The Transparency and Management of Derivatives Market in the Era of Digital Transformation in Vietnam

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Abstract

In the globalization and integration era with 4.0 industry, global derivative markets have certain impacts on opportunities and challenges, and roles of speculators who are main players in the derivative market. Derivative instruments will benefit investors in some aspects: risk prevention and help them to finalize profits before unexpected fluctuations, exchange rate gap limitation and avoiding risks from exchange rate movements, or speculators will prefer earning profits in selling or buying within short time. Moreover, transparency on the derivative market need to be enhanced for investor information reliability.

In the development trend of digital transformation, digital economy and e-commerce 4.0, internet of things and Digital technology platform has supported much for the development of derivatives market, as well as data privacy solutions for investors. One of our study purposes is aiming to enhance management following digital economy and the connection between e-commerce 4.0 and derivative market in Vietnam.

This study uses mainly quantitative analysis combined with qualitative analysis, synthesys, analytical and dialectical materialism method. We run regression with Eviews software to measure the impacts of multi factors on derivative markets.

Key-words: Derivative Instruments, Derivative Market, Future, Speculators, Financial Crisis, Macro Policy.

JEL Classification Numbers: M1, M21.

1. Introduction

In the context of industry 4.0, we will mention much on roles of digital technology, ICT and digital transformation effects on derivative markets and financial markets, in general.

Abdulquadri et al (2021) said that A majority of Nigerian banks now have chatbots that enhance customer engagement and financial inclusion. WhatsApp was the most frequently used platform. Chatbots were often branded and presented with female gender identification. The chatbots were less responsive beyond their predefined path. While Nigeria is a multilingual country with English being the original language, none of the chatbots used any of the Nigerian's local languages.

And Kuzmina et al (2021) stated that Based on historical and statistical information, the authors simulated the process of analysis, development and implementation of a hedging strategy that reveals the content of the hedging procedure with derivative financial instruments in the context of digital transformation of the economic system.

A derivative financial instrument (often referred to as a new financial instrument) is a valuable financial instrument that is determined on the basis of the value of underlying financial instruments such as securities and foreign exchange. , ... The reason for calling these financial instruments "derivative" because these tools are derived (generated) from the value of the underlying assets. Investing in derivative instruments usually does not require a net initial investment or only requires an initial net investment much smaller than the underlying asset value.

In recent years, the market for derivatives has become increasingly important and essential for traders and investors. In fact, derivative financial instruments have grown steadily in both size and diversity. These are very successful financial innovations, providing effective risk management tools as well as tools for finding profits for financial investors and market traders.

Although there are risks for participants: technology, credit risks, liquidity risks, systemic risks, we also see that the development of global derivative markets increasing. Looking at exhibit 1, we find out that Indian , European (Eurex), USA and China still in the top biggest derivative markets.

So, this paper will approach some aspects of development of global derivative markets as well as roles of speculators and policy suggestions for emerging markets.

All data we use from reliable internet data sources. This is advantage of Internet of things.

The paper is organized as follows: after the introduction it is the research issues, literature review, conceptual theories and methodology. Next, section 3 will cover main research

findings/results. Section 4 gives us some discussion and conclusion and policy suggestion will be in the section 5.

2. Body of Manuscript

2.1. Research Issues

The scope of this study are:

Issue 1: What are challenges and roles of speculators in global derivative markets? What are development and trend of global derivative markets?

Issue 2: What are effects of digital transformation on derivative markets and financial markets?

Issue 3: What are impacts of macro economic factors on transaction volume of derivatives in global markets - case in USA?

2.2. Literature Review

Studies Related to Digital Transformation in Financial Markets

Shukla and Nerlekar (2019) mentioned that technology revolution, with advantages of time saving, energy and cash, has had an intense and irreversible impact on the globe and Indian securities market transactions. Walker (2021) stated that we can take advantage of Blockchain by adding value to all participants—buy-side, sell-side, custodians and regulators. Second, blockchain allow us ability to manage and optimise OTC derivatives throughout the full post-trade lifecycle.

