

A REVIEW ON THE RELATIONSHIPS AMONG ADAPTIVE MARKETS HYPOTHESIS, THE EFFICIENT MARKETS HYPOTHESIS AND BEHAVIOURAL FINANCE

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Abstract: *The Efficient Markets Hypothesis (EMH), which has had a significant impact on the field of finance since its development, has triggered many subsequent researches and some of the researches have brought a critical view to the Hypothesis. Two important alternatives have been put forward to overcome the criticisms and observed deficiencies of the EMH: Behavioural Finance and Adaptive Markets Hypothesis. Although various studies have been conducted to examine the relationship between these two approaches and the EMH, not much research has been conducted to examine their relationship with each other. In this study, the relationship between the Behavioural Finance approach and the Adaptive Markets Hypothesis, their similarities and differences are examined and it is aimed to complete this perspective that is felt to be lacking in the literature. The current study aims to cross-examine the hypotheses (EMH- Behavioural Finance, EMH- AMH), which are related to each other and try to answer the deficiencies seen separately, and in this way, it reveals that theories that are alternative to each other can also complement each other at various points and thus, when evaluated together, more effective evaluations can be made in the field of finance.*

Key words: Adaptive Markets; Efficient Markets; Behavioural Finance.

JEL Classification Codes: G10, G40, G41

1. INTRODUCTION

The Efficient Markets Hypothesis put forward by Fama in 1970, which has an important place and influence in the field of finance, has faced some criticisms over time and has failed to respond to the criticisms directed. This situation has paved the way for questioning the Efficient Markets Hypothesis and conducting new studies in order to eliminate its deficiencies. As a result of the studies carried out in order to eliminate the deficiencies and respond to the criticisms, two valuable approaches have been put forward: Behavioural Finance approach and Adaptive Markets Hypothesis. In his Efficient Markets Hypothesis, Fama assumed that the market is efficient and that every situation and all kinds of information that develop in the market are immediately reflected in the prices; however, the studies conducted have determined that investors may exhibit irrational behaviour and that efficiency may not always be achieved and may vary over time. In the face of these criticisms, to which the EMH was insufficient to respond, Behavioural Finance, which claims that investors do not always make rational decisions



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and that phenomena such as individual's biases and heuristics and other psychological factors have an impact on financial decisions, and the Adaptive Markets Hypothesis, which claims that market efficiency may change over time depending on changing market conditions (Lo, 2005), were developed.

Although various studies have been conducted on both studies, it has been observed that there is no study on the relationship between Adaptive Markets Hypothesis and Behavioural Finance. For this purpose, this study will try to explain the similarities and differences between the Adaptive Markets Hypothesis and Behavioural Finance. While explaining this relationship, the relationship between both approaches and the Efficient Markets Hypothesis will also be examined.

2. DEVELOPMENT OF THEORIES AND THE RELATIONSHIP BETWEEN THEM

According to the Efficient Markets Hypothesis, an efficient market is a market in which "a large number of rational profit maximising investors actively compete, the future market value of each stock is estimated, and all important current information is available to all market participants almost cost-free" (Chuvakhin, 2001: 3). According to this definition, it is not possible to make excessive profits in an efficient market and share prices are rational; prices are not influenced by psychological and other reasons originating from the individual, prices reflect only factors such as risk (Statman, 1999: 18). The Efficient Markets Hypothesis asserts that markets are composed of rational investors, that rationality can be expressed as the expected utility of choices or the choice of the highest value, and that shares are valued at their net present value. In the Efficient Markets Hypothesis, markets are always in equilibrium and the expected return of the investor does not exceed the expected return of the market (Firat and Fettahoğlu, 2011: 153).

However, the occurrence of market anomalies such as the dot.com and mortgage crises mentioned in Gupta et al. (2014) and Konstantinidis et al. (2012) in the presence of efficient markets and rational investors has led to the questioning of the efficient markets hypothesis. With the criticisms against the Efficient Markets Hypothesis and the attempts to test its validity, the field of Behavioural Finance, which is a new field, has developed and tried to shed light on the areas where the hypothesis is insufficient to respond. While the Efficient Markets Hypothesis is based on the assumption that investors in the market are always rational, Behavioural Finance argues that investors do not always exhibit rational behaviour when making their decisions, and that their decisions are affected by many emotional, psychological and cognitive factors. In the words of Sharma (2014), Behavioural Finance theory is a hypothesis that suggests that investors are not rational but normal. According to Behavioural Finance, normal people who do not always exhibit rational behaviour in their financial decisions may make mistakes. These mistakes cause deviations from efficient markets and prevent the market from always being efficient.

