ISTANBUL BILGI UNIVERSITY
INSTITUTE OF SOCIAL SCIENCES
FINANCIAL ECONOMICS MASTER'S DEGREE PROGRAM

ANALYSIS OF SECTORAL INDEX RETURNS IN TURKEY WITH CAPM AND TREYNOR AND MAZUY MODELS AT THE PRE-, DURING AND POST-CRISIS PERIODS

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SEKTÖR ENDEKLERİNİN FİNANSAL VARLIKLARI FİYATLAMA MODELİ VE TREYNOR& MAZUY PİYASA ZAMANLAMASI MODELİYLE KRİZ ÖNCESİ, SONRASI VE KRİZ DÖNEMİNDE ANALİZ EDİLMESİ

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Tezin Onaylandığı Tarih : .....

Toplam Sayfa Sayısı: .....

Anahtar Kelimeler (Türkçe)	Anahtar Kelimeler (İngilizce)
1) FVFM	1) CAPM
2) Piyasa Zamanlaması	2) Market-Timing
3) Anormal Getiri	3) Abnormal-Return
4) Sektörel Endeksler	4) Systematic Risk
5) Sistematik Risk	5) Sectoral Indices

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ABBREVIATIONS

CAPM : Capital Asset Pricing Model
REIT: A real estate investment trust
GDP: Gross Domestic Product
SML: Security Market Line
CML: Capital Market Line
SMB: Small Minus Big
HML: High Minus Low

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ABSTRACT

Analysis of Sectoral Index Returns in Turkey with CAPM and Treynor and Mazuy Models at the Pre-, During and Post-Crisis Periods

The Economic Crisis in 2008 has the negative effect on Turkish Economy as both developed and developing countries. To evaluate the effect of the crisis, and also to provide a broad view of the economy, twenty-three sectoral indices at BIST were analyzed. In this dissertation, two main points were considered while analyzing the performance of the indices. First, each of indices riskiness indicators called Beta were estimated with both Capital Asset Pricing Model (CAPM) and Treynor and Mazuy Quadratic Model, and all results analyzed in terms of how they differ according to the models and periods. Additionally, abnormal return coefficient (α) estimations were included the analyzing. Secondly, the indices' market-timing ability was calculated with the quadratic term at Treynor and Mazuy Market Timing Model. After all regression estimation, the average beta values indicate that the sectoral indices are riskier than the market at the crisis period for Treynor and Mazuy Model, while they seem less risky than the market for CAPM. Also, abnormal return estimations provide that the indices generally create less return relative to their risk. The other important point is that the gamma values estimated with Treynor and Mazuy Unconditional Model were mainly found insignificant at the pre-crisis and post-crisis period; on the other hand, the 60% of the results found significant at the crisis period, and it implies that the indices have market timing-ability either positive or negative.

Key Words: CAPM; Market-Timing; Abnormal-Return; Systematic Risk; Sectoral Indices

ÖZET

Sektör Endeklerinin Finansal Varlıkları Fiyatlama Modeli ve Trenor & Mazuy Piyasa Zamanlaması Modeliyle Kriz Öncesi, Sonrası ve Kriz Döneminde Analiz Edilmesi

2008 Ekonomi Krizi gelişmiş ve gelişmekte olan piyasalarda olduğu gibi Türkiye üzerinde de negatif etkilere neden olmuştur. Bu çalışmada krizin Türkiye'deki etkilerini ölçümlemek için Borsa İstanbul'da yayınlanan yirmi üç sektör endeksi analize dahil edilmiştir. Çalışmada temel olarak iki bakış açısı benimsenmiştir. İlk olarak, her bir sektör endeksinin riskinin kriz öncesi, sonrasında ve kriz döneminde nasıl farklılaştığı Finansal Varlıkları Fiyatları Modeli ve Treynor& Mazuy Piyasa Zamanlaması Modeli'nden elde edilen beta katsayıları ile yorumlanmıştır. Buna ek olarak ise bu dönemlerde yaşanan anormal getiri sonuçları her iki regresyondan elde edilen alfa katsayısı ile çalışmaya dahil edilmiştir. Sonrasında ise yatırımcıların bu dönemlerdeki zamanlama yeteneğinin ölçümlenmesi için yine Treynor&Mazuy Piyasa Zamanlaması Modeline başvurulmuş ve bu modelden gelen gama değerleri dönemler özelinde incelenmiştir. Yapılan çalışmalar sonucunda Treynor and Mazuy'den gelen ortalama beta değerleri sektör endeklerinin kriz döneminde piyasaya göre daha fazla riskli olduğu sonucu çıkarken, Finansal Varlıkları Fiyatlama Modeli sonuçlarına göre ise sektör endekslerinin riskinin piyasa riskinin altında kaldığı gözlemlenmiştir. Bunlara ek olarak, endekslerin anormal getirilerinin genelde negatif yönlü olduğu tespit edilmiştir. Sektörlerin piyasa zamanlama kabiliyetine baktığımızda ise Treynor& Mazuy Model sonucunun genel olarak anlamlı çıkmadığı, sadece kriz döneminde anlamlılık düzeyinin %60 seviyesine geldiği, yani yatırımcıların kriz döneminde pozitif yada negatif zamanlama yeteneğine sahip olduğu gözlemlenmiştir.

Anahtar Kelimeler: Sistematik Risk; Beta; FVFM; Anormal Getiri; Piyasa Zamanlaması

INTRODUCTION

PART 1:

1.1.BASICS OF INDICES

Indexes are the indicators which serve general outlook of the market thanks to including price, costs, production, and weighting details. Firstly, the portfolio of the indices are decided, and the weighting is calculated according to the indicators' price. Investors uses the indicies when they calculting their porfolios' movement over time. In this way, the investors can track the changes in the market. Especially, the stock indices are widely used in finance. Indices are not only gives general outlook of the special market, but also they are able to be used in derivative products or funds as an instrument. In this study, I concentrate on the twenty-three sectoral indexes calculated by Borsa Istanbul. The aim of the selection of sectoral indices is that provide general vision of Turkish Economy during both crisis and non-crisis period. In this way, there would be better vision of the sectors.

1.2. 2008 GLOBAL ECONOMIC CRISIS AND EFFECTS ON TURKEY

The economic crisis arise second half of 2007 in America, then it was spread all over the world and turn into Global Economic Crise due to the triggering effect of the capital globalization. There are four main connected reasons why the crisis happen. First, interest rate in America was considerably low since 2000 because of the fact that the government plan to encourage citizens to buy houses with mortgage credit. These credits generally offer 2 year fixed rate, after that it was turned to floating rate. Since the interest rates low, many low-income people started to buy house with mortgage credit. Hence, house prices increase because of the boost in demand. In 2006, Fed decided to hike interest rate. Later, low-income people failure to pay their mortgage credit and house market

entered in recession period. Second reason is securizitation. Since the banks would like to get rid of credit risk they issued debt securities which shows its future earnings as a colleteral. This securities are named collateralized debt obligation (CDOs). These securities were structured financial instruments, which purchase and collect financial assets, and they weighted according to their riskiness. In this way, the banks plan to get rid of risk and share with others. Unfortunately, these securities risk weighting was spoiled because people are

Table 1.1 GDP growth rate and Unemployment rate for Turkish Economy

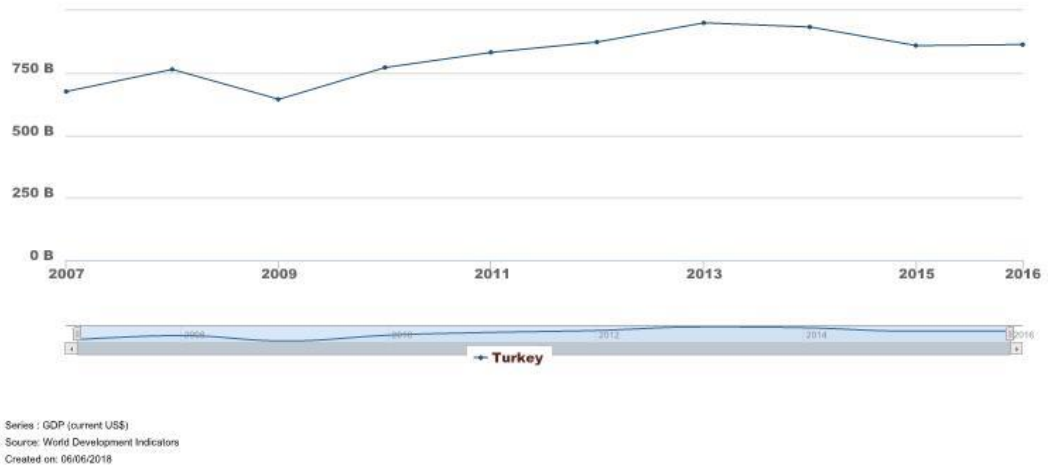
	2007	2008	2009	2010	2011	2012	2013
GDP growth (annual %)	**5.0**	**0.8**	**-4.7**	**8.5**	**11.1**	**4.8**	**8.5**
Unemployment, total (% of total labor force) (national estimate)	**8.9**	**9.7**	**12.6**	**10.7**	**8.8**	**8.1**	**8.7**

Created from: World Development Indicators

Country:Turkey

not able to pay their mortgage credit back. At this point, other important reason is occured. Credit rating institions did not downgraded credit rating of this securities. People continued to use derivative products based on these securities. Credit rating institutions were able to downgrade these products rating when the crisis start. This causes the market condition were not early detected by investors and the government. Last but not least problem was transperency. This problem is related to prior reason. Banks and investment companies were not aware of their open position because complicated derivative products effects were hard to be detected. Risk management calculation were not effective. Lastly, many financial institutions, which were known as a too big to fail, were collapsed like Lehman Brothers.

Figure 1.1: GDP (current US$)



(World Development Indicators, 2018)

Though the crisis began in America, it spreaded all over the world within the triggering effect of globalization. Since as in the case of many devoloping countries, Turkey experience shrinking by 4,7 also unemployment rate hike by 12,6 in 2009. Non-performing loan percentage rise to above 4,5% Even so, the effects of the crisis was not be devastating compared to the other economies, because of the precauitions which were taken after the 2001 crisis helped the banking and finance sector to stay strong. On the other hand, the reel economy is affected by lack of hot-money flow, hardship in finding external borrowing, increasing credit-cost and decrease in the foreign trade volume. So, the worsening of the macro indicators is mainly due to problem in the reel economy rather than finance sector. (Ertuğrul, İpek, & Çolak).

PART 2: LITERATURE REVIEW

There are many research made to test investors selectivity skill, evaluating risk and performance in Finance. All of the these experiment generally accepted to start with Markowitz Optimal Portfolio Theory, then it was evaluated by Jack Treynor (1961-1962), William Sharpe (1964), John Linter(1965) and John Mossin (1966) as Capital Asset Pricing Model. Also, one of the other important performance indicator market timing study was carried out by Treynor and Mazuy (1966). They argued whether the investors could forecast the market fluctiation by quadretic term. Though there are many different approach to evaluate performance of the investors or markets performance, I focused mainly these theories. In this section, I try to give overview of the latest work and different approaches which tested these theories in different environment.

2.1. LITERATURE WORK ON CAPITAL ASSET PRICING MODEL

(Çelik, 2013) tested the stability of the sectoral indices betas in Turkish Stock Market during crisis period (2007-2009). She analyzed the stability of the betas by recursive and rolling regression analysis. The finding shows that the beta values don't have strong characteristic, they are time-variying rather than constant. Also, finding implies that the constant beta might cause the overestimation or underestimation.

The sensitivity of to Market Index and Non-systematic Risk Measurement of Sector Indices in Borsa Istanbul is the paper evaluating performance of CAPM under crisis environment (2010-2012). This paper assume the market index as BIST100 (XU100) and used monthly return of the sectoral indices. They find that some sector indices are more aggreesive than others. They are banking, sport and tranportation; whereas some of sectors are less risky like information technology and trade. (Kaderli, Petek, Doğaner, & Babayiğit, 2013)

(Baillie & Cho, 2016) analyzed the relationship between the euro and other floating currencies' excess returns on bond market. Also, they consider that there are relationship with euro-dollar and the US and European equity market . They tested these assumption during the crisis period with the respect of International CAPM approach (I-CAPM). With the help of these approach, they evaluate the effect of the US excess equity return on Eurozone equity market. Also, they used the kernel weighted-time varying model to asses the effect of the time on structural parameters and risk-premium terms.Their study concluded that there are significantly relationship between the US and European equity markets and the euro-dollar exchange rate.

(Tuna & Ender, 2013) evaluated the performance of systematic risk indicator beta by Downside Beta (D-CAPM) and traditional Beta on Istanbul Stock Exchange, and made comparison of the estimation power of the expected return for the period 1991-2009. D-CAPM approach take into account only the negative deviations while calculating the beta coefficient called downside, while traditional CAPM don't consider. The results imply that the D-CAPM approach estimate 1,5% more expected return than traditional method. For these reason, they stated that the D-CAPM is better approach than the traditional CAPM for the applied period.

(Pettengill, Sundaram, & Mathur, 1995) The study focus on the relationship between returns and beta predicted by Sharpe-Linter-Black Model which uses expected return rather than realized return. It is assumed that there are always postive relationship between expected return and beta, but it is conditional relationship if the test realized return and market excess return. The experiments made for the period between 1926-1990. The data set diveded into two group: up market and down market. The results indicates that the beta which measure of systematic risk constant with all period and sub-period. Moreover, positive trade-off between beta and return relation consistent with the later theory. They concluded that beta should continued to be used as a market risk measure.

Another model is adjusted the US T-bill rate by Turkish and US inflation rate difference and used market index as BIST100. The study used beta of the twenty portfolio, which includes 10 stocks for the period between 1995-2004. They used two approach to validiy of the CAPM in Turkey: Fama&MacBeth(1973) and Pettengill et all (1995). For first approach, results indicates that there is no signigificant relationship between beta coefficient and historical risk premiums of the selected portfolios. Second, the strong beta -risk premium relationship were discovered: high-beta stocks have higher positive risk premiums when the market is up, and higher negative risk premiums when the market is down. (Gürsoy & Rejepova, 2007)

(Çoşkun, Selcuk-Kestel, & Yılmaz, 2017) The study based on Turkish REITs to ensure suggestion for the efficientt porffolio management for maximizing their return. The paper was used two model: CAPM and Fama-French three-factor model. The results illustrate that the most of T-REITs have defensive character for CAPM model. Fama-French result shows that the model increase its power of being market indicator. SML-HML approach improves the power of coefficient by taking into consideration the market's extrem fluctuation.

