

## The impact of depositary receipts on the stock price volatility

Ahmed Samir Abdel Aziz

Arab Academy for Science, Technology and Maritime  
School of Business & Technology, Cairo, Egypt

---

### Key words

Depositary Receipts (DR), Arbitrage, playing the margin

### Abstract

*Depositary Receipts (DR) listed in London and New York stock exchanges became one of the most important elements in the integrated study of exchanges in Egypt and developing countries stock exchanges and its effect on stabilizing stock prices.*

*From this point, this paper aimed to highlighting concepts of DR and its efficiency on lessening intensity of fluctuations in stock prices listed in Cairo and Alexandria stock exchanges (The range between highest price and lowest price). The paper divided the research plan into two stages: The first stage highlighted the concept, benefits and risks of issuing DR. It came out with the privilege of stocks covered with DR over stocks non-covered with DR. The second stage was based on statistical comparative analysis between fluctuations in stock prices covered and non-covered with DR listed in Cairo and Alexandria stock exchanges by using Standard deviation (StDev) and Coefficient of variation (CoefVar) as statistical tools for analysis where the higher degree of Coefficient of variation the higher the risk.*

---

### Introduction

Imagine the obstacles that faced US citizens in the 1920s who wanted to buy and collect their dividends from the London Stock Exchange. The journey from New York to London is 3458 miles and takes about 32 days, depending on wind and weather. Prior to ADRs investors had to either make this cumbersome trip themselves or hire an agent, at a significant cost, to present the share certificates required in London.

In 1927 J.P. Morgan created ADRs as a mechanism to facilitate the registration and dividend collection on non-U.S. stocks without being physically present at the foreign exchanges. Receipt holders in the United States were able to collect all their payments and dividends in U.S. dollars via U.S. depositary banks which held the securities in the country of origin and made the money available for their citizens residing in the U.S. All risks associated with currency fluctuation belong to the investors, who additionally indirectly pay fees to the depositary banks. Shares in the local market are symbolized by depositary notes representing a specific number of underlying shares; the bank makes new receipts for investors when the needed numbers of shares are deposited in their custodial account in the local market. ADRs can be cancelled or redeemed by simply reversing the process

The Securities and Exchange Commission (SEC), in 1955, established its Form for registering all depositary receipt programs and the present form of ADRs came into being. Another newer version of the Form replaced the original and is still being used today. ADRs are U.S dollar commercial paper issued in the U.S by a depositary bank representing ownership in non-U.S securities, commonly called underlying ordinary shares. By using ADRs U.S investors can buy and sell non-U.S securities in U.S dollars without worrying about time differences and other issued investors face when attempting to do business in other countries. Additionally non-U.S companies now have access to the U.S capital markets, the largest domestic investor base in the world (Deutsche Bank, 2003)

The U.S. Securities & Exchange Commission governs types of ADRs, putting them under regulations similar to those that control domestic stocks thereby enabling them to be traded on the New York Stock Exchange and NASDAQ in U.S. currency. Dividends and share trades are also conducted in U.S. dollars, according to U.S. market procedure. Direct investments in foreign markets can be a complicated and costly process, but streamlines and simplifies the entire process.

### **Types of Depositary Receipt Programs**

The two most common types of Depositary Receipts are Un-sponsored or Sponsored. Un-sponsored Depositary Receipts are issued without a formal agreement with the company by one or more depositaries in response to market demand. Lack of formal agreement also means lack of control over the transactions and conceivable hidden costs. Un-sponsored Depositary Receipts are considered outmoded and practically speaking almost never used. Sponsored Depositary Receipts may be issued in different levels available in various trading markets and are issued by one depositary appointed by any company under a Deposit Agreement or service contract. Sponsored Depositary Receipts offer the flexibility to list on a U.S. or European stock exchange and raise the capital needed.

### **Sponsored Level I Depositary Receipts**

Companies are able to easily access the U.S. and non-U.S. capital markets using a Sponsored Level I Depositary Receipt program. Prices of Level I Depositary Receipts are published in the Pink Sheets, allowing them to be traded on both the U.S. over-the-counter (OTC) market and on some exchanges outside the United States. Since the establishment of a Level I program does not require full SEC registration and the company does not have to report its accounts under American Generally Accepted Accounting Principles (GAAP) or provide full Securities and Exchange Commission (SEC) disclosure, it can be used as a way to enter the US Capital market without performing any changes in the company reporting or registration. Using a Sponsored Level I Depositary Receipt program companies reap the rewards of a publicly traded security without restructuring to meet SEC requirements.

