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Analysis of the Hungarian investment funds along economic cycles

Abstract. As a result of the 2008 financial crisis, the international financial system underwent a fundamental change. The crisis has highlighted various weaknesses in the economic system. One of these weaknesses was the unregulated nature of investment markets and their inefficient structural structure. Funds managed by investment fund managers have also been hit hard by the crisis. In the post-crisis period of 2008, there was a dynamic economic boom, which also affected the types of investment funds and their changes. However, the economic crisis caused by the COVID-19 pandemic from 2020 onwards is a special crisis. Its unique nature is reflected in the fact that financial markets have remained stable under the influence of central banks. This, in turn, did not necessarily affect the investment market, and in particular investment funds, as expected in the event of a downturn. In our research, we illustrate the change of investment funds along economic cycles through the quantitative changes of Hungarian investment funds. In our analysis, we illustrate the evolution of fund changes through hierarchical cluster analyzes. In the course of our research, we found that Hungarian investment funds move in line with market and retail investment trends, and the structure of investment funds does not show a significant change during the sixteen years examined, regardless of changes in economic cycles.
Keywords: Macro Finance; Investment Funds; COVID-19 Crisis; Economic Cycles; Hierarchical Cluster Analysis
JEL Classification: E32; E44; F30

1. Introduction

The economic crisis of 2008 highlighted a number of problems and anomalies in economic systems. It has had a complex impact on the global financial system, resulting in a complete and

fundamental overhaul of the macro-financial system. As a result of the expansionary policies of national banks, interest rates began to fall after the crisis, and various government interventions and guarantees resulted in new economic, financial and international investment markets. The crisis has also raised the issue of the regulation of investor markets. Both market participants and the state have changed their behavior in relation to previous investment markets. Attention to the operation of investment funds has increased during and after the crisis. Due to state-level regulation of the operation of these investment funds, changes in international capital flows and consumer preferences, this sector has undergone significant changes since the economic crisis.

There are many different types of investment funds, but the structures and proportions of these funds relative to all investment funds have changed greatly in recent years. The release of COVID-19 in 2020 caused a global economic crisis, but financial systems remained stable. In this type of downturn, investor decisions change, to which mutual fund markets also need to respond.

The constant alternation of economic cycles clearly defines investment markets, but the causes of downturns are different in each case. This, in turn, raises the question of how investment funds are able to adapt to different types of downturns and booms and what changes are taking place in this sector. Changes in the types of mutual funds are greatly influenced by the level of inflation and global yield levels. In the post-crisis period between 2013 and 2016, a special economic situation developed. It appeared to have a low inflation rate, coupled with high economic growth and low yields. Its impact has also been felt in the investment fund market, and the regulation of investment funds driven by economic policy has also had a major impact on investment funds and fund managers. In the period between 2017 and 2019, the rise in inflation and the spread of the pandemic from 2020 resulted in a new situation in the investment markets in Hungary and in the rest of the world. It is important to highlight the peculiarity of the Hungarian investment market, which highly prefers real estate investments, but at the same time the amount of savings stored in investment funds is showing dynamic growth from year to year (Szalavetz, 2006).

In our research, we analyze the changes in the Hungarian investment fund market along different economic cycles. In our research, we look for the answer to how and in what direction investment funds have changed as a result of the financial crisis of 2008 and the COVID-19 crisis of 2020, and in economic cycles. In our analysis, we examined the types of investment funds of different periods by cluster analysis based on the quantitative changes of investment funds. Comparing the results of the cluster analyzes, we examined the changes in the types of investment funds and the correlations of possible changes in the case of economic cycles.

2. Brief Literature Review

The theory of portfolio construction is embodied in investment funds, as each investment fund can be considered as a portfolio in its own right.

Mutual funds, which pool and manage the savings of a large number of investors, have been created to address problems of scale. They are a response to the problem that most households' investment portfolios are not large enough to include a wide range of securities. High costs are incurred due to brokerage and dealing fees. Buying a small number of shares in many different companies is not economically efficient. It is much more economical to buy shares and bonds in large sizes. This observation offers a profit opportunity, it was recognised and mutual funds were created to address this problem (Bodie et al., 2011).

A mutual fund is a pool of assets created and operated by the public or private issuance of units, managed by a mutual fund manager on behalf of and for the general mandate of investors (Somi, 2007).