(Huang & Cheng, 2005) The paper analyzed the regularity of the time-varying betas and Sharpe-Linter CAPM model while adding structural changes in betas. The experimental periods includes 930 monthly observations from July 1926 to December 2003. According to the findings, the most of the break dates same with each others, which implies that there should be at least one structural break. Also, the betas are changing over time with the model, while single model assume they can't change. The other important point is that Linter hypothesis that expected value of the intercept is zero, but it is accepted by some regimes, while others rejected.

(F.Brune, Li, Kritzman, Myrgen, & Page, 2008) The paper offer new approach for pricing stocks and market integration, and provide calculation of beta on

securities in the developed and the emerging markets. They create a value-weighted index from their sample portfolio to serve as a market index. The study includes 61 portfolio made by several indices, and tested 14.371 securities all over the world. Their finding support that the selection of the market portfolio is more important in the emerging markets than the developed markets. Also, the model claims that the emerging markets have downward trend according to their evel of integration.

2.2. LITERATURE WORK ON TREYNOR AND MAZUY MARKET TIMING MODEL

(Şahin, 2017) analyzed the market-timing ability of the 7 number of BIST30 index fund managers between January, 2005 and December, 2015 by using Treynor-Mazuy, Henriksson Merton and Jensen-Alfa models. The results show that none of fund manager have significant market-timing ability according to the result of the each models. Also, each of the index fund create less return compared to its risk than the market portfolio.

(Olbrys, 2009) evaluate performance of 15 selected open-end equity mutual fund between January 2003 and April 2009 period with the help of both unconditional (Treynor&Mazuy) and conditional (The Ferson-Schadt) model. The performance evaluation was made two different approach: market-timing skill and selectivity skill of the fund managers. According to the analysis, the Polish Equity funds could not significantly outguess the market. Also, the conditional models quality is found lower compared to the unconditional (T-M) model.

(Ünal & Tan, 2015) investigate the performance of the A-type Turkish equity funds in the period of January 2009 and November 2014. The paper is used

various models to evaluate the performance. Specifically, for the market-timing skill, Treynor & Mazuy and Henriksson & Merton regression analysis were used. The results indicates that the investors don't have significant market-timing skill during the period.

(Dhar & Sinha, 2016) conduct an experiment to evaluate the performance of 51 mutual fund schemes operating in India between January 2008 and March 2012. They additionally tested the linkage between bootstrap efficiency scores and market-timing coefficient by truncated-regression model. The results don't approve that there are significant relationship between market-timing ability coefficient and boostrap efficiency scores.

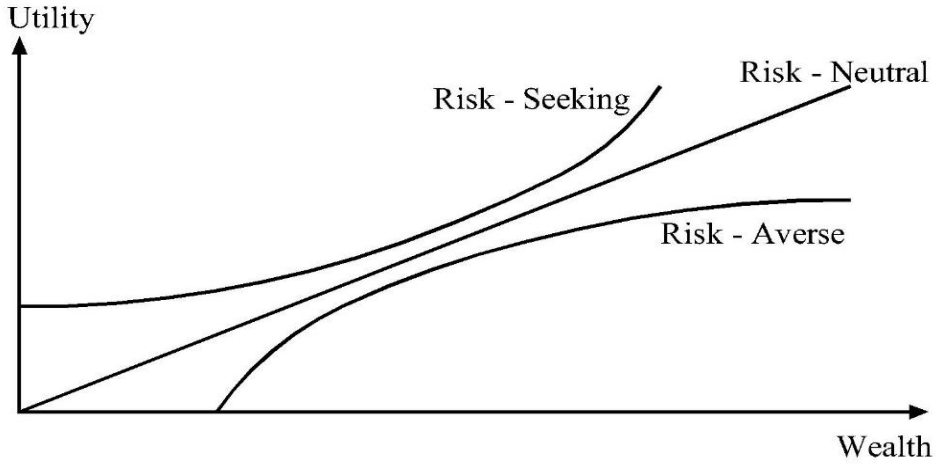
(Sherman, O'Sullivan, & Gao, 2017) The study focused on market-timing ability of the Chinese equity securities investment funds in the period from May 2003 to May 2004 by using Treynor&Mazuy, Henriksson-Merton and the Jiang non-parametric test. The results point out that the Chinese securities don't have market-timing skill.

(Paramita, Primiana, Sudarsono, & Febrian, 2016) The study includes 30 equity funds in the Indonesian Capital market between the period 2008-2012. The main focuse of the article is that testing the models; Jensen Alpha and Treynor&Mazuy conditional model and Treynor&Mazuy multifactor model. The results show that the most effective tool to measure performance is Treynor&Mazuy Five Factor Model since it are able to be used both the bull and the bear market condition.

PART 3 : METHODOLOGY

People need to manage their resources and assets effectively. But, why people actually need it? The basis of all theories in portfolio management come from people's behaviour and attitude with perception of risk. There are maily three type of investors: risk-averse, risk- seeking and risk-neutral. The risk-seeking investors desire to gain higher return at the expense of risk. It means that they accept greater volatility and uncertaninty in their investment. Other type of investors are risk-neutral. These investors neglect risk in their investment, they only care about their return on assests. On the other hand, the risk averse investors prefer lower return with known risk rather than unknown risks. They avoid risk but it doesn't mean that they don't take any risk. They accept little return on predicatable or acceptable risk level. In the finance theory, it is accepted that people are generally risk averse, and they avoid risky behaviour in their portfolio. In the following paragraphs, I will elaborate on the theories in portfolio management chronologially.

Figure 3.1: Risk Behaviour with utility function



3.1. TRADITIONAL PORTFOLIO THEORY

In the history, all investors were seeking for maximizing their return while minimizing their risk as today. But, the approach of eliminating risk was different than modern portfolio theories. The traditional theory basically based on diversification. The theories assumed that each instrument or security's return acts independently from each other, so creating portfolio means that minimizing investment risk. In other words, they aver that increasing number of instrument is the only efficient way of eliminating risk level. Because of strong weakness in risk perception, this theory was highly elicited by modern portfolio theorists.

3.2. MODERN PORTFOLIO THEORY

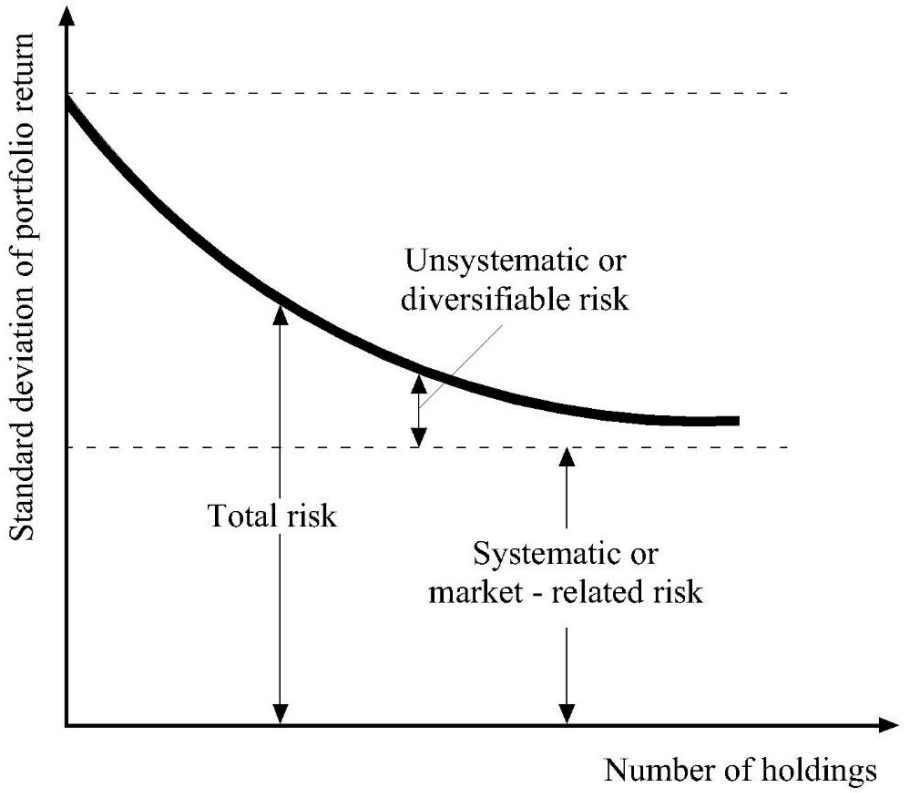
Harry Markowitz's paper named Portfolio Selection(1952) was a milestone in finance literature. This work accepted as a first step of Modern Portfolio Theory. Then, the theory was expanded and explained detailed at his further work, Portfolio Selection: Efficient Diversification. (1959). About thirty year later, he was honored with Nobel prize for the pioneering contribution to portfolio selection. The theory provides great contribution to explain maximizing return with lower return with the help of adding new assets. There are some main assumption Markowitz Portfolio Theory:

- Return and variance are the only factors effects investors' decision.
- All investors are risk averse: if they have to choose between portfolios which have same return, while have different standard deviation or risk, investors would choose the portfolio which has lower standard deviation than other one.

- All investors have same insight about expected return, variance and covariance, which called homogenous expectation assumption.
- All investor have one- period time horizon. (Fabozzi & Grant, 2001)

To maximize return of investors, expected (mean) return (E) and variance of the portfolio, V, was described for portfolio selection. He described expected return as a desirable things, whereas variance of the returns as an undesirable. (Markowitz H. , 1952). In the portfolio theory, the professor Markowitz explained the variance of the portfolio rate of return as the appropriate measure of the risk. (Fabozzi & Grant, 2001) This risk have two component: systematic risk and unsystematic risk.

Figure 3.2: Systematic risk and Unsystematic Risk



3.2.1. Systematic Risk

Systematic risk widely accepted as a undiversifiable risk or market risk. This risk related with the general market and economic condition. It means that entire market able to effect this risk, not only one particular sector or asset. This risk is not able to be avoided through diversification.

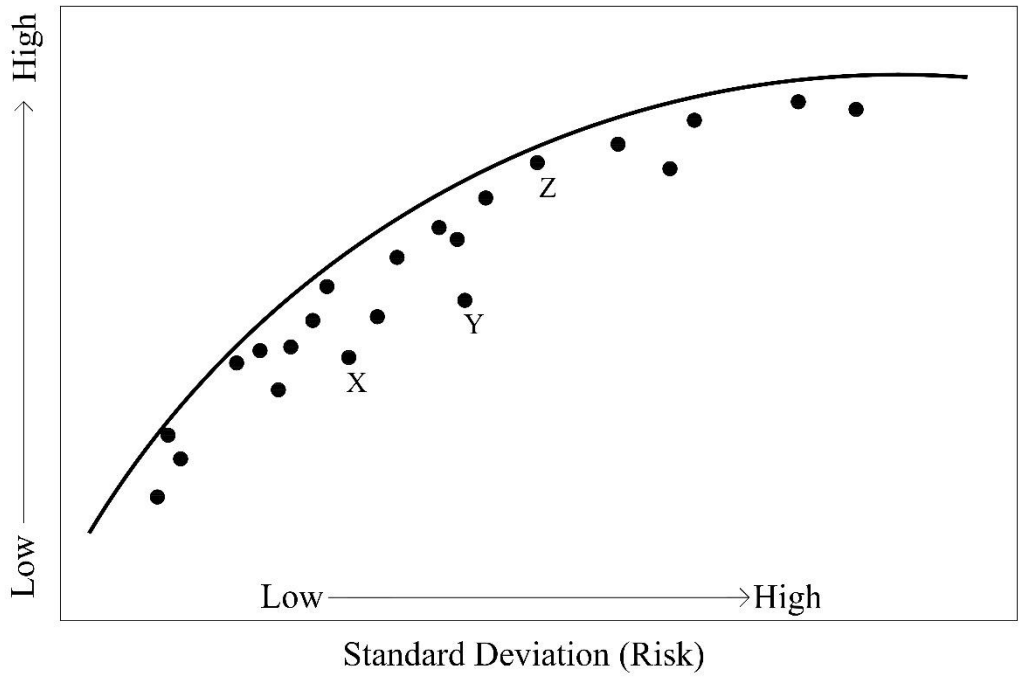
3.2.2. Unsystematic Risk

Unsystematic risk known as a specific risk or diversifiable risk. When a company or an industry experience sudden change or difficulty, their assets' price fluctuate while other assets would be stable. Investors can be eliminated this risk through diversification.

Professor Markowitz also add great contributions to distinguish efficient and inefficient porfolio selection concept. Efficient portfolios has a set of efficient mean-variance combinations, which reflects investors' desired risk & return combinations. In other words, if a portfolio accepted as a efficient, it should offer more return with same or lower risk than other investment. Later, this phrase evolved into the efficient frontier. (Markowitz H. M., 1999). The efficient frontier is the plot that describes number of optimum portfolios which offer more expected return in given risk level. Two key important property the efficient frontier graph have. First, the graph is upward-sloping graph rather than straight line. Since the effect of allocation of the portfolio, their avarage standard deviation will be less than the single asset. Another important aspect is each point on the line stands for an optimal combination of the securities given level of risk. In other words, the point on the line symbolize the best portfolios. The below of the curve represent less efficient portfolios due to the fact that these portfolios don't be diversified enought than the upper point on the curve.

X,Y, Z represent the points that includes more risk for the same level of the return on the curve. (Investing Answers, 2018)

Figure 3.3: Efficient Frontier



(Investing Answers, 2018)

Markowitz theory underlines the point that creating efficient portfolio doesn't mean that it should include so many securities for diversification, it advocated that the portfolio need to include enough, well-selected securities. (Ş. Y. Yiğiter, 2017). Besided, Markowitz portfolio theory suggests that correlation between securities is not flawless. It means that securities' price are able to act together under similar circumstances. So, before portfolio selection, positively related return of securitites do not added same portfolio for the account of eliminating risk. Basically, Markowitz portfolio theory assumes two steps before portfolio selection. First, combining information for the securities future performance with the scope of experiences. Second, is selection efficent portfolio.

