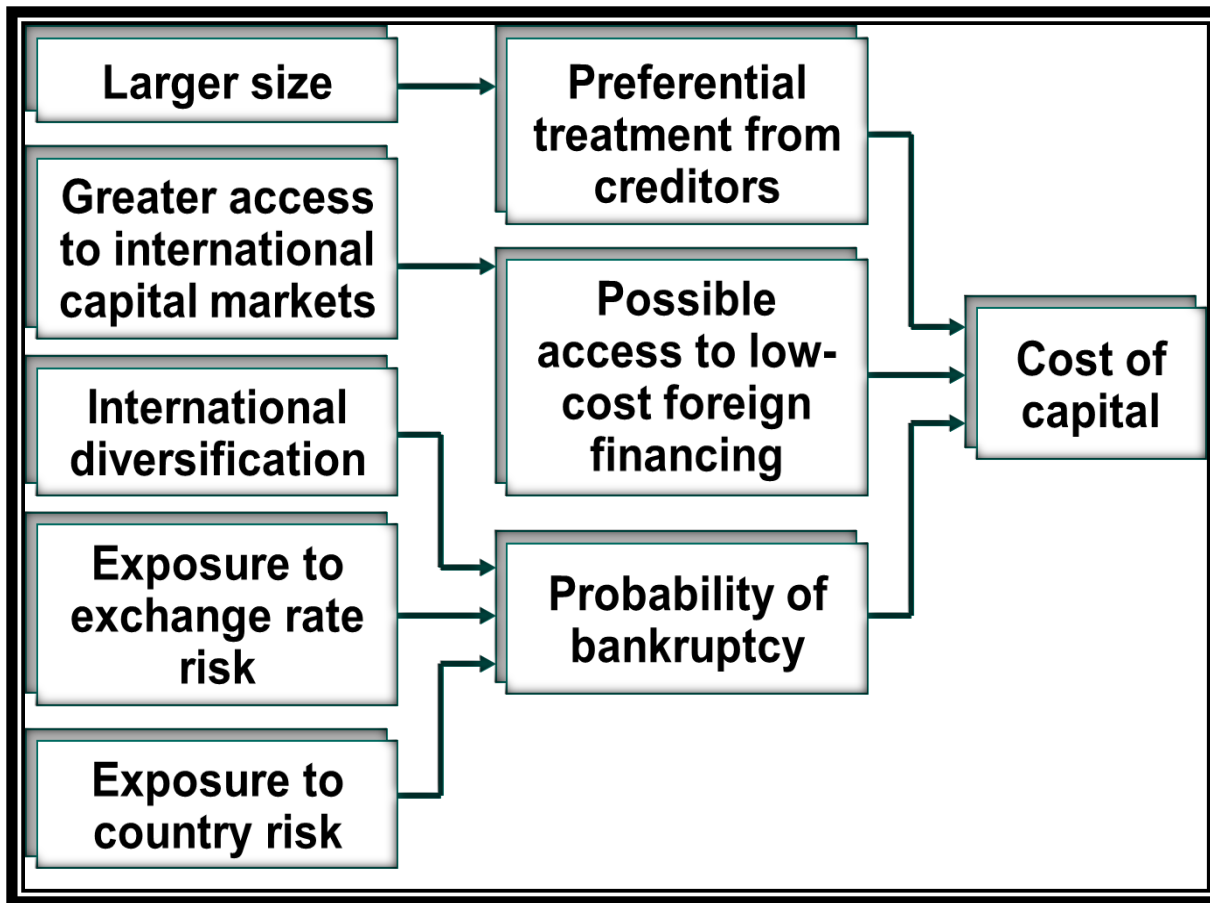
Source: Madura (2018)

But does the empirical evidence confirm or refutes this prediction? The evidence suggests that although the cost of debt is lower for MNCs than domestic counterparts, the WACC of MNCs is higher than them. This is because MNCs seems to have less debt-to-capital ratio compared to domestic firms. Also, the cost of equity required by investors is higher for MNCs than for domestic firms. Possible explanations are higher exposures to exchange and country risk as well as higher agency costs.

5.3.1 Cost of Equity Capital

The CAPM is one (generalised) approach which can be used to **determine the firm's Cost of Equity Capital (CoEC).** The CAPM states that the equilibrium expected rate of return on a security is a linear function of the systematic risk inherent in the security:

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$$R_i = R_f + \beta_i \, (\, R_m - R_f \,)$$

R_i is the equilibrium expected return for asset i, R_f is a risk-free rate of return (e.g. Treasury bills), R_m is the expected return on the market portfolio consisting of all risky assets, and $\beta_i = \rho_{im}\sigma_i \, /\sigma_m$, where ρ_{im} is the correlation between the returns on security i and the market portfolio m, and σ_i and σ_m the standard deviations of returns on asset i and market portfolio m. β_i accounts for the **systematic non-diversifiable risk** inherent to *the particular security. Thus, the firm's beta (β_i) can be used as a **proxy for the CoEC for a specific listed firm**, since it reflects the risk involved to the firm as a whole.*

When applying the CAPM, the base portfolio against which the proxy betas are estimated can be the home portfolio, or the global market portfolio. The resulting implementation of the CAPM depends on which base portfolio is selected. The appropriate market portfolio to use in measuring a foreign project's beta depends on one's view of world capital markets. More precisely, it depends on whether or not capital markets are globally integrated. If they are, then the world portfolio is the correct choice; if they are not, the home portfolio is the correct choice.

The test of capital market integration depends on whether assets are priced in a common context. That is, capital markets are integrated to the extent that security prices offer all investors worldwide the same trade-off between systematic risk and real expected returns. Hence, in **segmented markets** the risk is priced in a domestic context. It is highly likely that future cash flows, with the same level of risk, are priced differently across countries. While in **fully-integrated markets**, the future cash flows, with the same level of risk, will be priced in the same way everywhere.

The **integration** or **segmentation** of international financial markets is a **decisive factor for motivating the investor to consider a foreign project**, and in extent **for determining the cost of capital.** Results show that **markets are integrated but only to a certain degree**, therefore, they also contain a certain degree of segmentation. Also, results show that stocks that are cross-listed are priced higher in an integrated market in contrast to stocks that are listed only in the local market which are priced partly in a segmented market, i.e. there are **differences in costs of capital.** If international financial markets are less than fully integrated, which is the case, then there must be **systematic differences in the cost of capital among countries. Hence, there is a point from seeking equity capital overseas.**

Example, suppose that the domestic UK beta of British Petroleum (**BP**) is β_i =1.0, the expected return on the UK market portfolio (FTSE All-Share index) is R_m=12% and the risk-free return (UK governmental bond) is R_f =6%. What is the expected return on British Petroleum?

$$R_i = R_f + \beta_{im} (R_m - R_f) = 6 + 1.0 (12 - 6) = 12\%$$

By **assuming that the UK markets are segmented** from the rest of the world considering the BP's domestic beta, inventors would require 12% return in the investment on BP's stock. A beta of 1.0 means that BP is exactly as risky as the market as the whole, i.e. when the market's expected return goes up, BP's expected return goes up exactly at the same amount.

Now, consider that **the UK markets are integrated with the rest of the world** and investors can chose to include foreign securities in their portfolio. BP's beta measured against the world portfolio is estimated at β_i =0.8, where the world return is equal to R_m=12% and the World Bank's risk free return is equal to R_f =6%

$$R_i = R_f + \beta_{ig} (R_g - R_f) = 6 + 0.8 (12 - 6) = 10.8\%$$

If the world markets can offer lower betas to the valuation of the firm's risk, then investors will require a lower return on BP stock, since there is less risk involved.

Integrated capital markets are shown to provide this benefit (lowers the riskiness of the firm) over segmented capital markets[31].

Generally, a MNC may **benefit from cross-border listing** of its shares in many ways. (1) It expand its equity base which increases stock price & lower its CoC, (2) It enhances the liquidity of the company's stock and the visibility of the company's name and products, (3) Cross-listed shares may be used as the 'acquisition currency' for taking over a foreign company, (4) It also improves the company's corporate governance and transparency.

Regardless of the incentives for cross-border listings, **governments** in both developed and developing countries are concerned with losing control to foreign ownership. Therefore, governments tend to **impose**

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[31] *Stulz, R. M. (1995). The cost of capital in internationally integrated markets: The case of Nestlé.* European Financial Management, 1*(1), 11-22*

restrictions on the maximum percentage ownership of local firms by foreigners, or allow firms to issue two classes of shares (non-tradable A class, publicly available B class).

Due to these restrictions, foreign and domestic investors may face different market share prices. This dual pricing phenomenon is called **Pricing-to-Market** (**PTM**). For example, **Nestlé**, a Swiss firm, issues (i) **registered stocks**, (ii) **voting bearer stocks** and (iii) **nonvoting bearer stocks.** Nestlé allowed **foreigners to buy only bearer stocks**. As a result, in 1987, its registered shares accounted for 68% of the votes outstanding which makes it impossible for a foreigner to gain control. Nestlé, however, raises more than 95% of its revenue abroad, it is highly multinational and makes high-profile cross-border acquisitions (e.g. UK's Rowntree, and US's Carnation). Nestlé restrictions were criticised as unfair and incompatible to world free markets. **In 1988, Nestlé decided to lift this ban.**

Once the restrictions on foreign ownership of registered shares were lifted, the price of registered shares rose by 35% while the price of bearer shares fell by about 25%. Overall, the market value of Nestlé rose by 10%, since there were much more registered shares than bearer shares. The jump in the total market value of Nestlé is consistent with a decline in its CoEC (see Figure 5.2).

One of the possible explanations of this increase in Nestlé is based on the application of ICAPM[32]. The Swiss market risk premium was estimated at 6.9% based on the difference between the Swiss stock market's historical average return of 10.2% and the historical return to Swiss governmental bond returns equal to 3.3%. The estimated Swiss beta for Nestlé was equal to 0.885. At the time, the risk-free rate of return was set to 3.3%, and the domestic version of CAPM yielded an estimated CoEC for Nestlé equal to 9.4065%,

$$R_i = R_f + \beta_i (R_m - R_f) = 3.3 + 0.885 \times (10.2 - 3.3) = 9.4065\%$$

Once the restrictions were relaxed, Nestlé's shares were exposed to the world portfolio. The global market risk premium was estimated at 10.4% based on the difference between the historical average return of a World portfolio and the historical return to global bonds. The estimated World beta for Nestlé fell to 0.585
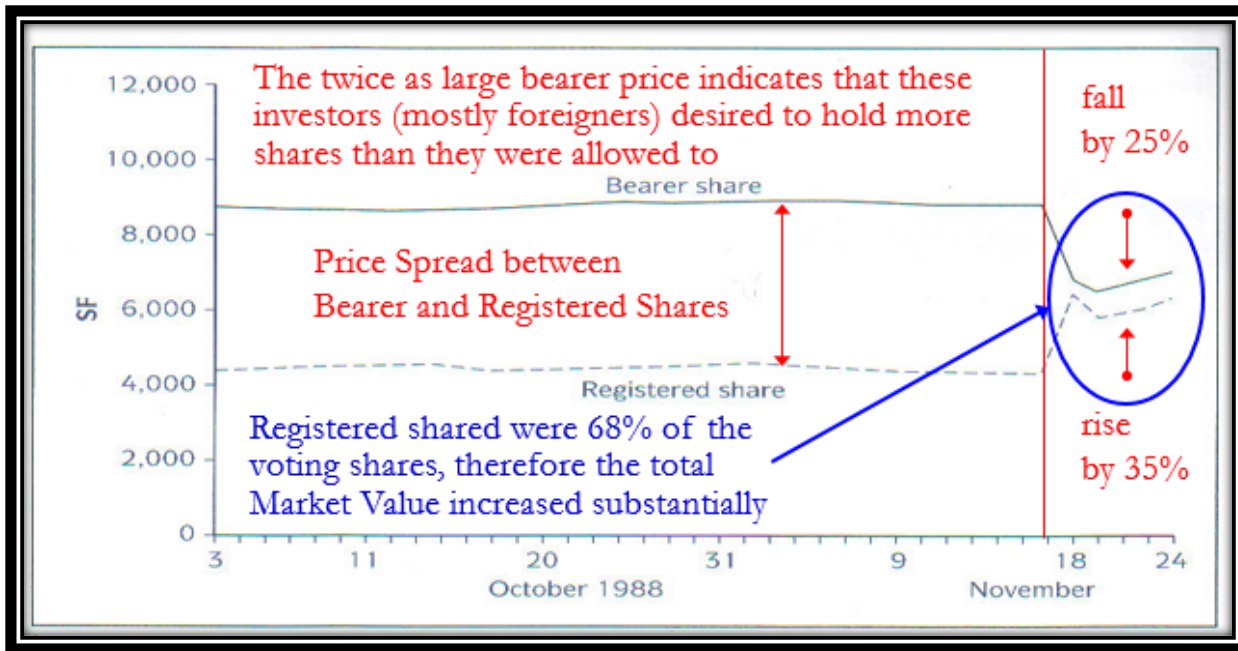
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[32] *Stulz, R. M. (1995). The cost of capital in internationally integrated markets: The case of Nestlé.* European Financial Management, 1*(1), 11-22*

The international version of CAPM (ICAPM) yielded an estimated CoEC for Nestlé equal to 9.384%,

$$R_i = R_f + \beta_g (R_g - R_f) = 3.3 + 0.585 \times (13.7 - 3.3) = 9.384\%$$

Figure 5.2 Nestlé's Pricing-to-Market

Source: Shapiro (2014) reconstructed by the author

5.3.2 Cost of Debt Capital

In order to calculate the dollar costs of foreign currency debt that enter into the WACC calculations, we need to take into account the interest rate on the debt, any currency gains or losses, and the effects of taxes[33].