In our research, we examine the quantitative changes of Hungarian investment funds along business cycles. The business cycle assumes regular fluctuations in production and income. The formal description of the fluctuation is partly independent of what causes the fluctuation. Each fluctuation is associated with an upward and a downward movement. In many cases, these movements represent a self-reinforcing phase of growth or decline. Fluctuation can be defined mainly along two different properties: its extent over time (duration) and the degree of fluctuation (amplitude). The reason for triggering wave motion is that a self-reinforcing increase or decline collides with some (usually external) constraint. The root cause of a boom is fundamentally

determined by the factor that causes the recovery to inhibit or the onset of another recovery, i.e., what constitutes the upper and lower turning points of the cycle. A complete business cycle can be divided into two basic phases: an expansion period (also known as a business cycle) when output increases and a downturn period (or downturn) when output shows a declining trend (Samuelson & Nordhaus, 2009).

Economic activity can be measured mainly by the development of total output and income (Bloom et al., 2018). An examination of empirical data shows that investment, consumption expenditure, and employment correlate with changes in GDP. Therefore, in most cases, business cycle researchers agree that the best and most important indicator of economic activity is the change in output. Based on these, in our research we determined the economic cycles along the output and other characteristics in relation to the Hungarian economy.

The global financial crisis of 2007 - which is estimated to have left several trillions of dollars in losses worldwide - was not caused by war or a major recession, but by the «shadow banking system» in the United States, i.e. investment banks, hedge funds and the «animal spirit» of supermarkets' own banks (Ilzetzki et al., 2013). According to Losoncz et al. (2014) analysis, the first phase of the crisis cycle began as early as the early 2000s with a worldwide decline in interest rates. The crisis, in fact, began to feel its effects in March 2007, when worse news came about the mortgage market, until in August 2007 the economic collapse began (Király et al., 2008). By September 2008, the average price of U.S. real estate had fallen by more than 20 percent from its mid-2006 peak, resulting in mortgage debt exceeding the value of real estate (Chan et al., 2011). The global scale of the economic crisis has also caught up with the investment sector, but may not have affected households as much as it has (Csiszárik, 2017). Mizruchi (2010) writes that one of the reasons for the collapse of the financial system is an overly liberal attitude.

The overly lax regulation, on the other hand, was not due to the government's inability to regulate the market, but rather to the laissez-faire attitude, that is, the prevailing neoliberal thinking that markets are self-regulating. This attitude, in turn, prevented the government from taking effective action.

The exploding recession has hit all of the national economies hard. Hungary was hit by a wave of crisis in 2008, which hit it particularly hard. The main reason for this is that the country is considered vulnerable due to its high external debt stock and high public debt. It is true that fiscal austerity since 2006 has improved the balance, but it has not solved the problems of the previous five years. The situation was further aggravated by the fact that the inflation-targeting monetary policy, which was alien to small and open economies, only stimulated indebtedness through high forint interest rates (Kovács, 2016). It can be said that the crisis that hit the world economy in 2008 reached Hungary in a very weak state, but the Hungarian government tried to intervene with appropriate financial instruments from 2010 and then from 2013 (Matolcsy, 2019).

At the heart of the economic policy turn of the past ten years, it has set itself the goal of creating economic growth, implementing structural reforms, and economic recovery (Baksay & Palotai, 2017; Lentner et al., 2021). A further feature of this economic policy turn is the development of a new set of values and the synergistic cooperation of the state and the market (Parragh, 2019).

The COVID-19 crisis has affected the world economy in several areas. Among other things, it has reduced demand, hampered the provision of input, tightened credit conditions, caused liquidity difficulties, and increased uncertainty (Nicola et al., 2020; Karácsony, 2020). In general, with regard to deconstruction articles, the willingness to invest decreases. However, prior to the pandemic situation, the global environment for foreign direct investment (FDI) was already beginning to be characterized by rapidly deteriorating investor confidence (Vasa & Angeloska, 2020). In addition to this decline in investor confidence, it has been associated with initial uncertainties in trade and investment policies, an initial slowdown in global economic growth, falling commodity prices and rising levels of protectionism. In this global economic situation, COVID-19 has arrived, which has significantly raised the level of investor risk (Sarkodie & Owusu, 2020).

COVID-19 presented another challenging period for Hungary. At the same time, in contrast to the financial crisis of 2008, the coronavirus reached the Hungarian economy in a stable financial situation and in a growth phase. Unlike the world economy, the world economy showed significant economic growth in the year before the pandemic-induced crisis, with declining public debt and a disciplined budget. In addition to the improving competitiveness of the national economy, the high level of the investment rate is also decisive (Túróczi et al., 2020).