3.3. CAPITAL MARKET THEORY

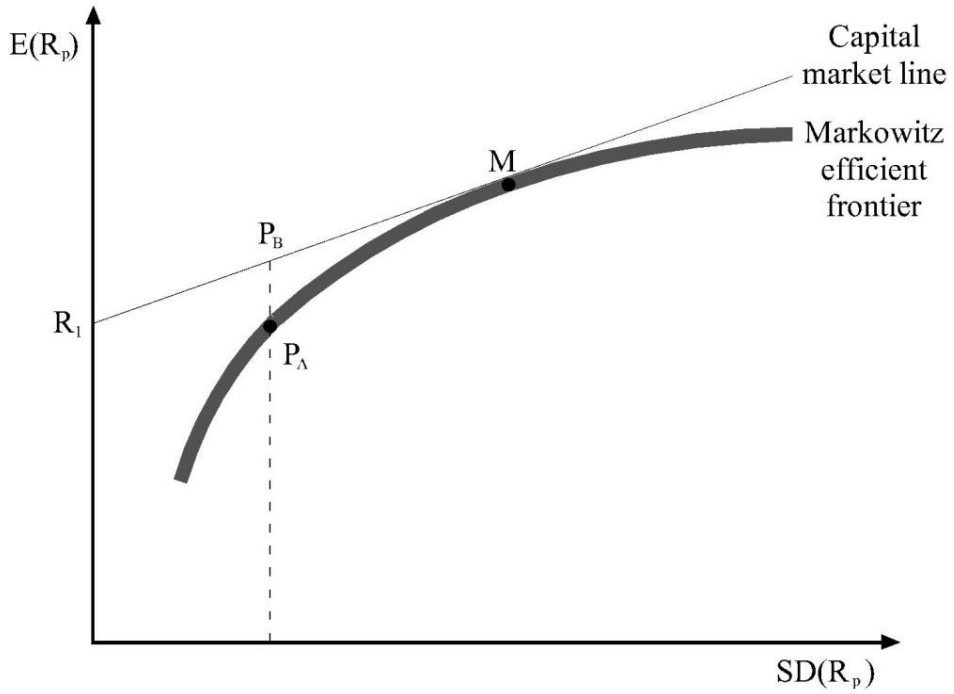
In the mid of 1960, Capital Market Theory was improved by William Sharpe within the scope of further work of Modern Portfolio Theory. This model start with exploring effect of risk-free asset. Although Sharpe was accepted the father of the theory, John Linter and John Mossin had great controbution to the theory with their individual works. Today, the theory is widely known as Sharpe-Linter-Mossin (SLM) Capital Asset Pricing Model. There are some key assumption on the Capital Market Theory:

- All investors are efficient. They make investment decision after considering expected return and risk.
- Investors accepted that they borrow or lend at the risk-free rate.
- Investors are rational and risk-averse and subcribe to Markowitz method of portfolio diversification. (J Fabozzi, 2001)
- Investors made their investment for the equal of time horizon.
- There are no transaction costs or no taxes or no inflation or no mispricing within the capital markets
- All investors expectations are homogenous.They have same probabilty of outcome. (Capital Market Theory, 2018)

Markowitz efficent portfolio was generated based on expected return and variance, and efficient portfolio was described as the portfolio which has lower variance while it provide same return level. In this regard, we are able to conclude that Markowitz Efficient Portfolio consist of risky asset. On the other hand, Capital Market Theory attirubute risk-free rate property into the former theory. Risk-free rate is theoretical rate which offer return on investment with zero-risk. It genereally provide lower rate of return due to fact that the rate don’t take additional risk. (Risk-Free Rate Of Return, 2018) It means that investors obtain higher return on his holdings only by incurring additional risk. (Sharpe, September 1964)

When we combine Markowizt efficient frontier with risk free rate, capital market line and Markowitz Efficient Frontier will be tangent at point M. All the point on the capital market line combines risk-free asset with risky assets. The slope of the line shows trade off between risk and return. Right of the M point represent more levereged portfolio than the right of the point since it includes more risky asset. When we compare same level of risk or standard deviation both Capital Market Line and Efficient Frontier at the point P_b and P_a , P_b point supply more higher return than the P_a on the same level of risk. It means that risk- averse investors would prefer P_b portfolio in their investments.

Figure 3.4: Capital Market Line



(Fabozzi & Grant, 2001)

3.4. CAPITAL ASSET PRICING MODEL

Capital Asset Pricing is widely used model in finance which helps required rate of return on asset to make investment decision. Jack Treynor (1961-1962), William F. Sharpe (1964), John Linter (1965), evolved this theory with their individual work on the previous portfolio and Capital Market Theory. The main attribution of the Capital Asset Pricing model is adding systematic risk (non-diversifiable risk) into the model thanks to the term beta (β). It also includes expected return of the market and expected return of theoritical risk-free rate of return. As the previous theories, it accepts that overall risk consist of systematic (non-diversifiable) and unsystematic risk (diversifiable risk). The theory explains that required return of the asset and its systematic risk has linear relationship. There are some crucial assumption in the Capital Asset Pricing Model:

- All market is perfectly competitive: There are many investors and price movement cannot be changed or effected by individual investors.
- All investors are risk-averse and they have homogenous expectation.
- Investors can borrow and lend at risk-free rate.
- Investors hold well-diversified portfolios: Investors eliminated unsystematic risk or ignored
- All market are frictionless: There are no transaction cost or tax for investment.
- There are perfect market condition: Information is reachable for all investors.
- All investors use single period of time: All the assets tested at same period of time to eliminate time effect on the model.

The empirical CAPM formula is:

$$(r_{it} - r_{ft}) = \alpha_i + \beta_i (r_{mt} - r_{ft}) + \in_{it}$$

r_{it} : return of the stock i at time t,

r_{ft}: risk-free rate at time t,

α_i: intercept term of stock i,

r_{mt}: market return at time t,

β_i: beta of the stock i,

$\in_{it}$: error term of the stock i at time t.

3.4.1. Market Risk Premium

Market risk premium is the excess return on the risk-free rate. It basically describes relationship with asset in the portfolio and theoritically excepted risk-free rate. Generally, investors use treasury bond-yield as a risk-free rate. In Turkey, 2-year Treasury Bond yield accepted as a benchmark rate..

$$\text{Market Risk Premium} = (r_{mt} - r_{ft})$$

3.4.2 Beta

Beta used as a risk metric in the CAPM model. It represent systematic risk or volatility comparing to the entire market. This beta value shows only individual assets or portolios' risk and it is completely different from variance (σ^2), which explains diversifiable part of risk.

$$\beta_i = \frac{\sigma_{i,m}}{\sigma_m^2}$$

While we intertpreting beta, R-square value must be taken into consideration. R-square show that percentage of explanatory level achived by regression. For this reason, it will not be logical to interpret beta as a risk indicator, if the regression R-square level is relatively low. (Investopedia, 2018) Theoritically, the market beta value is accepted as 1. As mentioned before, the performance of the portfolios compared according to the market risk exposure. Then, we are able to conclude that beta interperation can be made at these ways:

If Beta = 1: It means that the portfolio or stock exposure same amount of risk with the market. In other words, if the stock market rise up by 1%, the selected portfolio would be rise up by 1%

If 0 < Beta <1: It means that portfolio would not be affected by the fluctuation as the overall market. This portfolio or stocks are less volatile than the market.

If Beta > 1 : It means that the asset is more volatile than the overall market. It will fluctuated more than the market, so this accepted as more risky assets.

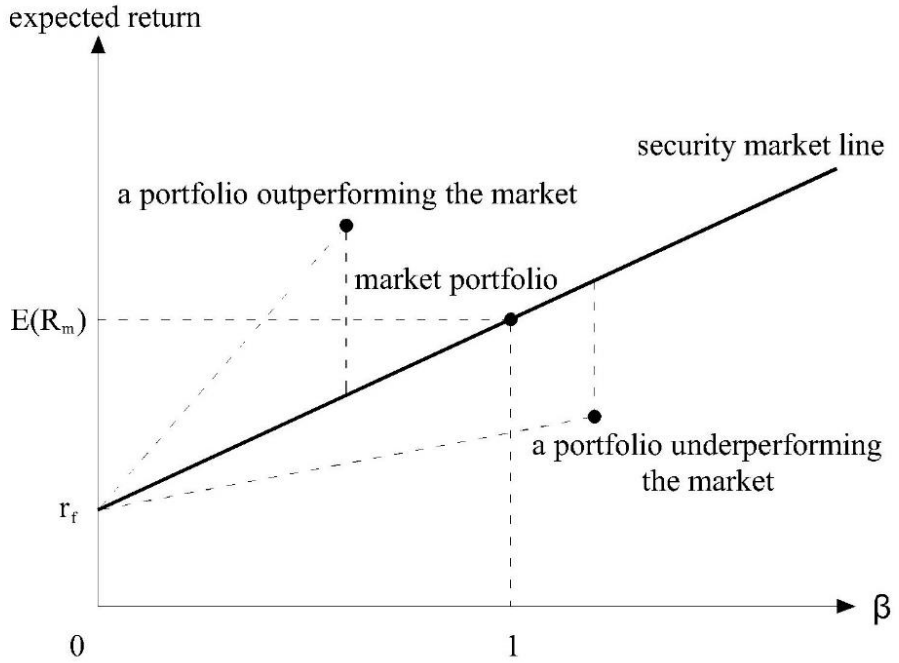
If Beta < 1 : It means that asset act perfectly different from the overall market. It means that if the overall market rise up 1%, the asset will be go down by 1%.

3.4.3. Security Market Line

The security market line accepted a characteritic Line, is a visiual explanation of the Capital Asset Pricing Model. The line illustrates expected return of a portfolio at given level of risk, while it takes into consideration risk-free rate.

Security market line based on systematic risk. Though it seems similar to Capital Market line, their risk measure is different from each other. Security Market Line uses Beta as the risk measure, whereas Capital Market Line uses stanadard deviation. We know that standard deviation stands for unsystematic risk or diversifiable risk. On the other hand, each point on the security market line represent expected return level versus market risk level or systematic risk level. Besided, security market line includes both efficient and non-eficient portfolios, while capital market line only illustrate efficient portfolios. Below of the security market line shows underperforming portfolios compared to the market, whereas above of the line shows outperforming portolios compared to the market.

Figure 3.5. Security Market Line

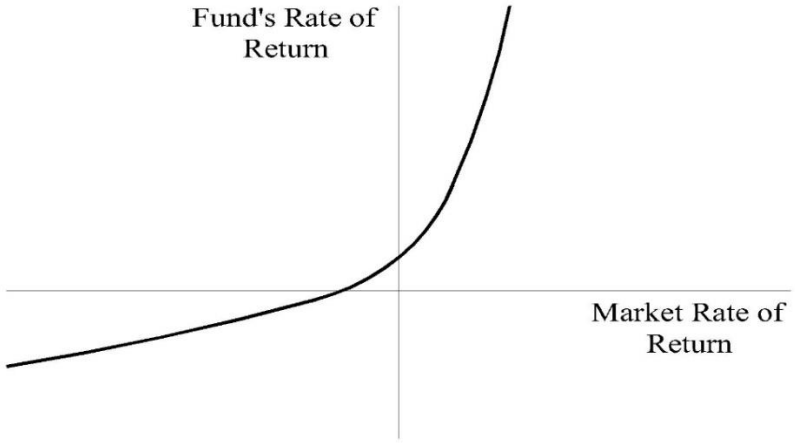


3.5. TREYNOR AND MAZUY MARKET TIMING MODEL

Treynor and Mazuy introduce a unconditional model to estimate market timing ability of the investors in their article named " Can mutual funds outguess the market" in 1966.

They assume that all investors would like to outguess the market. Each investor would like to create their portfolio with less volatile assets if they expect the market is going fall. On the other hand, if they expect the market is going to shift they do vice versa. First, they asked question before they conduct an experiment: *"Is there a evidence that the volatiliy of the fund was higher in years when the market did well than in years when the market did badly"* (Treynor & Mazuy, 1966) Within this scope, they improved CAPM by using quadratic term to explain market timing ability of the investors. The model mainly test whether the portfolio managers are able to adjust their position on time according to the expectation of fluctuation in the market.

Figure 3.6. Characteristic Line for the fund which able to outguess the market better than average.



(Treynor & Mazuy, 1966)

Traditional Capm theory indicates that expected return of the fund and market returns have linear relationship. However, Treynor and Mazuy indicated that they have a convex relatonship rather than linear. They illustrates this relationship by the line called The Charachteristic Line. The investors perfectly adjust their position whether market is bullish o bearish. Because of the perfect predict ability of the investors, the charachteristic line will have smoother, quadratic behaviour as the Figure 3.6. The convex behaviour of the line implies that the investor are able to perform market-timing ability, in this way they gain more return than normal, and change the systematic risk of the portfolio. (Treynor & Mazuy, 1966).

Treynor and Mazuy Market Timing Regression:

$$(r_{it} - r_{ft}) = \alpha_i + \beta_i(r_{mt} - r_{ft}) + \gamma_i(r_{mt} - r_{ft})^2 + \in i$$

r_{it} : return on stock i at time t,

r_{ft}: risk-free rate of return at time t,

α_i: selectivity ability,

γ_i: the parameter measuring the market timing performance.

According to the theory, if the gamma (γ_i) > 0, which is coefficient of the $(r_{mt} - r_{ft})^2$, the fund manager have market- timing ability. On the other hand, if the gamma (γ_i) < 0, it means that fund managers don't have market timing ability.

3.6. THE MODEL

The aim of this dissertation is that evaluting performance of the sectoral indices with Capital Asset Pricing Model and Treynor & Mazuy Market Timing Model in Turkey. It also means that evaluating performance of these theories under both crisis, pre-crisis and post-crisis conditions.

To the make this experiment, I used classical version of the Capital Asset Pricing Model as below formula:

$$(\mathrm{r_{it}} - r_{ft}) = \alpha_i + \beta_i\,(r_{mt} - r_{ft}) + \in_{it}$$

I used daily closing price of all indices, and calculate logaritmic return of both sectoral indices and market index as below formula:

$$r_{it} = In\left(\frac{p_T}{p_{T-1}}\right)$$

r_{mt}: logaritmic return of market index

r_{it} : logaritmic return of index p

$P_{T:}$ closing price of index at time t

$P_{T-1:}$ closing price of the index at time (t-1)

I compare all the sectoral indices β and compare which indices swing more than the market, while for those of them which swing less than the market. As theoritically excepted, I assume that market beta is equal to 1.

For many work, alpha value is called excess return or abnormal return. I interpret α value as below comparision for the gauge for the market index explanatory capability at the given level of the regression, and called it as a abnormal return of the regression.

Alpha < 0 : If the α value is below zero, I interpret that the sectoral indicies provide less return comparing to its risk,

Alpha = 0 : If the α value equal to zero, I interpret that the sectoral indicies neither create nor destroyed value a the given risk level,

Alpha > 0 : If the α value above zero, I interpret that that the sectoral indicies provide more return compared to its risk.