Because of their simplicity and because it's easy to upgrade from the Sponsored Level I Depositary Receipt to a Level 2(listing) or Level 3(offering) program, numerous well-known multinational companies have taken advantage of this, making it the fastest growing segment of the Depositary Receipt business. Companies with a Level I program often obtain 5 percent to 15 percent of its shareholder base in Depositary Receipt form to enjoy the benefits of Depositary Receipt investing.

### **Sponsored Level 2 and Sponsored Level 3 Depositary Receipts**

In order to list their Depositary Receipts on a U.S. stock exchange (NASDAQ, American or New York), raise capital or make an acquisition using securities companies use Sponsored Level 2 or Sponsored Level 3 Depositary Receipts. Despite Level 2 and Level 3 Depositary Receipt programs requiring SEC registration and adherence to applicable requirements for U.S. GAAP, companies choosing them attract a significant number of U.S. investors. Features of these types of Depositary Receipts include the ability to be listed on some exchanges outside the United States. Capital is being raised with Level 3 programs so they generate the most U.S. investor interest, as opposed to Level 2 Depositary Receipts which are exchange-listed securities but do not involve raising new capital.

### **Privately Placed and Offshore (SEC Rule 144A / Regulation S) Depositary Receipts**

To access the U.S. and other capital markets without SEC registration, companies can either use three levels of sponsored Depositary Receipt programs that trade publicly in the U.S.,

or enter through SEC Rule 144A and/or SEC Regulation S Depositary Receipt facilities. Rule 144A programs allows capital to be increased by using Depositary Receipts with qualified investors (often referred to as QIBs or qualified investor buyers) in the U.S. domestic market. Increasing capital can be achieved with Regulation S programs by placing DRs offshore to non-U.S. investors utilizing Regulation S. A Level I program can be created in tandem with a Rule 144A program and a Regulation S program may be joined into a Level I program after the time limitations have expired.

### Benefits of Depositary Receipt

In many emerging markets companies are often faced with seemingly endless hurdles to foreign investment but the DR solves this by functioning as an instrument to increase global trade. At the same time they can help increase not only business on local and foreign markets, but can also ease the exchange of information, technology, regulatory procedures and promote market transparency. Thus, the DR investor and company can both benefit from investment abroad.

In order to gain the benefits of diversification, immediately turn an investors' portfolio into a global one while trading in their own market under familiar settlement and clearance conditions, or more critically, capture the benefits of these usually higher-risk, higher-return equities investors just purchase a DR. Purchasing a DR also avoids the added risks of going directly into foreign markets, where they may face the dangers of lack of transparency or instability resulting from changing regulatory procedures. Even though many risks are neutralized, it is important to remember that an investor will still bear some foreign-exchange risk as there will always be a degree of instability in emerging economies and societies. What is more, companies distributing DRs have the added benefit of increasing the share's ease of conversion into cash while advancing the company's image on its local market. Depositary receipts fortify a global shareholder base, and provide expatriates living abroad with a more convenient method to invest in their home countries. In many countries, especially those with emerging markets, hindrances often block foreign investors from accessing the local market. By issuing a DR, a company can buoy international investment and overcome barriers to entry that a foreign investor might otherwise face. Since DRs may be traded free just like any other security, either on an exchange or in the over-the-counter market.