3. Purpose

The aim of the research is to explore the changes of Hungarian investment funds along different economic cycles. We examine the change in the position of previously preferred instruments, taking into account the economic conditions affecting the market. The change in the number of investment funds is a good illustration of the economic situation and structural structure of an investment market. In our research, we examine the effect of economic cycles on the investment preference of the Hungarian market, and we make a comparison between the changes in economic cycles.

4. Results

Analysis of investment markets is a key area of macro-financing and modern economic policy. The global financial and economic crisis that began in 2008 has highlighted the fact that changes in the structure, risk, and types of investment funds may, in some cases, deepen the extent of crises (Spatt, 2020). There is no optimal composition of investment funds at the global and national level. In the present research, our aim is not to assess the composition of investment funds, but to change the type of investment funds and to explore the relationships between cyclicalities.

For our study, we chose the development of the number of open-ended securities investment funds and other investment funds registered in Hungary between May 2005 and May 2021. For statistical analysis, the Association of Hungarian Investment Fund Managers and Asset Managers (BAMOSZ). We analyzed data on the number of mutual funds examined in five different cycles:
1. before the economic crisis (2005-2007);
2. period during the financial crisis (2008-2012);
3. business cycle without inflation (2013-2016);
4. higher inflation business cycle (2017-2019);
5. COVID-19 crisis period (2020 to May 2021).

In our analysis, we used hierarchical cluster analysis, which is suitable for evaluating a small number of data sets. In the initial state of hierarchical procedures, each element forms a separate cluster. The procedure then determines the distance of all the elements in the test and combines the smallest distance. The most similar groups are grouped into another cluster, which reduces the number of clusters by one. The merger thus continues until all the elements are grouped into a large cluster. The Ward method was used during the merger.

We distinguished 9 different types of mutual funds used in the analysis. The types of investment funds listed in Table 1 do not appear in all economic cycles. This is due to the fact that several investment funds closed or new ones were formed in the years analyzed. Therefore, we used the grouping of investment funds by type. This allows you to track the types of mutual funds while taking into account changes in mutual funds.

Money market funds: these are funds where the average residual maturity of the bond-like instruments in the portfolio must not exceed 1 year.

Bond funds:

Short bond funds: funds where the average remaining maturity of the bond-like assets in the portfolio is 1-3 years.

Long bond funds: Funds with an average residual maturity of bond-like assets in the portfolio of more than 3 years.

Free Maturity Bond Funds: Free Maturity Bond Funds provide their investors with a share of the returns on government and corporate bonds, without any restrictions on the average remaining maturity, at a medium risk level.

Mixed funds: they mix bonds and equities in their portfolio.

Bond-weighted: The proportion of non-bond type assets in the portfolio should not exceed 35%. Non-equity type assets analysed by category (e.g. real estate type, commodity type, etc.) should not exceed 20%.

Balanced: The proportion of non-bond type assets in the portfolio is approximately 35-65%. Non-equity type assets by category (e.g. real estate type, commodity type, etc.) are limited to a maximum of 40%.

Dynamic: The proportion of non-bond type assets in the portfolio is greater than 65%. Non-equity type assets by category (e.g. real estate type, commodity type, etc.) may account for up to 40%.

Equity funds: the proportion of equity-type assets in this type of portfolio exceeds 80%.

Other unclassified funds: securities not included in any of the other categories.

Fund of funds: the portfolio of fund of funds type investment funds consists of units of other investment funds. Typically, a fund of funds is a fund of funds that contains investment funds that are more difficult to access from Hungary with smaller investments.

Special funds: types of investment funds that cannot be classified as equity funds or debt funds. These funds are unique and work well for investors who have specific financial goals.

Private funds: when issued, the securities are offered only to predetermined investors on an individual basis, on the basis of a prior declaration of intent by the investor.

Derivative funds: invest in securities not directly but through some form of derivative instrument.

Capital protected funds: the capital invested is repaid in any case after the maturity or predetermined holding period.

Real estate funds: they invest in various commercial and residential properties.

Table 1 illustrates the types of investment funds in the periods covered by the study. The types of investment funds have changed over the years. The changes are the result of changes in the BAMOSZ data collection methodology and government interventions.