To evaluate market timing of the investors, I used quadratic Treynor and Mazuy Market Timing Model as below:

$$(\mathrm{r}_{\mathrm{it}} - r_{ft}) = \alpha_i + \beta_i(r_{mt} - r_{ft}) + \gamma_i(r_{mt} - r_{ft})^2 + \in i$$

I consider alpha and beta value as a market timing adjusted value of the CAPM, and analyze how it changed when the quadratic term added into the regression, and compared classical version of CAPM value of them.

As the theory accepted, I interpret that positive value of the gamma, which is the coefficient of the quadratic term of the excess return of the market, as the investors have market timing ability, whereas the negative value of the gamma as the non-timimig ability of the investors.

PART 4: DATA

In the thesis, 23 of primary sectoral indices in BIST are analyzed. The closing price of the indices are obtained from Bloomberg Terminal, and all the calculations made in Microsoft Excel and Eviews. The experiment period is between January 3, 2004 and December 31, 2017. To make comparison, this data is divided into three parts: pre-crisis period as January 3, 2004 to October, 1 2007, crisis period as October 1, 2007 to December 31, 2010 and the post-crisis period January, 3 2011 to December 31, 2017. These division made with the help of Investing graph tool. The breaking points in the experiment represent the parts : the pre-crisis, the crisis and the post-crisis period.

Figure 4.1 XUTUM index movement between 2007 and 2012

(XUTUM, 2018)

Bist All Index, whose ticker symbol is XUTUM, is used as a market index. The index includes all traded stocks in Borsa Istanbul (BIST) except investment trusts. In the experiment, only BIST Spor Index (XSPOR) is started from April 1, 2004 due to fact fact that the index was introduced at that time.

Table 4.1. Sectoral Index Lists used in the experiment with ticker symbols

	INDEX LIST	SYMBOL
1	BIST BANKS	XBANK.IS
2	BIST BASIC METAL	XMANA
3	BIST INF. TECHNOLOGY	XBLSM
4	BIST ELECTRICITY	XELKT
5	BIST FINANCIALS	XUMAL
6	BIST REAL EST. INV. TRUSTS	XGMYO
7	BIST SERVICES	XUHIZ
8	BIST HOLD. AND INVESTMENT	XHOLD
9	BIST CHEM. PETROL PLASTIC	XKMYA
10	BIST LEASING FACTORING	XFINK
11	BIST NONMETAL MIN. PRODUCT	XTAST
12	BIST BIST METAL PRODUCTS MACH.	XMESY
13	BIST TRANSPORTATION	XULAS
14	BIST INDUSTRIALS	XUSIN
15	BIST INSURANCE	XSGRT
16	BIST SPORTS	XSPOR
17	BIST TECHNOLOGY	XUTEK
18	BIST TEXTILE LEATHER	XTEKS
19	BIST TELECOMMUNICATION	XILTM
20	BIST W. AND RETAIL TRADE	XTCRT
21	BIST TOURISM	XTRZM
22	BIST WOOD PAPER PRINTING	XKAGT
23	BIST FOOD BEVERAGE	XGIDA

Since the experiment period's duration is long, and market advancement in the early of 2000s is low, risk- free rate in Turkey are not able to be determined as of today's norm. Though 2-year benchmark bond rate is accepted as a risk-free rate today because the 2-year bond was firstly issued in

2007, we cannot use this rate in the experiment. Instead of this, Interbank rate is accepted as a benchmark rate, and the data obtained from Central Bank of Turkey Database. The indices return calculated on daily basis, and all the returns on both CAPM and Treynor and Mazuy Market Timing Formula calculated as a logaritmic return.

PART 5: RESULTS

In the first section, Alpha (α), Beta (β) and R^2 values for each of sectoral indices come from both CAPM and Treynor& Mazuy Market Timing Model are determined, analiyzed under three-period scale: the pre-crisis, the crisis, the post-crisis. In the second section, each of indices market timing abilities explained with gamma(ɣ) values which come from Treynor&Mazuy Market Timing Model.

5.1. RESULTS FOR BIST BANK (XBANK) INDEX:

According to the Table 5.1, It can be seen that R-squared value relatively high during pre-crisis period and crisis period; the model successfully explained by independent variables at that periods, while it is considerably low on post-crisis periods. Hence, interpreting regression results on post-crisis period is not meaningful for both models. Beta values in CAPM for both period show that XBANK index more aggresive than the market index (XTUM) due to fact that its Beta is higher than 1. If the market index increase 1%, the index will be increase higher than 1, whereas if the market index decrease 1%, the XBANK index will be. It is also significant that Beta value at crisis period is higher than other periods, 1,063956. Conversely, Beta value come from Treynor and Mazuy model is considerably lower than 1, and it has lowest value at the crisis period. Additionally, Abnormal return values (alpha) are not significant at Treynor&Mazuy Model, while abnormal return in CAPM is significant at 1% level. The results indicates that XBANK index have positive abnormal return, and its highest abnormal return is in the crisis period, 0,010282. So, in the crisis period, XBANK made more return than expected based on its risk.

Table 5.1. CAPM and Treynor&Mazuy Regression results for XBANK

Model	CAPM			T&M		
Period	Pre-crisis	Crisis	Post-crisis	Pre-crisis	Crisis	Post-crisis
BETA	1,038424	1,063956	1,057879	0,991908	0,855512	1,081166
p-value	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***
ALPHA	0,008676	0,010282	0,005408	0,003632	-0,004443	0,006493
p-value	0,0000 ***	0,0000 ***	0,0093 ***	0,482800	0,271100	0,303400
R^2	0,973533	0,970083	0,559282	0,973561	0,970888	0,559289

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

The Treynor and Mazuy Model analysis shows that XBANK index investors have positive market timing ability at the post-crisis periods, but the value is not significant at the periods Conversely, the investors have a negative market timing ability both at the crisis period and pre-crisis period, but only the crisis period is statistically significant at the 1% level.

Table 5.2. Market-timing regression coefficient results for XBANK

Pre-crisis			Crisis			Post-crisis		
Gamma	p-value	R^2	Gamma	p-value	R^2	Gamma	p-value	R^2
-0,1037	0,316	0,97356	-0,66	0,0001 ***	0,97089	0,11977	0,8554	0,55929

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.2. RESULTS FOR BIST BASIC METAL (XMANA) INDEX:

Each of models have relatively high R-squared value, it means that the variables in the models are explain the model successfully. The CAPM results shows that The Basic Metal Index have aggresive behaviour at the crisis period because the beta value is higher than 1. Also, it has positive abnormal return on the crisis period, but it is not statistically significant. All statistically significant abnormal values are negative. It proves that XMANA stocks created less return value than expected level of risk. According to the Treynor&Mazuy results, Beta, which

stands for systematic risk, reach its highest point at the post-crisis period, 0,999537. It is also significant that CAPM and Treynor and Mazuy result for Beta is relatively different from each other. Treynor&Mazuy model results point out that the index exposure apparently less risk than the market, while CAPM results show it is nearly as risky as the market.

Table 5.3. CAPM and Treynor&Mazuy Regression results for XMANA

Model	CAPM			T&M		
Period	pre-crisis	crisis	post-crisis	pre-crisis	crisis	post-crisis
BETA	0,956645	1,007791	0,952720	0,770392	0,892098	0,999537
p-value	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***
ALPHA	-0,008997	0,000885	-0,004187	-0,029192	-0,007288	-0,002006
p-value	0,0008 ***	0,738900	0,0015 ***	0,0099 ***	0,363400	0,615700
R^2	0,867248	0,883179	0,719469	0,867715	0,883431	0,719516

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

BIST Basic Metal index Treynor and Mazuy results show that the index have negative-timing ability on the pre-crisis period and it is significant at the 10% level. However, the index market timing ability coefficient (ɣ) is not significant at other periods.

Table 5.4. Market-timing regression coefficient results for XMANA

Pre-crisis			Crisis			Post-crisis		
Gamma	p-value	R^2	Gamma	p-value	R^2	Gamma	p-value	R^2
-0,4153	0,0661 *	0,86772	-0,3663	0,2801	0,88343	0,24079	0,5631	0,71952

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.3. RESULTS FOR BIST INFORMATION TECHNOLOGY (XBLSM) INDEX:

Except post-crisis period, all R-squared values are relatively high, in other words, the explaining capacity of the regression at these periods are enough. The beta coefficient value, which reflect systematic risk, is the highest point on the crisis period for Treynor and Mazuy Market Timing Model, 1,242076. It means that the index is %24 more volatile than the benchmark index. On the other hand, CAPM Beta coefficient is less than 1. It seems the index less volatile than the market, also its all abnormal return is negative and it is statistically significant.

Table 5.5. CAPM and Treynor&Mazuy Regression results for XBLSM

Model	CAPM			T&M		
Period	Pre-crisis	Crisis	Post-crisis	Pre-crisis	Crisis	Post-crisis
BETA	0,976334	0,961678	0,884737	0,768903	1,242076	0,556537
p-value	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***
ALPHA	-0,006311	-0,00582	-0,010967	-0,028803	0,013989	-0,026259
p-value	0,0024 ***	0,0160 **	0,0000 ***	0,0010 ***	0,05330 *	0,0000 ***
R^2	0,918469	0,893138	0,614314	0,919057	0,894781	0,616582

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

According to the Treynor&Mazuy Market Timing Model, BIST Information Technology Index have positive market-timing ability during crisis period with the 99% confidence level. On the other hand, it has negative timing ability both pre- and post-crisis periods with the 99% confidence level.

Table 5.6. Market-timing regression coefficient results for XBLSM

Pre-crisis			Crisis			Post-crisis		
Gamma	p-value	R^2	Gamma	p-value	R^2	Gamma	p-value	R^2
-0,4625	0,0084 ***	0,91906	0,88783	0,0038 ***	0,89478	-1,688	0,0006 ***	0,61658

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.4. RESULTS FOR BIST ELECTRICITY (XELKT) INDEX:

All regressions for both CAPM and Treynor&Mazuy has considerable high explanatory power, its R-squared value is range between 0,724546 and 0,824375.In the table 5.7, statistically significant alpha coefficients are negative. It means that the index has less return than expected at the regressions. All the Beta values are significant at the 1% level, and it illustrates that the index less fluctuate than the market index. Especially, the beta value in the Treynor and Mazuy Model seems considerably low in the post-crisis period, 0,640649.

Table 5.7. CAPM and Treynor&Mazuy Regression results for XELKT

Model	CAPM			T&M		
Period	Pre-crisis	Crisis	Post-crisis	Pre-crisis	Crisis	Post-crisis
BETA	0,947869	0,9679	0,944677	0,934825	0,907517	0,640649
p-value	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***
ALPHA	-0,012003	-0,004643	-0,005824	-0,013417	-0,008909	-0,01999
p-value	0,0001 ***	0,1611	0,0000 ***	0,3136	0,3733	0,0000 ***
R^2	0,824375	0,817723	0,724546	0,824377	0,817792	0,72656

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

According to the Treynor and Mazuy Market Timing Model, none of market-timing coefficient is statistically significant except post-crisis period. At that period, XELKT index have negative market timing ability at the 1% significance level since its coefficient value is below zero, -1,56368. The portfolio which forming the index is not succesfully estimate the market fluctuation early.

Table 5.8. Market-timing regression coefficient results for XELKT

Pre-crisis			Crisis			Post-crisis		
Gamma	p-value	R^2	Gamma	p-value	R^2	Gamma	p-value	R^2
-0,0291	0,9124	0,82438	-0,1912	0,6513	0,81779	-1,56368	0,0001***	0,72656

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.5. RESULTS FOR BIST FINANCIALS (XUMAL) INDEX:

All the regressions' R-squared values are notably high at all the periods. It means that the all regressions almost perfectly explained by coefficients. Unlike Treynor and Mazuy values for Beta, CAPM value of the beta carry more risk compared to the benchmark index. The beta coefficient only above 1 at the post-crisis period for Treynor and Mazuy Model, whereas other periods it is below 1. In the crisis period, it is interesting that the index seems less risky than the market. When we look at the Alpha value, which stands for abnormal return, the regressions have positive abnormal return value except Treynor and Mazuy Model regression at the crisis period. It implies that the regressions have more excess return at the given level of risk.

Table 5.9. CAPM and Treynor&Mazuy Regression results for XUMAL

Model	CAPM			T&M		
Period	Pre-crisis	Crisis	Post-crisis	Pre-crisis	Crisis	Post-crisis
BETA	1,030468	1,049164	1,068064	0,997498	0,8635	1,042465
p-value	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***
ALPHA	0,006725	0,007798	0,006486	0,00315	-0,005318	0,005293
p-value	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0600 *	0,0114 **
R^2	0,988229	0,984467	0,921716	0,988243	0,985134	0,921731

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

According to the Treynor and Mazuy Market Timing Abililty Model, the index have the negative market-timing ability at all period, but none of period- except the crisis period-statistically significant. In the crisis period, the index has negative market timing ability at the 1% significant level due to its gamma coefficient is below the 0.

Table 5.10. Market-timing regression coefficient results for XUMAL

Pre-crisis			Crisis			Post-crisis		
Gamma	p-value	R^2	Gamma	p-value	R^2	Gamma	p-value	R^2
-0,0735	0,2792	0,98824	-0,5879	0,0000 ***	0,985134	-0,13166	0,5457	0,921731

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.6. RESULTS FOR BIST REAL ESTATE INVESTMENT TRUST (XGMYO) INDEX:

According the regression results at Table 5.11, it is obvious that the regressions accounts for the model almost perfectly because of the fact that high R-squared value. Unlike the crisis period on The Treynor and Mazuy Model, the other periods beta below the benchmark index value, which is accepted that is equal to 1. It implies that the index generally less volatile or risky than the market. But in the crisis period, if the the market index expected to change 1%, the index will be either go up or go down more than by 1,18%. Besides that, all abnormal return values seems negative on the table, which mean that the return of the index will be less than the expectation at given risk level. The only positive alpha is in the Treynor and Mazuy crisis period, but it is not significant at any level.

Table 5.11. CAPM and Treynor&Mazuy Regression results for XGMYO

Model	CAPM			T&M		
Period	Pre-crisis	Crisis	Post-crisis	Pre-crisis	Crisis	Post-crisis
BETA	0,957883	0,962127	0,963928	0,89249	1,182164	0,613339
p-value	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***
ALPHA	-0,009319	-0,006504	-0,00369	-0,01641	0,00904	-0,020026
p-value	0,0000 ***	0,0007 ***	0,0005 ***	0,0770 *	0,11630	0,0000 ***
R^2	0,906971	0,929696	0,803752	0,907031	0,930749	0,806605

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

Treynor and Mazuy Regression Results illustrate that the index has negative market- timing ability in the post-crisis period with 99% confidence level. Conversely, the index market-timing ability is positive during the crisis period with 99% confidence level. Though the pre-crisis period it has negative timing-ability, it is not statistically significant.