Example, suppose that Gamma S.A., the French subsidiary of a U.S. based MNC, borrows €10 millions for one year at an interest rate of 8%. This euro loan is equivalent to an $8.7 million loan at the current exchange rate of $0.87/€. In one year, Gamma will have to repay the principal plus interest, or €10.8 million. If the end-of-year exchange rate is $0.85/€, Alpha's loan will cost $9,180,000 to repay (10,800,000*0.85). Although the euro interest rate is 8%, the dollar cost of the loan is 5.52%, (9,095,000-8,700,000)/8,700,000=0.0552.

[33] Shapiro, A.C.(2014)

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The dollar cost is less than 8% because of the depreciation of the euro. In general, the dollar cost of borrowing local currency (LC) at an interest rate of r_L and a currency change of c, is the sum of the dollar interest cost plus the percentage change in the exchange rate.

The currency change is computes as $c=(e_1-e_0)/e_0$, where e_0 and e_1 are the beginning and ending ER,

$$(0.85-0.87)/0.87=-2.3\%$$

The Dollar cost of LC loan=Interest rate+ ER change = $r_L(1+c)+ c$

$$=0.08(1-0.023)-0.023=5.52\%$$

Suppose Alpha's effective tax rate is 40%, then the after-tax cost of paying the €700,000 in interest is

$$€800,000* (1-0.40) = €480,000$$

This figure translates into an after-tax interest expense of 4.8%, and the dollar cost is even lower. Given that Alpha borrowed €10 millions, the after-tax cost of repaying the principal plus interest is €10,480,000. At the end-of-year exchange rate, this amount translates into $8,908,000. The net after-tax dollar cost of Alpha's loan then is $208,000 (8,908,000-8,700,000). The effective dollar interest rate is ((8,857,000-8,700,000)/$8,700,000)= 2.39%

After-tax dollar cost of LC loan=Interest rate+ ER change

$$= r_L(1+c)(1-t_a)+ c=0.08(1-0.023)(1-0.4)-0.023=0.023896$$

Where t_a is the affiliate's marginal tax rate.

Does the CoC Differ among Countries?. Evidence show that indeed, there are significant differences when comparing the cost of capital among four major developed countries, Germany, Japan, the UK and the US[34]. It shows that despite the cost of equity and cost of debt converge to be almost similar in integrated markets, there are still big differences in debt-to-equity ratio with Germany and Japan enjoying the cheapest WACC.

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[34] *McCauley, R. N., & Zimmer, S. A. (1994). Exchange rates and international differences in the cost of capital.* Exchange Rates and Corporate Performance*, 119-148*

While the developed world is witnessing a **convergence in the cost of equity and the cost of debt**, the capital structure between traditionally dissimilar jurisdictions **remains significantly different.** Japan and Germany are institutional systems that traditionally rely on heavy debt financing, through keiretsu industrial systems and universal banking systems. Therefore, debt is not that risky for these companies, since that is the way the system works, i.e. they allow banks to participate in the decision-making process of the firm also reducing the agency problems. Therefore, it makes sense that companies operating in these countries would enjoy cheaper cost of capital. The UK and the US are market-oriented systems and rely more on equity, however, recognizing the importance of debt financing, they follow a more balanced capital structure.

Example: Novo is a Danish MNC that controls about 50% of the world industrial enzyme market. In the 1970s the firm's management decided to move away from the segmented Danish market at that time and expand internationally in search for lower CoC. The following is the historical development of Novo's expansion[35]:

1977: Novo disclosed financial statements also in English; its stock price was about DKr200-225.

1978: Raised $20m by offering convertible Eurobonds, and cross-listed on LSE.

1980: organised a marketing seminar in NYC promoting its stock to US investors; its stock rose to DKr600.

1981: Novo offered ADRs on NASDAQ and later that year was cross-listed on NYSE; its price jumped to DKr1400 and foreign ownership rose to over 50% of the common shares.

Figure 5.3 illustrates Novo's B-Share Prices performance in comparison to a number of stock market indices. It clearly shows that Novo's share performs similar to the stock market it listed in before it outperformed it when it is listed in another market.

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[35] *Eiteman et al.(2016)*

Figure 5.3 Novo's B-Share Prices compared with Stock Market Indices
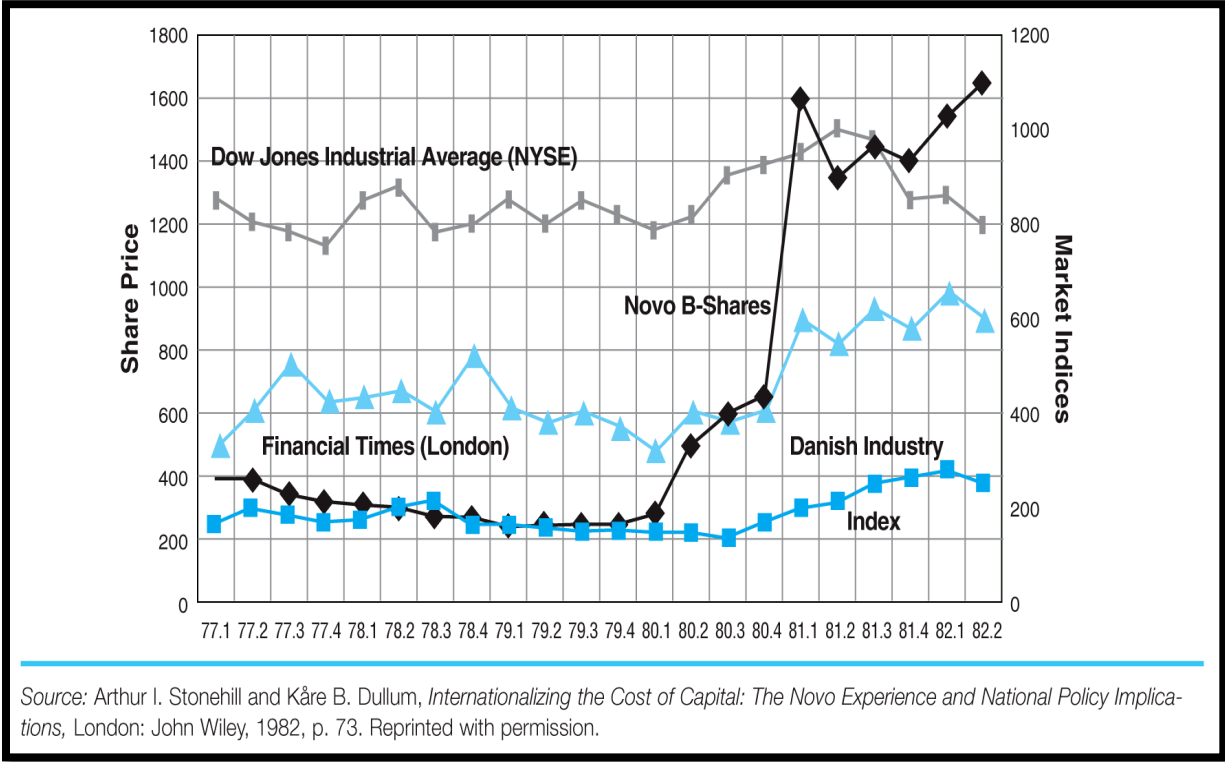
Source: Eiteman et al.(2010)

Questions and Applications

1. Hilton Inc. with a debt-to-equity ratio of 1:3, an after-tax cost of debt of 8%, and a cost of equity capital of 16% is interested in pursuing a foreign project. The debt capacity of the project is the same as for the company as a whole, but its systematic risk is such that the required return on equity is estimated to be about 14%. The after-tax cost of debt is expected to remain at 8%. What is the project's weighted average cost of capital? How does it compare with parent's WACC?.

WACC=0.75*14%+0.25*8%=12.5%

2. Ford is considering having its British affiliate issue a 1-year, $100 million bond denominated in pounds and priced to yield 8%, Alternatively, Ford's British unit can issue a dollar-denominated bond of the same size and maturity and carrying an interest rate of 7%. If the pound is expected to depreciate by 2% after one year, what is the expected dollar cost of the pound-denominated bond? How does this compare to the cost of the dollar bond?

The expected dollar cost of the pound-denominated bond=7%(1+2%)+2%=9.14%>8%

3. Daimler merged with its competitor, Chrysler, in 1998 to form Daimler Chrysler. Nine years later, the merger was dissolved. Using standard investor information like P/E ratios, share prices, debt ratios, and betas pulled from various company Web sites, compare the cost of capital of these two major companies today.

Daimler: www.Daimler.com/en

Chrysler: www.Chrysler.com

4. Choose the correct answer:

The after-tax cost of foreign debt could be lower than local debt if:

a. The foreign currency appreciates against the local currency

b. The local currency appreciates against the foreign currency

c. local tax rate increases

d. More bonds are issued globally

5. True/False Questions

No	Statement	T	F
1	International diversification is expected to increase the cost of capital of MNCs		✔
2	The cost of equity capital of a MNC can be computed through the CAPM		✔
3	Cross-listing is expected to decrease the cost of equity capital	✔	
4	The developed world is witnessing a convergence in the cost of equity & debt	✔	

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Chapter 6: International Portfolio Investment

Topic Title: *International portfolio investment: methods and barriers*

Key Words:

International diversification, Methods Used to invest internationally, benefits and barriers for international diversification, International Efficient Frontier.

Summary:

This chapter highlights the benefits from international investing and particularly diversification. It describes the main barriers of international investing, compares, and contrasts five methods of international investing. Then, it decomposes total returns from international investing into returns from currency exchange fluctuations and returns in home currency.

Outcomes and Learning Objectives:

1. *To appreciate the benefits from international investing*
2. *To illustrate barriers to international investing*
3. *To compare methods of international investing*
4. *To measure total returns from international investing*

Chapter Outline:

6.1 Introduction

6.2 Benefits from International Investing

6.3 Barriers to International Investing

6.4 Methods of International Investing

6.4.1 Direct purchase of foreign stocks

6.4.2 Purchasing MNC stocks

6.4.3 Depository receipts

6.4.4 Exchange-traded funds (ETFs)

6.4.5 International mutual funds

6.5 Measuring Total Returns from International Investing

6.1. Introduction

Portfolio investment represents one of the components of the financial account in the balance of payment. It refers to investment in which the investor has no control over the assets. The purchase of debt securities across borders is also classified as portfolio investment because debt securities by definition do not provide the buyer with ownership or control. Portfolio investment is motivated by a search for better risk-return tradeoffs rather than to control or manage the investment. International Portfolio Investment is defined as a portfolio of investments formed by individuals, MNCs and institutions in international stocks, bonds and other financial securities.

6.2 Benefits from International Investing

International investing offers the additional **advantages**.

A. International investing means a **greater market** where there is more participants and more capital and far more liquidity.

B. Local markets remain small in terms of market capitalisation. For example, more than 55% of stock market capitalisation is non-US and it is increasing steadily, which suggests more incentive for US investors to invest abroad.

C. **International diversification** expands the universe of securities available for investment which suggests better risk-return trade-off even for US investors. A portfolio investment normally involves two types of risk: (1) **Unsystematic Risk**: the risk involved in each security based on the financial characteristics of the particular investment. This is a security-specific risk and it is diversifiable, and (2) **Systematic Risk**: the risk related to the market in which the security is traded. This is the market risk and it is non- diversifiable. A portfolio of securities (stocks, bonds etc) that is traded domestically, involves only the **domestic systematic risk** which is non-diversifiable (plus the unsystematic risk of the various securities).

If the portfolio includes also securities that are traded in other international markets, then the particular domestic risk can now be diversified and the non-diversifiable risk is now the world-markets risk. Therefore,

the domestic risk is now a type of unsystematic risk and it is diversifiable. The systematic risk is now the combined risk from all the world markets from which securities are included into the international portfolio.

International diversification is probably the most **important benefit** from considering an international portfolio of securities. This suggests opportunities for **achieving a better risk-return trade-off** than by investing solely in a single domestic market. That is, to achieve higher levels of expected return for the same amount of risk, or to achieve lower levels of risk for the same level of expected return. *The broader the diversification, the more stable the returns and the more diffuse the risks.*

Does Diversification Work?. Diversification can eliminate the unsystematic risk attached to each security. For example, studies have shown that a fully diversified US portfolio of stocks across all industries is only about 27% (systematic risk) as risky as a typical individual stock, on average. This means that 73% is the unsystematic component of the total risk that can be eliminated or at least minimised. Nevertheless, the minimisation of the systematic component of the risk through diversification has limited possibilities since all companies within a country are subject to the same cyclical economic fluctuations.