In our analysis, we have carried out five hierarchical cluster analyses for the different periods we have defined. We did not predefine the number of clusters in the hierarchical cluster analysis. The resulting number of clusters was defined at the lowest level. In this way, at least four clusters were identified for each of the five periods, but in some cases several clusters were created. Clusters were separated on the basis of quantitative and quantitative changes in the types of investment funds.

The average of the investment funds of the created clusters is compared with the total average of the investment fund types of the examined year. Thus, we get a difference that can be used to determine the extent to which Hungarian investment funds preferred the elements of a given cluster in their investment decisions in the current year.

Table 1:
The types of investment funds

Categories	2005-2007	2008-2012	2013-2016	2017-2019	2020-2021
Money market funds	Liquidity	Liquidity	Liquidity	Liquidity	Liquidity
	Money market	Money market	Money market	Money market	Money market
Bond funds	Short bond	Short bond	Short bond	Short bond	Short bond
	Long bond	Long bond	Long bond	Long bond	Long bond
	Free maturity bond	Free maturity bond	Free maturity bond	Free maturity bond	Free maturity bond
Mixed funds	Bond-weighted	Bond-weighted	Bond-weighted	Bond-weighted	Bond-weighted
	Balanced	Balanced	Balanced	Balanced	Balanced
	Dynamic	Dynamic	Dynamic	Dynamic	Dynamic
Equity funds	Equity overweight	Equity overweight	Equity	Equity	Equity
	Pure equity	Pure equity	-	-	-
Other unclassified funds	Other unclassified funds	Other unclassified funds	Other unclassified funds	Other unclassified funds	Other unclassified funds
Fund of funds	Fund of funds	Fund of funds	Fund of funds	Fund of funds	Fund of funds
Special funds	Guaranteed	Guaranteed	-	-	-
	-	Commodity market	Commodity market	Commodity market	Commodity market
	-	Absolute return	Absolute return	Absolute return	Absolute return
	-	Capital protected	Capital protected	Capital protected	Capital protected
	Derivative	Derivative	Derivative	Derivative	Derivative
Private funds	Money market	Money market	Money market	Money market	Money market
	Bond	Bond	Bond	Bond	Bond
	Mixed	Mixed	Mixed	Mixed	Mixed
	Equity	Equity	Equity	Equity	Equity
	-	Absolute return	Absolute return	Absolute return	Absolute return
	-	Capital protected	Capital protected	Capital protected	Capital protected
	-	Derivative	Derivative	Derivative	Derivative
	-	Real estate	Real estate	Real estate	Real estate
	Other	Other	-	-	-
Real estate funds	Real estate distributor	Real estate distributor	-	-	-
	Real estate developer	Real estate developer	-	-	-
	-	Investing directly in real estate	Investing directly in real estate	Investing directly in real estate	Investing directly in real estate
	-	Investing in indirect real estate	Investing in indirect real estate	Investing in indirect real estate	Investing in indirect real estate

Source: Compiled by authors using data from BAMOSZ

The grouping is used to estimate the deviation from the mean. We formed the groups and their thresholds (Table 2) based on the normative choice of subjective expert opinion.

The averages within the groups were compared to the mean of the given variable.

Five clusters were created between 2005 and 2007. The five clusters include the changes in the total number of funds over the three years under review (Table 3). These quantitative changes in the period before the financial crisis show that the deviation of the clusters from the overall average is not significant in any of the years. This means that there is no significant dispersion in the types of investment funds on the market over the period under review.

Table 2:
Categories thresholds and marks

Category	Marking	Interval
Not valid	Ø	
Very below average	--	(< -15)
Slightly below average	-	(-15 – -5)
Around average	0	(-5 – 5)
Slightly above average	+	(5 – 15)
Very above average	++	(15 – 25)
Extra above average	+++	(25 <)

Source: Compiled by authors

Table 3:
Cluster analysis of economic cycles

Before the economic crisis (2005-2007)			
Ward Method	2005	2006	2007
Very below average	(--) 0.88	(--) 1.13	(--) 1.63
Below average	(-) 6.6	(-) 10.6	(-) 11.4
Average	(0) 15.83	(0) 17.67	(0) 23.5
Above average	(++) 25	(+++) 47	(+++) 71
Very above average	(+++) 35	(+++) 69	(+++) 110
Total average	9.29	13.52	18.67