Table 5.12 Market-timing regression coefficient results for XGMYO

Pre-crisis			Crisis			Post-crisis		
Gamma	p-value	R^2	Gamma	p-value	R^2	Gamma	p-value	R^2
-0,1458	0,4314	0,90703	0,69671	0,0043 ***	0,930749	-1,80315	0,0000 ***	0,806605

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.7. RESULTS FOR BIST SERVICES (XUHIZ) INDEX:

The results on the Table 5.13 shows that all the regressions have R-squared value, in other words, the variables successfully describes the regression. The beta values both come from CAPM and Treynor and Mazuy Market Timing Model is below the market index, between 0,855906 and 0,966147. But only the beta value on the Treynor and Mazuy Market Timing Model is relatively higher than the market index, 1,221269. It means that it is aggressive and riskier than

the market index (XUTUM) during crisis period. Besides, the index has provided a return that is lower according to its risk, since all the alpha values are negative except the crisis period on the Treynor and Mazuy Model but it is not meaningful at any given level.

Table 5.13. CAPM and Treynor&Mazuy Regression results for XUHIZ

Model	CAPM			T&M		
Period	Pre-crisis	Crisis	Post-crisis	Pre-crisis	Crisis	Post-crisis
BETA	0,966147	0,92931	0,891522	0,958621	1,221269	0,855906
p-value	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***
ALPHA	-0,007326	-0,010954	-0,010543	-0,008142	0,00967	-0,012202
p-value	0,0000 ***	0,0000 ***	0,0000 ***	0,20300	0,0447 *	0,0000 ***
R^2	0,954299	0,94519	0,872905	0,95430	0,947213	0,872942

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

The result on the Table 5.14. illustrates that the BIST Services index has positive market-timing attitude during the crisis period with the 99% confidence level. On the other hand, both the pre-crisis and post-crisis the index have negative market-timing attitude, but they are not statistically meaningful at desired levels.

Table 5.14. Market-timing regression coefficient results for XUHIZ

Pre-crisis			Crisis			Post-crisis		
Gamma	p-value	R^2	Gamma	p-value	R^2	Gamma	p-value	R^2
-0,0168	0,8955	0,9543	0,92457	0,0000 ***	0,947213	-0,18318	0,4417	0,872942

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.8. RESULTS FOR BIST HOLDING AND INVESTMENT (XUHOLD) INDEX:

According to the regression results, all independent value in the regressions are able to stands for the depended variable almost perfectly, since the R-squared value is between 0,908033 and 0,971658. In the CAPM regressions, all the beta values- except post-crisis period- are above the market, 1,02031 and 1,013745, respectively. It illustates that the index more risky than the market at that periods. Controversely, the beta value is only above the market index beta, 1,091619, at the Treynor and Mazuy Market Timing Model post-crisis period. Moreover, the alpha value on the Treynor and Mazuy Model at the crisis period is considerably have negative effect on the return due to its value is -1%, and it is confident at the 99% level.

Table 5.15. CAPM and Treynor&Mazuy Regression results for XUHOLD

Model	CAPM			T&M		
Period	Pre-crisis	Crisis	Post-crisis	Pre-crisis	Crisis	Post-crisis
BETA	1,020301	1,013745	0,979632	0,98724	0,834249	1,091619
p-value	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***
ALPHA	0,003998	0,00173	-0,001902	0,000413	-0,01095	0,003316
p-value	0,0013 ***	0,2200	0,0059 ***	0,9375	0,0097 ***	0,1128
R^2	0,971644	0,964463	0,908033	0,971658	0,965117	0,908352

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

The results on the Table 5.16 indicates that the index have negative timing-ability during the crisis period, while it has positive ability at the post-crisis period at the 1% significance level. However, the market timing coefficient is not statistically meaningful at the pre-crisis period.

Table 5.16 Market-timing regression coefficient results for XHOLD

Pre-crisis			Crisis			Post-crisis		
Gamma	p-value	R^2	Gamma	p-value	R^2	Gamma	p-value	R^2
-0,0737	0,4839	0,971658	-0,5683	0,0015 ***	0,965117	0,57597	0,0083 ***	0,908352

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.9. RESULTS FOR BIST CHEMICAL, PETROL AND PLASTIC (XKMYA) INDEX:

The R-squared value on Table 5.17 indicates that the depended variables are able to be explained relatively by independent variable apart from the post-crisis period for both models. All significant alpha values, which called abnormal return, are negative, and it was considerably effective with -0,010223 value on Treynor and Mazuy Model. It implys that return at the period is lower compared the its risk level. Systematic risk indicator, Beta values is less than the market index value, so the index exposure less risk than the market. But only, the index seems more aggresive than the market at the Treynor and Mazuy Model pre-crisis period.

Table 5.17. CAPM and Treynor&Mazuy Regression results for XKMYA

Model	CAPM			T&M		
Period	Pre-crisis	Crisis	Post-crisis	Pre-crisis	Crisis	Post-crisis
BETA	0,973323	0,969235	0,924451	1,034106	0,923893	0,856642
p-value	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***
ALPHA	-0,006019	-0,004931	-0,007063	0,000572	-0,008134	-0,010223
p-value	0,0031 ***	0,0074 ***	0,0000 ***	0,94700	0,1427	0,0013 ***
R^2	0,921103	0,936159	0,792076	0,921154	0,936103	0,79219

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

Treynor and Mazuy Market Timing model is not effectively work at the BIST Chemical, Petrol and Plastic Index since all p-values in each periods shows that the model is not statistically meaningful at given levels.

Table 5.18. Market-timing regression coefficient results for XKMYA

Pre-crisis			Crisis			Post-crisis		
Gamma	p-value	R^2	Gamma	p-value	R^2	Gamma	p-value	R^2
0,13554	0,4310	0,921154	-0,1436	0,5404	0,936103	-0,34877	0,2928	0,792190

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.10. RESULTS FOR BIST LEASING AND FACTORING (XFINK) INDEX:

According to the result on the Table 5.19, all R-squared values at both models are not as high as expected, range from 0,655199 to 0,842345; in other words, the independent variables are not perfectly explained the models. Each of beta values- except Treynor and Mazuy Model pre-crisis period beta value- imply that the index less aggresive than the market. During pre-crisis period, the beta coefficient is 1,108974, which indicates that the index effected market fluctuation nearly 0,11% more. Abnormal indicator, alpha, provides that the return of the index is less than planned because of the fact that each of statistically significant values are negative, and it augments at the post-crisis period in each model.

Table 5.19. CAPM and Treynor&Mazuy Regression results for XFINK

Model	CAPM			T&M		
Period	Pre-crisis	Crisis	Post-crisis	Pre-crisis	Crisis	Post-crisis
BETA	0,971944	0,981117	0,874113	1,108974	0,588802	0,806707
p-value	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***
ALPHA	-0,006243	-0,003428	-0,012082	0,008617	-0,031275	-0,015223
p-value	0,0779 *	0,272200	0,0000 ***	0,56720	0,0009 ***	0,0004 ***
R^2	0,793176	0,839447	0,655199	0,793399	0,842345	0,655303

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

Treynor and Mazuy Market-Timing Ability regression illustrates that the index have negative market-timing attitude during crisis period with the 1% significance level. On the other hand, the market-timing coefficient, which is called gamma, are not meaningful at other periods in the given confidence levels.

Table 5.20. Market-timing regression coefficient results for XFINK

Pre-crisis			Crisis			Post-crisis		
Gamma	p-value	R^2	Gamma	p-value	R^2	Gamma	p-value	R^2
0,30548	0,3101	0,793399	-1,238	0,0017 ***	0,842345	-0,34661	0,435	0,655303

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.11. RESULTS FOR BIST NON-METAL MINING PRODUCT (XTAST) INDEX:

According to the Table 5.21 data, all the regressions considerably explained well by the independent variables since R-squared value is quietly strong, it is range from 0,825075 to 0,942831. The Non-metal Mining Products Index seems less risky than the market on the CAPM significantly, its beta value is lower than the market theoritically accepted beta value, 1. On the other hand, the beta value reach at its highest point at the crisis period according to the Treynor and Mazuy

Model. It implies that the index nearly 15% riskier than the market. Besides, Meaningfully accepted alpha values provides that the return of the index relatively below compared to the its risk level.

Table 5.21 CAPM and Treynor&Mazuy Regression results for XTAST

Model	CAPM			T&M		
Period	Pre-crisis	Crisis	Post-crisis	Pre-crisis	Crisis	Post-crisis
BETA	0,9488	0,922295	0,882978	1,012895	1,152666	0,723163
p-value	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***
ALPHA	-0,011038	-0,012714	-0,011518	-0,004088	0,00356	-0,018965
p-value	0,0000 ***	0,0000 ***	0,0000 ***	0,5727	0,47440	0,0000 ***
R^2	0,939942	0,94156	0,825075	0,940002	0,942831	0,8258

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

Treynor and Mazuy market- timing ability regression results indicates that the XTAST index have negative- timing ability during the post crisis period, while the index have positive timing- ability in the crisis period at the 99% confidence level. Conversely, pre-crisis period coefficient value is not meaningful at the given significance levels.

Table 5.22. Market-timing regression coefficient results for XTAST

Pre-crisis			Crisis			Post-crisis		
Gamma	p-value	R^2	Gamma	p-value	R^2	Gamma	p-value	R^2
0,14292	0,3239	0,940002	0,72943	0,0006 ***	0,942831	-0,82197	0,0038 ***	0,825800

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.12. RESULTS FOR BIST METAL PRODUCTS MACHINERY (XMESY) INDEX:

According to result on the Table 5.23, each of regression R-squared values is markedly high; the independent variables are able to explain well the dependent

variables, it provides that these variables have strong positive correlation. Apart from Treynor and Mazuy Regression on the post-crisis period, the index seems less volatile than the market because all beta values are below the accepted market beta value. Also, only three of alpha value are statistically meaningful, and these values indicates that the return of the BIST Metal Products Machinery Index is low relative to its risk. Especially, in the pre-crisis period, the index return relatively below the its risk because of the alpha coefficient is nearly 1,8 % on the Treynor and Mazuy Model.

Table 5.23. CAPM and Treynor&Mazuy Regression results for XMESY

Model	CAPM			T&M		
Period	Pre-crisis	Crisis	Post-crisis	Pre-crisis	Crisis	Post-crisis
BETA	0,975207	0,986489	0,949792	0,867207	0,983855	1,031579
p-value	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***
ALPHA	-0,006087	-0,002390	-0,004507	-0,017797	-0,002576	-0,000696
p-value	0,0001 ***	0,258800	0,0000 ***	0,0065 ***	0,68700	0,81260
R^2	0,953076	0,919445	0,825115	0,953242	0,919445	0,825280

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

The results on the Table 5.24 points out that the none of period except pre-crisis period is not statistically significant at given confidence levels. On the pre-crisis period, BIST Metal Products Machinery Index have negative-timing ability; its coefficient is -0,240 at the 10% significance level.

Table 5.24 Market-timing regression coefficient results for XMESY

Pre-crisis			Crisis			Post-crisis		
Gamma	p-value	R^2	Gamma	p-value	R^2	Gamma	p-value	R^2
-0,2408	0,0653 *	0,953242	-0,0083	0,9754	0,919445	0,42065	0,1693	0,825280

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.13. RESULTS FOR BIST TRANSPORTATION (XULAS) INDEX:

The result on the Table 5.25. provides that the market index behaviour does not able to explain well the index return fluctuation at the post-crisis period for both CAPM and Treynor an Mazuy Market Timing Model since the R-squared values are 0,699072 and 0,699522, respectively. It is also outstanding that the index seems more risky than the market at the pre-crisis period according to the Treynor and Mazuy Model, whereas CAPM results shows that the index more volatile than the market at the post-crisis period. Besides, none of Treynor and Mazuy abnormal return coefficient is statistically significant. On the other hand, CAPM regression abnormal return coefficients are meaningful at the 99% confidence level-except the crisis period- the results shows that the index provides less return on the pre-crisis period, while it contributes return on the post-crisis period compared to its risk.

Table 5.25. CAPM and Treynor&Mazuy Regression results for XULAS

Model	CAPM			T&M		
Period	Pre-crisis	Crisis	Post-crisis	Pre-crisis	Crisis	Post-crisis
BETA	0,93939	0,995904	1,055167	1,017231	0,994017	0,891727
p-value	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***
ALPHA	-0,013718	0,001439	0,005674	-0,005278	0,001306	-0,001941
p-value	0,0000 ***	0,62280	0,0002 ***	0,70760	0,88250	0,67620
R^2	0,802845	0,858885	0,699072	0,802923	0,858885	0,699522

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

The results for the market timing ability could not reject the null hypothesis that the index don't have market-timing ability at the pre-crisis and the crisis period because of the high probabality value compared the given level of significance level. On the other hand, the post-crisis result implies that the index have a negative market timing ability at the 10% significance level.

Table 5.26. Market-timing regression coefficient results for XULAS

Pre-crisis			Crisis			Post-crisis		
Gamma	p-value	R^2	Gamma	p-value	R^2	Gamma	p-value	R^2
0,17358	0,5372	0,802923	-0,006	0,9872	0,858885	-0,84061	0,0827 *	0,699522

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.14. RESULTS FOR BIST INDUSTRIAL (XUSIN) INDEX:

The results on the Table 5.27 shows that the regressions have strong R-squared value (between 0,915134 and 0,974023), the benchmark index and the BIST Industrial Index have strong correlation. Except the crisis-period for Treynor and Mazuy Model, the index beta coefficients are below the theoretical beta value, which is equal to 1. When the market index going up or going down 1%, the index will be act less than the market. But, in the crisis period, the index seems more aggresive because of the index coefficient is 1,02966. Besides these, the index provides less return relative to its risk because of the fact that the all regression results implies that the alpha value, which called abnormal return, is negative, and they are found statistically significant except one result on the table.

Table 5.27. CAPM and Treynor&Mazuy Regression results for XUSIN

Model	CAPM			T&M		
Period	Pre-crisis	Crisis	Post-crisis	Pre-crisis	Crisis	Post-crisis
BETA	0,96358	0,958578	0,909335	0,949182	1,029666	0,877058
p-value	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***
ALPHA	-0,00809	-0,006732	-0,008614	-0,009651	-0,00171	-0,010118
p-value	0,0000 ***	0,0000 ***	0,0000 ***	0,0427 **	0,63850	0,0000 ***
R^2	0,97402	0,970694	0,915103	0,974023	0,97081	0,915134

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

None of Treynor and Mazuy market timing ability is found significant due to the high p-value. It means that we could not conclude that the index has market timing ability either negative or positive.