In contrast to domestic diversification, international diversification incorporates into the portfolio a bundle of cyclical fluctuations, and by doing that, it offsets the mismatched cyclic trends. Similar to a fully diversified domestic portfolio, a fully diversified portfolio of stocks across all industries and across many countries will certainly beat the benchmark of 27% and strike even lower levels of risk. For example, a political disturbance that shocks the UK economy will possibly not be heard in the Japanese market. The same goes for natural disasters.

The early evidence suggests that a fully diversified US domestic portfolio points to a 27% level of systematic risk. A fully diversified portfolio of stocks across all industries and many countries must beat this benchmark of 27%, or else there will be few incentives to invest in an international portfolio. As his results show, the standard deviation of a fully internationally diversified portfolio (for before 1974) appears to be as little as 11.7% by adding individual world securities. An internationally diversified portfolio is found to be less than half as risky as a fully diversified US portfolio that considers only domestic securities[36].

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[36] *Solnik, B. H. (1995). Why not diversify internationally rather than domestically?.* Financial Analysts Journal, 51*(1), 89-94.*

The efficient frontier is the set of portfolios that has the smallest possible standard deviation (risk) for its given level of expected return, or in another words, it is the set of portfolios that has the highest possible expected return for its given level of standard deviation (risk). International diversification pushes out the efficient frontier. It offers the opportunity for achieving better risk-return trade off.

Figure 6.1 Potential Gains from International Diversification
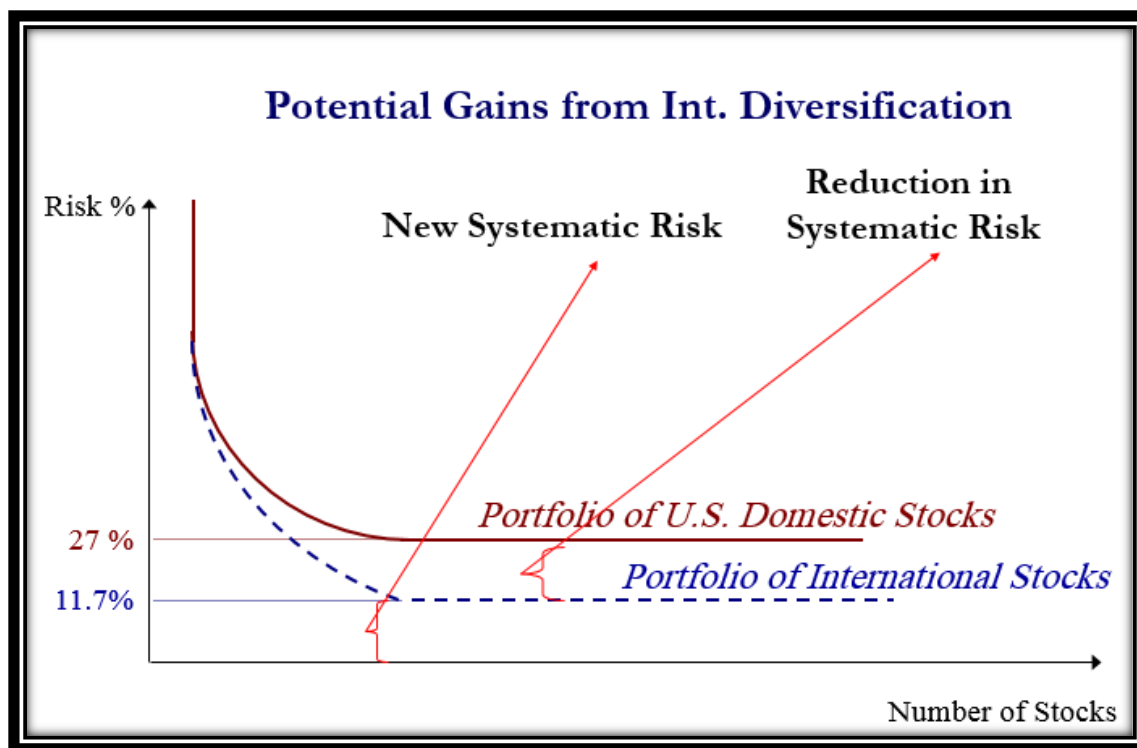
Source: Solnik (1974, *Financial Analysts Journal*)

Consider a portfolio p *whose fraction α% is invested in the US and (1-α)% is invested in the rest of the world EAFE index. The return and standard deviation of* p *is equal to*

$$r_p = \alpha r_{US} + (1-\alpha) \ r_{EAFE}$$

$$\sigma_p = \left[\alpha^2 \sigma_{US}^2 + (1-\alpha)^2 \sigma_{EAFE}^2 + 2\alpha(1-\alpha)\sigma_{US}\sigma_{EAFE}\rho_{US,EAFE}\right]^{1/2}$$

From Morgan Stanley Capital International (www.msci.com), we find that for 1970-2000: the standard deviation of US portfolio σ_{US}=53.2%, the standard deviation of a portfolio represents Europe, Australia & Far East stock index (which reflects all major developed country markets outside of North America, 22 altogether)

σ_{EAFE}=58.1%, and the correlation coefficient between both portfolios is $\rho_{US,EAFE}$=0.50. We find that the standard deviation of the 50% internationally diversified US portfolio is equal to σ_p=48.2%. As we can see, the risk of 48.2% is about 10% lower than the portfolio of the rest of the world, and about 5% lower than the US domestic portfolio. This effect is documented in many studies for various time periods and portfolios around the globe, when considering a number of domestic portfolios against the world market portfolio (see for example; Driessen & Laeven (2007) and Chiou (2009)).

International diversification is successful because of *low correlations* between domestic asset returns and international asset returns[37]. This low correlation between various national markets comes from differences in local monetary and fiscal policies, differences in institutional and legal regimes, cultural differences, regional economic, political and natural shocks, and differences in industrial structure and currency movements. In the past, correlations where indeed very low due to lack of aligned technology, expensive telecommunication, transaction costs, frequent governmental intervention, fixed exchange rates and generally, less freely traded securities. Now, all these have changed towards the free market (also towards a single market), in which demand and supply define the assets prices. National capital markets become more highly correlated which significantly reduces the benefits of international diversification. As for the developing and emerging countries, these are viewed as very risky and are avoided unless you are a sophisticated institutional investor or a speculator.

It is shown by many studies that a market with high level of risk in a developing or economically emerging nation (i.e., a nation that is becoming more engaged with global markets), tends to **contaminate with this risk of** other nations surrounding that geographic region. This means that risky markets tend to have high return correlations within the **pool of other regional markets** (many domestic markets surrounding a geographical region). Therefore, when considering a world market portfolio, there is no need to consider more than 1 (or 2) local markets from a particular region in order to diversify the international risk.

International stock diversification yields a substantially better risk-return trade-off than holding domestic stocks only. International diversification that combines both stock and bond investments results in substantially

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[37] *Goetzmann, W. N., Brown, S. J., Gruber, M. J., & Elton, E. J. (2014). Modern portfolio theory and investment analysis.* John Wiley & Sons. *United States.*

lower risk and (or) higher return than international stock diversification alone. That is, it pushes the efficient frontier up and higher, constructing international efficient frontier, compared to the domestic efficient frontier (Figure 6.2). The various market indices commonly used to measure world stock and bond portfolios do not lie on the efficient frontier. Therefore, to improve the risk-return trade-off, investors should construct internationally diversified portfolios whose weights do not refer to these indices.

The long-term historical performance of individual national markets may be misleading as it focuses on return without equivalent emphasis on risk. Hence, returns from national markets should be examined per unit of risk and not in isolation. For example, Hong Kong recorded the highest return among 18 major stock markets, including the U.S and UK markets, in the period 1977-1996 with monthly return of 1.5%. However, it has also the highest risk among those markets with 9.61% standard deviation[38]. Therefore, it is recommended to consider measure that combine both risk and return in evaluating portfolio performance such as Sharpe and Treynor measures.

The benefits from international diversification can also be seen in the case of MNCs. One can consider any MNC as a portfolio of projects and any possible additional project as a new security that will be added to the portfolio. Then, a new method to evaluate foreign projects will be developed in terms of portfolio theory framework.

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[38] *Eiteman et al. (2010), Multinational Business Finance, 12th Edition, Pearson Education.*

Figure 6.2 The International Efficient Frontier
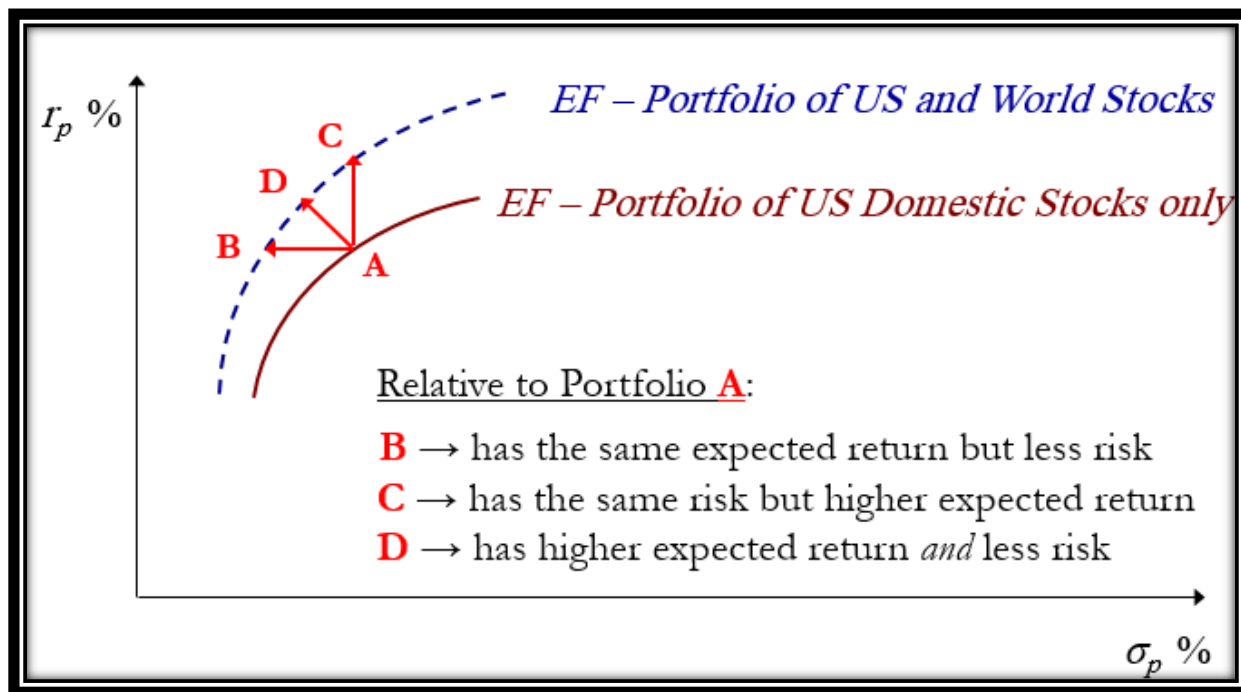
Example: consider Alpha Co. a U.S. firm that is considering the location of a new investment project that faces the following information:

	Characteristics of Proposed Project If Located in	
	the U.S.	the U.K.
Project's mean expected annual after-tax return	20%	20%
Standard deviation of project's return	.09	.11
Correlation of project's return with return on existing U.S. business	.80	.03

In terms of return, neither project has an advantage with 20% expected return for both projects. With regard to risk, the new project is expected to exhibit slightly less variability in returns if located in the U.S..Suppose that the project constitutes 30% of Alpha's total funds, and that the standard deviation of Alpha's return on existing U.S. business is 0.10.

$$\sigma_p^2 = w_A^2 \sigma_A^2 + w_B^2 \sigma_B^2 + 2\, w_A w_B \sigma_A \sigma_B \rho_{AB}$$

If the new project is located in the U.S., the portfolio variance for the overall firm will be,

$$\sigma_p^2 = 0.70^2 \times 0.10^2 + 0.30^2 \times 0.09^2 + 2 \times 0.70 \times 0.30 \times 0.10 \times 0.09 \times 0.80 = 0.008653$$

If the new project is located in the U.K., the portfolio variance for the overall firm will be,

$$\sigma_p^2 = 0.70^2 \times 0.10^2 + 0.30^2 \times 0.11^2 + 2 \times 0.70 \times 0.30 \times 0.10 \times 0.11 \times 0.03 = 0.0061276$$

Thus, as a whole, Alpha will generate more stable returns if the new project is located in the U.K