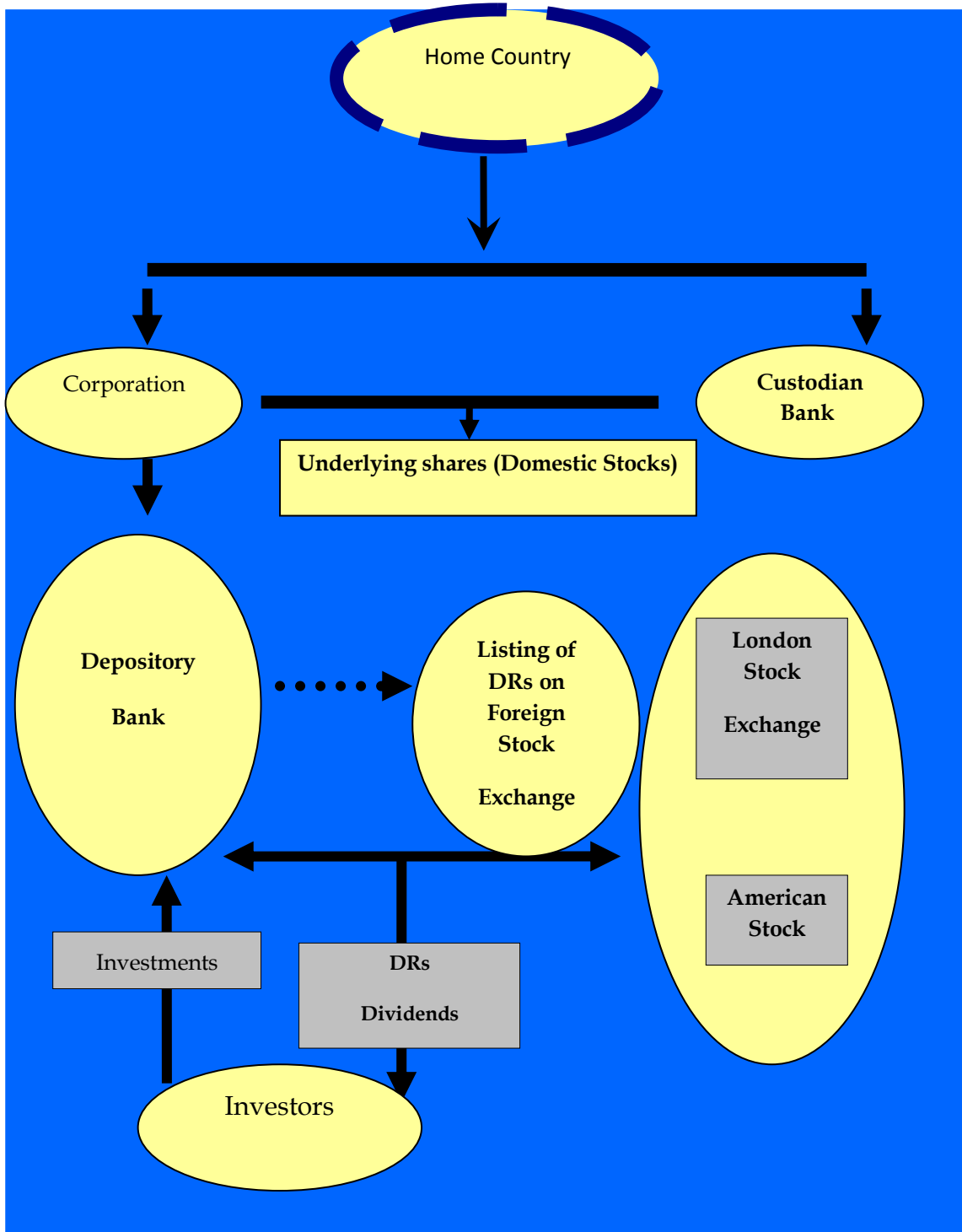
The establishment of a Depositary Receipt program extends multiple advantages to non-U.S. companies. The major reasons to establish a Depositary Receipt program can be divided into two widespread categories: capital and commercial. Advantages may include:

1. Increased market share via widespread investor exposure, possibly increasing or stabilizing the share price, with potentially more liquidity
2. Higher profile for the company's products, services and financial instruments in foreign marketplaces.
3. Flexible mechanism for raising capital and a vehicle or currency for mergers and acquisitions. Reduced administration costs to save individual investors money.

When individuals want capitalize on growth potential outside the local market a DR is an excellent way to buy shares in a foreign company. With that said, trading in foreign markets isn't just about return on investment. It also contains potential risks such as the following:

- **Political Risk** - Is the political climate in the home country of the ADR stable?
- **Exchange Rate Risk** - Is the currency of the home country stable? ADRs follows the shares in the home country; therefore, if its currency is devalued, can adversely affect your ADR.

- **Inflationary Risk** - This is an outgrowth of the exchange rate risk. Inflation is very injurious to business, causing the currency of a country with high inflation to go down daily.



**Literature Review**

study applied by Johnson and Walther (1992) who examined three types of foreign equities traded in U.S. capital markets using an active portfolio management strategy for the

1983-86 period -- ADRs, direct foreign shares (DFS), and international mutual funds. Their analysis shows that both ADRs and DFSs contribute substantially to improvements in investment return and, to a lesser degree, to reductions in investment risk when compared to domestic diversification strategies. Average improvements in investment return per unit of investment risk ranged from 18.5% to 57.6% over the 3-year investment period. study applied by Johnson and Walther (1992) who examined three types of foreign equities traded in U.S. capital markets using an active portfolio management strategy for the 1983-86 period -- ADRs, direct foreign shares (DFS), and international mutual funds. Their analysis shows that both ADRs and DFSs contribute substantially to improvements in investment return and, to a lesser degree, to reductions in investment risk when compared to domestic diversification strategies. Average improvements in investment return per unit of investment risk ranged from 18.5% to 57.6% over the 3-year investment period. Errunza, Moreau, and Duan (1993) found that the prices of the ADRs do not vary much from those of the ordinary shares in the local market for extended periods due to the effects of arbitrage.

