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Managing Financial Instruments: Impact of Covid-19 Pandemic on Global Derivatives Market

Gestión de instrumentos financieros: impacto de la pandemia de Covid-19 en el mercado mundial de derivados

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Resumen

La globalización de la economía, la inestabilidad de las tasas de interés y de cambio, la inflación significativa y la crisis mundial de la década de 1970 se han convertido en incentivos para el surgimiento de herramientas eficientes de gestión de riesgos financieros. Estos instrumentos financieros derivados contribuyen a mejorar la eficiencia funcional operativa, informativa, de precios, de valoración y de distribución, aumentando significativamente la eficiencia de los mercados financieros y de materias primas. El mercado de derivados en el mundo actúa como un indicador del estado de desarrollo y las tendencias tanto en la economía de cada estado individual como en la economía global en su conjunto. El propósito del estudio es evaluar el impacto de la pandemia de COVID-19 en el estado del mercado mundial de derivados. Los autores analizan la tendencia de los instrumentos financieros derivados para el período 2019-2021, incluyendo el aspecto regional. Se concluye que durante la pandemia ha crecido la negociación de instrumentos financieros derivados en todo tipo de contratos, excepto los futuros de divisas, y en todas las regiones. Al mismo tiempo, el aumento del volumen de negociación de derivados observado en el período 2020-2021 está impulsado por la necesidad de gestionar el riesgo en un entorno de mayor incertidumbre y volatilidad provocado por la pandemia de COVID-19.

Palabras clave: Instrumentos Financieros Derivados, Opciones Sobre Acciones, Futuros Sobre Tipos De Interés, Opciones Sobre Materias Primas, Futuros Sobre Divisas.

Abstract

Globalization of the economy, instability of interest and exchange rates, significant inflation, and the global crisis in the 1970s have become incentives for the emergence of efficient financial risk management tools. These derivative financial instruments contribute to the improvement of operational, informational, price, valuation, and distribution functional efficiency, thus significantly increasing the efficiency of financial and commodity markets. The derivatives market in the world acts as an indicator of the state of development and trends in both each individual state economy and the global economy as a whole. The purpose of the study is to assess the impact of the COVID-19 pandemic on the state of the global derivatives market. The authors analyze the trend of derivative financial instruments for the period 2019–2021, including the regional aspect. It is concluded that during the pandemic, trading in derivative financial instruments has grown in all types of contracts, except for currency futures, and in all regions. At the same time, the increase in the volume of trading in derivatives observed in the period 2020–2021 is driven by the need to manage risk in an environment of increased uncertainty and volatility caused by the COVID-19 pandemic.

Keywords: Derivative Financial Instruments, Stock Options, Interest Rate Futures, Commodity Options, Currency Futures.

Introduction

The development of the world economy is manifested in the constant complication of relations between its structural elements and the increasing role of the global securities market in ensuring the international movement of capital (Ramazanov et al., 2021; Denisova et al., 2021; Lukhmanova et al., 2018). The increase in the internationalization of production, the deepening of economic ties between national markets, the development of international trade, and financial globalization determine the need for new investment tools and risk minimization (Hammoudeh & McAleer, 2013; Kulanov et al., 2020; Nezhnikova et al., 2018).

The above trends in the transformation of the world economy led to the emergence of one of the most successful innovations in the financial markets of derivative financial instruments (derivatives). Maintaining consistently high financial performance requires professional participants in the securities market and institutional investors to efficiently manage risks and use new financial instruments for trading in the stock market (Bezler & Borbasova, 2018; Lochan et al., 2021; Ruiz, 2018). Various types of financial derivatives act as such instruments (Bezzina & Grima, 2012; Gasparian et al., 2021). Due to this, transactions with derivative securities hold an important place in the financial activities of the main participants in the global securities market, forming its relatively new and very promising segment – the global derivatives market. Since almost every subject occasionally feels the need to hedge risks or receive additional profit through trading in the stock market, derivative securities at the present stage of development of market relations are turning into one of the main instruments of not only the national but also international securities market (al Janabi, 2021; Sundaram, 2012).