D. **Growth**: especially in emerging markets. It is well-known that real GDP growth is far higher in developing countries compared to developed countries. This will be reflected in more opportunities for capital gains. Figure 6.3 and 6.4 illustrate the real GDP growth in a number of developing and developed countries in the period 1990-2000. It can be seen that real GDP growth reaches around 15% while it only reaches around 7% for developed countries. On the contrary, real GDP growth declines by around 14% in the set of Asian countries while only declines by 6% for developed countries.
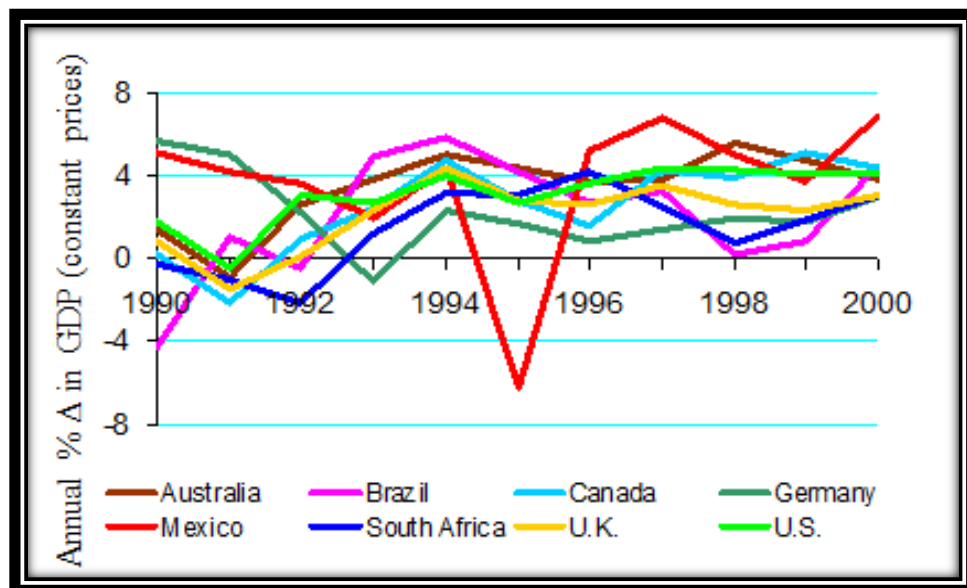
Figure 6.3 Real GDP Growth in some Asian Countries
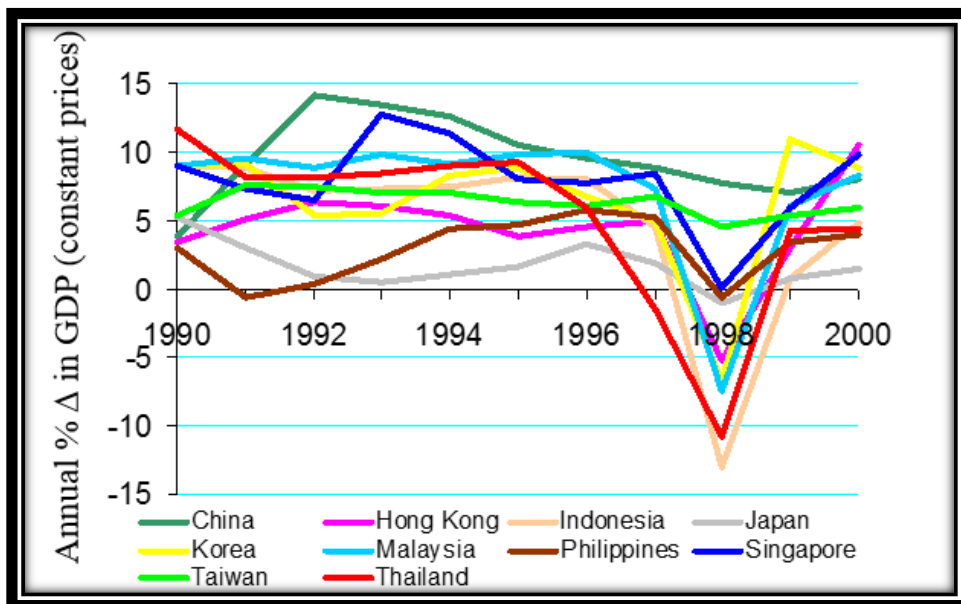
Source: IMF (2002)

Figure 6.4 Real GDP Growth in Developed Countries

6.3 Barriers to International Investing

A. Changes in Currency Exchanges Rates: such fluctuations will increase or decrease the total investment return of the portfolio when converting cash flows back to the home currency (dividend payouts and liquidation of securities). Therefore, investors need to hedge against currency exchange rate fluctuations.

B. Dramatic Changes in Market Values: like all markets, foreign markets and particularly emerging markets, can experience dramatic shocks. Hence, investors should try to invest in the long-run and diversify through more than one international market or through an international mutual fund.

C.Political and Social Economic Events: investors and MNCs may not appreciate the foreign culture as they can for their own. Therefore, MNCs usually rely on their local managers to deal with the securities traded in the local markets.

D.Lack of Liquidity: The ability to buy and sell securities efficiently is a main concern of international investors especially in less developed markets[39]. Foreign markets (especially smaller and emerging markets)

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[39] Shapiro, A.C. (2014)

may have low trading volumes and fewer listed companies. Some countries also place restrictions in the amount of stocks that foreign investors can buy (foreign ownership), and some others open the stock market for public trading only a few hours a day.

E. Less Information: some smaller and emerging markets are often accused for lack of transparency, which is ironic considering that the biggest financial scandals are found in the more advanced economies. Yet, it is commonly believed and shown by many studies that the more developed economies offer better shareholder's protection, and more precise valuation[40].

F. Other reasons such as delay in transactions due to outdated technology, different types of enforcement, the financial statements may not be available in more than one language.

Despite the erosion of the majority of these barriers, there is a growing international portfolio investment by both institutions and individuals. However, such investments are still reluctant to designate large portion of their portfolios to international stocks in what is known as home bias as 82% of U.S. stock portfolios are still consisted of domestic stocks in 2011[41].

6.4 Methods of International Investing

There are a number of methods that investors may attempt for international stock diversifications[42], namely;

6.4.1 Direct purchase of foreign stocks

Investors can purchase foreign stocks directly through foreign brokers at foreign stock exchanges. However, foreign market imperfections make this approach inefficient as it normally entails higher transaction costs and lack of information in addition to tax differentials among countries.

An alternative approach could be the purchase of cross-listed stocks in the investors' local market. For instance, Royal Dutch Shell (of the Netherlands) and Sony (of Japan) are both cross-listed in the U.S. and investors can purchase them directly from U.S. stock exchanges.

6.4.2 Purchasing MNC stocks

MNCs, with international projects around the world, can be seen as an international stock portfolio. Hence,

[40] *La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. (2002). Investor protection and corporate valuation.* The Journal of Finance*, 57(3), 1147-1170.*
[41] *Shapiro A.C. (2014)*
[42] *Madura, J. (2018)*

investors can diversify their portfolios through purchasing MNCs' stocks. However, the empirical evidence suggests that the performance of MNCs' stocks is more linked to the respective local market than other international exchange markets' movements.

6.4.3 Depository receipts

An alternative approach to the purchase of cross-listed stocks is to buy depository receipts which are certificates the represent ownership of foreign stocks. Normally, the cross-listing requirements are stronger than those for trading depository receipts especially in terms of following the local accounting standards. If depository receipts are traded in the U.S. then they are called American Depository Receipts. In the United States, there are more than 1,000 ADRs mostly traded at over-the-counter (OTC)[43]. GDRs are similar to ADRs but they are different in that they are traded in more than one market outside the foreign issuer's home market.

6.4.4 Exchange-traded funds (ETFs)

One concern regarding investing in international stock exchanges is that international indices are non-investable. Many international stock indices contain stocks that are not traded. Hence, replicating the performance of those indices or following their performance become meaningless. ETFs offer investors a way to pool their money in a fund that makes investments in a stock index representing any marker of several countries. For instance, S&P Depository Receipts (SPDR) is an exchange-traded fund (ETF) that tracks the Standard & Poor's 500 Index. iShares (previously known as WEBS) are funds track an international stock or bond market index.

6.4.5 International mutual funds

An alternative method of international investing is through purchasing shares in funds that represent portfolios of stocks from different countries. International mutual funds are popular among investors because it provides them with a number of advantages such as (1) the minimum investment necessary to participate is low (2) experienced investment managers, and (3) high degree of stock diversification[44]. Global funds usually refer to funds that invest anywhere in the world, including the U.S. International fund refers to funds that invests only outside the U.S.

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[43]*Madura, J. (2018)*
[44] *Madura, J. (2010)*

6.5 Measuring Total Returns from International Investing

The return from international investing is not only affected by the return on the security in its national market but also by the change in exchange rates between the security's own currency and the currency of the investor's home country. Hence, there could be a big difference between the return on foreign investment and the return on the security in its national market based on the domicile of the investor.

For a U.S. investor, the dollar return on a foreign investment can be decomposed into two components, one that is related to the return on the security in its national market and the other is related to the currency gains or losses. Hence, the dollar return can be expressed as:

(1+Dollar return) = (1+Foreign currency return) X (1+Currency Gain or loss)

Example, if a U.S. investor purchases a Mexican stock for 50 pesos and holds it for a month when he receives a dividend income of 1 peso. At the end-of-this month, she sold the stock for 52 pesos and the Mexican peso depreciates by 8% against the U.S. dollar during the period.

The return to the Mexican investor expressed in the home currency (peso) is

$$1 + R_H = \frac{(52 - 50) + 1}{50} \implies R_H = 6\%$$

However, the return to the U.S. investor is -2.48% ;

$$1 + R_{US} = (\ 1 + R_H)\ (1 + R_{EX}) = (1 + 6\%)(1 - 8\%) \implies R_{US} = -2.48\%$$

The Mexican investor received a positive return of 6% whereas the U.S. investor lost money because the Mexican peso worth less at the end of the month.

Questions and Applications

1. Alan, a U.S. investor, is evaluating the performance of shares in Virgin Atlantic, a publicly traded company in England listed at LSE. The baseline investment amount used by Alan is 100,000 euros. The stock price rose from £130 in Jan 1 to £150 in Dec 31 with £10 dividends paid during the year. The exchange rate decreased from $1.30/£ in Jan 1 to $1.23/£ at the end of the year.

a. What was the return on the security in local currency term?

$$1 + R_H = \frac{(150 - 130) + 10}{130} \implies R_H = 23.08\%$$

b. What was the return on the security in U.S. dollar term?

$$1 + R_{US} = (1 + R_H)(1 + R_{EX}) = (1 + 23.08\%)(1 - 5.38\%) \implies R_{US} = 16.45\%$$

c. Does this mean it was a good investment for a local investor, a U.S.-based investor, or both?

It is a very good investment for a local investor but is just good for a U.S.-based investor

2. Comment on the following statement: "Because ADRs are denominated in dollars and are traded in the United States, they present less foreign exchange risk to U.S. investor that do the underlying foreign shares of stock".

Although a U.S investor pays the price of ADRs in U.S dollars but the future price of it depends on the exchange rate of U.S dollars against the foreign currency (through arbitrage) and this is also true for all dividends that come from the ADRs.

3. Access the following websites: www.adr.com and www. finance.yahoo.com/etf and compare the performance of ADRs and ETFs.

4. Choose the correct answer

All the following are methods for international investing apart from:

a. American Depositary Receipts (ADRs)

b. International Mutual Funds

c. Exchange-Traded Funds

d. Cross-listing stocks

5. True/False Questions

No	Statement	T	F
1	International diversification reduces the national unsystematic risks of a well-diversified portfolio		✔
2	Purchasing FX futures for speculation is one form of international investing		✔
3	International diversification leads to a higher efficient frontier	✔	
4	The return of international investing is not only affected by the local return but also by exchange rate fluctuations between local & foreign currencies	✔	

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Chapter 7: Foreign Direct Investment

Topic Title: *Foreign Direct Investment: motives, barriers, and other modes of entry.*

Key Words:

Modes of foreign market entry, Foreign Direct Investment (FDI), motives and barriers of FDI, designing global expansion strategy

Summary:

This chapter highlights global trends in FDI and differentiate between different modes of entry to foreign markets. It describes the common motives for establishing foreign direct investment and illustrates barriers of foreign direct investment. Then, it describes how host government encourage or discourage FDI and illustrates how MNCs can design global expansion strategy.

Outcomes and Learning Objectives:

1. *To highlight global trends in foreign direct investment*
2. *To differentiate between different modes of entry to foreign markets*
3. *To describe the common motives for establishing foreign direct investment.*
4. *To illustrate barriers of foreign direct investment*
5. *To explain the "Herfindhal- Hirschman (HHI)" and how it is computed*
6. *To describe how host government encourage or discourage FDI*
7. *To illustrate how MNCs can design global expansion strategy*

Chapter Outline:

7.1 Introduction

7.2 Trends and Terminology

7.3 Methods of International Expansion

7.4 Motives for Foreign Direct Investment

7.4.1 Revenue-related Motives

7.4.2 Cost-related Motives

7.5 Barriers for Foreign Direct Investment

7.6 Designing a Global Expansion Strategy

7.1. Introduction

Multinational companies frequently capitalize on foreign business opportunities by engaging in a number of methods, one of them is Foreign Direct Investment (FDI). FDI is investment in real assets (such as land, buildings, equipment or existing plants) in foreign countries. Financial managers need to understand the potential risk and return associated with FDI in order to make investment decisions that maximize the MNC's value.

