

The Reliability of Prediction Factors, for the World Stock Markets

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Abstract

This paper is aimed to identify the predicted factors for the world stock market in the last six decades, and up to the first quarter of 2021 year. The historical data and analysis of trends for volumes, and prices besides the fundamentals data such as interest rates, currency exchange rates, inflation rates, trading volume, and annual returns for listed corporations, used to be the predicted factors available to forecast the financial stock markets prices and volume, for the listed companies, national stock index, and regional stock indexes. However, in the last six decades, other new major factors became more reliable keys for the prediction of future prices and volume trends, in the world stock markets besides the previous two factors. These include the options strike rates for underlying shares, psychological price barriers, national, regional and international crises, irrational and noise trading, and finally the health crisis known as the COVID-19, as what happened in 2020. This paper discussed these predicted factors which now dominate in the world stock markets, and suggested stated ratios for the reliability of each presented measure, during different decades up to April of 2021, and how the reliability of these indicators was changed from one decade to another.

Keywords

World Stock Markets, Stock Markets Trends, Options Strike Rates, Irrational Trading, Psychological Price Barriers, Financial Crisis

1. Introduction

The volume of world financial stock markets increased significantly in the last decades. It reached for the first time to 109 USD\$ trillion in November 2020, with increase of 20% compared to 2019 (WFE, 2020a). This is also an increase in the new listed companies through IPOs, and the total number of listed compa-

nies (WFE, 2020a). The world stock market is witnessed also significant changes in the last decades besides the increase of trading volume, it is moving so rapidly towards globalization, and integration of local financial markets through cross borders transactions (Sabri, 2007). In addition, the role of financial instruments is increasingly significant in the economic developments of both developed and emerging economies (Sabri, 2011). On the other side, the high volatility of stock prices also increased during short periods, which makes prediction of prices more difficult and investments in financial markets are riskier due to the globalization environment (Sabri, 2002a, 2006). The trends of financial market prices have been volatilities significantly in the last four decades.

Moreover, the world stock markets witnessed significant changes related to trading practices, such as using internet trading and investment advice, changing from floor trading to computerized trading, changing in organization and legal entity of settlements agencies, reducing the period time for settlement, increasing the role of international rating agencies, and increasing the role of derivative market, (Sabri, 2007). Besides other changes that occurred in the eighties such as increasing adverse information (Sabri, 1999), increasing the cross-listed companies in more than stock markets, as well as increasing the linkages between emerging and developed markets (Sabri, 1999, 2002b, 2002c). The increasing linkages among the world stock markets which increased significantly in the nineties will increase volatility of prices due to the interaction between the world stock exchanges prices (Sabri, 2002d, 2002e). In addition, the high stock price volatility is responding to non-fundamental and adverse information which may lead to financial crisis according to financial experts' opinions (Sabri, 1995a). All the above new practices as well as the new major factors lead to having new reliable predicted factors for forecasting the financial market's prices.

The perdition of the world financial markets prices used to be mainly based on analysis of historical data trends and related fundamentals. Today and in the last decades various new factors incorporated into the world financial markets, including the last factor COVID-19 Pandemic, which no one was expected from investors and other stakeholders, to happen in 2020 year. In which the world stock market prices drooped up to 21% in the first quarter of 2020 (WFE, 2020b).

Accordingly, this paper is aimed to identify the predicted factors of the world stock market in the last six decades and up to the first quarter of 2021 year. In order to point out the reliability percentages of predicting the world stock markets trends during the last six decades.

2. The Reliability of Predicted Factors for the World Stock Markets

The reliability of prediction factors has been changing in the last sex decade, Since using two major factors to predict future trends of financial markets. Thereafter, when other major factors entered the world stock markets and be-

came more reliable for predicting the financial stock market prices. This section will discuss these predicted factors.