The study of Ely David; Salehizadeh-Mehdi (2001) uses joint unification techniques and designs error-correction models to look at the degree of integration between U.S. and 3 foreign equity markets. Results show that ADRs are a substitute for normal shares because they are co integrated with ordinary shares trading in the UK, Japan, and Germany. This seems to be most true for long-term investors.

Chung-Huimin; Ho-Tsung-Wei-ling-Ju (2005) attempt to predict the changing balance between the prices of ADRs and their underlying stocks, over both a short period and long period of time, making use of current advancements in the threshold co integration framework . The empirical results support the notion of nonlinear mean reversion of the prices of ADRs and their underlying stocks.

### Methodology

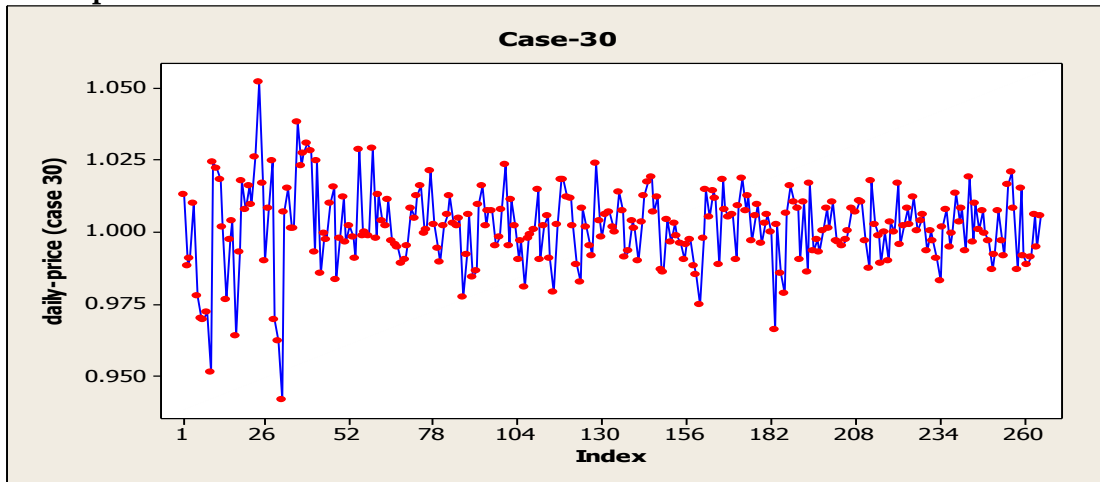
Generally, stock exchanges are characterized by daily fluctuations in stock prices, these fluctuations differ from stock price to another and from stock exchange to another. These fluctuations totally are reflected by several indexes that measure level and intensity of activity in stock exchanges. Dow Jones Case Egypt Titans 20 Index and Case 30 Index are the official indexes in Cairo and Alexandria stock exchanges in Egypt.

By using Minitab Statistical Software, the following table summarizes the integrated statistical comparison variance analysis for the two indexes CASE 30 & Dow Jones Case Egypt Titans 20.

CASE 30.	Dow Jones Case Egypt 20 Titans	
1.0014	1.0012	Mean
0.0136	0.0135	St. deviation
0.000185	0.000182	Variance
1.36	1.35	Coeff.of variation