Lo (2004) argues in his study that most of the behaviours that behavioural financiers see as violations of rationality inconsistent with market efficiency, such as loss aversion, overconfidence, overreaction, mental accounting and other behavioural biases, are in fact consistent with an evolutionary model of individuals adapting to a changing environment through simple heuristics as claimed in the Adaptive Markets Hypothesis. However, in the same study, he also stated that the Adaptive Markets Hypothesis has concrete applications for both investment managers and advisors.

In the next section of the article, the Adaptive Markets Hypothesis is analysed in order to ensure the comprehensibility of the relationship and to approach the concept in more detail.

2.1. ADAPTIVE MARKETS HYPOTHESIS

Ghazani and Araghi (2014) evaluated whether AMH is an alternative hypothesis to EMH by analysing THEPIX index in Tehran Stock Exchange. In this study, daily returns between 1999 and 2013 were divided into two groups and analysed by subjecting them to four different tests. The results of linear (auto variance ratio and auto portmanteau) and non-linear (generalised spectral and McLeod-Li) tests showed that the Adaptive Markets Hypothesis exhibits an oscillating pattern. In the same study, the Adaptive Markets Hypothesis, looking at the situation from a different perspective but having some points in common with Behavioural Finance, claimed that market efficiency may vary over time and that changes in market efficiency are caused by changes in other market components such as the behaviour of individuals in the market, institutions, regulations and technology (Ghazani and Araghi, 2014: 51).

In addition, Lim and Brooks (2011), in their article in which they conducted a systematic review of the weak-form market efficiency literature that analyses return predictability from past price changes by focusing on stock markets, also stated in the Adaptive Markets Hypothesis that investors also establish transactions by taking into account their interests, that they adapt to new situations and conditions by learning from mistakes made, and that competition in the market pushes investors to adapt and renew themselves (Lim and Brooks 2011).

Hiremath and Narayan (2016), in their study conducted in the Indian markets, do not expect the market to be efficient as in the EMH, but expect it to exhibit a progressive outlook as suggested by the AMH, and in the study conducted in this direction, they concluded that the Indian markets have developed towards efficiency as claimed in the AMH. This study argues that the markets are variable and that they are open to development and adaptive (Hiremath and Narayan, 2016: 173).

Ertaş and Özkan (2018) conducted a study on the stock markets of Turkey and the United States to test the validity of the Adaptive Markets Hypothesis and concluded that the Adaptive Markets Hypothesis is more successful than the Efficient Markets Hypothesis in explaining market behaviour for both markets. They conducted their analyses using BIST 100 index and S&P 500 Composite indices.

In their study, Ertaş and Özkan (2018) stated the propositions of the Adaptive Markets Hypothesis as follows:

- Contrary to what is claimed in the EMH, arbitrage is possible in Adaptive Markets.
- The risk premium may vary over time depending on market conditions and investor characteristics.
- The success of investment strategies may vary depending on market conditions.
- In order to survive in the market, it is necessary to adapt to new and changing conditions and to adapt to these innovations. Adapting to changing conditions is important in generating income.
- The main goal of every player in the market is to maintain its existence in the market (Ertaş & Özkan, 2018: 28-29).

In his studies, Lo (2004, 2005, 2007 and 2012) put forward the Adaptive Markets Hypothesis, which aims to eliminate the incompatibilities between the two opposing views, the Efficient Markets Hypothesis and Behavioural Finance (C. Ertaş, O. Özkan, 2018).

Lo (2005) analysed the studies carried out in the field of neurology, and it was observed that in the first of the two studies, the same result was obtained with the operation of two different regions of the brain (smiling), and in the second study, a single brain feature could develop two different results (physical and emotional pain). These studies show that the human brain can evolve and gain the ability to behave in accordance with changing conditions. Since the human brain is focused on sustaining its life, it has been concluded that it has the ability to

change by adapting to the changing conditions around it (Lo, 2005). From this situation, it is inferred that behaviours can be expected to change with the change of environment and conditions through the change of preferences as a result of learning and natural selection. This neurological approach has led to the idea that market forces and preferences, which form the basis of the AMH, interact to create a much more dynamic economy driven by competition, natural selection and a diversity of individual and institutional behaviour. In this respect, it can be said that Lo (2005) also states that the Adaptive Markets Hypothesis is a new version of the Efficient Markets Hypothesis derived from evolutionary principles.