2.1. Historical Data

The examining of data trends used to be the only main way of predicting the future prices and volume of the world stock markets for a listed corporation, and for both national and regional markets. Generally before the financial market became more sophisticated, it was almost the major valid way to guide the investors. Using time series analysis approaches as reported by various studies, example of that (Arora & Hemavathi, 2015; Kannan et al., 2010; Urquhart & Hudson, 2013; Zapata et al., 2012; Angadi & Kulkarni, 2015; Plastun et al., 2020). However, other researchers use more sophisticated ways and means to analyze the financial data, and may add other elements besides the historical data of price and volume trends, Such as the study of Pang et al. (2020). While other researchers used stock big data to achieve more accurate forecasting as reported by Jeon et al. (2018) and Zhou et al. (2018).

2.2. Fundamentals Data

Beside the trends of historical data for the financial markets movements, the fundamentals data for the national market as well for the individual listed corporations are valid and reliable elements are reliable in predicating the stock markets movements. The impacts of each of the fundamental elements use to lead trading volume and prices of financial markets. This include trading volume, financial laws, liberalization of related rules and regulations and corporate laws, national currency exchange rate movements, local interest rates and Libor interest rate, the GDP data, the Inflation rates, the earning announcements, tax Laws, foreign trading and capital inflow investments. This section is allocated to summarize the major fundamentals bases for the national stock exchanges.

2.2.1. Trading Volume

It is well know that increasing of stock market trading volume will increase the stock market prices in general, with exceptions, when other factors interfere such as financial crisis and irrational trading occurred in a single or regional market. This fact is known in economic principles as well as reported by published literature. But, the new phenomenon here as reported that the increasing volume of trading will increase the volatility of prices. This phenomenon became more significant after the year 2000 compared to the trading period of 1999s as found in the Arab Stock markets (Sabri, 2008). This conclusion is also reported for the developed economies markets, which found that changes in trading volume was the most predicted variable of stock price volatility (Sabri, 2009).

2.2.2. Financial and Tax Laws

This includes corporate laws and national exchanges regulations, which are considered the major fundamentals of national stock markets. It is known that the

financial and tax laws as well as the corporate governance practices of national markets are different from one economy to another, which responds differently to market trading movements. In addition, there are so different laws and features of traded shares in different national markets, which act differently during financial crisis or during high prices volatility situation. For example, There are more than twenty types and features of traded shares in both developed and emerging economies, such as certificate share, bearer share, non-vote share, par value share non-par value share, dual class share, common share, preferred shares, dual class for voting rights, and other types which are existed in the world stock market (Sabri, 2005).

Other related financial laws may also make different in predicting the price and volume of stock exchanges, such as the repurchase shares activities known as the treasury shares, which make the listed company to buy its own shares within the related corporate laws framework and up to 10% in average. A study found that there is an increasing movement in the world stock market towards adopting the share repurchase activities, More than half of the selected sample witnessed a change in the related laws of share repurchases during the period 1995 to 2000 (Sabri, 2003). Accordingly, we may conclude that the merits of financial and corporate laws and regulations, which may different from one national market to another is considered one of the major fundamentals to be considered in case of predicting the trend of the stock market prices and volume.

2.2.3. National Currency Exchange Rates

The currency exchange rate is considered as the most impact factor on the prices of stocks at national level, for both emerging and developed economies. For example, a study found that changing in national exchange rate was the most predicting variable volatility of stock prices compared to other variables in most of the selected developed countries, followed by a change in stock trading volume and deposit interest rate respectively (Sabri, 2009). However, the world States followed different currency systems which should be considered in the expectations of the national stock prices.

According to the International Monetary Fund report, there are 38 states fixed their currencies on US\$, and 25 states fixed it on Euro, while 41 states keeping their currencies exchange rates floating within inflation target, besides other 26 states currency keeping their currency exchange rates floating within target framework, and 54 states using other targets (IMF, 2020). In addition, the major two world currencies including US\$ and Euro exchange rates are fluctuated significantly during the last two decades, it ranged between 1.06 to 1.50 up and down as the highest rate (Macrotrends, 2019-2020), which will reflect on the majority of the states' currencies rates.

Therefore, most of national currency exchange rates are changing in daily basis as long as either floated or based one of the two currencies (US\$ and Euro), which are also changing in a daily basis. It is well known that the currency exchange rate is associated with stock prices at national listed corporation, and an

important factor of predicting variables of increasing price volatility, especially in emerging economies (Sabri, 2004).