The sequence of events associated with the spread of the COVID-19 pandemic has had a clear impact on equity markets, with an initial decline in global market capitalization along with record levels of trading activity in both equities and derivatives.

Research overview

The essence and functions of various types of derivative securities as well as the development patterns of the international derivatives market have been repeatedly covered in economic literature. For example, S.M. Bartram, G.W. Brown, J. Conrad (2011) thoroughly studied the functioning of the financial derivatives market and the methodology for determining the market value of various types of derivative securities as well as option strategies and a hedging mechanism using derivatives. J.C. Hull (2008) analyzed the essence, development history, and significance of derivative securities markets within the framework of the modern economic system, considered the features of transactions with such securities. V.A. Galanov (2019) studied the mechanism of functioning of futures, forward and options markets, pricing models in the derivatives markets, and revealed the trends in the development of the securities market in the Russian Federation.

The analysis of research findings (Allayannis et al., 2012; Chang et al., 2018; Hsiao & Tsai, 2018; Vo et al., 2019) shows that it is advisable to consider derivatives as derivative securities that have the form of futures contracts that determine the rights and obligations of the parties for the purchase or sale of some assets in exchange for other assets on the terms determined at the time of signing the contract, or for settlements based on the results comparing the strike price with the stock index at the close of trading on the day the contract is executed.

The turnover of derivatives is associated with the turnover of underlying financial assets and, accordingly, the price of derivatives also depends on the value of the underlying asset (Safonova, 2016). For stock derivatives, the underlying asset is securities and stock indices, for currency derivatives – currency, for commodity derivatives – tangible assets (Ameer et al., 2011). There are currently no restrictions on innovation in the derivatives market. In addition to standard underlying assets (share prices, stock market indices, interest rates, exchange rates, etc.), in world markets, underlying assets can be any time-varying values, which leads to the emergence of new non-standard financial instruments (Bartram et al., 2009).

The main international centers for derivatives transactions are such stock exchanges as Chicago (CME); New York (NIMEX); London (LIFFE); Parisian (MATIF). However, 95% of derivatives market operations belong to the over-the-counter market (OTC), banks, and other financial institutions (Zheng, 2019).

According to researchers (Carbonneau, 2021; Tanha & Dempsey, 2017), the derivatives market performs two functions. The first is the redistribution of risks between business entities (reflects hedging operations), the second is the redistribution of income between participants in the derivatives market (associated with speculative trading).

Despite the substantial amount of research into derivatives as derivative financial instruments and the state of the global derivatives market in general, there are not enough studies on the impact of the COVID-19 pandemic on the state of the global derivatives market. Therefore, the purpose of the article is to assess the impact of the COVID-19 pandemic on the state of the global derivatives market.

Materials and Methods

To achieve the goal of the study, we performed a qualitative and quantitative study of the impact of the COVID-19 pandemic on the state of the global derivatives market. Structurally, the study consisted of analyzing the dynamics of derivative financial instruments for the period 2019–2021, including the regional aspect.

The reference framework of the study included research on various aspects of the functioning of the derivatives market (monographs, articles from scientific peer-reviewed journals Scopus and Web of Science) as well as reviews of the derivatives markets of the World Federation of Exchanges during the COVID-19 pandemic. The reference framework was actualized by the time of publication of the articles and limited by the requirement for free access to the necessary materials.

In the study, based on the trend of such indicators of derivative financial instruments as stock options and futures, options and futures for stock indices, options and futures for interest rates, commodity and currency options and futures, the volumes of derivatives trading in the period 2019–2021 were compared, namely we compared 1H 2020 with 2H 2019 and 1H 2019 as well as 1H 2021 with 2H 2020 and 1H 2020.

All results are also analyzed at the regional level: North and South America (the Americas), Asia-Pacific (APAC) and Europe (including Russia), Middle East, and Africa (EMEA).