(source: https://www.tradersmagazine.com/am/poised-for-digital-transformation-derivatives-post-trade-processing/, access date 5/7/2021)

All parties have one single matched trade lifecycle, covering all events such as a new trade, innovation, confirmation, cash flows, option exercise and termination, recorded on a shared, peer-to-peer ledger.

Next, Feyen et al (2021) mentioned because of technological advances and digital innovation has brought major improvements in connectivity of systems, in computing power and cost, and in newly created and usable data. There is rise to new business models and new entrants. It helps to enhance information exchange and reduced transaction costs. (Source: https://www.bis.org/publ/bppdf/bispap117.htm, access date 15/7/2021).

And Huy, D.T.N et al (2020) also suggested better risk management policies of commercial bank in Vietnam.

Studies Related to Derivative Markets

First, Chi and Young (2006) stated that Financial derivatives markets experience price discovery function of emerging futures markets.

Next, Barracchini and Addesi (2012) would not consider information asymmetry, and from the trend of underlying assets, construct independent strategies.

Licarrdo (2013) mentioned that derivatives' trading market include speculation with participation of speculators -destabilize spot prices.

Then, Chand et al (2012) presented that after global crisis in 2008, India equity derivatives market has been affected much.

Beside, Brunetti et al (2016) specified that: speculators destabilize financial markets with less evidence, with 2005–2009 data.

Next, Motorniuk (2016) pointed that Global derivatives market considered derivative risks, purpose and benefits of the use of derivatives and their role.

Last but not least, Stankovska (2017) pointed that market involves Speculators and price discovery and arbitrage is for derivative risk management strategies.

2.4. Methodology

In this study, analytical research method and specially, analysis and dialectical materialism method is used, combined with quantitative data analysis.

Data from USA ICE report market data: futue and commodity (theice.com/marketdata, dat access 24/11/2020). Lending rate, CPI and GDP growth from US market, commercial banks and Bureau statistics. Thourgh 10-year period from 2010-2019.

We build a regression model with Eview software to measure impacts of factors. Volume of total future and option is a function with 4 variables as follows:

Y (Volume of future and option) = f (x1, x2, x3, x4) = ax1 + bx2 + cx3 + dx4+ k

With: x1: GDP growth rate US (g), x2: inflation, x3: lending rate, x4: S & P500.

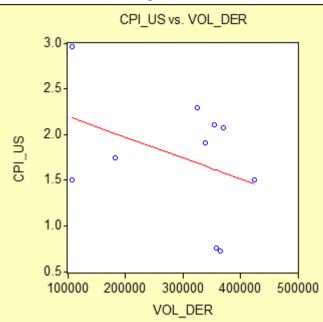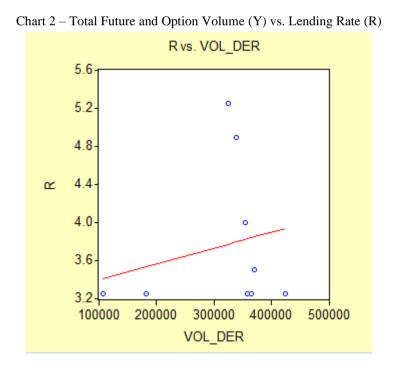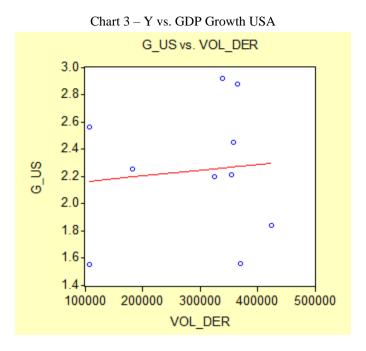The below chart 1 shows us that Y has a negative correlation with CPI_US:

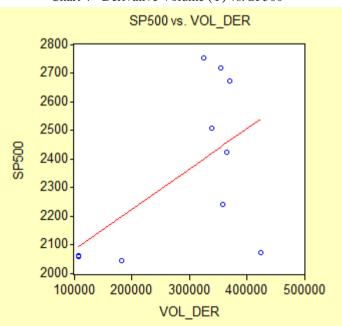Chart 1 – Total Future and Option Volume (Y) vs. CPI USA(C)

Next we find out that, based on the below scatter chart, Y (derivative volume) has positive correlation with lending rate (R).
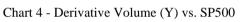
Chart 2 – Total Future and Option Volume (Y) vs. Lending Rate (R)

Looking at the below chart 3, we also recognize that Total future and option volume (Y) and GDP growth USA have positive correlation.