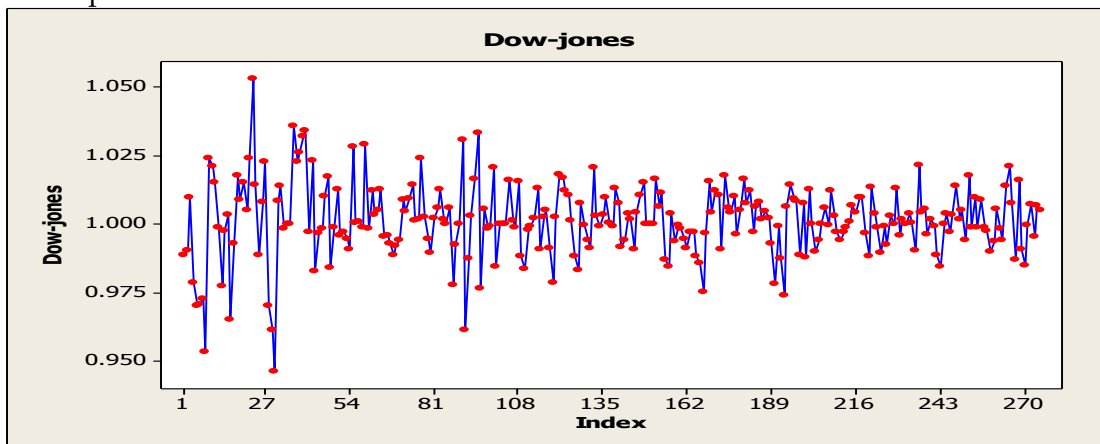
Graph (1)

### Daily Index Data of Case 30 The tops & bottoms



Graph (2)

### Daily Index Data of Dow Jones The tops & bottoms



According to the schedules; graphs and statistical analysis there are fluctuations (tops & bottoms) in Cairo and Alexandria stock exchanges which reflect fluctuations in stock prices.

### Research Model

The researcher goal is to study fluctuation's level in stock prices covered with depositary receipts and stock prices uncovered with depositary receipts.

### Statistical tools for Analysis

#### Standard deviation (StDev) and Coefficient of variation (CoefVar)

In probability and statistics, the standard deviations of a probability distribution, random variable, or population or multiset of values is a measure of the spread of its values. It is usually denoted with the letter  $\sigma$  (lower case sigma). It is defined as the square root of the variance. Coefficient of variation in probability theory and statistics is a measure of dispersion of a probability distribution. It is defined as the ratio of the standard deviation  $\sigma$  to the mean  $\mu$ :

$$c_v = \frac{\sigma}{\mu}$$

The coefficient of variation is a dimensionless number. For distributions of positive-valued random variables, it allows comparison of the variation of populations that have significantly different mean values. It is often reported as a percentage (%) by multiplying the above calculation by 100.

Standard deviations and coefficient of variation are considered the most important tools in investment decisions.

A large standard deviation indicates that the data points are far from the mean and a small standard deviation indicates that they are clustered closely around the mean. In investment, coefficient of variation is a representation of the risk associated with a given security (stocks, bonds, property, etc.), or the risk of fluctuations in stock prices. Risk is an important factor in determining how to efficiently manage a portfolio of investments. Coefficient of variation gives investors a mathematical basis for investment decisions as it measures intensity of fluctuations in stock prices. If the investors' main goal is to stabilize capital of portfolio which is the minimum of fluctuation in stock prices so he decides the smallest coefficient of variation of fluctuations.

### Data collections

The researcher gathered the data from information listed in Cairo and Alexandria stock exchanges concerning daily prices of stocks. The sample is composed of sixteen companies, which were divided into two categories. The first category contains **all** the eight companies covered with depositary receipts in the **Egyptian stock market** and the second category of companies was selected according to their nearest matching with the first category company's activities and their market cap

Table (1)

Stocks covered with DR	Stocks non- covered with DR
El Ezz Steel Rebars	Egyptian Iron & Steel
Commercial International Bank CIB (Egypt)	National Societe Generale Bank (NSGB)
Paint & Chemicals Industries (Pachin)	Egyptian International Pharmaceuticals (EIPICO)
Orascom Construction Industries (OCI)	Six of October Development & Investment (SODIC)
Suez Cement	South Valley Cement
Telecom Egypt	Egyptian Company for Mobile Services (Mobinil)
Orascom Telecom Holding (OT)	Raya Holding For Technology And Communications
Egyptian Financial Group-Hermes Holding Company	Olympic Group Financial Investments

### The Period Covered By the Study

The data of the study covers thirty-six months from 1/9/2007 to 31/8/2010 as data of the study was completed with the completion of eight companies covered with DR. the researcher determining this period to be after Egyptian revolution to avoid the crisis that face the Egyptian stock exchange markets.

