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National Technical University “Kharkiv Polytechnic Institute”,  
Kharkiv, Ukraine***PORTFOLIO DIVERSIFICATION ON A GLOBAL SCALE**

*The research is aimed to analyze different types of portfolios and identify the one with the lowest level of risk. The first portfolio included US and EU securities. The other one studies crypto currency impact on portfolio riskiness.*

**Keywords:** *investments, investment strategy, portfolio, crypto currency, globalization, securities, risks.*

Portfolio investments can include a wide range of asset classes such as stocks, bonds, T-bills, REITs, ETFs, mutual funds, certificates of deposit, derivatives and physical investments [1]. Globalization expands available options with opportunities to add foreign financial assets and crypto currencies into portfolios to offset country risk and to align the desired outcome with the personal investment strategies. Let’s consider a portfolio consisting of 10 securities representing different countries and industries and compare it to S&P 500 over the time period of April 2018 (Table 1).

**Table 1**

Portfolio consisting of 10 securities from different countries

#	Security	Description	Share, %	Covariance	Beta
1	Aberdeen Global	Fund / Japan	5	-0,00693	-0,02465
2	DivDAX	ETF / GER	14,5	0,11707	0,41619
3	ETF091	ETF / America	4	-0,09243	-0,32862
4	Lukoil	Stock / R	21,5	-0,11925	-0,42395
5	MSCI World	ETF	3	-0,02171	-0,07718
6	Bilfinger	Stock / GER	14	0,00216	0,00766
7	Fresenius	Stock / GER	7	-0,17123	-0,60874
8	DWS	Fond / GER	27	-0,20148	-0,71632
9	MSCI World Tech		2	-0,16922	-0,60161
10	Amazon	Stock / USA	2	0,09951	0,35379

VAR (S&amp;P) = 0,281279105

Portfolio Beta = 0,287395355 less volatile than S&amp;P 500

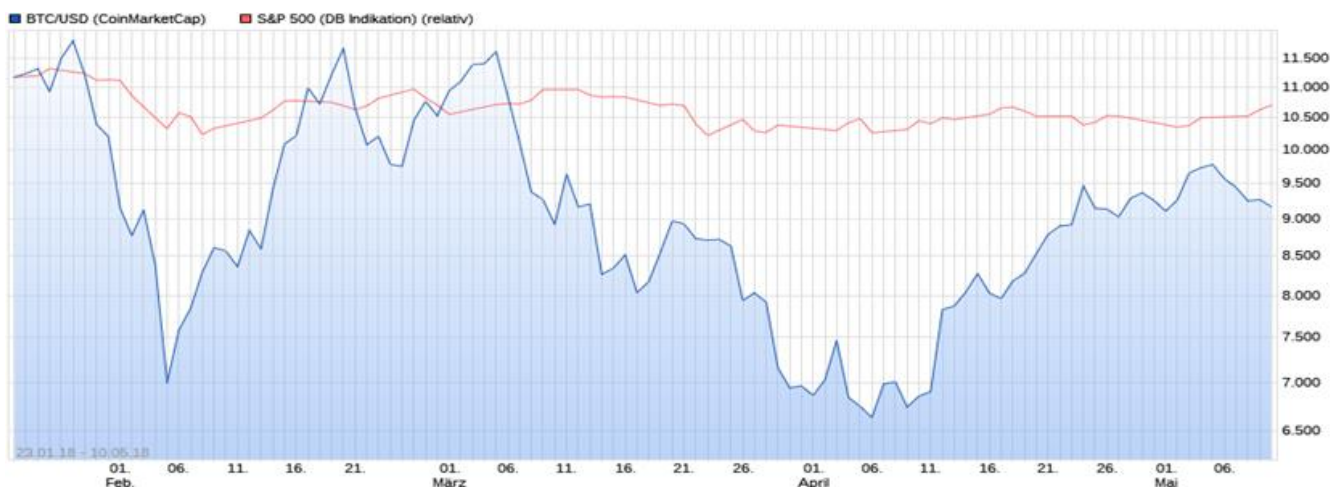
*Note: calculated by the authors on the basis of sources [2-3]*