Period during the financial crisis (2008-2012)					
Ward Method	2008	2009	2010	2011	2012
Very below average	(--) 0.80	(--) 0.80	(--) 0.87	(-) 4.93	(-) 5.67
Disappearances and new mutual funds	(+) 22.40	(+) 23.20	(+) 29.20	(--) 0.60	(--) 1.20
Average	(0) 17.29	(0) 18.43	(0) 20.00	(+) 27.86	(+) 28.29
Above average	(+++) 80.00	(+++) 79.00	(+++) 87.00	(+++) 106.00	(+++) 105.00
Above average new mutual funds	Ø 0.00	Ø 0.00	Ø 0.00	(+++) 144.00	(+++) 154.00
Very above average, but disappearances	(+++) 167.00	(+++) 156.00	(+++) 153.00	Ø 0.00	Ø 0.00
Total average	16.4	16.4	17.97	17.4	18.27

Business cycle without inflation (2013-2016)			
Ward Method	2013	2014	2015	2016
Very below average	(--) 5.23	(--) 5.62	(--) 5.23	(--) 6.92
Average	(0) 21.25	(0) 22.88	(0) 26.38	(0) 29.88
Above average	(+++) 69.50	(+++) 74.00	(+++) 78.00	(+++) 82.50
Very above average	(+++) 135.00	(+++) 146.00	(+++) 140.00	(+++) 127.00
Total average	25.88	27.84	28.6	29.92

Higher inflation business cycle (2017-2019)		
Ward Method	2017	2018	2019
Very below average	(--) 8.94	(--) 8.31	(--) 6.88
Above average	(+) 42.67	(+) 41.50	(+) 41.50
Very above average	(+++) 89.00	(+++) 94.50	(+++) 98.00
Extra above average	(+++) 138.00	(+++) 143.00	(+++) 146.00
Total average	28.6	28.56	28.04

COVID-19 crisis period (2020 to May 2021)		
Ward Method	2020	2021
Very below average	(--) 7.29	(--) 7.29
Above average	(++) 45.40	(++) 46.00
Very above average	(+++) 102.00	(+++) 104.00
Extra above average	(+++) 146.00	(+++) 144.00
Total average	28.04	28.24

Source: Compiled by authors

For the period 2008-2012, six clusters can be clearly distinguished from each other. Among the clusters, the «Disappearances and new mutual funds» should be highlighted. This cluster includes those types of investment funds that have ceased to exist or have been created during the period under review. This cluster is therefore specific. Within the cluster, there has been a change of name over the years, as several investment fund types included in the cluster have ceased to exist in 2011, mainly due to market changes and government regulation. Furthermore, new fund types have been added to this cluster since 2011, but have not shown dynamic growth.

The fund, which belongs to the «above-average new mutual funds» cluster, was established in 2011 and has grown dynamically over the years. Between 2008 and 2010, the «Very above average but disappearances» cluster performed well above average in the three years studied. However, from 2011 onwards, the value of the indicator became immeasurable as the investment fund in the cluster ceased to exist.

In the next three examined periods, it can be said that the structure of the investment fund types developed similarly. The mutual funds were divided into four separate clusters for each of the three periods. An exception is the period 2013-2016, for which an «average» cluster has also emerged. This cluster does not differ significantly from the average.

In the comparison of the cluster analyses (Table 4), the composition of the types of investment funds has changed significantly for the periods under consideration. The results of the cluster analyses reflect these changes. The analysis of the periods shows that the structure of investment funds has changed as a result of both market changes and government intervention. This change has resulted in the disappearance of certain types of funds and the creation of new ones, as well as quantitative changes in the different types.

The period 2005-2007 was a period of dynamic economic growth in the Hungarian economy. During this period, economic growth was accompanied by a higher inflation rate. These macro factors have had a positive impact on the growth of the volume of investment funds. Based on the cluster analysis, it can be stated that the most popular type of Hungarian investment funds were guaranteed funds. These funds were considered innovative and low-risk products in the Hungarian investment market. Therefore, their popularity increased dynamically year by year.

The impact of the global economic crisis was felt in Hungary from approximately 2008 until 2012. During this period, economic performance declined significantly, which had an impact on investor markets. The majority of investment funds operating during this period were classified in the «average» or «very below average» cluster. The decline in the volume of investment funds is an excellent illustration of the negative trend in the propensity to invest. The exception to this is the closed equity fund type, which has seen a more significant increase in volume compared to the previous period. During this period, a number of funds have been closed down or withdrawn from the market, and these funds have been classified in the «Disappearances and new mutual funds» cluster. Disappearance types in this cluster had a minimum above-average volume and newly created funds performed significantly below average in terms of volume.