FDI can take two main forms: (1) Greenfield investments, which involves the establishment of new operations in a foreign country. (2) Cross-border mergers and acquisitions, which involve combining with or buying out existing foreign businesses (most of Cemex's expansion has been in the form of acquisition). Acquisitions can be a minority (where the foreign firm takes a 10% to 49% interest in the firm's voting stock), majority (50% to 99%), or full outright stake (100%).

An example of FDI is the Mexican cement maker Cemex. Between the early 1990s and 2005, Cemex made FDI of $16 billion to establish operations in 50 countries. By 2005, Cemex became a MNC with annual sales in excess of $15 billion, only 15% of which were generated in Mexico.

A famous example of mergers is the merge between Daimler and Chrysler. By combining forces, in 1997, Daimler (the largest German industrial group) and Chrysler (third US largest carmaker) brought together the financial abilities, infrastructure and technical know-how that had no match at a global scale. DaimlerChrysler produces all types of cars (luxury cars but also minivans, trucks etc) and by combining their product-development forces, they were able to cut costs by up to $3 billion annually (including $1.1 purchasing costs). DaimlerChrysler now truly addresses the world market, covering a great variety of geographical regions and diversified consumer demand.

7.2 Trends and Terminology

When discussing FDI, it is important to distinguish between a number of concepts. The **flow of FDI** refers to the amount of FDI undertaken over a given time period (normally a year). The **stock of FDI** refers to the total accumulated value of foreign –owned assets at a given time. The **outflows of FDI**, meaning the flow of FDI out of the country. The **inflows of FDI**, meaning the flow of FDI into a country.

Horizontal FDI is FDI in the same industry in which a firm's operates at home. Cemex's acquisition of RMC in Britain is an example of horizontal FDI. While **Vertical FDI** is FDI in an industry that provides inputs for a firm's domestic operations, or it may be FDI in an industry abroad that sells the outputs of a firm's domestic operations. For example, large BP operations involve extracting natural resources therefore it tends to own oil fields, mine deposits, and forest to ensure that inputs will flow at stable prices with no need to import the raw material.

FDI has grown more rapidly than world trade and world output for several reasons. First, despite the general decline in trade barriers over the past 30 years, business firms still fear protectionist pressures. most of the recent increase in DFI is driven by the political and economic changes occurring in many parts of the developing nations, such as the general shift toward democratic political institutions and free market economies. Third, the globalisation of the world economy. For example, a firm like Cemex now sees the whole world as their market.

Most FDI flow has been to developed countries from developed countries. The U.S. has often been the favourite target for DFI inflows and continued to be the largest recipient of DFI in the late 1990s. In 2000, the U.S. was again the largest national recipient of DFI, accounting for $314 billion of the $1.2 trillion in global FDI. The $2.1 trillion stock of FDI in U.S. at the end of 2008 corresponds to approximately 16% of U.S. GDP.

FDI increases to developing countries since 1985 with much of it moved to the emerging Asian and Latin America economies. However, Africa received the smallest amount of inward investment. It reached a record high of $88 billion in 2008 but it still low due to political unrest, armed conflict, and frequent changes in economic policy in the region.

UNCTAD conducted a survey to identify the most attractive economies for the location of FDI for the period 2014 to 2016. Figure 7.1 shows that China leads the list, with 44 per cent of all respondents, followed closely by the United States, cited by 41 per cent. Also, Indonesia took over India in the third place. However, Malaysia, Japan, and Singapore are least favorite for TNCs' managers[45].

Figure 7.1 TNCs' top prospective host economies, 2014–2016
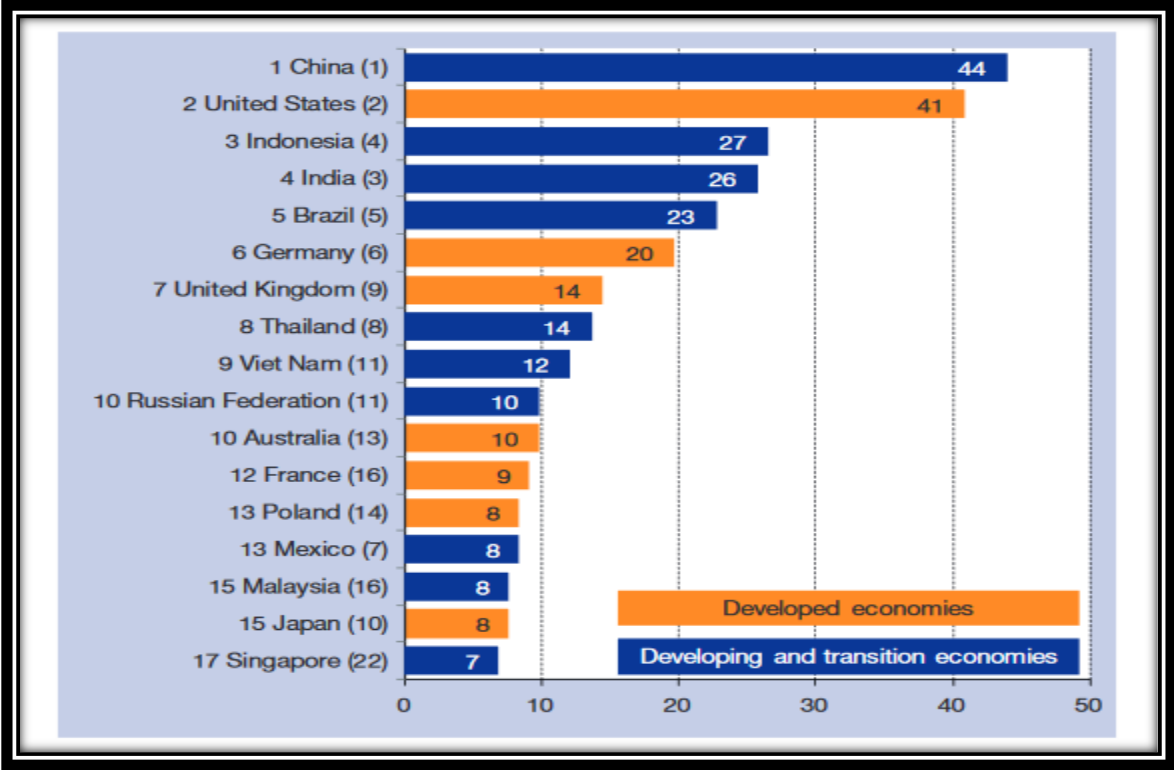
Source: UNCTAD (2015)

[45] *World Investment Prospects Survey 2014–2016 (2015), United Nations Conference on Trade and Development (UNCTAD), Geneva, Switzerland.*

7.3 Methods of International Expansion

Studies have shown that MNCs expand overseas by degrees:

A. Exporting

At first, an internationally conscious company would engage in foreign trade transactions. These initially involve only imports and exports. Following some time of trading, the firm understands better the foreign environment and therefore eliminates local intermediaries and deals directly with foreign agents. Capital requirements and startup costs are minimal, political risk is low[46], and profits are immediate. It provides the opportunity to learn about present and future supply and demand conditions, competition, channels of distribution, payment conventions, financial institutions and financial techniques. The setting of a foreign sales outlet is the final phase of this step.

Exporting does not help to realise the full sale potential of a product. In contrast, by manufacturing abroad, a company is directly involved with the local market and can adapt its products to specific needs and market conditions.

Exporting is the first step that gives the opportunity to the firm to understand better the foreign market and foreign corporate environment. When ready, the firm realises that to minimise its foreign dealing costs it must move into foreign production. This foreign production can take a number of methods such as licensing, franchising, joint ventures, merger and acquisition, and greenfield investment.

B. Licensing

A MNC may license a local firm to manufacture the company's products in return for royalties (A periodic payment for the right or privilege of using another person's know-how under a know-how or trade secrets agreement) and other forms of payment. The prime advantages of licensing is that the licensor is not involved

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[46] *Eiteman et al. (2016)*

in any type of cash or debt investment and sets back to enjoy the benefits foreign sales. Also, the firm enters the foreign market immediately with fewer financial and legal risks

The main disadvantage is that the future generated foreign cash flows are much lower and if the foreign licensee becomes very strong throughout the years of trading the licensed product, then the licensor may face problems entering the foreign market when the license expires. Other disadvantages are that it is difficult to maintain product quality and to control exports by the foreign licensee.

C. Franchising

In a franchising arrangement, one firm provides a specialized sales or service strategy, support assistance, and probably an initial investment in the franchise in return of periodic fees, allowing local residents to own and manage the units*47*. For example, McDonald's typically purchases the land and the building and rents them to the franchisee who will be responsible for the investment in all equipment and furniture to operate the business for a number of years (such as 20 years) but the franchisee should adhere to the standards set by McDonald's. Some authors consider franchising as one type of foreign direct investment.

D. Foreign Direct Investment

The final step for going international is by largely taking in **Direct Foreign Investments**. This can be done by exploiting international product, market and capital imperfections. *DFI can take two main forms: (1)* **Greenfield investments**, which involves the establishment of new operations in a foreign country, and (2) **Cross-border mergers and acquisitions**, which involve combining with or buying out existing foreign businesses (most of Cemex's expansion has been in the form of acquisition). Acquisitions can be a minority (where the foreign firm takes a 10% to 49% interest in the firm's voting stock), majority (50% to 99%), or full outright stake (100%).

Firms prefer Merger and Acquisition (M&A) rather than undertake Greenfield investment for a number of reasons. First, M&A are quicker to execute than greenfield investment. For instance, Cemex is the world's third largest cement company and Mexico's largest multinational. It reached its global status in less than a decade which was driven mainly by acquisitions. If Cemex had relied on Greenfield investments, it could not have become so large so fast. Second, Foreign firms are acquired because those firms have valuable strategic

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47 Madura, J. (2018)

assets, such as brand loyalty, customer relationship, trademarks or patents, etc. Third, firms make acquisitions because they believe they can increase the efficiency of the acquired unit by transferring capital, technology, or management skills.

Firms often view other ways of multinational expansion (e.g. exports) as substitutes for FDI. For example, Toyota, when deciding to serve the North American market, chose between exporting and FDI. Although Toyota initially served the North American market through exports, increasingly it has turned to FDI. Toyota now has the capability to produce 1.45 million cars a year in North America. Also, it is important to understand why a firm might prefer to engage in FDI rather than licensing. Although the licensor does not have to pay for opening a foreign market nor to bear the risk associated with opening a foreign market, many firms are reluctant to engage in straight licensing arrangements.

If there are imperfections and asymmetry in the **market of intangibles**, then a MNC with strong intangible assets may not be interested in merging and instead, move to acquire a foreign firm (aggressively or through a deal). In this case, large and strong MNCs are interested in investing very large amounts of FDIs to obtain **already established** production facilities, distribution and supplier networks, workforce etc. In combination with its own competitive advantage (superior intangible assets), it will create an immediate access to the local market and obtain additional market shares.

7.4 Motives for Foreign Direct Investment

Foreign direct investment can improve profitability and enhance shareholder wealth, either by boosting revenues or reducing costs[48].

7.4.1 *Revenue-Related Motives*

A. Attract new sources of demand, especially when the potential for growth in the home country is limited. Possibly because of intense competition. Even if it faces little competition, its market share may be near its potential peak. Moreover, consumers in many developing countries (China, Argentina, ..) have historically

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[48] *Madura, J. (2018)*

been restricted from purchasing goods produced by firms outside their countries, the market for some goods are not well-established and offer much potential for MNCs. In 2004, Coca-cola Co. has invested about $500 million in bottling facilities in China while Pepsi Co invested about $200 millions.

B. Enter profitable markets. If prices are too high in a foreign market, a MNC may plan to undercut the prevailing excessively high prices. But local competitor may reduce their prices too.

C. Exploit monopolistic advantages, especially for firms that possess resources or skills not available to competing firms particularly in the least advanced technology markets. If a MNC has strong intangible assets then it may use them to enter a new foreign market and crush local competition. Coca-Cola chooses to expand internationally *only* through DFI because it wants to protect the non-patented formula.

If a MNC reveals its intangible secrets to a foreign licensee, then it faces the *boomerang* effect. This decision will return to haunt the MNC. **Intangible assets** include **patents**, **know-how**, **superior R&D capabilities**, the **brand** of a product etc.

D. React to trade restrictions. The previous three motives are aggressive but the fourth is defensive aims to go around trade barriers. Example: Japanese Automobile firms (Toyota and Honda) established their won plants in US in anticipation of export restrictions.

E. Diversify internationally: more stable net cash flows will achieve from sales across countries. A firm can make its net cash flows less volatile and lower its risk and consequently its cost of capital. Example: In 2001, several technology firms experienced weak sales because of reduced US demand for their products. Therefore, AT&T, IBM increased expansion in China.

7.4.2 *Cost-Related Motives*[49]

A. Fully benefit from economies of scale, especially for firms that utilize much machinery. That is, lower average cost per unit resulting from increased production. For example: one product can be produces in Slovakia and sold in the whole European market with the same label but with instructions written in a number of languages.

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[49] *Madura, J. (2010)*

B. Use cheaper foreign factors of production: Labour services in a country **may be severely under-priced** relative to its productivity because workers are not allowed to freely move across borders to seek higher wages.