Result and discussion

The findings showed that the largest derivatives trading market is APAC (45%), then the Americas (42%), and the rest of the contracts are traded in EMEA (13%) (T. W. R. Team, 2020).

The results of the trend of derivative financial instruments for the period 2019–2021 are presented in Table 1

(Table 1): The trend of derivatives over 2019–2021 (by region), %

Instrument (region)	1H 2020 /2H 2019	1H 2020 /1H 2019	1H 2021 /2H 2020	1H 2021 /1H 2020
Stock options	**16.72%**	**40.52%**	**19.99%**	**68.84%**
the Americas	16.70%	47.22%	18.87%	72.28%
APAC	8.44%	2.16%	33.21%	78.73%
EMEA	29.24%	21.35%	23.96%	7.20%
Stock futures	**45.35%**	**58.24%**	**10.35%**	**83.23%**
the Americas	-8.22%	302.64%	36.19%	640.49%
APAC	64.58%	43.82%	16.86%	33.08%
EMEA	29.11%	70.72%	-2.53%	87.27%
Stock market index options	**27.62%**	**45.86%**	**27.41%**	**59.05%**
the Americas	52.11%	57.23%	14.48%	-15.78%
APAC	20.66%	44.56%	29.74%	76.66%
EMEA	49.52%	43.72%	-1.92%	-29.23%
Stock market index futures	**63.42%**	**90.32%**	**14.89%**	**8.76%**
the Americas	56.14%	110.35%	20.11%	26.19%
APAC	77.52%	66.24%	6.21%	-15.16%
EMEA	65.70%	68.12%	-2.37%	-28.98%
Interest rate options	**40.17%**	**35.17%**	**68.60%**	**4.23%**
the Americas	56.45%	38.28%	72.70%	5.32%
APAC	-9.88%	35.66%	-26.64%	-71.94%
EMEA	-5.34%	15.16%	52.45%	-0.01%
Interest rate futures	**34.89%**	**33.20%**	**32.69%**	**0.89%**
the Americas	39.25%	44.64%	41.09%	0.32%
APAC	21.29%	20.97%	4.62%	-13.50%
EMEA	27.09%	10.80%	21.34%	6.20%
Commodity options	**28.32%**	**70.13%**	**16.76%**	**27.26%**
the Americas	36.28%	38.42%	6.53%	-0.71%
APAC	27.24%	262.41%	31.11%	140.37%
EMEA	11.58%	78.55%	10.03%	-23.65%
Commodity futures	**12.08%**	**46.14%**	**2.10%**	**19.40%**

the Americas	23.89%	28.12%	5.18%	-16.24%
APAC	3.14%	50.16%	1.53%	43.24%
EMEA	33.26%	49.41%	2.97%	-22.83%
Currency options	**-8.74%**	**-7.88%**	**29.77%**	**58.59%**
the Americas	9.13%	-13.42%	-4.17%	-24.90%
APAC	-12.43%	-7.22%	36.42%	73.66%
EMEA	33.24%	-9.11%	-5.78%	-20.67%
Currency futures	**35.61%**	**34.48%**	**-1.50%**	**22.45%**
the Americas	15.54%	26.82%	-5.71%	26.01%
APAC	32.84%	27.94%	5.28%	9.07%
EMEA	62.57%	54.06%	-4.97%	28.43%

compiled based on (The WFE Research Team, 2020; The WFE Statistics Team, 2020, 2021), Compiled by the authors

Discussion

The study showed that the impact of the COVID-19 outbreak has been particularly evident in the derivatives markets, which have surged in trading across almost all contract types and regions. According to the researchers, this was a consequence of the fact that the uncertainty in the stock markets in connection with the outbreak of the COVID-19 pandemic forced investors to rely heavily on derivatives markets to hedge their positions. Futures trading, however, has increased proportionately more than options trading. In general, the volume of derivatives in the 1H 2020 increased by 58.82% compared to the same period in 2019 The WFE Statistics Team, 2020).