Table 5.28. Market-timing regression coefficient results for XUSIN

Pre-crisis			Crisis			Post-crisis		
Gamma	p-value	R^2	Gamma	p-value	R^2	Gamma	p-value	R^2
-0,0321	0,7356	0,974023	0,22509	0,144	0,970810	-0,16601	0,3919	0,915134

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.15. RESULTS FOR BIST INSURANCE (XSGRT) INDEX:

The regression results in the Table 5.29 illustrates that the market index is not able to explain the model well at the post-crisis periods both in CAPM and Treynor and Mazuy Model. It is not meaningful to interpret the coefficient at that period. However, other periods the model seems strong high with R-squared value. Systematic risk indicator, CAPM beta value reflects that the the index is more aggresive than the market index at the pre-, and during crisis period. It moves same way with the market, but it move with higher magnitude, so it exposure more systematic risk than the market. The statistically meaningful abnormal return results in the table indicate that the return of the index could not explained by the given risk level, especially in the post-crisis period at the Treynor and Mazuy Model since the alpha coefficient is -0,020746.

Table 5.29. CAPM and Treynor&Mazuy Regression results for XSGRT

Model	CAPM			T&M		
Period	Pre-crisis	Crisis	Post-crisis	Pre-crisis	Crisis	Post-crisis
BETA	1,025099	1,00817	0,770586	1,175179	0,742349	0,803074
p-value	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***
ALPHA	0,005759	0,000992	-0,02226	0,022032	-0,017786	-0,020746
p-value	0,02040 **	0,65160	0,0000 ***	0,0364 **	0,0071 ***	0,0000 ***
R^2	0,896485	0,916983	0,542791	0,896758	0,918362	0,542816

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

The index market-timing ability regression results shows that the index have a negative market timing ability at the 1% significance level. Though other periods the index have positive market-timing behaviour, it is not statistically significant at the given levels of confidence.

Table 5.30. Market-timing regression coefficient results for XSGRT

Pre-crisis			Crisis			Post-crisis		
Gamma	p-value	R^2	Gamma	p-value	R^2	Gamma	p-value	R^2
0,33466	0,1116	0,896758	-0,8417	0,0026 ***	0,918362	0,16709	0,7357	0,542816

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.16. RESULTS FOR BIST SPORTS (XSPOR) INDEX:

According to the result on the Table 5.31, the all the regressions almost perfectly explained by the independent variables, because of the high R-squared values, which are between 0,999823 and 0,999963. By the way, BIST Spor index was started to calculate after 3.31.2004, so it should be considered its pre-crisis period of data is shorter than the other indices. The beta coefficients results provides that the index as risky as the market due to its beta value near the proxy value for the market. The results shows that beta coefficient is range from

0,997312 to 1,002411. Apart from the crisis period on the CAPM, the regression results points out that the abnormal values are not statistically significant. Hence, the abnormal value interperation is not able to be made.

Table 5.31 CAPM and Treynor&Mazuy Regression results for XSPORT

Model	CAPM			T&M		
Period	Pre-crisis	Crisis	Post-crisis	Pre-crisis	Crisis	Post-crisis
BETA	1,000196	0,999299	1,000235	1,002411	1,00138	0,997312
p-value	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***
ALPHA	0,003714	-0,01028	0,001856	0,026985	0,004134	-0,012199
p-value	0,395500	0,0217 **	0,5264	0,31750	0,86450	0,4859
R^2	0,999963	0,999961	0,999823	0,999963	0,999961	0,999823

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

The result obtained from Treynor and Mazuy Market Timing regression for the BIST Sport index are not statistically significant at the any given confidence level. For this reason, we can not conclude that whether the index have a timing ability or not.

Table 5.32 Market-timing regression coefficient results for XSPORT

Pre-crisis			Crisis			Post-crisis		
Gamma	p-value	R^2	Gamma	p-value	R^2	Gamma	p-value	R^2
5,2E-05	0,3824	0,999963	6,9E-05	0,5451	0,999961	-0,00015	0,4154	0,999823

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.17. RESULTS FOR BIST TECHNOLOGY (XUTEK) INDEX:

According to the results on the Table 5.33, R-squared values indicates that all regression depended variable well explained by independent variable except

CAPM post-crisis period value. Treynor and Mazuy regression results shows that the index is riskier than the market at the pre-crisis and the crisis period, the beta values are 1,002411 and 1,00138 respectively. Other beta values seem below the accepted market beta value, which means that the index doesn't effect the systematic risk as much as the market index. There are only two meaningful abnormal data indicator, which is called alpha, and these negative values support that the index return was lower compared to its risk.

Table 5.33 CAPM and Treynor&Mazuy Regression results for XUTEK

Model	CAPM			T&M		
Period	Pre-crisis	Crisis	Post-crisis	Pre-crisis	Crisis	Post-crisis
BETA	0,976103	0,975913	0,90102	1,002411	1,00138	0,997312
p-value	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***
ALPHA	-0,006076	-0,003304	-0,00893	0,026985	0,004134	-0,012199
p-value	0,0069 ***	0,1098	0,0000 ***	0,3175	0,86450	0,485900
R^2	0,905459	0,921474	0,657444	0,999963	0,999961	0,999823

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

It is outstanding that the gamma values, which estimate the market-timing ability, are negative at the pre-crisis and the post-crisis period, while it has positive market-timing ability at the crisis period with the 1% significance level. However, the post-crisis period regression result is not meaningful at any given levels.

Table 5.34 Market-timing regression coefficient results for XUTEK

Pre-crisis			Crisis			Post-crisis		
Gamma	p-value	R^2	Gamma	p-value	R^2	Gamma	p-value	R^2
-0,4136	0,0298 **	0,905923	0,7453	0,0046 ***	0,922633	-0,705	0,1214	0,657852

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.18. RESULTS FOR BIST TEXTILE (XUTEKS) INDEX:

The results on the table 5.35 shows that the R-squared value is relatively low at thre post-crisis period for both of models, but it can be acceptable for interpreting. The most outstanding beta value is that Treynor and Mazuy's beta value at the post-crisis period. It is only 0,351463, which indicates that the index risk is obviously lower than the market, whereas the index risk is above the market in the pre-crisis period with 1,021059 beta value. On the other hand, CAPM results imply that the index carry relatively low risk than the market with the beta values, which is range from 0,891238 to 0,939452 at all periods. It is also significant that the statistically meaningful abnormal returns of the index values are negative. Especially in the post crisis result of Treynor and Mazuy model, the abnormal return coefficient is considerably high, -0,035388.

Table 5.35 CAPM and Treynor&Mazuy Regression results for XUTEKS

Model	CAPM			T&M		
Period	Pre-crisis	Crisis	Post-crisis	Pre-crisis	Crisis	Post-crisis
BETA	0,939452	0,925989	0,891238	1,021059	0,962924	0,351463
p-value	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***
ALPHA	-0,013847	-0,011714	-0,010238	-0,004999	-0,009105	-0,035388
p-value	0,0000 ***	0,0000 ***	0,0000 ***	0,55540	0,15960	0,0000 ***
R^2	0,918144	0,907528	0,711494	0,918242	0,907559	0,718497

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

Treynor and Mazuy Market Timing Model results illustrates that the index have a negative timing ability at the post-crisis period with the -2,77618 gamma value, and it is statistically meaningful at the 99% confidence level. On the other hand, other periods the index has positive market-timing abilty, but they are not significant at any given levels.

Table 5.36 Market-timing regression coefficient results for XTEKS

Pre-crisis			Crisis			Post-crisis		
Gamma	p-value	R^2	Gamma	p-value	R^2	Gamma	p-value	R^2
0,18198	0,2829	0,918242	0,11697	0,6690	0,907559	-2,77618	0,0000 ***	0,718497

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.19. RESULTS FOR BIST TELECOMMUNICATION (XILTM) INDEX:

According to the regression results on the Table 5.37, the R-squared value is considerably low at the post-crisis period for each of models. For this reason, interpreting post-crisis period value does not reflect the real situation. The CAPM beta estimates indicates that the index carry less risk than the market, while the the Treynor and Mazuy Model estimates that the BIST Telecommunication Index (XILTM) is more risker than the market. At the crisis period, its risk reaches the peak point with 1,138433 beta value. These estimation result claims that if the market go up 1%, the index also will go up 1,138% or if the market go down 1%, the index will go down 1,138%. Besides that, none of alpha values are significant at Treynor and Mazuy Model, but the value is negative at the crisis and post crisis period on the CAPM model and they are significant at the 1% level.

Table 5.37 CAPM and Treynor&Mazuy Regression results for XILTM

Model	CAPM			T&M		
Period	Pre-crisis	Crisis	Post-crisis	Pre-crisis	Crisis	Post-crisis
BETA	0,994643	0,931132	0,8536	1,102001	1,138433	0,815069
p-value	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***
ALPHA	-0,001036	-0,011085	-0,014455	0,010604	0,00356	-0,016251
p-value	0,7523	0,0001 ***	0,0000 ***	0,4470	0,6684	0,00010
R^2	0,82292	0,856737	0,665677	0,823056	0,857656	0,665714

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

The index market timing ability regression results points out that the index have positive market-timing ability at pre-crisis and the crisis period, but only the crisis period estimation result is significant at the 10% level. Conversely, the index market-timing ability seems negative at the post-crisis period, but it is not meaningful at any given levels.

Table 5.38 Market-timing regression coefficient results for XILTM

Pre-Crisis			Crisis			Post-crisis		
Gamma	p-value	R^2	Gamma	p-value	R^2	Gamma	p-value	R^2
0,2394	0,3905	0,823056	0,65638	0,0622 *	0,857656	-0,19817	0,6398	0,665714

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.20. RESULTS FOR BIST WHOLESALE AND RETAIL TRADE (XTCRT) INDEX:

The results on the Table 5.39 illustrate that the R-squared values in the both of models' post-crisis period are not high. It means that the independent variables are not able to explain the the dependent variable well, so interpreting any coefficient estimations at that period could not provide clear information neither CAPM nor Treynor and Mazuy Model. When we look into the both pre-crisis period and crisis period, CAPM points out that the index less volatile than the market due to fact that beta values are only 0,958897 and 0,913828 respectively; however, the Treynor and Mazuy Model beta estimations, which are 1,023754 and 1,347469, provides that the index more volatile than the market at that periods. Other important point is that according to the CAPM estimation results, the index provides less return compared to its risk. On the other hand, Treynor and Mazuy abnormal return results differ according to the periods. At the post-crisis period, it supplies less return, while it provides more return relative to its risk at the 10% significance level.

Table 5.39. CAPM and Treynor&Mazuy Regression results for XTCRT

Model	CAPM			T&M		
Period	Pre-crisis	Crisis	Post-crisis	Pre-crisis	Crisis	Post-crisis
BETA	0,958897	0,913828	0,851629	1,023754	1,347469	0,971478
p-value	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***
ALPHA	-0,00903	-0,012986	-0,014199	-0,001998	0,017648	-0,008615
p-value	0,0000 ***	0,0000 ***	0,0000 ***	0,81560	0,0534 *	0,0578 *
R^2	0,919626	0,824598	0,613491	0,919685	0,828616	0,613818

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

The estimation result for the market- timing ability indicates that the index have positive market-timing ability at the crisis period with 99% confidence level. Also, other periods the index have positive market-timing ability, but they are not significant at any given levels.

Table 5.40 Market-timing regression coefficient results for XTCRT

Pre-Crisis			Crisis			Post-crisis		
Gamma	p-value	R^2	Gamma	p-value	R^2	Gamma	p-value	R^2
0,14463	0,3984	0,919685	1,37304	0,0004 ***	0,828616	0,61641	0,1926	0,613818

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.21. RESULTS FOR BIST TOURISM (XTRZM) INDEX:

The estimation results in the Table 5.41 illustrates that the post-crisis period estimates could not effectively explain the model due to its low R-squared value both for CAPM and Treynor and Mazuy Model. According to the CAPM, the beta is slightly lower than the theoritical market beta, so the the index less aggresive than the market. On the other hand, Treynor and Mazuy Regression results indicates that the index less agreesive than the market at the crisis period with 0,788197 beta value, while it is more aggresive than the market at the pre-

crisis period with 1,278868 beta value. Statistically abnormal return results points out that the return of the index relatively low relative to its risk except Treynor and Mazuy pre-crisis period. It claims that at this period, the index create more return compared to its risk with 0,027755 alpha value.

Table 5.41. CAPM and Treynor&Mazuy Regression results for XTRZM

Model	CAPM			T&M		
Period	Pre-crisis	Crisis	Post-crisis	Pre-crisis	Crisis	Post-crisis
BETA	0,976109	0,977677	0,908451	1,278868	0,788197	0,423433
p-value	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***
ALPHA	-0,005073	-0,003878	-0,009259	0,027755	-0,017263	-0,031858
p-value	0,18000	0,1561	0,0000 ***	0,0836 *	0,0364 **	0,0000 ***
R^2	0,771419	0,870498	0,624184	0,772472	0,871206	0,628958

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

Within the respect of market-timing ability regression results, the index have negative market timing ability both crisis and post-crisis period with the given confidence levels. Conversely, the index have positive market timing ability in the pre-crisis period because its gamma value is 0,67512 at the 1% significance.

Table 5.42 Market-timing regression coefficient results for XTRZM

Pre-Crisis			Crisis			Post-crisis		
Gamma	p-value	R^2	Gamma	p-value	R^2	Gamma	p-value	R^2
0,67512	0,0353 **	0,772472	-0,5999	0,0853*	0,871206	-2,49455	0,0000***	0,628958

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.22. RESULTS FOR BIST WOOD, PAPER PRINTING (XKAGT) INDEX:

According to the BIST Wood Paper Printing Index estimation results, the independent variables explain the model well with the strong R-squared values apart from the post-crisis period for both models, but they are also at the

acceptable level. Except the crisis period at the Treynor and Mazuy Model, the index seems less volatile than the market. Especially, Treynor and Mazuy post-crisis period claims that the index significantly less exposure the systematic risk. Moreover, the alpha coefficient results provides that the index return is less compared to its risk level.