Among all factor markets, **the labour market is the most imperfect**. The recent EU expansion partially addressed this imperfection, since cheap labour from the emerging Eastern European countries could now move across borders to work in more developed countries. However, when workers cannot move due to immigration barriers, then the MNCs move to find the workers, in order to benefit from the under-priced labour.

Volkswagen expanded its capacity in Slovenia, and cut jobs in Spain. While it originally established operations in Spain because the wages were about half of those in Germany, wages in Slovenia are less than half of those in Spain. Peugeot has recently also moved production from the UK to Eastern Europe.

C. Use foreign raw materials, especially if the MNC plans to sell the finished product back to the consumers in that country due to transportation costs.

D. Use foreign technology. Corporations are establishing overseas plants or acquire existing overseas plants to learn the technology of foreign countries. They can also engage in joint venture to gain the know how on new technology from their partners. This new technology can then be used to improve the productivity at home and in subsidiaries. For example, Hyundai announced in 2019 the establishment of $4 billion joint venture with GM spinoff Aptiv PLC to develop driveless cars.

E. React to exchange rate movements. When a firm perceives that a foreign currency is undervalued, the firm may consider DFI in that country, as the initial outlay would be relatively low. Although MNC's do not engage in large projects simply on the basis of currency movements, the feasibility of proposed projects may be dependent on existing and expected ER movements

FDI can also help reduce the changing demand for a company's exports due to exchange rate fluctuations. Example: when Japanese automobile manufacturers build plants in the US, they can reduce exposure to exchange rate fluctuations by incurring dollar costs for their production which offset dollar revenues.

In the early 1980, **Honda**, a Japanese automobile manufacturer build an assembly plant in Marysville, Ohio and began to produce cars for the North American market. These cars were substitutes for imports from Japan (its was **cost-efficient** to assemble the cars in the US).There were **trade barriers** imposed on Japanese car manufacturers, and the only way to increase their North American market share was by manufacturing in the US. United Auto Works (a union) welcomed Honda's choice since it created **job opportunities.** Ohio included

additional motives by setting up a **special trade zone** that allowed Honda to import automobile parts from Japan at a reduced tariff rate. Finally, as the Ohio plant expanded, Honda starter exporting Japanese cars from the US to Japan.

7.5 Barriers to Foreign Direct Investment

Governments may impose various **constraints on free flows** of investments. These barriers are:

A. Barriers that protect local firms or consumers. All countries have one or more agencies that monitor mergers and acquisitions. For example, the EU commission assesses mergers that may affect competition in Europe. It rejected the merger between GE and Honeywell because it believed that the merger would have resulted in monopoly.

The U.S. Department of Justice uses the HHI for evaluating mergers. Herfindhal- Hirschman (HHI) Index. The closer a market is to being a monopoly, the higher the market's concentration (and the lower its competition). If, for example, there were only one firm in an industry, that firm would have 100% market share, and the HHI would equal 10,000 (100^2), indicating a monopoly. Or, if there were thousands of firms competing, each would have nearly 0% market share, and the HHI would be close to zero, indicating nearly perfect competition.

The U.S. Department of Justice considers a market with a result of less than 1,000 to be a competitive marketplace a result of 1,000-1,800 to be a moderately concentrated marketplace and a result of 1,800 or greater to be a highly concentrated marketplace. As a general rule, mergers that increase the HHI by more than 100 points in concentrated markets raise antitrust concerns.

B. Barriers that restrict ownership. These barriers may limit or prevent international acquisitions. For example, Mexico only recently announced that it would allow foreign companies to own 100% of their subsidiaries established in Mexico.

C. "Red tape" barriers. They are implicit barriers to FDI. However the current efforts to make regulations uniform across Europe have simplified the paperwork required to acquire European firms.

D. Industry barriers. The local firms of some industries in particular countries have substantial influence on the government and will likely use this influence to prevent competition from MNCs that attempt FDI.

E. Country risk. Transparency International distinguishes between three proxies for country risk: corruption, regulatory quality and political stability and absence of violence. A positive long-term impact of fighting corruption and improving political stability and absence of violence increase the attractiveness of host countries to FDI[50]. If a country is susceptible to abrupt changes in government and political conflicts, the feasibility of FDI may depend on the outcome of these conflicts. MNCs want to avoid a situation in which they will lose their FDI if the government is removed after the FDI occurs.

Another classification of country risk decomposes it into transfer risk, cultural risk and institutional risk. While we explained cultural and institutional and cultural risks in Chapter one, transfer risk is related to the limitations imposed on MNCs' ability to transfer funds to into and out of a host country without restrictions[51]. Countries, which run out of foreign exchange, impose restrictions on transferring foreign exchange out of the country in what is known as blocked funds. We will discuss the impact of these restrictions on the evaluation of foreign projects in the final chapter.

How host government view FDI?. For the government, the ideal DFI solves problems such as unemployment and lack of technology without taking business away from the local firms. The government may provide incentives to encourage the forms of DFI that it desires, and impose preventive barriers or conditions on the forms of DFI that it does not want. The ability of a host government to attract DFI is dependent on the country's markets and resources, as well as government regulations and incentives.

Common incentives offered by the host government include tax breaks, discounted rent for land and buildings, low-interest loans, subsidized energy, and reduced environmental restrictions. Common barriers imposed by the host government include the power to block a merger/acquisition, foreign majority ownership restrictions, excessive procedure and documentation requirements (red tape), and operational conditions.

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[50] *Al-Samman, H., & Mouselli, S. (2018). Does Country Risk Affect FDI to GCC Countries?.* Pertanika Journal of Social Sciences & *Humanities, 26(4), pp.2627 – 2642.*
[51] *Eiteman et al. (2016)*

7.6 Designing a Global Expansion Strategy

If a company currently holds a competitive advantage either in production or marketing, it needs to consider the following five elements while designing its global expansion strategy[52]:

A. Awareness of profitable investment opportunities: investments that enhance the MNC's competitive advantage. If a company doesn't have brand names or distribution capabilities it is better to just export.

B. Selecting a mode of entry: The optimal method for a firm to penetrate a foreign market is partially dependent on the characteristics of the market. For example, if the consumers are used to buying domestic products, then licensing arrangements or joint ventures may be more appropriate. That is, comparing the alternatives and selecting the optimal mode of entry.

C. Auditing the effectiveness of entry modes: the continual audit of the effectiveness of current entry strategy. For example, If a company has built a brand name, it can change its mode of entry. Also, As conditions change over time, some countries may become more attractive targets for DFI, while other countries become less attractive.

D. Using appropriate evaluation criteria: the need to look beyond the returns associated with the project itself to know its true impact on the firm. For example, an investment mode to save a market threatened by competition or trade barriers must be judged on the basis of the sales that would otherwise have been lost.

E. Estimating the longevity of a competitive advantage: If this advantage is easily replicated, if both local and foreign competitors will soon apply the same concept and process, then profits will decline. Therefore, firm's competitive advantage should be constantly monitored and maintained to ensure the existence of effective barrier to enter the market. If these barriers breakdown, the firm must react quickly and either reconstruct them or build new ones. In fact, companies must invest in developing competitive advantages that are not easily replicated.

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[52] *Shapiro, A.C. (2014)*

Questions and Applications

1. Describe some potential benefits to a MNC as a result of direct foreign investment.

{Guided answer Section: 7.4}

2. Visit Nike.com and discuss which motives for DFI encouraged Nike to expand its footwear production in Latin America?

3. Why would foreign governments provides MNCs with incentives to undertake FDI there?

{Guided answer Section: 7.5}

4. Read Lehner, M. (2009). Entry mode choice of multinational banks. Journal of Banking & Finance, 33(10), 1781-1792, *and* answer the following:

   a) Analyse the entry modes available for Multinational banks?

   b) How does their choice differ from country to another and why?

5. Read the following article: Al-Samman, H., & Mouselli, S. (2018). Does Country Risk Affect FDI to GCC Countries?. Pertanika Journal of Social Sciences & Humanities, 26(4), pp.2627 – 2642, and answer the below question:

   a) What are the three proxies of country risk according to Transparency international and how do they measure?

   b) What are the status of FDI and country risk of GCC countries?

   c) What are the main findings of the article and how can you explain them?

6. Choose the correct answer: All the following are revenue-related motives of FDI apart from

a. Diversify internationally

b. React to Exchange rate movements

c. Exploit monopolistic advantage

d. Enter profitable markets

7. True/False Questions

No	Statement	T	F
1	Host governments always welcome FDI		✔
2	To fully benefit from economies of scale is a revenue-related motives for FDI		✔
3	"Red tape" barriers are explicit barriers to FDI		✔
4	The optimal method for a firm to penetrate a foreign market is not constant	✔	

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Chapter 8: Capital Budgeting for Multinational Projects

Topic Title: Capital budgeting for the Multinational Corporation

Key Words:

Capital budgeting, Project versus parent valuation, Blocked funds, Sensitivity valuation, Real option analysis

Summary:

This chapter highlights the importance and complexities that arise in valuing multinational projects. It compares and contrast capital budgeting analysis from the parent and subsidiary points of view. In addition, it shows how capital budgeting can be conducted for multinational projects. It considers additional factors in valuing multinational projects that are not usually examined in local contexts. Moreover, it contrast the net present value approach to real option analysis and to explain how to incorporate them in a capital budgeting analysis. Furthermore, it shows how risk can be integrated in the capital budgeting of multinational projects.

Outcomes and Learning Objectives:

1. *To appreciate the differences between project and parent cash flows*
2. *To compare the capital budgeting analysis of an MNC's subsidiary with that of its parent*
3. *To distinguish between factors affecting the capital budgeting for MNC's project and those of local projects.*
4. *To apply capital budgeting for multinational projects*
5. *To assess the profitability of foreign investments by identifying the incremental cash flows generated by these investments*
6. *To contrast the net present value approach to real option analysis and to explain how to incorporate them in a capital budgeting analysis*
7. *To integrate risk in the capital budgeting of multinational projects*

Chapter Outline:

8.1 Introduction

8.2 Subsidiary versus parent perspective

8.3 Inputs for Multinational Capital Budgeting

8.4 Real Option Analysis in Multinational Capital Budgeting

8.5 Adjusting Project Valuation for Risk

8.1. Introduction

Multinational Capital budgeting compares the benefits and costs of international projects. While this sounds similar to what is normally done in the case of local capital budgeting, there are many factors that are contributing to make capital budgeting of multinational projects very complicated. Multinational capital budgeting is a critical function because many international projects are costly, irreversible, and cannot be easily sold.

8.2 Subsidiary versus Parent Perspective

Should the capital budgeting for a multi-national project be conducted from the viewpoint of the subsidiary that will administer the project, or the parent that will provide most of the financing?. The results may vary with the perspective taken because the net after-tax cash inflows to the parent can differ substantially from the cash flows of the project received by the subsidiary. Such differences can be due to:

Tax differentials: The feasibility of multinational projects is largely affected by taxes imposed on remitted funds by the parent's government. If the taxes imposed by the parent's government are high, the project may be feasible from the point of view of the subsidiary but not for the parent.

Restricted and Excessive Remittances: MNCs need to consider regulations by host governments that restrict remittances such as blocking the transfer of profits or that require reinvesting profits inside the host country for a number of years before transfer them to the parent company. Excessive remittances should also be considered as the parent may charge its subsidiary very high administrative fees and royalties that are returns to the parent but expenses for the project.

Exchange rate movements: The remittance of earnings from the subsidiary to the parent requires a conversion of earnings from the subsidiary's local currency to the parent's currency. Hence, exchange rate movements affect the amount received by the parent from international projects. Some projects looks feasible locally, but a decline in the host currency value turns the project to be infeasible. For instance, the continuous decline of the Syrian pound value since 2011 substantially reduces the value of earnings remitted from the Arab bank working in Syria to its parent in Jordan.

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Incremental revenues or losses: estimating incremental cash flows are the most difficult part of evaluating multinational projects. Incremental cash flows refer to cash flows that only occur if the project is accepted[53]. MNC shareholders are not concerned by total cash flows from an international project but with incremental cash flows generated by the project. Incremental cash flows can differ from total cash flows for a number of reasons:

(1) Cannibalization. It refers to the case when a new product takes sales from the firm's existing products or if the project involves substituting local production for parent company exports. Thus, the new project's estimated profits must be reduced by the earnings on the lost sales[54].

(2) Sales creation is the opposite of cannibalization. When an investment creates or expected to create additional sales for existing products, such additional sales and associated incremental cash flows should be attributed to the project. For instance, the establishing of GM's auto plants in Britain use parts made by its U.S. plants which would not otherwise be sold if GM's British plants disappeared.

(3) Opportunity Cost. It represents the true economic cost of any resource required for the project, regardless of whether the firm own the resource or has to buy it. For instance, If Nestle decides to build a new plant in Syria on a land it bought 10 years ago, Nestle must include the current market value of the land in calculating the net present value from undertaking the project.

(4) Transfer Pricing: It refers to the pricing of goods and services traded internally between the parent company and its subsidiary at levels significantly different from market prices. For example, if a Ford plant in the U.S. reduces the prices of engines sold to its British subsidiary, this will increase the profitability of its British subsidiary. Transfer pricing distorts the profitability of a proposed project and will lead to misleading revenues. Therefore, market prices should be applied when evaluating projects and if market prices are unavailable for such products, then international projects must be evaluated on the basis of their cost saving or additional generated profits.