2.2.4. Interest Rates and Libor Rate

The decrease of interest rates on national level as well as the LIBOR rate for USD may reflect on financial markets in a positive way and vice versa, as considered as alternatives for investments. The Libor (London Interbank Offered Rate for USD) is a global generally accepted benchmark, for interest rate in both emerging and developing economies. During the last five decades the LIBOR interest rate moved from 10.3% as the highest in 1989 to less than 1% (0.15) as the lowest in 2020, and the annual percent changes ranged between 150.73% plus to 91.5%, minus (Macrotrends, 2021). The high percentage changes of interest rate during the last decades present a high volatility factor, reflecting in financial stock markets.

2.2.5. Profit Announcements

Such as earning announcements (EPS) for listed corporations, book share value (BVPS), and P/E ratio, will reflect in the prediction factors of stock markets and share prices.

2.2.6. Other National Economic Fundamentals

Such as Inflation rates, foreign capital flow, GDP, balance of payments, and other national indicators will reflect to national stock exchange trading volume and prices.

2.3. Options Strike Price Rates: Introducing New Instruments

New Financial instruments which have been introduced to the world financial markets in the last decades since seventies. Such instruments know as derivative instruments which is stated in a contractual form and attached to a specific underlying real instrument. The real or the basic instrument may be a share, a bond, an interest rate, and a currency (Sabri, 2007). For stock markets many new instruments and ways added to the trading of financial markets besides the cash stock markets known as Spot contract. Including stock options, index options, futures market, equity swaps. The option markets due to contracts or an agreement to buy or to sell an underling share, bond or currency, at a stated future time for a pre-determined price in a regular exchange. The trading of future and options mainly started in USA, and then moved to some European Countries and lately to Asian countries such as Japan and Korea. The volume of the world options and future trading contracts increased from 6.4 billion in 2007 (WFE, 2007) and to 32 billion in the period from 2010-2019 (WFE, 2019), to 46.3 Billion US\$ in 2020 according to World Federation of Exchanges (WFE, 2020b).

These new instruments of financial market create strong interaction to the underling listed corporations, thus, it becomes the third major element of predication the trends of prices and indexes due to the increasing linkages between

the two major trading, either in positive or negative way, especially between the option prices and the underlying shares in the spot markets. Accordingly, it became the third reliable prediction factor after, the historical and Fundamentals data of the national economy and to the listed corporations.

In addition, the majority of related literature reported the significant of option prices on underling share prices and the association between the two markets. For example, [Hu \(2014\)](#) found that the options market played a key role in including private information into stock prices. [Simpson & Ramchander \(2004\)](#) found that the futures market is integrated with the corresponding cash market of treasury securities of U.S. In addition, [Booth et al. \(1999\)](#) found that the spot index and futures index have substantially larger information shares than index options in the German equity index derivatives markets.

2.4. Psychological Barriers of Prices

The existing of psychological impact on the investors' decisions and what is known as behavior finance became a fact in the world of stock markets. This became known as the barrier factor of prices for an individual corporation or for at national stock exchange index, it is act as psychological anchors, which should considered in forecasting the future of pricing.

In the last two decades various studies examined this issue and found that there are psychological barriers of stock prices as reported by [Woodhouse et al. \(2016\)](#) who found that the stock price barrier effects are present in NASDAQ Composite index, and it is considered by investors trading strategies. Another study found the existence of a price barrier in the stock index of Taiwan region as reported by [Bahng \(2003\)](#). [Lobão et al. \(2020\)](#), showed also a strong signs of psychological barriers in Argentina, Mexico, Panama and Peru stock markets. In addition, [Lobão and Pereira \(2016\)](#) fond that there were significant psychological barriers in the stock markets of Germany, Finland and the Netherlands.