Chart 3 – Y vs. GDP Growth USA

We also recognize that Y and SP500 have clear positive correlation.

Chart 4 - Derivative Volume (Y) vs. SP500

3. Main Results

Vanden (2006) said that special cases involve A digital option, a bull and bear spread, and portfolios of bull spreads and also address option pricing with transaction costs, and superreplication with multiple risky assets.

Empirical Research Findings and Discussion

Model 1 - SWOT Analysis of Speculators in Derivative Market

Strengths:

- Speculators are among main players in derivative markets.

- Speculators can make huge profits from buy contracts at low and sell at high prices.

- There are various speculators in the market: traders, portfolio managers, market maker or trading companies, etc.

- Speculators are those who predict and forecast prices of contracts, up or down, then decide buy or sell. For instance, war and natural disaster and OPEC crisis can cause a high oil price in future, so speculators have to buy to increase price at this moment to drive down the larger price in future.

- Speculators may help us to transfer risks for those who are experienced and can handle these risks, so it is a good point.

Weaknesses:

- Speculators may forecast wrong and they get losses.

- Sometimes, speculators will buy so much, then affecting price, which leads to what called manipulation in the market.

Opportunities:

- High demand from markets, GDP growth increases in many countries

- In future market, speculators can sell in advance and then, they will buy at lower price

- In case of trading firms, they will allocate big source of capital together with knowledge and proper education for their traders to gain profits in derivative markets

- Hedge funds can heging against risk by short (sell) in bear markets whereas market maker try to make profits from spreading between offer and bid prices.

Threats:

- There might be high credit risks, technology risks during China-Trump war.

- Covid 19 impacts will slow down globalization process and derivative markets.

Model 2 - SWOT Analysis of the Development of Global Derivative Market

Strengths:

- Derivative markets attract many main players: banks, investment companies and funds, insurance firms and businesses, until now, derivative market accounts for around 20 percent of wholesale financial markets in Europe.

- Corporations, financial companies can use derivative as insurance to protect unexpected movement in interest rate, exchangae rates and material prices.

- Esp. Many biggest corporations use derivatives for price risk management.

Weaknesses:

- Financial crisis make policy makers to consider enhancing regulation and framework for derivative market in specific and financia markets in general. But on the other hand, deregulation will help to develop derivative markets.

Opportunities:

- High demand from emerging markets to receive supports from global market development leaders in Europe, USA

- Asian can learn success of derivative market from Europe as the biggest derivative market, accounting for more than 40% global derivative markets.

- 4.0 industry and AI development has bring opportunities for technological innovation and improving online trading

Threats:

- There might be high credit risks, technology risks and potential economic crisis.

- Liquidity risk might increase in OTC or not well-established derivative markets.

- Economic recession might reduce number of players, so reducing liquidity for derivative market.

- An important player fails in derivative transaction, it will affect other players, so causing system risk in a domino effect.