In the Adaptive Markets Hypothesis developed by Lo, markets are defined as an ecosystem and it is stated that the efficiency is variable with the effect of the elements in the ecosystem. The Adaptive Markets Hypothesis also takes into account cycles that can occur in financial markets such as trends, bubbles, crashes, craziness (Popović et al. 2013). According to the hypothesis, market conditions do not remain constant but may change, and since market participants have the urge to compete, they compete for resources, utilise arbitrage opportunities and redefine their risk perceptions in accordance with changing conditions (Meier, 2014).

Urquhart and McGroarty (2014) evaluated the Adaptive Markets Hypothesis (AMH) through 4 important calendar anomalies and conducted the study using sub-sample analysis and rolling window analysis of the Dow Jones Industrial Average between 1900 and 2013. The results of the study prove that the four calendar anomalies support the AMH and that the performance of each anomaly has improved over time. In addition, it is also concluded that AMH is more successful than EMH in explaining calendar anomalies. In this study, the Adaptive Markets Hypothesis states that individuals act in their own self-interest but can also make mistakes. Individuals learn from their mistakes and have the ability to adapt their mistakes. While this ability enables individuals to react to changing market conditions, it may also cause the change to affect market dynamics (Urquhart and McGroarty, 2014; Urquhart and Hudson, 2013).

One of the most important contributions of the Adaptive Markets Hypothesis to the literature is that it states that market efficiency is not continuous but occasional and that there are anomalies in the market contrary to the EMH. Meier (2014) stated that anomalies occur due to investment patterns, trends and investor behaviour.

According to the Adaptive Markets Hypothesis, the risk premium may vary over time depending on the market and the demographic characteristics of the investor in the market. Arbitrage opportunities may arise from time to time. The effectiveness of investment strategies may vary depending on ecosystem conditions. The aim of all market participants is to survive. According to the hypothesis, adapting to innovations is the most important source of survival and earning returns (Lo, 2004; Urquhart and Hudson, 2013). In their article, Urquhart and Hudson (2013) tested the AMH by conducting an empirical study using the long-run results of the US, UK and Japan market data. Daily data are divided into 5-year sub-samples and subjected to linear and non-linear tests to examine the independence of stock returns over time. Linear autocorrelation, run and variance ratio tests were conducted and the test results revealed that each market showed evidence of being an adaptive market where returns go through periods of independence and dependence. The non-linear test results, on the other hand, show strong dependence for each sub-sample in each market, although the magnitude of the dependence varies. The overall results of the study showed that the AMH was more successful than the EMH in explaining the behaviour of stock returns.

2.2. ADAPTIVE MARKETS HYPOTHESIS AND BEHAVIOURAL FINANCE

Lo (2012) described a new paradigm that reconciles the EMH with behavioural biases in a consistent and intellectually satisfying way; this new paradigm, called the "Adaptive Markets Hypothesis" (Lo 2004), is based on widely known principles of evolutionary biology, such as competition, mutation, reproduction and natural selection, and their impact on financial institutions and market participants determines the efficiency of markets and the increase or decrease of investment products, businesses, industries and ultimately corporate and individual wealth. The EMH is expressed as a "frictionless" ideal in which capital market imperfections such as transaction costs, taxes, institutional rigidities and limitations in the cognitive and reasoning abilities of market participants do not exist. However, in the presence of such imperfections in the real world, the laws of natural selection, or more appropriately "survival of the rich", determine the evolution of markets and institutions. Within this paradigm, behavioural biases are simple heuristics taken out of context; they are not examples that oppose/demonstrate the absence of rationality. This view, which brings a new perspective by looking at the claims of Behavioural Finance from a different perspective, also changes the perception of irrational investors, which is one of the basic assumptions of Behavioural Finance. While AMH also states that investors may make mistakes due to reasons such as incomplete information or misinterpretation as a result of innovation in the market, at this point, besides the effect of behavioural biases, this effect will not last long; in the presence of sufficient time and sufficient competitiveness, any inefficient cognitive method will be reshaped to better fit the current environment. The dynamics of natural selection and evolution provide a unifying set of principles from which all behavioural biases can be derived. At this point, the fact that the Hypothesis does not deny the existence of various biases that Behavioural Finance identifies and provides a financial perspective, but only states that these biases and other heuristics may evolve over time, shows that the Hypothesis does not reject the views of Behavioural Finance, but only gives a new perspective to these views.