2.5. National, Regional & International Crises

The phenomenon of national, regional and international crises have been increasing in both developed and emerging economies. The last two major world financial crises occurred, where the black Monday crisis which occurred in the USA and moved to Europe in 1987 ([Sabri, 1995b](#)), while the second financial crisis was in 2008, which was extended from developed markets to emerging markets, due to the increasing linkages between the world stock markets indexes as reported by previous studies ([Sabri, 2002d](#)). In spite of the fact that no clear causes of the financial crisis occurred in the world finical markets, either on national or Reginald, or at the world levels, but for each one there are so many studies reported diffident causes and justification to what happened for each. Some crisis were related to adverse effect of political risk, adverse impact of related markets, adverse effect of political risk, noise trading and adverse information, inefficiency of related laws , high correlation between world stock indi-

ces, overreaction for earning announcements, Adverse impact of other related markets such as bond markets (Sabri, 2002b).

This phenomenon created new facts in the world stock market, where ever a national, regional or Global financial crisis will reflect on other markets regarding prices and volatility of prices, and return, due to the interactions between markets as well as the increased associations between price indexes, which are increasing in the last decades, including both emerging and developed stock markets (Sabri, 2002b, 2002c, 2007). For example, the 2008 financial crisis which started in USA, was extended to all over the world and hit the national economies as well the world stock markets. For example, Terazi & Şenel (2011) found that the global financial crisis affected the real economy in Central and Eastern European Union countries.

It also has significant impact in on China's financial market and macro economy as found by Li et al. (2012). In addition, it's reported also that the crisis hit stock markets in emerging economies such as the Nigeria stock market (Njiforti, 2015).

2.6. Irrational and Noise Trading

The world stock markets witnessed another feature in the last decades, what is known as irrational trading, noise trading and overreaction, which leads to high prices volatilities, not based on fundamentals data. The irrational trading is considered as the most argument against the efficiency concept of the stock market, and may initiate a stock market crisis. The irrational behavior of trading in financial markets includes national and foreign investors, and extended to loyal stockholders, who make the predicted process of trading trends and stock prices difficult. In addition, emerging stock markets become more correlated with developed stock markets during irrational stock trading movements (Sabri, 2007, 2002a).

The irrational trading may occurred by investors, either if they don't have market and trading information, or having it, but act against fundamentals data. For example, Bloomfield et al. (2009) reported that uninformed traders behave irrational against price movements. Dale et al. (2005) presented the negative impact of irrationality trading on stock markets and suggest that policy makers have interfere to prevent damage of trading. In addition, Verma & Verma (2007) reported the effect of irrational and noise trading on determinant of stock volatilities.

2.7. COVID-19 Pandemic

The Health crisis Pandemic as became known as COVID-19 is new phenomenon in the world economy. In spite of the short pored of its starting and is still existing for about one year and a quarter, it has a negative aspect on the financial markets as reported by equity market indexes, all over the world including developed and emerging economies. The world equity market indexes lost from

February and March of 2020, between 30% and 10% as percentage of low index, with an average of 19% for 30 developed and emerging markets in **Table 1** (WFE, 2020b).

Table 1. The changing of the world equity market indexes due to corona pandemic. (February to March-2020) For selected sample of developed and emerging markets.

Stock Exchange	Index	20-February-2020	20-March-2020	Percentage of low index
B3 - Brasil Bolsa Balcão	Ibovespa	104,171.57	73,019.76	30%
NYSE	Composite	2954.22	2584.59	13%
Nasdaq - US	Composite	8567.37	7700.10	10%
Indonesia Stock Exchange	JSX Composite	5452.70	4538.93	17%
Singapore Exchange	Straits Times	3011.08	2481.23	18%
Athens Stock Exchange	General Price	720.50	558.30	23%
Exchange of India	S & P CNX 500	9236.05	6996.75	24%
Bolsa Mexicana de Valores	IPC CompMx	353.01	283.43	20%
The Stock Exchange of Thailand	SET Index	1340.52	1125.86	16%
Borsa Istanbul	BIST 100	105,993.65	89,643.71	15%
Cyprus Stock Exchange	CSE Genera	64.26	48.62	24%
Deutsche Boerse AG	CDAX Price	516.08	429.84	17%
Euronext Amsterdam	AAX	778.39	662.36	15%
Euronext Brussels	General Price	10,482.88	8507.60	19%
Johannesburg Stock Exchange	Actuaries Index	51,038.18	44,490.31	13%
London Stock Exchange	FTSE All Share	3673.61	3107.42	15%
The Egyptian Exchange	EGX 30 Index	13,008.94	9593.94	26%
Dubai Financial Market	DFMGI	2590.00	1771.31	32%
Vienna Stock Exchange	SE Price Index	1113.25	845.69	24%
BME Spanish Exchanges	IGBV Index	1146.69	895.72	22%
Nigerian Stock Exchange	NSE All	26,216.46	21,300.47	19%
Muscat Securities Market	msm30	4130.91	3448.29	17%
Luxembourg Stock Exchange	Lux General	515.07	403.23	22%
Colombo Stock Exchange	CSE All Share	5592.92	4571.63	18%
ASX Australian Exchange	S&P/ASX	6511.53	5110.56	22%
Bourse de Casablanca	MASI Float	12,260.94	9704.85	21%
Shanghai Stock Exchange	SSE Composite	2880.30	2750.30	5%
Taiwan Region Stock Exchange	TAIEX	11,292.17	9708.06	14%
Saudi Stock Exchange	TADAWUL	7628.34	6505.35	15%
LSE Group Borsa Italiana	FTSE ITALIA	19,906.98	15,663.03	21%
Average falling index				19%