In contrast, there are two clusters that are unique and the investment funds in these clusters have also had a unique character in the Hungarian investment fund market. The «Above Average New Investment Funds» cluster has achieved dynamic volume growth since its inception. The capital protected fund was, like the guaranteed fund of the previous period, an innovative, low-yielding but safe investment. Guaranteed funds were the dominant investment type between 2008 and 2010. However, from 2011 onwards, its volume value has been reduced to zero. It should be noted, however, that the high proportion until 2010 is largely due to the closed-end form of the funds. If they had been open-ended rather than closed-ended, the stock market crash that started in October 2008 would probably have led investors to place a large number of redemption orders in these funds as well. This may have been the reason why these funds were placed in the «Very above average but disappearing» cluster.

The period of economic activity without inflation (2013-2016) is unique in the history of the Hungarian economy. Inflation was around 0% and this was coupled with strong economic growth. Low inflation and high economic growth have resulted in low interest rates and yields in the investment market. The effect of this was not a significant effect on the quantitative change of investment funds. At the same time, there has been a significant increase in volume for equity funds. Within the cluster of the previous period, the equity-type investment fund was already classified in the «above average» cluster within this period. Most mutual fund types should be for the first period because of the

significant amount of growth, because the increase in the overall return on equities significantly exceeds the rate of return on other investment products on the market. The capital-protected and fund-of-funds types are grouped into the «Very Above Average» cluster. These base types retained their above-average values in the previous period. Following the cluster analysis, it can be observed that the structure of the investment fund types of the period is similar to the pre-crisis period (2005-2007).

The period 2017-2019 is a period with higher inflation in the Hungarian economy. Inflation growth may be a major factor influencing the reclassification of hedge funds to a «popular» cluster. The growth of private real estate funds, which was grouped into the «above average» cluster during the period, should be highlighted. During this period, the rate of return on real estate market investments showed a significant increase. The reason for this is, on the one hand, the low level of the international interest rate environment and, on the other hand, the emergence of Hungarian state transfers in the real estate market. The low interest rate environment also had a negative impact on money market and liquidity fund types. In contrast, overweight and balanced mixed funds show volume growth due to the low interest rate environment. During this period, the equity fund maintained its previous position.

We have analysed the pandemic period from 2020 to May 2021 based on existing data. The economic environment is characterised by recession, but financial stability has been maintained both

Table 4:
Classification of investment funds by cluster

2005-2007	2008-2012	2013-2016	2017-2019	2020-2021
Very below average	**Very below average**	**Very below average**	**Very below average**	**Very below average**
Free maturity bond	Short bond	Dynamic	Liquidity	Liquidity
Dynamic	Free maturity bond	Other unclassified funds	Money market	Money market
Equity	Dynamic	Commodity market	Long bond	Long bond
Bond	Commodity market	Money market	Free maturity bond	Free maturity bond
Mixed	Money market	Bond	Dynamic	Dynamic
Money market	Bond	Mixed	Other unclassified funds	Other unclassified funds
Other	Mixed	Equity	Commodity market	Commodity market
Real estate developer	Absolute return	Absolute return	Money market	Capital protected
Below average	Capital protected	Capital protected	Bond	Money market
Liquidity	Derivative	Derivative	Mixed	Bond
Short bond	Real estate	Real estate	Equity	Mixed
Pure equity	Other	Investing directly in real estate	Absolute return	Equity
Other unclassified funds	Real estate developer	Investing in indirect real estate	Capital protected	Absolute return
Derivative	Investing directly in real estate	**Average**	Derivative	Capital protected
Average	Investing in indirect real estate	Liquidity	Investing directly in real estate	Derivative
Money market	**Disappearances and new mutual funds**	Money market	Investing in indirect real estate	Investing directly in real estate
Long bond	Equity overweight	Short bond	**Above average**	Investing in indirect real estate
Bond-weighted	Pure equity	Long bond	Short bond	**Above average**
Balanced	Other unclassified funds	Free maturity bond	Bond-weighted	Short bond
Equity overweight	Derivative	Bond-weighted	Balanced	Bond-weighted
Real estate distributor	Real estate distributor	Balanced	Capital protected	Balanced
Above average	**Average**	Derivative	Derivative	Derivative
Fund of funds	Liquidity	**Above average**	Real estate	Real estate
Very above average	Money market	Equity	**Very above average**	**Very above average**
Guaranteed	Long bond	Absolute return	Equity	Equity
	Bond-weighted	**Very above average**	Absolute return	Absolute return
	Balanced	Fund of funds	**Extra above average**	**Extra above average**
	Absolute return	Capital protected	Fund of funds	Fund of funds
	Equity			
	Above Average			
	Fund of funds			
	Above average new mutual funds			
	Capital protected			
	Very above average, but disappearances			
	Guaranteed			