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[53] *Ross, S. A., Westerfield, R., Jordan, B. D., & Biktimirov, E. N. (2016).* Essentials of Corporate Finance*. 9th Edition, McGraw-Hill/Irwin.*
[54] *Shapiro, A. C.,(2014)*

(5) Fees and Royalties. Often parents charge their subsidiaries for various items such as legal counsel, rent, research and development, head-quarter staff, management costs and the like. Those charges are costs to the subsidiary but they are a benefit for the parent. Ideally, international projects should be charged only by additional expenditures that are related to the project while discarding overhead expenses that are unaffected by the project when estimating project cash flows.

(6) Incorporating Intangible Benefits. Many international projects provide intangible benefits in the form of valuable learning experiences and a broader knowledge base such as sharpening the parent competitive skills and exposing it to emerging technologies. Acquiring such knowledge and adopting practices, products, and technologies discovered overseas can improve the company's worldwide competitive position. The estimation and incorporation of such intangible benefits, shortcuts and simplifications, in the valuation of international projects is extremely difficult. However, it provides financial managers with insights on the real benefits from international projects and how far they are from thorough analysis.

Figure 8.1 illustrates the process of remitting subsidiary earnings to the parent. It shows how cash flows generated by the subsidiary may be reduced until they reach the parent by different types of taxes and retained earnings.

Figure 8.1 Process of Remitting Subsidiary Earnings to the Parent
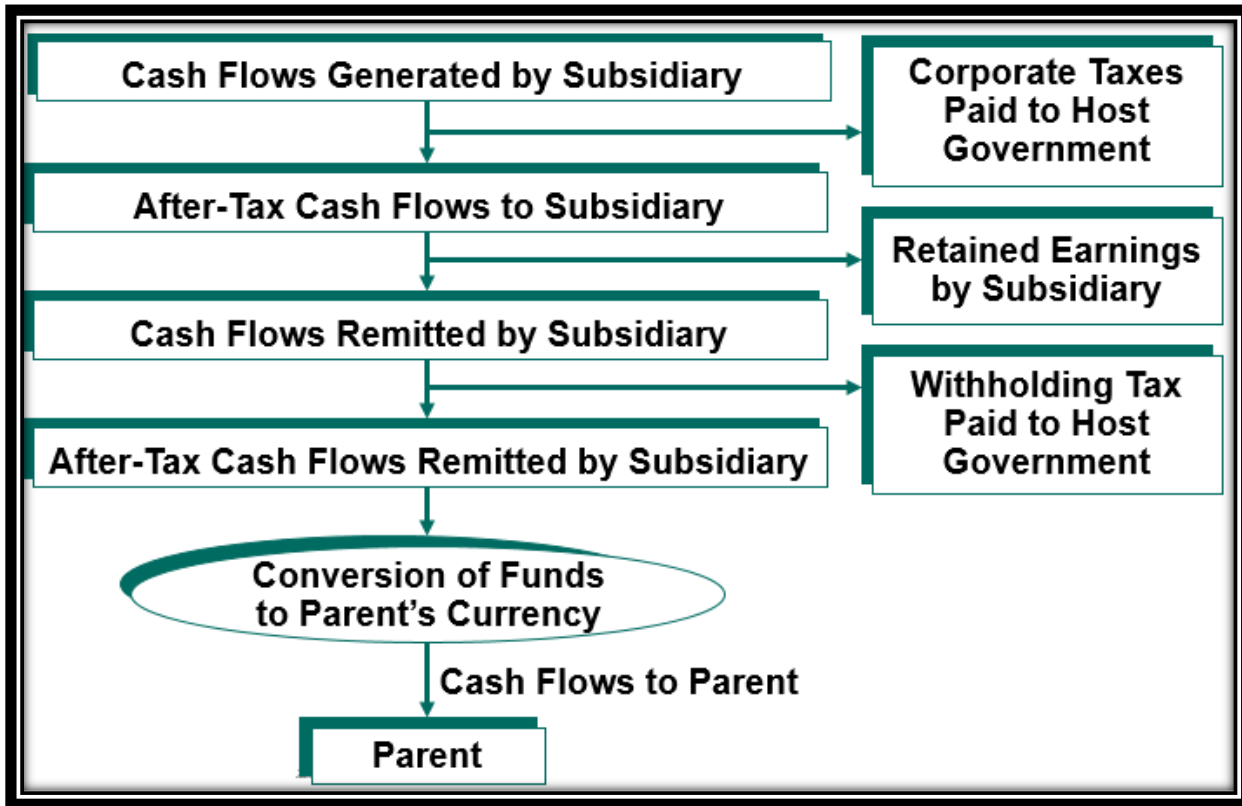
A parent's perspective is more appropriate when evaluating a project, because the economic theory states that the project value is determined by the NPV of future cash flows back to the investors. Evaluation of a project from the subsidiary perspective serves some useful purposes, but it should be subordinated to evaluation from the parent's viewpoint. Hence, the parent MNC should only value cash flows that are, or can be, repatriated net of any transfer costs (such as taxes) because only accessible funds can be used for the payment of dividends and interest, for amortization of the firm's debt, and for investment. However, one exception to this rule occurs when the foreign subsidiary is not wholly owned by the parent. In this case, the foreign subsidiary has a group of shareholders that it must satisfy.

8.3 Inputs for Multinational Capital Budgeting

Firms normally requires forecasts of certain economic and financial characteristics regardless of the type of long-term project it considers. However, there are additional economic and financial characteristics that MNCs require in addition to the usual characteristics. Each of these characteristics is briefly explained below:

A. Initial Investment

The parent's initial investment usually constitutes the major source of funds to start a certain project. Initial investment does not only include capital spending necessary to start the project, but also additional funds such as a working capital, such as inventory and wages, to support the project over its lifetime.

B. Price and Consumer demand

One of the important components in the cash flow estimation is to predict the price at which products will be sold and the consumer demand of the products during the project lifetime. This prediction will be based on the prices of competitive products and future inflation at the host country. Forecasting consumer demand for a product is very valuable and difficult especially if the company can pull a percentage of the market share of its competitors.

C. Variable and Fixed Costs

Similar to price estimates, a company needs to predict both variable and fixed costs in order to derive its forecasted cash flows. Despite that variable costs per unit is relatively easy to predict, mistakes could happen in the estimated sales. Also both variable and fixed costs are subject to changes in inflation between the time those costs are estimated and the time when they are occurred.

D.Tax laws

Tax laws vary from country to another with huge variations on tax rates and tax credits. Not only that earnings are subject to taxes in the host country, but also earnings remitted to the parent company are usually subject to tax deductions. It is essential that all types of taxes and tax credits are considered in the estimation of future

cash flows in the international capital budgeting of foreign projects.

E. Restrictions on remitted funds

Some countries impose restrictions on the ability of a subsidiary to transfer earnings to its parent. The aim of such restrictions is to encourage local investing or to avoid excessive supply of local currency for the exchange of another currency. Blocked funds penalize a project if the return on such reinvestment is less than the required rate of return on the project. Given that such restrictions will alter the net cash flows to the parent, a MNC should consider these restrictions in the calculations of net cash flows and predict any future changes in these restrictions.

F. Salvage (Liquidation) value

Since the salvage value typically has a significant impact on the project's NPV, the MNC may want to incorporate various possible outcomes for the salvage value and re-estimate the NPV based on each possible outcome. It may even desire to compute the break-even salvage value, which is the salvage value necessary to achieve a zero NPV for the project. If the actual salvage value is expected to equal or exceed the break-even salvage value, the project is feasible.

G. Exchange rate fluctuations

Firms know that the exchange rate will typically change over time but they do not know the exact change. Since it is difficult to accurately forecast exchange rates, different scenarios can be considered together with their probability of occurrence. From the parent's point of view, appreciation of the host country currency would be favorable since the host currency inflows would someday be converted to parent currency and vice versa.

H. Host government incentives

A host government may encourage some foreign projects if they have a favorable impact on the economic conditions in the host country. Any incentives offered by the host government must be incorporated within the capital budgeting analysis. For example, a low-rate host government loan or a reduced tax offered to the subsidiary would enhance periodic cash flows. Similarly, if the government subsidizes the initial establishment of the subsidiary, the MNC's initial investment would be reduced.

J. Required rate of return

Once the project cash flows are estimated, the parent should determine the rate of return at which those cash flows will be discounted at. This rate of return is the cost of capital of funds used to finance the project that could be different from the parents' cost of capital. This required rate of return is an important input in the valuation formula of foreign projects.

Multinational Capital Budgeting Example:

Adidas, Inc. is considering the establishment of a subsidiary in Malaysia that would manufacture footballs locally. Adidas's management requests that each department to provide relevant information for a capital budgeting analysis. In addition, a number of Adidas executive managers have met Malaysian officials to discuss the proposed subsidiary. The Malaysian government will pay the parent 20 million Malaysian Ringgit to assume ownership of the subsidiary at the end of four years. All relevant information follows.

1. Initial investment of 40 million Malaysian Ringgit (MR), which includes funds to support working capital, are needed for the project. Given the existing spot rate of €0.20 per Malaysian Ringgit, the euro amount of the parent's initial investment is €8 million.

2. Price and demand: The estimated price and demand schedules during each of the next 4 years as well as variable costs are shown in Table 8.1 here:

Table 8.1: Price, demand and variable costs estimates per football

	Year 1	Year 2	Year 3	Year 4
Price per football	MR300	MR300	MR350	MR400
Demand in Malaysia	150,000	150,000	180,000	200,000
Variable costs per football	MR200	MR200	MR250	MR300

3. Fixed costs: the expense of leasing extra office space is MR2 million per year and other annual overhead expenses are expected to be MR2 million per year.

4. The subsidiary will use the maximum depreciation rate of MR5 million per year that is allowed by the Malaysian government. The tax rate on income is 20 percent and the withholding tax on any fund remitted to the parent is 10 percent. Also, the German government will allow a tax credit on taxes paid in Malaysia.

Therefore, earning remitted to the German parent will not be taxed by the German government.

5. Remitted funds. The Adidas subsidiary plans to send all its net cash flows back to its parent and the Malaysian government promises no restrictions on remitted funds but imposes 10 percent withholding tax.

6. Exchange rates are expected to remain in its current levels for four years at €0.20 per Malaysian Ringgit.

7. The required rate of return on this project by Adidas Inc. is 15 percent

Analysis

The capital budgeting will be conducted from the parent's point of view. The first step is to calculate the contribution margin as the difference between the price and variable costs multiplied by the number of units sold. Then, fixed costs of office space and overhead costs as well as depreciation will be deducted from the contribution margin to reach pre-tax profit. Next, host government tax will deducted and depreciation will be added to compute net cash flows to subsidiary. All these cash flows will be remitted to the parent after deducting 10 percent withholding tax before they are converted into euros at the expected exchange rate.

Despite the availability of several capital budgeting methods, a commonly used method to evaluate projects is to estimate the cash flows and salvage value to be received by the parent and compute the project's NPV (discussed in Chapter 5):

$$NPV = -initial\ outlay + \sum_{t=1}^{n} \frac{cash\ flows\ in\ period\ t}{(1+k)^t} + \frac{salvage\ value}{(1+k)^t}$$

The net cash flow per period is discounted at the required rate of return and the cumulative NPV is determined by consolidating the discounted cash flows of each period and subtracting the initial investment as outlined in the formula above. In our example, the cumulative NPV at the end of the last period is €1,140,034 which is positive. The Internal Rate of Return (IRR) is 15.1% which is higher than the required rate of return of 10%. Hence, Adidas Inc. may accept the project.

Table 8.2 Capital budgeting Analysis: Adidas, Inc.

Year	0	1	2	3	4
Contribution margin		15,000,000	15,000,000	18,000,000	20,000,000
Office space		-2,000,000	-2,000,000	-2,000,000	-2,000,000
Overhead		-2,000,000	-2,000,000	-2,000,000	-2,000,000
Depreciation		-5,000,000	-5,000,000	-5,000,000	-5,000,000
Pre tax profit		6,000,000	6,000,000	9,000,000	11,000,000
Income tax 20%		-1,200,000	-1,200,000	-1,800,000	-2,200,000
Add back depreciation		5,000,000	5,000,000	5,000,000	5,000,000
After tax cash flow		9,800,000	9,800,000	12,200,000	13,800,000
Remitted to parent		9,800,000	9,800,000	12,200,000	13,800,000
Withholding tax 10%		-980,000	-980,000	-1,220,000	-1,380,000
Net after witholding		8,820,000	8,820,000	10,980,000	12,420,000
Salvage value	20,000,000				20,000,000
Exchange rate	0.2	0.2	0.2	0.2	0.2
Remitted US$ equiv.		1,764,000	1,764,000	2,196,000	2,484,000
Asset cash flow	-8,000,000				4,000,000
Parent cash flow	-8,000,000	1,764,000	1,764,000	2,196,000	6,484,000
NPV	1,140,034				
IRR	15.1 %				

Source: Author

Our analysis assumes that the exchange rate between the Euro and Malaysian Ringgits is fixed at €0.20/MR. However, if we relax this assumption and consider two scenarios for exchange rate movements: the first scenario where the Malaysian currency appreciates gradually against the euro while in the second scenario the Malaysian currency gradually depreciates against the euro. Table 8.3 illustrates that exchange rate fluctuations could either increase the net present value or reduce it. The first scenario would result in a NPV of €2,956,218 while the second scenario will turn NPV to be negative of -€1,578,330.