Source: (2020b) The World Federation of Exchange; Broad stock index performance; Market Statistics, available on line; <https://focus.world-exchanges.org/issue/december-2020/market-statistics>.

In addition to, the majority of recent studies supported the negative impact of this phenomenon. For example [Sansa \(2020\)](#) found that the COVID-19 had an impact on the financial markets in China and USA during March of 2020. Similar results reported that the COVID-19 fractal contagion has effects on both the stock markets return and volatility as reported by [Okorie & Lin \(2021\)](#). [Reinders et al. \(2020\)](#) estimated the market-implied losses of euro area banks to over €1 trillion, which is ranged between from 4% to 25% of corporate credits' book value, based on stock prices as of April 2020. [Akhtaruzzaman et al. \(2021\)](#) found that the financial contagion of COVID-19 has impact on both financial and non-financial firms, but it has more impact on financial firms.

While [Baker et al. \(2020\)](#) reported that no previous infectious disease such as 1918-1919, 1957-1958, and 1968, has affected the stock market as the COVID-19 pandemic did. In addition, ([Mazur et al., 2021](#)) found that there is different impact of COVID-19 from one business to another. On the other side other studies found the impact of the pandemic is relatively low, and the cause of the high negative stock returns to policy interventions as stated by [Shanaev et al. \(2020\)](#). Finally, it may conclude that the health crisis pandemic as became known as COVID hit almost all stock market exchanges.

3. The Suggested Reliability Ratios of Perditions Factors

Considering the related literature of the world financial markets volatility, trends, prices, and volume, as well as the statistical date in the last six decades related to volume, listed companies, price index for both developed as well as the emerging economies, the author suggesting the following reliability ratios for the perdition factors of the word financial markets, in the last six decades.

3.1. The Reliability Ratios of Prediction Factors for up to 1980

Up to eighties the main players of the world stock markets used to depend only on the two major elements were equally predicting the future trends of stock markets. This was up to introduce the option markets; accordingly, we may conclude that up to 1980, the reliability of predicted ratios were 50% for each one as presented in [Table 2](#).

3.2. The Reliability Ratios of Prediction Factors from 1981 to 1990

In the eighties the number of contract of derivatives increasing and expanding to

Table 2. The reliability ratios of prediction factors for financial market prices during period from 1960 to 1980.

Reliability Ratios	Prediction Factors
50%	Historical trends and Data
50%	Fundamentals data

other markets in Europe and Asia, which lead to strong interacting between options and underlining shares. Thus this became the third element to be considered in prediction factors and we readjust the new three ratios as presented in **Table 3**.

3.3. The Reliability Ratios of Prediction Factors from 1991-1999

For this period we may add another predicted factor as known as the psychology barriers of price levels, as reported by various studies covering different geographical stock markets, including emerging and developed economies, thus, we added this factor, to the previous three factors, and to readjust the predicted factors ratios, as presented in **Table 4**.