In the below section we will present our quantitative results from a regression model for a typical case in the US market:

Quantitative Model Results

Build Regression model: first we see descriptive statistics in below table:

Table 1 - Descriptive Stastics for future and option volume and macro factors

	VOL_DER	R	CPI_US	G_US	SP500
Mean	293303.3	3.714000	1.757000	2.242000	2354.985
Median	346801.0	3.250000	1.825000	2.230000	2331.120
Maximum	423639.0	5.250000	2.960000	2.920000	2752.060
Minimum	107287.0	3.250000	0.730000	1.550000	2043.940
Std. Dev.	115745.2	0.757308	0.679739	0.485290	294.9314
Skewness	-0.797120	1.257826	-0.051292	-0.103650	0.188642
Kurtosis	2.016621	2.914814	2.492443	1.916208	1.373326
Jarque-Bera	1.461933	2.639900	0.111724	0.507324	1.161837
Probability	0.481444	0.267149	0.945670	0.775954	0.559384
Sum	2933033.	37.14000	17.57000	22.42000	23549.85
Sum Sq. Dev.	1.21E+11	5.161640	4.158410	2.119560	782860.5

Correlation matrix:

Table 2 - Correlation among 5 Factors

Correlation Matrix					
	VOL_DER	R	CPI_US	G_US	SP500
VOL_DER	1.000000	0.257608	-0.390957	0.101164	0.554409
R	0.257608	1.000000	0.358286	0.251969	0.694167
CPI_US	-0.390957	0.358286	1.000000	-0.612037	0.172763
G_US	0.101164	0.251969	-0.612037	1.000000	0.074867
SP500	0.554409	0.694167	0.172763	0.074867	1.000000

Covariance matrix:

Table 3 - Covariance Matrix among 5 Factors

Covariance Matrix					
	VOL_DER	G_US	SP500	R	CPI_US
VOL_DER	1.21E+10	5114.149	17033233	20322.49	-27683.27
G_US	5114.149	0.211956	9.644020	0.083342	-0.181704
SP500	17033233	9.644020	78286.05	139.5404	31.17142
R	20322.49	0.083342	139.5404	0.516164	0.165992
CPI_US	-27683.27	-0.181704	31.17142	0.165992	0.415841

We can see:

The above table 2 shows us that correlation among 5 macro variables. An increase in lending rate and increase in GDP growth might lead to an increase in total derivative volume (Y). It also indicates that correlation between total option and future volume (Y) and SP500 and lending rate in the US (0.55 and 0.25) is higher than that between Y and CPI (-0.39) or between Y and GDP growth in US (0.1).

The table 3 shows us that covariance matrix among 5 macro economic variables. Total future and option volume (Y) has a negative correlation with US CPI but has a positive correlation with S&P500, and US GDP growth.

Hence, an increase in inflation may have slight negative impact on total option and future volume (Y).

Next, we use Eview to generate regression results as below:

For single factor model:

Regression with Eview give us results:

Coeeficient (R_lendingrate): 39372

Constant C: 147075

Y: Volume of total future and options in USA

Hence, Y = 39372 * R + 147075, $R^2 = 0.06$ SER = 118622

Within the range of 10 observations (2010-2019) as described in the above scatter charts, coefficient 39372, when lending rate increases, total derivative volume will increase.

Next we run gression for 2-3 factors model:

Table 4 - Regression 2-3 Factors Model

	Co-efficient	
	2 variables	3 variables
R	69732	148463
CPI_US	-94406	-225131
G_US		-227246
SP500		
C (Constant)	200190	646951

As we can see from the above result table, CPI in US and GDP growth in US still are 2 main variables affecting much on the volume of total future and option transactions.

We pay attention to regression model for 4 variables model:

Table 5 - Regression 4 Factors Model

Method	Least squares		Dependent variable	VOL_DER
	Co-efficient	Std. Error	T-Statistic	Prob
R	88637	69391	1.27	0.25
CPI_US	-194762	70336	-2.76	0.03
G_US	-184965	95425	-1.93	0.11
SP500	159.9	133.6	1.19	0.28
C (Constant)	344383	334613	1.03	0.35
R-squared	0.74		Akaike info criterion	25.68
Adjusted R-squared	0.53		Schwarz criterion	25.8
S.E. of regression	78565		F-statistics	3.63
Sum squared resid	3.09E+10		Prob(F-stastistic)	0.09

Hence, $Y = 88637*R - 194762*CPI - 184965* G + 159.9*SP500 + 344383$, $R^2 = 0.74$, SER $= 78565$

Here we see impacts of 4 macro factors, with the new variable: SP 500, the above equation shows that Volume of total future and option in US (Y) has negative correlation with CPI and US GDP growth, whereas it has positive correlation with S&P500 and lending rate. We also recognize that CPI,GDP growth, lending rate have the highest impact on future and option volume. When CPI increase and SP500 decline, it will decrease investment in stock as well as financial market, then it will lead to an decrease in Volume of total future and option.