Table 8.3:Analysis with Alternative exchange Rates Scenarios

Year	0	1	2	3	4
Net after witholding		8,820,000	8,820,000	10,980,000	12,420,000
Salvage value	20,000,000				20,000,000
Exchange rate	0.2	0.22	0.23	0.24	0.25
Remitted US$ equiv.		1,940,400	2,028,600	2,635,200	3,105,000
Asset cash flow	-8,000,000				5,000,000
Parent cash flow	-8,000,000	1,940,400	2,028,600	2,635,200	8,105,000
NPV	2,956,218				
IRR	22.3 %				
Net after witholding		8,820,000	8,820,000	10,980,000	12,420,000
Salvage value	20,000,000				20,000,000
Exchange rate	0.2	0.18	0.16	0.14	0.12
Remitted US$ equiv.		1,587,600	1,411,200	1,537,200	1,490,400
Asset cash flow	-8,000,000				2,400,000
Parent cash flow	-8,000,000	1,587,600	1,411,200	1,537,200	3,890,400
NPV	-1,578,330				
IRR	1.8 %				

Source: Author

Now, let's assume that the initial costs are going up to 50 million Malaysian Ringgit while the price at which it will sell the project to the Malaysian government increases to 25 million Malaysian Ringgit. Then, the project feasibility calculations will change to reflect such changes and the NPV will -€176,952. Thus, the project will turn to be infeasible Table 8.4.

Table 8.4 Capital Budgeting with Alternative Financing Arrangements

Year	0	1	2	3	4
Contribution margin		15,000,000	15,000,000	18,000,000	20,000,000
Office space		-2,000,000	-2,000,000	-2,000,000	-2,000,000
Overhead		-2,000,000	-2,000,000	-2,000,000	-2,000,000
Depreciation		-5,000,000	-5,000,000	-5,000,000	-5,000,000
Pre tax profit		6,000,000	6,000,000	9,000,000	11,000,000
Income tax 20%		-1,200,000	-1,200,000	-1,800,000	-2,200,000
Add back depreciation		5,000,000	5,000,000	5,000,000	5,000,000
After tax cash flow		9,800,000	9,800,000	12,200,000	13,800,000
Remitted to parent		9,800,000	9,800,000	12,200,000	13,800,000
Withholding tax 10%		-980,000	-980,000	-1,220,000	-1,380,000
Net after witholding		8,820,000	8,820,000	10,980,000	12,420,000
Salvage value	25,000,000				25,000,000
Exchange rate	0.2	0.20	0.20	0.20	0.20
Remitted US$ equiv.		1,764,000	1,764,000	2,196,000	2,484,000
Asset cash flow	-10,000,000				5,000,000
Parent cash flow	-10,000,000	1,764,000	1,764,000	2,196,000	7,484,000
NPV	-176,952				
IRR	9.4 %				

Source: Author

Let us now assumes that the Malaysian government imposes restrictions on remitting earning to Adidas Inc. That is, the subsidiary can only transfer earnings at the end of project life. Also, assumes that the subsidiary is successful in reinvesting blocked funds internally at 5% reinvestment rate. Table 8.5 shows that the NPV declines from the initial level but is still positive at €901,619 with IRR of 13%

Table 8.5 Capital Budgeting with Blocked Funds

Year	0	1	2	3	4
Contribution margin		15,000,000	15,000,000	18,000,000	20,000,000
Office space		-2,000,000	-2,000,000	-2,000,000	-2,000,000
Overhead		-2,000,000	-2,000,000	-2,000,000	-2,000,000
Depreciation		-5,000,000	-5,000,000	-5,000,000	-5,000,000
Pre tax profit		6,000,000	6,000,000	9,000,000	11,000,000
Income tax 20%		-1,200,000	-1,200,000	-1,800,000	-2,200,000
Add back depreciation		5,000,000	5,000,000	5,000,000	5,000,000
After tax cash flow		9,800,000	9,800,000	12,200,000	13,800,000
Remitted to parent		9,800,000	9,800,000	12,200,000	13,800,000
					11,344,725
					10,804,500
					12,810,000
Withholding tax 10%					-3,594,923
Net after witholding					45,164,303
Salvage value	20,000,000				20,000,000
Exchange rate	0.2	0.20	0.20	0.20	0.20
Remitted US$ equiv.		0	0	0	9,032,861
Asset cash flow	-8,000,000				4,000,000
Parent cash flow	-8,000,000	0	0	0	13,032,861

Source: Author

In our example, there is no presumed impact of the new project on prevailing cash flows. In reality, however, there may often be an impact. Assume that without subsidiary, Adidas's export business to Malaysia is expected to generate net cash flows of €1 million over the next four years. With a subsidiary, these cash flows would be foregone. These forego cash flows should be deducted annually from the euro cash flows and NPV will be recalculated. Table 8.6 considers the impact of the project on prevailing cash flows and shows that the project turns to be infeasible with negative NPV of -2,029,831 euros.

Table 8.6 Capital Budgeting when prevailing Cash Flows are Affected

Year	0	1	2	3	4
Contribution margin		15,000,000	15,000,000	18,000,000	20,000,000
Office space		-2,000,000	-2,000,000	-2,000,000	-2,000,000
Overhead		-2,000,000	-2,000,000	-2,000,000	-2,000,000
Depreciation		-5,000,000	-5,000,000	-5,000,000	-5,000,000
Pre tax profit		6,000,000	6,000,000	9,000,000	11,000,000
Income tax 20%		-1,200,000	-1,200,000	-1,800,000	-2,200,000
Add back depreciation		5,000,000	5,000,000	5,000,000	5,000,000
After tax cash flow		9,800,000	9,800,000	12,200,000	13,800,000
Remitted to parent		9,800,000	9,800,000	12,200,000	13,800,000
Withholding tax 10%		-980,000	-980,000	-1,220,000	-1,380,000
Net after witholding		8,820,000	8,820,000	10,980,000	12,420,000
Salvage value	20,000,000				20,000,000
Exchange rate	0.2	0.2	0.2	0.2	0.2
Remitted US$ equiv.		1,764,000	1,764,000	2,196,000	2,484,000
Forgone Sales		-1,000,000	-1,000,000	-1,000,000	-1,000,000
Asset cash flow	-8,000,000				4,000,000
Parent cash flow	-8,000,000	764,000	764,000	1,196,000	5,484,000
NPV	-2,029,831				
IRR	0.8 %				

Source: Author

8.4 Real Option Analysis in Multinational Capital Budgeting

The discounted cash flow (DCF) analysis used in capital budgeting and valuation in general, has long had its critics. Importantly, when MNCs evaluate competitive projects, traditional cash flow analysis is typically unable to capture the strategic options that an individual investment may offer. This has led to the development of real options analysis. Real options analysis is the application of the option theory to capital budgeting decisions.

Real option is a different way of thinking about investment values. At its core, it is a cross between decision-tree analysis and pure option-based valuation[55]. Real option valuation allows to analyze a number of managerial decisions that in practice characterize many major capital investment projects: the option to defer, the option to abandon, the option to alter capacity, the option to start up or shut do.

To illustrate the importance of real option analysis, assumes that a company has to take the decision to reopen a gold mine or not. It knows that this gold mine has 40,000 ounces of gold remaining that can be produces in one year at a variable cost of $380 per ounce. Assuming the cost of reopening the mine is $1 million and the expected gold price in one year per ounce is $400, then the company will make a profit of $20 per ounce (ignoring taxes and other costs). If the required rate of return is 15 percent, this project has a highly negative net present value of -$304,347. This analysis, however, ignores the option not to produce gold if it is unprofitable to do so.

To illustrate the flaws of NPV method, let us assume that the company has only two possible gold prices next year; $300/ounce and $500/ounce, each with a probability of 50 percent. Although the expected value of gold remains the same at $400/ounce, the company will only mine gold at $500/ounce. Incorporating the mine owner's option not mine gold when the price falls below the cost of extraction reveals a positive net present value of $913,043. In an analogy, this investment can be seen as a call option to buy a security at a fixed predetermined price. By failing to take into account this option, the traditional NPV will tend to understate project values[56].

Reconsider the Adidas example and assume that the government in Malaysia promised that if Adidas established the subsidiary to produce footballs in Malaysia, it will allow Adidas to purchase some government lands at discounted price. Such promise does not directly affect the cash flows of the examined project but it represented an implicit call option that Adidas should exercise in the future. In some case, real options can be very valuable and may encourage MNCs to undertake projects that they would otherwise be rejected if such option does not exist.

[55] Eiteman et al. (2016)
[56] Shapiro, A. C. (2014)

8.5 Adjusting Project Valuation for Risk

If a MNC is uncertain of the estimated cash flows of a proposed project, it needs to consider certain measures to integrate this risk in the project valuation. There are three common methods used for adjusting the evaluation for risk.

A. Risk-adjusted Discount Rate

The greater the uncertainty, the larger the discount rate that should be applied to the cash flows, other things being equal. This approach is easy to use but somewhat arbitrary. Moreover, an equal adjustment to the discount rate over all periods does not reflect differences in degree of uncertainty from one period to another. For example, if the political conditions in a country is slowly destabilizing, the probability of blocked funds, expropriation, etc., will increase over time. Hence, cash flows sent to the parent are less certain in the distant future than they are in the near future. Therefore, a different discount rate should be applied to each period according to its corresponding risk.

B. Sensitivity Analysis

Sensitivity analysis involves considering alternative estimates for the input variables. For example, demand for the Adidas subsidiary footballs is estimated, in our earlier example, to be 150,000 in the first two years and 180,000 and 200,000 in the next two years, respectively. What if the demand were 150,000 in all four years. The use of what if scenarios is referred to as sensitivity analysis. If the NPV is consistently positive during these revisions, then the MNC should become more comfortable with the project, and vice versa. The two exchange rate scenarios discussed earlier represent a form of sensitivity analysis.

C. Simulation

Simulation involves repeating the analysis many times using input values randomly drawn from their respective probability distributions. Reconsider Adidas Inc. and assume that the exchange rate is expected to depreciate by 2 to 8 percent per year (with an equal probability of all values in this range occurring). Unlike a

single point estimate (sensitivity analysis), simulation can consider the entire distribution of possibilities for the Malaysian Ringget exchange rate and randomly picks one for each of the four years. Based on this random selection, the NPV is determined.

The above mentioned procedure constitutes one iteration. This process is then repeated using a simulation program for, say, 100 iterations, and the NPV of the project is computed. This means that 100 different possible scenarios are created for the possible exchange rates of the Malaysian Ringgit during the four-year project period. The NPV is then calculated for each scenario, which generates a distribution of NPV's for the project[57]. From this distribution, Adidas can determine the probability that the NPV will be positive or greater than a particular level.

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[57] *Madura, J. (2018)*

Questions and Applications

1. Explain why capital budgeting for international projects should be assessed from the parent's perspective despite that they are managed through the subsidiary?

{Guided answer Section: 8.2}

2. What additional factors, that normally are irrelevant for a purely domestic project, deserve consideration in multinational capital budgeting?

{Guided answer Section: 8.3}

3. List various methods for adjusting risk in multinational capital budgeting. Discuss any advantages or disadvantages of each method.

{Guided answer Section:8.5}

4. Describe in general term how future depreciation of the Chinese Yuan will likely affect the value (from the parent's perspective) of a project established in China today by a US-based MNC. Will the sensitivity of the project value by affected by the percentage of earnings remitted to the parent each year?

The future depreciation of the Chinese Yuan will decrease the future cash flows to the parent denominated in dollars even though the earnings are not remitted each year.

5. Dior, Inc., considers a project in Thailand that requires an initial investment of 3 billion Thai baht. The project is expected to generate net cash flows to the subsidiary of 4 billion and 5 billion baht in the 2 years of operations, respectively. The project has no salvage value. The current value of the baht is 40 baht per euro, and the value of the baht is expected to remain constant over the next 2 years.

a. What is the NPV of this project if the required rate of return is 15 percent?

b. Repeat the question but assume that the value of baht is expected to be 45 baht per euro after 2 years. Further assumes that the funds are blocked and that the parent company will only be able to remit them back to France in 2 years. How does this affect the NPV of the project?

6. Choose the correct answer: Blocked funds are

a. expected to increase the IRR of the project

b. incentives offered by host countries

c. important factor in evaluating local projects

d. expected to decrease the NPV of the project if funds are reinvested at a lower rate

7. True/False Questions

No	Statement	T	F
1	Foreign projects are generally less costy and less risky than local projects		✔
2	Capital budgeting foreign projects does not consider FX fluctuations		✔
3	Sensitivity analysis involves repeating the analysis many times using input values randomly drawn from their respective probability distributions		✔
4	Required rate of return can be adjusted to consider expected change in risk	✔	

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