3.4. The Reliability Ratios of Prediction Factors from 2000-2009

The two major financial crises occurred in 1987, and 2008, besides other national and regional crises have significant impact on other stock prices of national and regional price indexes, due to increasing the linkages of the world stock exchanges indexes. It means we have to add the impact of the financial crisis to other markets as the new predicted factor to be added to the previous factor, and to adjust the ratios as presented in **Table 5**.

Table 3. The reliability ratios of prediction factors for financial market prices during period from 1981 to 1990.

Reliability Ratios	Prediction Factors
40%	Historical trends and Data
40%	Fundamentals data
20%	Option prices of underling shares

Table 4. The reliability ratios of prediction factors for financial market prices during period from 1991 to 1999.

Reliability Ratios	Prediction Factors
30%	Historical trends and Data
30%	Fundamentals data
20%	Option prices of underling shares
20%	Psychological barriers levels

Table 5. The reliability ratios of prediction factors for financial market prices during period from 2000 to 2009.

Reliability Ratios	Prediction Factors
25%	Historical trends and Data
25%	Fundamentals data
20%	Option prices of underling shares
15%	Psychological barriers levels
15%	National, regional & international crises

3.5. The Reliability Ratios of Prediction Factors from 2010-2019

In spite the fact that the irrational and noise trading feature is existed in the last three decades. However, this feature has been more materialized after the world financial cerise of 2008. Therefore, we adjust the previous stated predicted factors to include the irrational factor and noise trading as the sixth predicted as presented in **Table 6**.

3.6. The Reliability Ratios of Prediction Factors for Financial Market from 2020 to 2021

The last predicted factor to be added since last year is the health crisis known COVID-19, which is very new feature and cost the world stock about 19% of its market value in March, 2020 as indicated above. Accordingly, we suggest the following new stated ratios as presented in **Table 7**.

Finally, we may state that they are other factors may affect the reliability of the above suggested ratios, such as the political relationships development between different states such as between US, Russia, Europe, and Chine besides regional relationships, which may impact the world financial markets. Other factors also may affect the above articulated reliability ratios such as changing in gold, oil, and interest rates at national levels as alternatives for investments for the stock markets.

Table 6. The reliability ratios of prediction factors for financial market prices during period from 2010 to 2019.

Reliability Ratios	Prediction Factors
25%	Historical trends and Data
25%	Fundamentals data
20%	Option prices of underling shares
10%	Psychological barriers levels
10%	National, regional & international crises
10%	Irrational and noise trading

Table 7. The reliability ratios of prediction factors for financial market prices during period from 2019 to 2021.

Reliability Ratios	Prediction Factors
20%	Historical trends and Data
20%	Fundamentals data
20%	Option prices of underling shares
10%	Psychological barriers levels
10%	National, regional & international crises
10%	Irrational and noise trading
10%	Health crisis: COVID-19 (Coronavirus) news

4. Summary and Conclusions

Major new merits and practices entered to the world financial markets in the last six decades. Such as increasing linkages between the world stock price indexes in both emerging as well as the developed economies, introducing the options trading, increasing the irrational trading, existing of psychological barriers levels, increasing national, regional & international crises, and finally the most recent phenomenon is the COVID-19 Pandemic. Thus, the reliability of predicted factors to forecast the future and trends of prices, earning ratios, and volume of national, regional and world financial markets, are changing during the last decades.

Accordingly, the paper articulated six groups of ratios for each of the last decades and suggested predicted ratios for each factor for predicting stock prices. The importance of predicted factor was changed from one period to another due to the features and practices added to the world financial markets trading. Up to 1980, we suggested two factors, including historical data, and fundamental data at national, and listed corporation level, with 50% for each.

Thereafter, new products known as options, futures and derivatives were introduced giving Option prices of 20% as a reliable factor for the underlying shares besides fundamentals data and historical data. Thereafter, three new factors included psychological barriers levels, national, regional and financial crisis, and irrational and noise trading which became common in the world stock trading, and finally we include the health crisis known as COVID-19 from 2020 up to now. Finally, we can say the major merit of the paper is considering most of the used prediction factors in one study rather than other related literature, which usually considering few predicted factors.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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