Share option volumes in 1H 2020 increased by 40.52% compared to the same period in 2019. Growth was mainly recorded in the Americas (+47.22%) and the EMEA region (+21.35%). Compared to 2H 2019, volumes were up 16.72%, with EMEA showing the most growth.

Individual stock futures volumes were 58.24% higher in 1H 2020 compared to the same period in 2019, with significant increases across all regions: the Americas (+302.64%), APAC (43.82 %), the EMEA region (70.72%). Compared to 2H 2019, the growth was 45.35%, and it was recorded in all regions except the Americas.

The volume of options on stock indices in 1H 2020 was 45.86% higher compared to the same period in 2019. Growth was observed in all regions: in the Americas, contract trading volume increased by 57.23%, in APAC by 44.56%, and in the EMEA region by 43.72%. Compared to 2H 2019, volumes increased by 27.62%, with growth in all regions.

Trading volumes in stock index futures in 1H 2020 were 90.32% higher than in the same period in 2019. An increase in trading activity was recorded in all regions: in the Americas, trading volume in the corresponding contracts increased by 110.35%, in APAC by 66.24%, and in the EMEA region by 68.12%. Compared to 2H 2019, volumes increased by 63.42%, with growth recorded across all regions.

The volume of interest rate derivatives trading in 1H 2020 increased by 64.38% compared to the same period in 2019. At the same time, volumes of interest rate options in 1H 2020 were 35.17% higher than in the same period of 2019 and an increase in activity was observed in all regions. Compared to 2H 2019, volumes were up 41.27% but growth was largely driven by the Americas.

Commodity derivatives trading volumes increased by 46.15% in 1H 2020 compared to the same period in 2019.

In particular, commodity option volumes in 1H 2020 were 70.13% higher than in the same period in 2019, with growth in activity across all regions. Compared to 2H 2019, volumes increased by 28.32%, also in all regions.

The volume of commodity futures in 1H 2020 was 46.14% higher than in the same period in 2019. At the same time, an increase in trading activity was also observed in all regions. Compared to 2H 2019, volumes increased by 12.08%, also in all regions.

The volume of currency derivatives in 1H 2020 increased by 19.12% compared to the same period in 2019. At the same time, the volume of currency options in 1H 2020 was 7.88% lower than in the same period of 2019 and the decrease in trading activity was observed in all regions. Compared to 2H 2019, volumes were 8.74% lower, as determined by APAC where most trading takes place.

On the contrary, the volumes of currency futures in 1H 2020 increased by 34.48% compared to the same period in 2019, and an increase in trading activity was noted in all regions. Compared to H2 2019, volumes increased by 35.61%, also in all regions.

The 1H 2021 data confirms the upward trend seen at the end of 2020, with many indicators hitting record levels, especially in the Americas. According to researchers, the growth of derivatives markets was facilitated by government measures such as the introduction of vaccines against COVID-19, additional stimulus packages; financial savings accumulated during the pandemic as well as the increased confidence of traders in the economic recovery (The WFE Statistics Team, 2021).

Compared to the same period in 2020, 36% more contracts were concluded: options and futures increased by 56% and 20.4%, respectively. By region, the increase was spread across the Americas (29.2%), APAC (57.7%), and EMEA (3.7%). Compared to 2H 2020, derivatives volumes were up by 18% to a record 29.2 billion contracts. The number of contracts increased for all types of contracts except for currency futures. Options increased by 27.9% to 14.7 billion contracts, while futures rose by 9.3% to 14.5 billion contracts. The volume of trading in derivatives increased in all regions: the Americas (18.3%), APAC (22.7%), and the EMEA region (2.9%).

Stock option volumes in 1H 2021 increased by 68.8% compared to the same period in 2020, with the increase driven by positive indicators across all regions. Compared to 2H 2020, share option volumes in 1H 2021 were up 20%. The increase was mainly driven by the growth of 18.9% in the Americas, accounting for 89% of global volumes, as well as by the countries of APAC and EMEA, which grew by 33.2% and 24%, respectively. Researchers (Hsiao & Tsai, 2018) note that stock options are the second most traded product with a share of 16.9% after stock market index options.