Risk happens and makes future and option volume declines if CPI increases and SP500 declines, then US GDP growth increases and lending rate declines.

4. Discussion for Further Researches

Sahoo and Nayak (2019) stated that new dimension and technological wing to derivatives market. Application of derivative can eb enhanced with the period of Information Technology (IT) and the procedure of using derivatives is going digital.

First, global derivative markets such as US market have been affected by many factors such as CPI, GDP growth, lending rate and SP500, including factors from crisis. For instance, we need to reduce inflation to increase trading volume of total future and option.

Next, for emerging markets, looking at Vietnam derivative market as an example for development. After 3 years of operation, the derivative stock market had a very good growth, exceeding the expectations set. The market has increasingly shown its role as a risk prevention tool, positively contributing to stabilizing the underlying market and attracting the attention of domestic and foreign investors.

Trading volume on the derivative stock market has a strong growth rate, the first 7 months of 2020 reached over 165,000 contracts / session, an increase of 86.5% compared to 2019 and 15 times more than the first year. open the market (average nearly 11,000 contracts / session).

Market transactions are particularly active whenever the underlying market has strong volatility. Liquidity continuously set new records and the latest record was 356,033 contracts on July 29, 2020, a figure that many previously developed markets took decades to achieve.

(source: tinnhanhchungkhoan.vn, date access 23/11/2020).

However, we need to look at both sides of derivative market development, positive sides and negative aspects.

First, we need to analyze carefully lessons from financial collapses of big groups such as Lehman Brothers during 2008 financial crisis.

Second, we need to evaluate impacts from China- Trump war and Covid 19 on derivative markets.

5. Conclusion and Policy Suggestion

Huarng and (2019) said that The importance of innovation is manifest. Recently, a hotter issue is moving to global innovation. Global innovation is highly related to competitive advantage.

The derivative stock market has brought into play its three roles well: risk prevention, keeping cash flows on the stock market; is an investment tool to make profit in the short term and stabilize the market, and regulate the base market.

From our research model, we recognize that te government need to control macro policies, fiscal and monetary policies, in order to control inflation, reducing it, to have better performance of derivative markets. Beside, banks system need to control interest rates, for example, they might keep lending rate slightly increasing to strengthen derivative markets. Last but not least, we find out that the better performance of stock market as well as SP500 index will have positive effect on increasing total derivative volume.

Finally, this study opens some new directions for further researches in risk control policies in derivative market as well as in the global economy. And we need to organize some more scientific conferences as well as investment seminars for this industry.

Management Implications

Not only we focus on legal framework and macro policies, but also we have to manage better derivative markets.

For instance in emerging markets such as Vietnam, stock exchange committee is continuing to set a legal framework to prepare for the launch of new products, and solutions to promote the investor diversification.

In parallel, we continued to coordinate with regulators to strengthen supervision on the derivative market as well as inter-market surveillance, ensuring smooth, efficient, and safe operation of the market for investors.

Recommendations for Emerging Markets

Enterprises and policy makers in emerging markets need to be knowledgeable about derivative instruments, risks and derivative markets.

Beside, we need to focus on training members and investors, connecting members, developing product diversity and promoting products, using the trading and payment systems of the world's leading providers, building transparent transaction and payment rules, in line with international practices.

Last but not least in Vietnam case, until now, the Future contracts of government bonds is only for institutional investors to participate to prevent risk. It lacks of the presence of: Investors speculating risks (speculators); and investor seeks profit on the difference between the derivative price and the base price. So, it will affect liquidity.