Source: Compiled by authors

in Hungary and internationally. Following the cluster analysis of investment funds, no major changes have occurred compared to the previous period. The exception to this is the capital protected fund type, which has been reclassified from the «above average» cluster of the previous period to the «very below average» cluster. In terms of quantitative change, it has declined significantly over the years analysed. The impact of the crisis over the period under review is not observed in the change in the structure of investment funds. Apart from the capital protected funds, there was no significant quantitative reduction in the fund types analysed, nor was there a process of fund type closures, withdrawals and new fund type creation similar to that of the 2008-2012 financial crisis. Looking around the domestic investment market, we see that the majority of investment funds have weathered the crisis of the COVID-19 crisis unscathed until the end of May 2021.

In our analysis, comparing the clusters of the two different deconjunctural periods, it can be stated that no identity can be observed in the quantitative changes of investment funds. We also point out that the two deconjunctures are fundamentally different, while the period 2008-2012 can be called a financial crisis, the crisis starting from 2020 is not a crisis due to the structure of the economy, but driven by an external factor. The stability of financial markets, in which national banks also play an important role, has a major impact on the relative stability of the structure of investment funds. Regardless of the rate of inflation, no significant structural change can be observed in periods of economic activity. At the same time, the quantitative change of some type of investments fund was significantly influenced by, for example: capital-protected funds, real estate funds. In the examined periods, the fund's investment type should be highlighted, which is grouped into the «above average» or «very above average» cluster in each period. The fund of funds is the sum of the units of other investment funds. So in this case, the investment fund's portfolio does not include stocks, bonds and other derivatives, but only investment certificates.

5. Concluson

In this article, we examined the change in the volume of investment funds over five economic periods. Hierarchical cluster analysis was used to analyze the change. Our results show how economic downturns and cyclical periods affect the mutual fund market. We do not find consistent patterns in the quantitative change in the flow of investment funds between the two crisis periods examined. No typical quantitative change can be observed between the pre-crisis cyclical periods before the 2008 financial crisis and the pre-crisis COVID-19 changes. We found no significant difference in the composition of mutual funds over the five periods studied. However, for some investment fund types, there were significant volume changes during the periods under review.

Our results show that changes in investment fund types largely follow investment market trends. The Hungarian investment fund market also responds to the interest and yield levels that determine the investment market, as well as to the economic environment. This is underlined by the disappearance of guaranteed funds caused by changes in financial markets. In addition, the dynamic growth of the hedge fund market in the post-2008 crisis and the decline in the volume of higher-inflation and lower-yield funds.

A feature of the Hungarian retail investment culture is the preference for real estate market investments (Balogh et al., 2019). However, in the investment fund market, the volume change of real estate funds was not significant during the periods under review. From 2017, on the other hand, the volume of private real estate funds increased significantly, while the change in the volume of funds investing in open-ended direct and indirect real estate did not increase significantly. This contradicts Kutasi et al. (2018) with a preference for retail investment culture.

During the COVID-19 pandemic crisis, despite the economic recession, there was no significant decline in the volume of investment funds other than hedge funds, nor was there a process of liquidation, delisting and the creation of a new fund type similar to the 2008-2012 financial crisis. Based on these, it can be said that the majority of investment funds in the domestic investment market remained intact in the crisis caused by the coronavirus until the end of the period under review. This partly confirms the result of Pástor and Vorsatz (2020) that the measures taken by national banks to stabilize and liquidity investment markets have proved successful.

Our research can be complemented by a comparative analysis with data from the Visegrad 4 countries and the average of the European Union member states. Another area of research is the market share of funds focusing on sustainable investments. Although these funds are not yet significant in terms of the overall Hungarian market, greater consumer awareness, environmental and climate protection gives these products a justification.

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