The Adaptive Markets Hypothesis states that the correct answer to the question of how individuals determine the point at which their optimisation behaviour is satisfactory is that these points are not determined analytically, but through trial and error and, of course, natural selection. Individuals make choices based on their past experiences and their "best guesses" about what might be optimal, and learn from the results by receiving favourable or unfavourable support/ feedback. In this way, individuals develop heuristics to solve various financial problems, and as long as these problems remain constant, heuristics will adapt to produce approximately optimal solutions to them.

On the other hand, according to the study, if the environment changes, it is expected that the heuristics of the old environment may not be suitable for the new one, and in such cases, "behavioural biases", i.e. behaviours that are not clearly recommended in the current situation, may be observed. However, instead of labelling such behaviour as "irrational" in the Adaptive Markets Hypothesis, it would be more accurate to use the term "maladaptive" for such sub-optimal behaviour by removing heuristics from their evolutionary context. "A fish's flapping on land may seem strange and inefficient, but underwater the same behaviour may distract the fish from predators." (Lo, 2012).

Lo (2012) argues that competition, cooperation, market-making behaviour, general equilibrium and disequilibrium dynamics are all adaptations developed to address specific environmental challenges faced by the human species and that by looking at them through the lens of evolutionary biology, the apparent contradictions between EMH and EMH and the existence and persistence of behavioural biases can be better understood. In this respect, the Adaptive Markets Hypothesis makes an important contribution to the development of human-

specific behaviour and its interaction with the market, which has been brought to the agenda by Behavioural Finance.

The Adaptive Markets Hypothesis is a new version of the Efficient Markets Hypothesis derived from evolutionary principles. The ideas that constitute the main components of the AMH are expressed by Lo as follows:

- (A1) Individuals act in their own self-interest.
- (A2) Individuals make mistakes.
- (A3) Individuals learn and adapt.
- (A4) Competition encourages adaptation and innovation.
- (A5) Natural selection shapes market ecology.
- (A6) Evolution determines market dynamics.

While the first point is a common point for AMH and EMH, they differ from each other in points 2 and 3. In the Efficient Markets Hypothesis, investors do not make mistakes and there is no learning and adaptation since the market environment is static and always in equilibrium. However, in the AMH framework, mistakes occur frequently and individuals have the ability to learn from their mistakes and adapt their behaviour accordingly. Point 4 states that adaptation does not take place independently of market forces, but is driven by competition, i.e. the drive for survival. The interactions between the various market participants are governed by natural selection (survival of the richest in the hypothesised context) and point 5 states that the current market environment is a product of this selection process. Point 6 states that the sum of these components (selfish individuals, competition, adaptation, natural selection and environmental conditions) is the totality of what is referred to as market dynamics.

The main articles analysed in the study are summarised in the table below:

Table 1: Abstract

Article	Author	Study	Result
Evaluation of the Adaptive Market Hypothesis as an Evolutionary Perspective on Market Efficiency: Evidence from the Tehran Stock Exchange	Ghazani, Majid Mirzaee & Araghi, Mansour Khalili (2014)	He evaluated whether AMH is an alternative hypothesis to EMH by analysing THEPIX index in Tehran Stock Exchange. In this study, daily returns between 1999 and 2013 were analysed by dividing them into two groups and subjected to four different tests.	Linear (auto-variance ratio and auto-portmanteau) and non-linear (generalised spectral and McLeod-Li) test results show that the Adaptive markets hypothesis exhibits an oscillating pattern.
Testing the Adaptive Market Hypothesis and Its Determinants for the Indian Stock Markets	Hiremath and Narayan, (2016)	In their study conducted in the Indian markets, they do not expect the market to be inefficient as in the EMH, but they expect it to exhibit a progressive outlook as suggested by the	They conclude that Indian markets have evolved towards efficiency as claimed in the AMH.