Factors affecting the development of derivative commodities on the stock market include:

A. Starting from Investors

Investment needs, investment purposes, financial capacity, understanding of investors for Commodities which has a decisive meaning in developing derivative commodities in the stock market, when it comes to demand. Beside, Investment refers to the need to have a product to meet the needs of society, and source of all development processes.

B. Economic Environment

The economic environment is mentioned as: The national income situation, the growth rate economic growth, economic growth cycle, inflation situation, employment, main role coverage in macroeconomic stability ...

C. Legal Environment

A complete and strict legal system, that legal system must ensure the request:

- Protection of investors
- Ensuring a fair, stable and efficient market.
- Ensuring the development of the market:
- Reducing system risks

D. Financial Institutions when Participating in the Stock Market

A financial institution is a business whose primary assets are financial assets

Also known as bond forms such as stocks, bonds and loans. Institutions finance for customers to borrow or buy securities. Financial institutions mainly appear in the stock market such as: commercial banks, financial companies, securities companies, financial consulting companies, companies management of funds and investment funds, credit rating organizations ...

From the above arguments, it shows the important role of financial institutions when Participate in the stock market, play a role in creating markets, institutional institutions

The main task is to maintain buy and sell orders with price levels to ensure market play stable development, or more correctly, stabilize the market.

In order for an institution to fulfill well, the institutions must also equip themselves

Necessary conditions such as: Size, financial capacity, quality of human resources capable

ability to well meet the needs of the market ...

Besides the roles of domestic financial institutions, it must also be mentioned role of foreign institutions in the current integration trend.

6. Finally, Recommendations for Digital Transformation and IT Infrastructure

The IT infrastructure serving the market plays an important, key and decisive role success in building and developing derivative commodities. IT infrastructure develops synchronously create convenience for investors to access the market and that market is always guaranteed confidential, secure and transparent.

Therefore, when putting online transactions into transactions on the market, it will be applied

Modern IT systems are fully prepared from facilities to the level of operators implementation, modernizing stages in transactions, ensuring fast transactions fast, accurate and liquidity in the market.

Next, we focus on financial innovation and technological innovation with tablet, laptop, mobile applications

Beside, we need to research on capabilities of block chain technology application in derivative market and financial markets.

Then, how ICT affect OTC market transactions in derivative markets also need to be addressed.

Last but not least, we nee to mage better cybersecurity risk, and facilitate e-trading platform for derivatives.

Limitations of the Paper

It is not going to enter deeper risk control policies in derivative markets in order to avoid bad effects such as financial collapses happening during 2008-2009.

Acknowledgements

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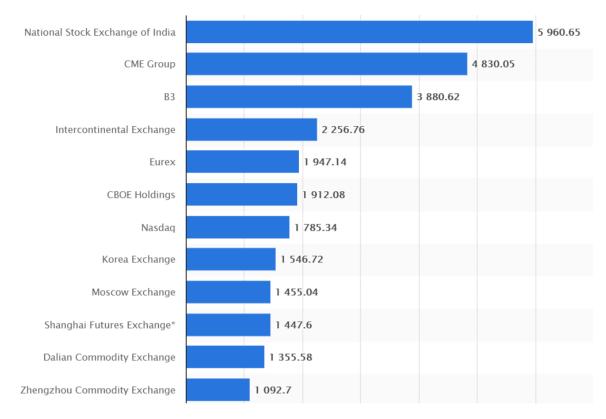
Exhibit

Exhibit 1 –Number of Contracts in Largest Derivative Markets Till 2019 (million) (Source: statista.com, date access 24/11/2020)

National Stock Exchange of India — 5 960.65
CME Group — 4 830.05
B3 — 3 880.62
Intercontinental Exchange — 2 256.76
Eurex — 1 947.14
CBOE Holdings — 1 912.08
Nasdaq — 1 785.34
Korea Exchange — 1 546.72
Moscow Exchange — 1 455.04
Shanghai Futures Exchange* — 1 447.6
Dalian Commodity Exchange — 1 355.58
Zhengzhou Commodity Exchange — 1 092.7