Table 5.43 CAPM and Treynor&Mazuy Regression results for XKAGT

Model	CAPM			T&M		
Period	Pre-crisis	Crisis	Post-crisis	Pre-crisis	Crisis	Post-crisis
BETA	0,981733	0,949309	0,906271	0,891654	1,099701	0,668325
p-value	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***
ALPHA	-0,004444	-0,008474	-0,009213	-0,014211	0,00215	-0,0203
p-value	0,0374 **	0,0002 ***	0,0000 ***	0,11680	0,7536	0,0000 ***
R^2	0,914758	0,901582	0,727438	0,914867	0,902071	0,728783

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

The market-timing indicator from Treynor and Mazuy Model iluustrate that the index have negative market-timing ability at the pre-crisis and post-crisis period, but only post-crisis gamma value is statistically significant. On the other hand, the index has positive-market timing ability during the crisis period, but it is also not significant at any given level.

Table 5.44 Market-timing regression coefficient results for XKAGT

Pre-Crisis			Crisis			Post-crisis		
Gamma	p-value	R^2	Gamma	p-value	R^2	Gamma	p-value	R^2
-0,2009	0,2672	0,914867	0,47619	0,1006	0,902071	-1,22381	0,0016 ***	0,728783

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

5.23. RESULTS FOR BIST FOOD BEVERAGE (XGIDA) INDEX:

The estimation results on the Table 5.45 provides that all regression results have high R-squared value, but it is not valid for the post-crisis period regressions. CAPM regression results imply that BIST Food, Beverage Index less risky than the market with the low beta values, which is range from 0,91263 and 0,941462. On the other hand, Treynor and Mazuy regression indicates that the index is quietly aggressive both pre-, and the crisis periods than the market since the beta coefficients are 1,087281 and 1,234673 respectively. Within the scope of the abnormal return coefficient, we can conclude that the statistically significant abnormal index returns show that the index create less return at the given risk level.

Table 5.45 CAPM and Treynor&Mazuy Regression results for XGIDA

Model	CAPM			T&M		
Period	Pre-crisis	Crisis	Post-crisis	Pre-crisis	Crisis	Post-crisis
BETA	0,941462	0,91263	0,830524	1,087281	1,234673	0,788644
p-value	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***	0,0000 ***
ALPHA	-0,012801	-0,013685	-0,016516	1,00301	0,009065	-0,018467
p-value	0,0000 ***	0,0000 ***	0,0000 ***	0,8042	0,25840	0,0000 ***
R^2	0,845824	0,85935	0,62346	0,846112	0,861665	0,623502

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

Treynor and Mazuy Market Timing Model regression results points out that the index have positive timing ability both the pre-crisis and the crisis period, but only it is meaningful during crisis period because of the fact that p-value of the gamma coefficient is 0,0027. Though the regression gamma is negative at the post crisis period,which implies negative-timing ability, it is not confident at any given levels.

Table 5.46 Market-timing regression coefficient results for XGIDA

Pre-Crisis			Crisis			Post-crisis		
Gamma	p-value	R^2	Gamma	p-value	R^2	Gamma	p-value	R^2
0,32516	0,1805	0,846112	1,01969	0,0027 ***	0,861665	-0,21539	0,6336	0,623502

Significance levels: * indicates 10%, ** indicates 5%, *** indicates 1%

PART 6: CONCLUSION

In this paper, I examined 23 sectoral indices, which are announced by Borsa Istanbul, within three period of time: pre-crisis, crisis and post-crisis period. The aim of the study is that analyzing Capital Asset Pricing and Treynor and Mazuy Market Timing Model in different periods. The examination put excessive emphasis on three-points; how beta values differentiate according to periods and models, do the indices have significant abnormal return and whether the indices have market-timing ability or not. In the following paragraphs, I follow these range to conclude overall analyzing.

The coefficient for the determination results, R-squared values, indicate that that all independent variable- risk-free rate of return and market index return- are able to explain the dependent variable succesfully except the post- crisis period for both models. It illustrates that there are strong correlation between the market index and indices. On the other hand, post-crisis period results as not strong as the other periods, but they are at the statistically acceptable level.

Table 6.1. Mean value of the coefficient in terms of periods and models

	CAPM			Treynor & Mazuy			
Period	Beta	Alpha	R^2	Gamma	Beta	Alpha	R^2
Pre-Crisis	0,976522	-0,005156	0,903632	0,019589	0,985403	0,040287	0,903816
Crisis	0,972315	-0,004800	0,909254	0,114786	1,008596	-0,001622	0,910228
Post-Crisis	0,924024	-0,007241	0,739194	-0,581140	0,810906	-0,013117	0,740199

Null Hypothesis: Beta(β)=0 (There is no significant relationship with the index and market)

According to the results, all beta values are statistically significant at the 1% level for both of models, therefore we are able to conclude that the sectoral indices at Borsa Istanbul affected by market index (XUTUM) movement. All period CAPM results provides that average beta values below the theoritical market beta value, which is accepted as equal to one. It implies that the sectoral indices are less aggresive than the market; in other words, they carry less risk than the benchmark index. Specifically, the result for CAPM illustrates that the indices more volatile at the pre-crisis period, and less volatile at the post-crisis period. On the other hand, Treynor and Mazuy regression average emprical results shows that the sectoral indices are riskier than the market at the crisis period due to fact that average beta value is 1,008596. At the pre-crisis period, the sectoral indices seem as risky as the market with 0,985403 beta value, which is close to 1. But, the index seems less risky than the market at the post-crisis period due to average beta value (0,810906) is relatively below the market beta.

Also, the results on Table 6.2 illustrates that there are more indices which are accepted as riskier than the market in the pre-crisis and the crisis period for Treynor and Mazuy Market Timing model, whereas there are less indices for CAPM.

Table 6.2 Number of Beta, which is above one in terms of model and periods.

	Pre-Crisis	Crisis	Post-Crisis
CAPM	5	5	4
Treynor and Mazuy	9	10	4

Null Hypothesis: Alpha(α)=0 (There is no excess return, the return correspond to expected value compared to its risk.)

For the respect of the intercept term called alpha, CAPM regression results show that the index create less return compared to their risk because the mean value of the alpha at all period is negative. However, there are some values are not statistically significant at given periods. After we eliminate these values while calculating avarage, we also able to see that the indices generally provides negative abnormal return. It is also should be considered that the Treynor and Mazuy Market Timing Model estimation for the alpha is substantially insignificant.

Table 6.3. Number of Alpha, which is not significant at any given levels.

	Pre-Crisis	Crisis	Post-Crisis
CAPM	3	9	1
Treynor and Mazuy	14	14	8

Table 6.4. Average value of Alpha, which are significant at given levels.

	Pre-Crisis	Crisis	Post-Crisis
CAPM	-0,0054416	-0,00698564	-0,0076545
Treynor and Mazuy	-0,0083451	-0,00310678	-0,0174003

Null Hypothesis: Gamma(γ) =0 (The indices don't have market-timing ability)

The Treynor and Mazuy Market Timing Ability regression results indicates that most of the indices don't have market timing ability since the null hypothesis could not be rejected by the given confidence level. Specifically, There are only five indices which have market-timing ability at the pre-crisis period; XMANA, XBLSM, XMESY, XUTEK, XTRZM, and among these only XTRZM index

have positive market-timing ability. In the crisis period, number of indices which have market-timing ability augmented to fourteen. For those of them, only eight indices have positive market-timing ability, while six of them have negative market-timing behaviour. At the post- crisis period, the estimatition result shows that nine of indices have market- timing ability. As seen in Table 6.6, only 1 of 9 index (XHOLD) have positive market-timing ability, whereas the 8 of 23 indices have negative market timing ability. Hence, we are able to conclude that the investors are more succesfull to evaluate their investing at the crisis period than the other periods; on the other hand, they are less talented to manage their assets at the post-crisis period.

Table 6.5 Number of insignificant Treynor and Mazuy Estimation

	Pre-Crisis	Crisis	Post-Crisis
Treynor and Mazuy	18	9	14

Table 6.6 Number of significant Treynor and Mazuy Estimation

	Pre-Crisis	Crisis	Post-Crisis
positive market-timing ability	4	8	1
negative market-timing ability	1	6	8
Total	5	14	9

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APPENDIX

APPENDIX 1: XBANK

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/15/18 Time: 23:05
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.008676	0.001218	7.120408	0.0000
_RM_RF_	1.038424	0.005523	188.0120	0.0000

R-squared	0.973533	Mean dependent var	-0.216603
Adjusted R-squared	0.973506	S.D. dependent var	0.042111
S.E. of regression	0.006854	Akaike info criterion	-7.125760
Sum squared resid	0.045151	Schwarz criterion	-7.115645
Log likelihood	3433.053	Hannan-Quinn criter.	-7.121909
F-statistic	35348.51	Durbin-Watson stat	1.756439
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/15/18 Time: 23:04
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.003632	0.005173	0.702130	0.4828
_RM_RF_	0.991908	0.046690	21.24438	0.0000
_RM_RF_^2	-0.103725	0.103383	-1.003312	0.3160

R-squared	0.973561	Mean dependent var	-0.216603
Adjusted R-squared	0.973506	S.D. dependent var	0.042111
S.E. of regression	0.006854	Akaike info criterion	-7.124731
Sum squared resid	0.045104	Schwarz criterion	-7.109559
Log likelihood	3433.558	Hannan-Quinn criter.	-7.118954
F-statistic	17674.88	Durbin-Watson stat	1.755355
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/15/18 Time: 23:08
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.010282	0.001353	7.599237	0.0000
_RM_RF_	1.063956	0.008026	132.5689	0.0000

R-squared	0.970083	Mean dependent var	-0.160630
Adjusted R-squared	0.970027	S.D. dependent var	0.055321
S.E. of regression	0.009577	Akaike info criterion	-6.455138
Sum squared resid	0.049716	Schwarz criterion	-6.439333
Log likelihood	1757.797	Hannan-Quinn criter.	-6.448958
F-statistic	17574.50	Durbin-Watson stat	1.749691
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/15/18 Time: 23:09
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.004443	0.004033	-1.101634	0.2711
_RM_RF_	0.855512	0.054450	15.71178	0.0000
_RM_RF_^2	-0.660001	0.170571	-3.869361	0.0001

R-squared	0.970888	Mean dependent var	-0.160630
Adjusted R-squared	0.970781	S.D. dependent var	0.055321
S.E. of regression	0.009456	Akaike info criterion	-6.478760
Sum squared resid	0.048378	Schwarz criterion	-6.455052
Log likelihood	1765.223	Hannan-Quinn criter.	-6.469491
F-statistic	9021.260	Durbin-Watson stat	1.747950
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/15/18 Time: 23:11
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.005408	0.002078	2.602445	0.0093
_RM_RF_	1.057879	0.020930	50.54253	0.0000

R-squared	0.559282	Mean dependent var	-0.097521
Adjusted R-squared	0.559063	S.D. dependent var	0.027993
S.E. of regression	0.018588	Akaike info criterion	-5.131591
Sum squared resid	0.695532	Schwarz criterion	-5.126024
Log likelihood	5172.078	Hannan-Quinn criter.	-5.129548
F-statistic	2554.548	Durbin-Watson stat	2.672355
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

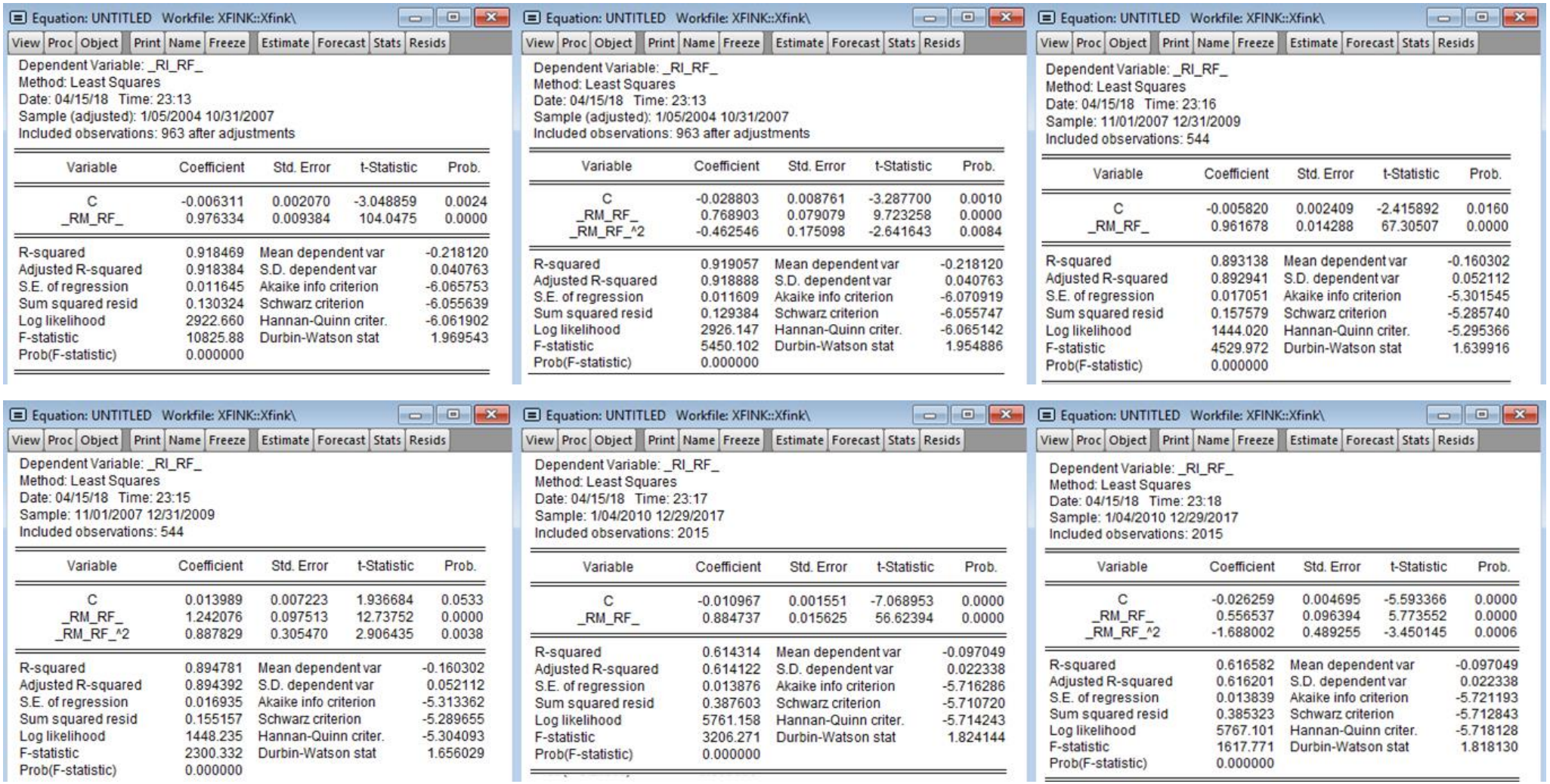
View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/15/18 Time: 23:10
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.006493	0.006307	1.029493	0.3034
_RM_RF_	1.081166	0.129507	8.348318	0.0000
_RM_RF_^2	0.119769	0.657322	0.182208	0.8554