Stock futures trading volumes in 1H 2021 were 83.2% higher than the same period of 2020, with strong gains across all regions, with the Americas growing the most at 640.5% thanks to the staggering performance of the Brazil stock exchange (749.1%); APAC showed growth by 33.1%, while the EMEA region, which is the largest market, grew by 87.3%. Compared to H2 2020, stock futures trading volumes in H1 2021 increased by 10.4%. Growth occurred due to the Americas (36.2%) and APAC (16.9%).

The 59% increase in stock market index option volumes in 1H 2021 compared to the same period in 2020 was due to the APAC region (76.7%), while the Americas and EMEA decreased by 15.8% and 29.2%, respectively. At the same time, compared to 2H 2020, the volume of stock index options in 1H 2021 increased by 27.4%. Stock index options, the most traded derivatives by volume (22% share), increased in the Americas and the APAC region, respectively by 14.5% and 29.7%. The study (Zheng, 2019) notes that they are traded mainly in the APAC region (91% of the total volume).

Stock index futures volumes in 1H 2021 increased by 8.8% compared to the same period in 2020, mainly due to the Americas (26.2%), while they decreased in the APAC region and EMEA by 15.2% and 29%, respectively. Compared to H2 2020, stock index futures volumes increased by 14.9%, mainly due to the Americas (20.1%), which is the largest market with 74% of the trading volume.

Currency options were 62.7% higher in 1H 2021 compared to the same period in 2020, driven entirely by APAC which grew by 73.7%, with volumes down by 24.9% in the Americas and by 20.7% in EMEA. Compared to 2H 2020, volumes increased by 33.2%, which was also due to growth in the APAC region (36.4%), where most of the volumes are traded (94%).

Currency futures were 21.2% higher in 1H 2021 compared to the same period in 2020, with growth across all regions. Compared to 2H 2020, volumes were 2.5% lower, driven by declines in the Americas (-5.7%) and EMEA (-5%).

Interest rate option volumes were 4.2% higher in 1H 2021 compared to the same period in 2020, driven by a 5.3% increase in the Americas. Compared to H2 2020, interest rate options were the product that rose in price the most (68.6%). The surge was driven by the largest American market, with an 82% share of trading volume which saw a 72.7% increase, and the EMEA region which grew by 52.4%.

Volumes of interest rate futures in 1H 2021 compared to the same period in 2020 increased minimally (0.9%). However, compared to 2H 2020, the volumes grew already by 32.7% due to all regions. Researchers (Chang et al., 2018) note that interest rate futures are the most traded interest rate derivative, with a volume share of 82%.

Commodity option volumes were 27.3% higher in 1H 2021 compared to the same period in 2020, entirely due to the explosive growth of 140.4% in the APAC region. Compared to 2H 2020, volumes increased by 16.8% due to all regions.

The 19.4% increase in commodity futures volumes in 1H 2021 compared to the same period in 2020 was entirely due to growth in the APAC region (43.2%), where 75% of contracts are traded, while in other regions there was a decline. Compared to 2H 2020, volumes increased slightly (2.1%). Researchers (Vo et al., 2019) note that commodity futures account for 96% of the volume of commodity derivatives.

Conclusion

During the last quarter of the 20th century, the volatility of the economic environment increased significantly, which led to a large increase in financial risks and caused both professional market participants and institutional investors to urgently need new types of derivative securities that would make it possible to effectively hedge and reduce losses in the event of adverse changes in the market and receive additional income from speculative operations in the market.

The findings showed that during the pandemic, trading in derivative financial instruments increased in all types of contracts, except for currency futures, and in all regions. While derivatives trading volumes have already shown positive momentum over previous years, the significant year-on-year increase during the pandemic is by far the largest in at least 15 years, including during the Great Financial Crisis of 2007–2008. This increase in derivatives trading volumes observed in 2020–2021, in our opinion, is explained by the need to manage risks in an environment of increased uncertainty and volatility caused by the COVID-19 pandemic.

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