This portfolio consists of 10 assets: Aberdeen Global, DivDax, ETF091, Lukoil, MSCI World, Bilfinger, Fresenius, DWS, MSCI World Technology, Amazon. The variance for S&P 500 amounts 0.2812. Aberdeen Global with 5% share in this portfolio is a Japanese fund which includes smaller Japanese companies with a covariance of -0.0069 there is almost no correlation to S&P 500. DivDAX with 14.5% share is a German ETF which includes 15 DAX companies with the highest dividends. DivDAX moves in the same direction as the S&P 500 with a covariance of 0.1170. The beta of 0.4161 shows that DivDAX is 59% less volatile than the market. Its beta and covariance are the highest in this portfolio. ETF091 with 4% share is an ETF which includes gold mining companies in the whole America. This ETF moves slightly in the opposite direction than the whole market, with a covariance of -0.0924 and beta -0.3286. Lukoil is an oil and gas company of Russia with a share of 21.50%. The calculated covariance -0.0119 shows that a movement opposite to the market exists. Beta -0.4239 shows an inverse relation. Same interpretation goes for covariance of MSCI World ETF, which has a share of 3% and includes big companies from different countries. -0.0217 covariance and beta -0.0771 also indicate inverse relation. Also, no correlation can be found for Bilfinger stock. It is a German industrial sector stock with 14% share in the portfolio. Covariance is 0.0021 and beta amounts to 0.0076. So regardless of which way the market moves, the value of Bilfinger stays unchanged. For the next 3 securities the covariance is negative and negative betas show inverse relation. Last but not least, largest internet retailer from US Amazon has a share of 2%. Covariance is 0.0995 and beta is 0.3537 which means that Amazon stock price moves along with the S&P 500 and is 65% less volatile than the market. This portfolio has a beta of -0.2873, so it has an inverse relation to S&P 500. As it is important to diversify a portfolio this one consists of securities from 4 different countries and industries, one American fund and 2 more funds with securities from all over the world. Using ETFs instead of stocks also reduces the risk, because the former already include different stocks which can offset each other. Also, every asset of this portfolio is a well-established entity with a long history. Many securities of this portfolio have negative beta which represents an insurance against some macroeconomic risk that affects the rest of the portfolio adversely, so the portfolio is oriented towards risk-aversion long-term investment strategy.

Let's consider whether crypto currency adds value to this portfolio. Bitcoin is the most popular crypto currency with more than 37% of the market share. Let's add a 7% Bitcoin share into the portfolio, adjust existing shares correspondingly and calculate new portfolio beta and covariation. With just 7% Bitcoin share the portfolio beta dropped to -0.2634, so it has even more inverse relation. Bitcoin by itself has a covariance of -0.0648 and beta of -0.2306. So, it is moving in the opposite direction to S&P 500. So, it looks like crypto currency can even reduce the portfolio's risk. But it is not enough to analyze just one-month data. Looking at a period from May 2016 till May 2018 the portfolio indicators are different: variance 486.21, covariance 2.6488 and beta 0.054. The variance is much higher and shows the huge spread between monthly prices. The

positive covariance means that Bitcoin moves in the same direction as S&P 500 in the long run. The beta with almost 0 indicates that there is no dependence between Bitcoin and S&P 500.

Bitcoin is independent of central banks, which influence markets indirectly through interest rates and money supply control. Limited number of Bitcoin is to prevent inflation and loss of savings value, control and restrictions set by authorities, banks or financial service providers and to provide anonymity and no transaction fees. However, Bitcoin exchanges are unregulated and therefore prone to insider's manipulation such as price fixing and insider trading which are forbidden at standard stock exchanges. The crypto currencies are extremely volatile and can be affected by the hackers and bubble bursts. In general, crypto currencies appeared just recently, so there is not enough experience and database to analyze them on a long-term basis. Crypto currencies for now are still highly speculative and not a safe investment. Although risk averse investors generally seek to include some negatively correlated assets to protect portfolio against volatility. Bitcoin is correlated negatively to gold, with  $-0.71$  to gold in USD and  $-0.74$  to gold in Euro (fig. 1).



**Fig. 1.** Comparison of Bitcoin to S&P 500 in the period of Jan, May 2018

*Note: Compiled by the authors on the basis of sources [2]*

Also, Euro/Dollar with slightly negative correlation of  $-0.08$  could be used. Depending on the time period these correlations also change. This case shows 60 days correlation, because as of now short-time investment in crypto currencies could be a proper option. Still an investor should be aware of any news and changes on the market all the time. Future analysis of crypto currencies development will provide more information on the matter. The portfolio consisting of 10 assets represented by different industries and countries was considered. It is a portfolio that fits risk-aversion long-term investment strategy. Adding of crypto currency may bring additional risk diversification in short-term period, but there's still no sufficient data to analyze its general impact on portfolio in the long run.

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## **CURRENT STATE AND PROSPECTS OF THE INSURANCE INTERMEDIATION IN EUROPE AND BULGARIA**

*Insurance intermediation is one of the most important elements of the insurance market. Nowadays, the role of intermediaries exceeds by far their primary information and distribution functions. At the same time, today's unique economic conditions set before the insurance agents and brokers challenges are related to new distribution channels, new risk management strategies, etc.*

**Keywords:** *Insurance intermediation, brokers, agents, market share*

### **1. Current state of the insurance market and the intermediaries' place in it**

The role of insurance intermediaries and before all brokers by far exceeds the simple distribution function. The specialized literature is abundant with research on their information function [1], on their role for improving market efficiency [2], including for reduction of distribution expenses on one hand and the efforts and expenses for finding insurance protection on the other hand. According to Rose (Rose, 1999) this is due to the cutting of the so-called coordination costs coming from the reduction in the number of marketing channels needed. This can be seen of Fig. 1.