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		AMH and the study was carried out in this direction.	
Testing the Adaptive Market Hypothesis in terms of Market Efficiency: The Case of Turkish and US Stock Markets	Ertaş and Özkan (2018)	In order to test the validity of the Adaptive Markets Hypothesis, the study conducted on the stock markets of Turkey and the United States of America was analysed using the BIST 100 index and the S&P 500 Composite indices.	It is concluded that the Adaptive Markets Hypothesis is more successful than the Efficient Markets Hypothesis in explaining market behaviour for both markets.
Calendar Effects, Market Conditions and the Adaptive Market Hypothesis: Evidence from Long-Run U.S. Data	Urquhart and McGroarty, (2014)	They evaluated the Adaptive Markets Hypothesis through 4 important calendar anomalies and conducted the study using sub-sample analysis and rolling window analysis of the Dow Jones Industrial Average between 1900-2013.	The results of the study proved that four calendar anomalies support the EMH and the performance of each anomaly has improved over time. In addition, it is also concluded that AMH is more successful than EMH in explaining calendar anomalies.
Efficient or Adaptive Markets? Evidence from Major Stock Markets Using Very Long Run Historic Data	Urquhart and Hudson (2013)	In the article, they tested the AMH by conducting an empirical study using long-run results of US, UK and Japanese market data. Daily data were sub-sampled into 5-year sub-samples and subjected to linear and non-linear tests to examine the independence of stock returns over time. Linear autocorrelation, running and variance ratio tests were conducted in the study.	The test results show that each market shows evidence of being an adaptive market where returns go through periods of independence and dependence. The non-linear test results, on the other hand, show strong dependence for each sub-sample in each market, although the magnitude of the dependence varies. The overall results of the study showed that the AMH was more successful than the EMH in explaining the behaviour of stock

			<p>returns.</p> <p>As a result of the study, behavioural finance has shown that value-expressing characteristics are important in both investor preferences and asset prices. Therefore, the finance discipline would do well to reject the idea that security prices are rational.</p>
Behavioural Finance: Past Battle and Future Engagements	M. Statman 1999	In his study, Statman examined Behavioural Finance and standard finance within the framework of market efficiency.	As a result of the study, behavioural finance has shown that value-expressing characteristics are important in both investor preferences and asset prices. Therefore, the finance discipline would do well to reject the idea that security prices are rational.
The Evolution of Stock Market Efficiency Over Time: A Survey of the Empirical Literature	Kian-Ping Lim, & Robert Brooks, 2011	This paper provides a systematic review of the weak form market efficiency literature that examines return predictability from past price changes, with a focus on equity markets.	The results of the study show that the majority of empirical studies examine whether the stock market is efficient in the weak form in absolute terms and assume that the level of market efficiency does not change over the estimation period.
Adaptive Markets Hypothesis: Empirical Evidence from Montenegro Equity Market	Sasa Popovića, Ana Mugošab, Andrija Đurović, 2013	The paper analyses the adaptive markets hypothesis (AMH) using three factors (observation period, time horizon represented by rolling window sizes, and level of data collection) that are	The evidence suggests that all three factors influence the degree of the weak form of Montenegrin stock market efficiency, which has serious consequences for profit opportunities.

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		<p>hypothesised to influence the weak form of market efficiency. The MONEX20 index, representing the Montenegrin stock market, was analysed over the period 2004-2011. Rolling window analysis with fixed parameter in each window was used to measure the persistence of deviations from the random walk hypothesis (RWH) over time.</p>	
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3. CONCLUSIONS

In the study, the studies conducted on AMH have been evaluated and as understood from the studies conducted, AMH combines the propositions of Behavioural Finance with the propositions of EMH. In other words, while AMH confirms some of the propositions of Behavioural Finance, it approaches EMH by diverging at some points. In order to overcome the shortcomings of both approaches, AMH considers human behaviour, which is the most important element of finance, from a different perspective. According to AMH, markets are neither efficient and investors are absolutely rational as in EMH, nor investors are completely irrational as in Behavioural Finance. In AMH, investors are irrational enough to make mistakes, but rational enough to learn from their mistakes and not repeat them. In this respect, AMH provides a more realistic and life-appropriate perspective on investor behaviour. Since individuals cannot apply the strategies they have previously developed with changing conditions to the new situation, they may make mistakes as expected, but they do not repeat the same mistake by realising their mistakes, adapting to new conditions and learning from their mistakes. In other words, individuals do not act completely irrationally as suggested by Behavioural Finance. However, there are also views where the hypothesis finds common ground with both views. AMH, like EMH, argues that the individual acts in his/her own self-interest, and that this instinct is the most important situation that is effective in adapting to changing conditions. This study reveals that AMH offers some common propositions with the field of Behavioural Finance and at the same time, it can meet common points with EMH, which is completely against the propositions of Behavioural Finance.