**The results of the statistical analysis were as follows:**

#### Standard deviation results in summary

StDev of Stocks covered with DR > stocks non-covered with DR at highest price	StDev of Stocks covered with DR < stocks non-covered with DR at highest price	StDev of Stocks covered with DR > stocks non-covered with DR at lowest price	StDev of Stocks covered with DR < stocks non-covered with DR at lowest price
1. El-Ezz Steel Rebars 2. C I B (Egypt) 3. Pachin 4. OCI 5. O T	1. Suez Cement 2. Telecom Egypt 3. Hermes	1. El-Ezz Steel Rebars 2. Telecom Egypt 3. OT 4. Hermes	1. C I B (Egypt) 2. (Pachin) 3. OCI 4. Suez Cement

#### Coefficient of variation results in summary

CoefVar of Stocks covered with DR > stocks non-covered with DR at highest price	CoefVar of Stocks covered with DR < stocks non-covered with DR at highest price	CoefVar of Stocks covered with DR > stocks non-covered with DR at lowest price	CoefVar of Stocks covered with DR < stocks non-covered with DR at lowest price
1. C I B (Egypt) 2. OCI 3. Telecom Egypt	1. El-Ezz Steel Rebars 2. Pachin 3. Suez Cement 4. OT 5. Hermes	1. El-Ezz Steel Rebars 2. Telecom Egypt 3. OT 4. Hermes	1. C I B (Egypt) 2. (Pachin) 3. OCI 4. Suez Cement

#### Comments

If Coefficient of variation of Stocks covered with DR < stocks non-covered with DR at highest price, this means that investment risks in the first are less than in the second and vice versa. Previous schedules show several Coefficients of variation values for stocks covered with DR and for stocks non-covered with DR as follows:

1. Coefficient of variation of 5 - out of 8 - companies' Stocks covered with DR is less than 5 similar companies' stocks non-covered with DR at highest price which means that stocks covered with DR is less in investment risks compared to similar companies with stocks non-covered with DR.
2. Coefficient of variation of 4 - out of 8 - companies' Stocks covered with DR is less than 4 similar companies' stocks non-covered with DR at lowest price which means that stocks covered with DR is less in investment risks compared to similar companies with stocks non-covered with DR.

At this point, there is no possibility of concluding a general relation between Stocks covered and non-covered with DR and investment risks through using Coefficient of variation.

#### Recommendations

- Updating this study in the future when there is enough number of companies' stocks covered with DR and enough coverage periods.
- For establishing a safe portfolio with less risk, it is recommended to use stocks covered with DR and fundamental analysis to select portfolio stocks instead of using technical

#### References

##### Books:

- Bowen, Earl K.; Starr Martin K. (1982) "Basic Statistics for business and economics" U.S.A. McGraw-Hill.
- Kohler, Heinz (1994) "Statistics for business and economics" 3rd edition. U.S.A. HarperCollins College Publishers.



Mayo, Herbert (2003) "Investments" 7th Edition. U.S.A: Cengage learning.

Pandey, I.M. (1981) "Financial Management", New Delhi.

Walmsley, Julian (2006) "New Financial Instruments". UK: John Wiley & Sons.

**Articles:**

Edelmann, Friederike (2006) "Investor Relations".

Billingsley, Randall (2005) "Arbitrage, Hedging, and the Law of One Price".

Kuepper, Justin (2004) "Trading the Odds with Arbitrage".

Chio-Yoon-k; Kim-dong-soon (2000) "Determinants of American depositary receipts and their underlying stock returns".

Ely David; Salehizadeh-Mehdi (2001) "American depositary receipts: an analysis of international stock price movements".

Chung-Huimin; Ho-Tsung-Wei-ling-Ju (2005) "The dynamic relationship between the prices of ADRs and their underlying stocks: evidence from the threshold vector error correction model".

Chen-Shen-Yuan; Chou-Li-chuan; yang-Chau-Chen (2002) "Price transmission effect between GDRs and their underlying stocks - evidence from Taiwan".

Kadapakkam-Palani-Rajan; Misra-Lalatendu; Tse-Yiuman (2003) "International price discovery for emerging market stocks".

Jackson-Dave-O; Grossmann-Axel (2006) "The impact of FOMC and ECB in interest rate announcements on European ADRs and their underlying stocks".

**Reports:**

1. Annual report by the Deutsche Bank (2003).
2. Annual report by the Bank of New York (2005).
3. The Journal of Finance, (2002) "History of Depositary Receipt".

**Online References:**

1. Cairo and Alexandria stock exchanges.
2. [www.egyptse.com](http://www.egyptse.com)
3. Global Depositary Receipt.
4. [www.investorwords.com](http://www.investorwords.com)
5. EAC (Egyptian American Company).
6. [www.eac-finance.com](http://www.eac-finance.com)
7. The Deutsche Bank.
8. [www.db.com](http://www.db.com)
9. The Bank of New York.
10. [www.bnymellon.com](http://www.bnymellon.com).