As seen in the study, it is not correct to assume that the market is always inefficient when evaluating market behaviour, nor is it correct to expect that individuals will always maintain their irrational behaviour. In this respect, in the evaluations, the learning and adaptability capacity of investors should be taken into consideration and it should be taken into account that the changes in the market may encounter different reactions in the following periods and that the change may show different results over time. It will be beneficial for the market participants if

the persons and institutions in the market take into consideration that the market will adapt to new conditions and realise their plans for the future periods with this view.

Finally, it has been observed that there is a gap in the literature on the relationship between Behavioural Finance and AMH or the testing of Behavioural Finance theories in terms of AMH while comparing AMH and EMH in various studies examined. It is believed that future studies will contribute to the finance literature by focusing on this area.

REFERENCES

1. Chuvakhin, N., 2001, *Efficient Market Hypothesis and Behavioral Finance—is a Compromise in Sight*, Pepperdine University's.
2. Eyüboğlu, K., & Eyüboğlu, S., 2020, “*Borsa İstanbul Endekslerinde Adaptif Piyasa Hipotezinin Geçerliliğinin Test Edilmesi*”. *Yaşar Üniversitesi E-Dergisi*, 15(59), 642-654.
3. Ertaş, Fatih Coşkun & Özkan, Oktay, 2018, “*Piyasa Etkinliği Açısından Adaptif Piyasa Hipotezi'nin Test Edilmesi: Türkiye ve ABD Hisse Senedi Piyasaları Örneği*”, *Finans Politik & Ekonomik Yorumlar* 55(642): 23-40.
4. Firat, D., & Fettahoglu, S., 2011, “*Investors' Purchasing Behaviour via a Behavioural Finance Approach*”, *International Journal of Business and Management*, 6(7), 153.
5. Ghazani, Majid Mirzaee & Araghi, Mansour Khalili, 2014, “*Evaluation of the Adaptive Market Hypothesis as an Evolutionary Perspective on Market Efficiency: Evidence from the Tehran Stock Exchange*”, *Research in International Business and Finance* 32: 50-59.
6. Hiremath, Gourishankar S. & Narayan, Seema, 2016, “*Testing the Adaptive Market Hypothesis and Its Determinants for the Indian Stock Markets*”, *Finance Research Letters* 19: 173-180.
7. Lim, Kian-Ping & Brooks, Robert, 2011, “*The Evolution of Stock Market Efficiency Over Time: A Survey of the Empirical Literature*”, *Journal of Economic Surveys* 25(1): 69-108.
8. LO, Andrew W., 2012, “*Adaptive Markets and the New World Order*”, *Financial Analysts Journal*, 68(2), pp. 18-29.
9. Meier, Christoph, 2014, “*Adaptive Market Efficiency: Review of Recent Empirical Evidence on Persistence of Stock Market Anomalies*”, *Review of Integrative Business & Economics Research*, 3(2), pp. 268-280.
10. Popović, Sasa, Mugoša, Ana & Đurović, Andrija, 2013, “*Adaptive Markets Hypothesis: Empirical Evidence from Montenegro Equity Market*”, *Ekonomika Istrazivanja – Economic Research* 26(3): 31-46.
11. Statman, M., 1999, “*Behavioral Finance: Past Battle and Future Engagements*”, *Financial Analysts Journal* November/December, 18–27.
12. Urquhart, Andrew & Hudson, Robert, 2013, “*Efficient or Adaptive Markets? Evidence from Major Stock Markets Using Very Long Run Historic Data*”, *International Review of Financial Analysis* 28: 130-142.
13. Urquhart, Andrew & McGroarty, Frank, 2014, “*Calendar Effects, Market Conditions and the Adaptive Market Hypothesis: Evidence from Long-Run U.S. Data*”, *International Review of Financial Analysis* 35: 154-166.