R-squared	0.559289	Mean dependent var	-0.097521
Adjusted R-squared	0.558851	S.D. dependent var	0.027993
S.E. of regression	0.018593	Akaike info criterion	-5.130615
Sum squared resid	0.695520	Schwarz criterion	-5.122265
Log likelihood	5172.094	Hannan-Quinn criter.	-5.127550
F-statistic	1276.677	Durbin-Watson stat	2.672338
Prob(F-statistic)	0.000000		

APPENDIX 2: XBLSM



Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/15/18 Time: 23:13
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.006311	0.002070	-3.048859	0.0024
_RM_RF_	0.976334	0.009384	104.0475	0.0000

R-squared	0.918469	Mean dependent var	-0.218120
Adjusted R-squared	0.918384	S.D. dependent var	0.040763
S.E. of regression	0.011645	Akaike info criterion	-6.065753
Sum squared resid	0.130324	Schwarz criterion	-6.055639
Log likelihood	2922.660	Hannan-Quinn criter.	-6.061902
F-statistic	10825.88	Durbin-Watson stat	1.969543
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/15/18 Time: 23:13
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.028803	0.008761	-3.287700	0.0010
_RM_RF_	0.768903	0.079079	9.723258	0.0000
_RM_RF_^2	-0.462546	0.175098	-2.641643	0.0084

R-squared	0.919057	Mean dependent var	-0.218120
Adjusted R-squared	0.918888	S.D. dependent var	0.040763
S.E. of regression	0.011609	Akaike info criterion	-6.070919
Sum squared resid	0.129384	Schwarz criterion	-6.055747
Log likelihood	2926.147	Hannan-Quinn criter.	-6.065142
F-statistic	5450.102	Durbin-Watson stat	1.954886
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/15/18 Time: 23:16
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.005820	0.002409	-2.415892	0.0160
_RM_RF_	0.961678	0.014288	67.30507	0.0000

R-squared	0.893138	Mean dependent var	-0.160302
Adjusted R-squared	0.892941	S.D. dependent var	0.052112
S.E. of regression	0.017051	Akaike info criterion	-5.301545
Sum squared resid	0.157579	Schwarz criterion	-5.285740
Log likelihood	1444.020	Hannan-Quinn criter.	-5.295366
F-statistic	4529.972	Durbin-Watson stat	1.639916
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/15/18 Time: 23:15
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.013989	0.007223	1.936684	0.0533
_RM_RF_	1.242076	0.097513	12.73752	0.0000
_RM_RF_^2	0.887829	0.305470	2.906435	0.0038

R-squared	0.894781	Mean dependent var	-0.160302
Adjusted R-squared	0.894392	S.D. dependent var	0.052112
S.E. of regression	0.016935	Akaike info criterion	-5.313362
Sum squared resid	0.155157	Schwarz criterion	-5.289655
Log likelihood	1448.235	Hannan-Quinn criter.	-5.304093
F-statistic	2300.332	Durbin-Watson stat	1.656029
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/15/18 Time: 23:17
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.010967	0.001551	-7.068953	0.0000
_RM_RF_	0.884737	0.015625	56.62394	0.0000

R-squared	0.614314	Mean dependent var	-0.097049
Adjusted R-squared	0.614122	S.D. dependent var	0.022338
S.E. of regression	0.013876	Akaike info criterion	-5.716286
Sum squared resid	0.387603	Schwarz criterion	-5.710720
Log likelihood	5761.158	Hannan-Quinn criter.	-5.714243
F-statistic	3206.271	Durbin-Watson stat	1.824144
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

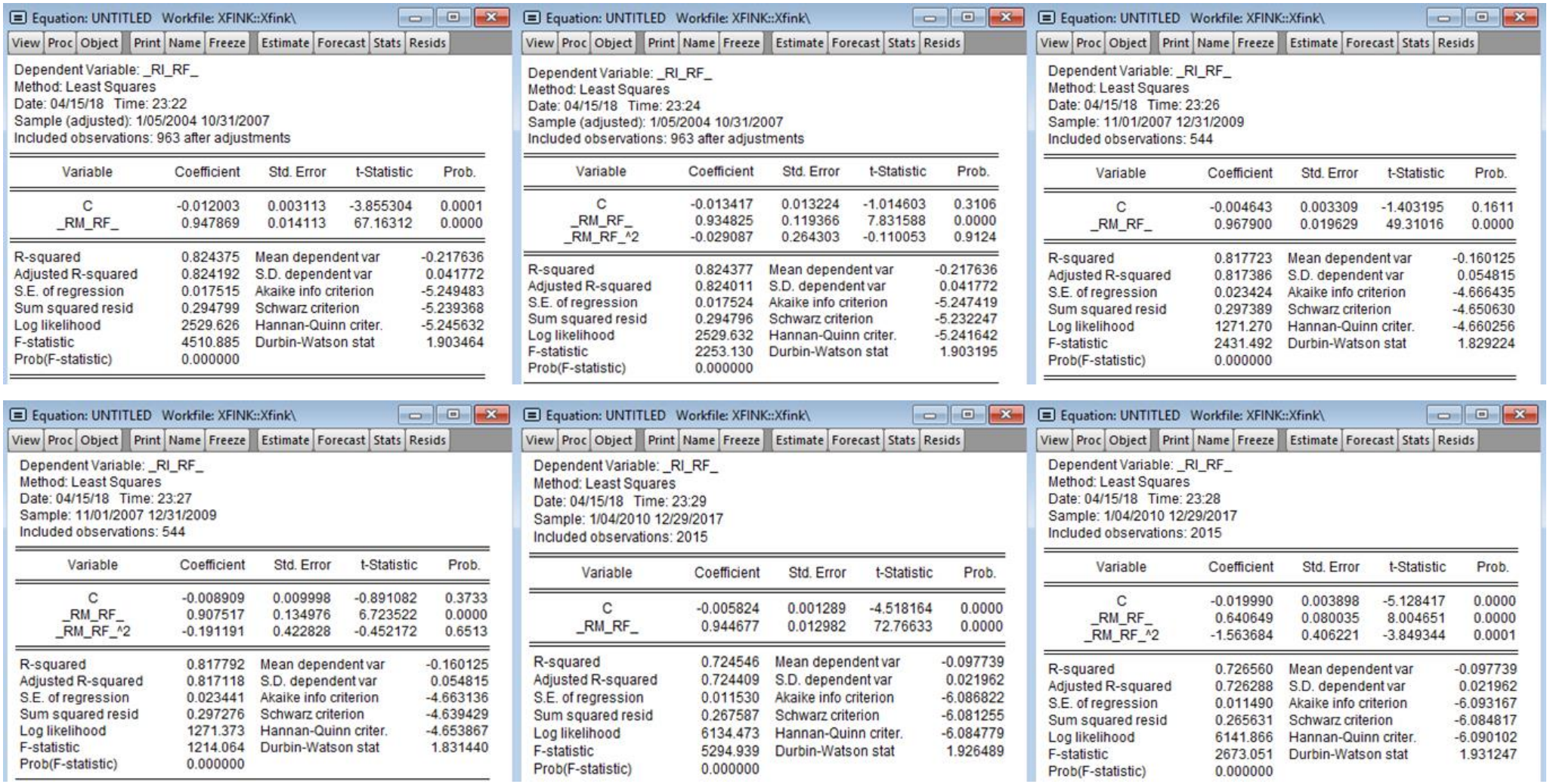
View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/15/18 Time: 23:18
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.026259	0.004695	-5.593366	0.0000
_RM_RF_	0.556537	0.096394	5.773552	0.0000
_RM_RF_^2	-1.688002	0.489255	-3.450145	0.0006

R-squared	0.616582	Mean dependent var	-0.097049
Adjusted R-squared	0.616201	S.D. dependent var	0.022338
S.E. of regression	0.013839	Akaike info criterion	-5.721193
Sum squared resid	0.385323	Schwarz criterion	-5.712843
Log likelihood	5767.101	Hannan-Quinn criter.	-5.718128
F-statistic	1617.771	Durbin-Watson stat	1.818130
Prob(F-statistic)	0.000000		

APPENDIX 3: XELKT



Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/15/18 Time: 23:22
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.012003	0.003113	-3.855304	0.0001
_RM_RF_	0.947869	0.014113	67.16312	0.0000

R-squared	0.824375	Mean dependent var	-0.217636
Adjusted R-squared	0.824192	S.D. dependent var	0.041772
S.E. of regression	0.017515	Akaike info criterion	-5.249483
Sum squared resid	0.294799	Schwarz criterion	-5.239368
Log likelihood	2529.626	Hannan-Quinn criter.	-5.245632
F-statistic	4510.885	Durbin-Watson stat	1.903464
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/15/18 Time: 23:24
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.013417	0.013224	-1.014603	0.3106
_RM_RF_	0.934825	0.119366	7.831588	0.0000
_RM_RF_^2	-0.029087	0.264303	-0.110053	0.9124

R-squared	0.824377	Mean dependent var	-0.217636
Adjusted R-squared	0.824011	S.D. dependent var	0.041772
S.E. of regression	0.017524	Akaike info criterion	-5.247419
Sum squared resid	0.294796	Schwarz criterion	-5.232247
Log likelihood	2529.632	Hannan-Quinn criter.	-5.241642
F-statistic	2253.130	Durbin-Watson stat	1.903195
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/15/18 Time: 23:26
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.004643	0.003309	-1.403195	0.1611
_RM_RF_	0.967900	0.019629	49.31016	0.0000

R-squared	0.817723	Mean dependent var	-0.160125
Adjusted R-squared	0.817386	S.D. dependent var	0.054815
S.E. of regression	0.023424	Akaike info criterion	-4.666435
Sum squared resid	0.297389	Schwarz criterion	-4.650630
Log likelihood	1271.270	Hannan-Quinn criter.	-4.660256
F-statistic	2431.492	Durbin-Watson stat	1.829224
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/15/18 Time: 23:27
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.008909	0.009998	-0.891082	0.3733
_RM_RF_	0.907517	0.134976	6.723522	0.0000
_RM_RF_^2	-0.191191	0.422828	-0.452172	0.6513

R-squared	0.817792	Mean dependent var	-0.160125
Adjusted R-squared	0.817118	S.D. dependent var	0.054815
S.E. of regression	0.023441	Akaike info criterion	-4.663136
Sum squared resid	0.297276	Schwarz criterion	-4.639429
Log likelihood	1271.373	Hannan-Quinn criter.	-4.653867
F-statistic	1214.064	Durbin-Watson stat	1.831440
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/15/18 Time: 23:29
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.005824	0.001289	-4.518164	0.0000
_RM_RF_	0.944677	0.012982	72.76633	0.0000

R-squared	0.724546	Mean dependent var	-0.097739
Adjusted R-squared	0.724409	S.D. dependent var	0.021962
S.E. of regression	0.011530	Akaike info criterion	-6.086822
Sum squared resid	0.267587	Schwarz criterion	-6.081255
Log likelihood	6134.473	Hannan-Quinn criter.	-6.084779
F-statistic	5294.939	Durbin-Watson stat	1.926489
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

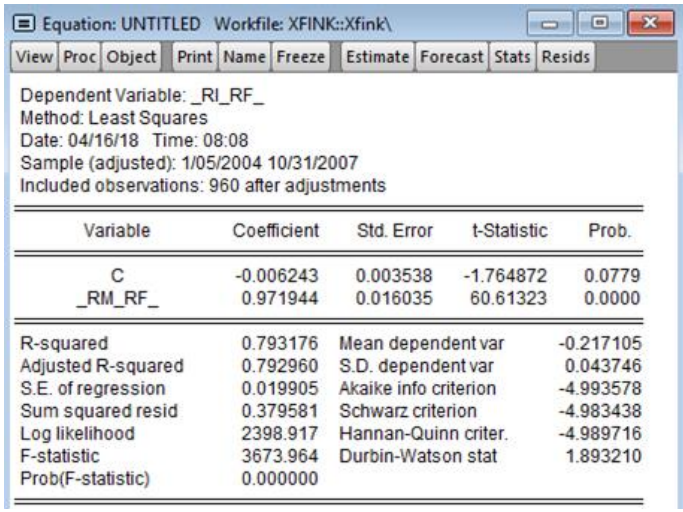
View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/15/18 Time: 23:28
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.019990	0.003898	-5.128417	0.0000
_RM_RF_	0.640649	0.080035	8.004651	0.0000
_RM_RF_^2	-1.563684	0.406221	-3.849344	0.0001

R-squared	0.726560	Mean dependent var	-0.097739
Adjusted R-squared	0.726288	S.D. dependent var	0.021962
S.E. of regression	0.011490	Akaike info criterion	-6.093167
Sum squared resid	0.265631	Schwarz criterion	-6.084817
Log likelihood	6141.866	Hannan-Quinn criter.	-6.090102
F-statistic	2673.051	Durbin-Watson stat	1.931247
Prob(F-statistic)	0.000000		

APPENDIX 4: XFINK



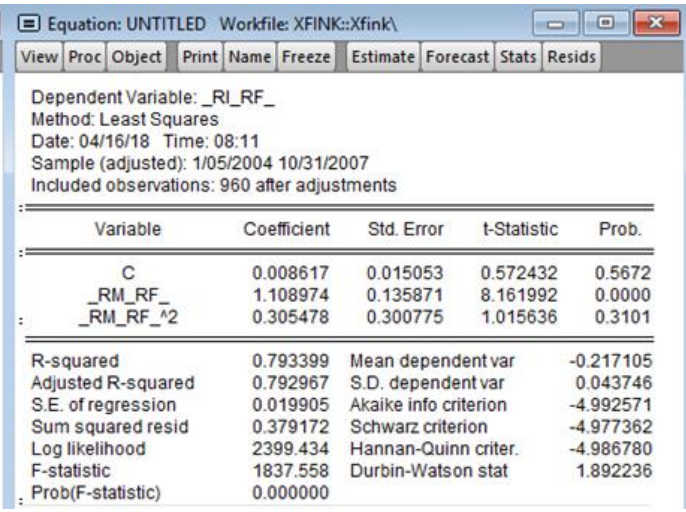
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 08:08
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 960 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.006243	0.003538	-1.764872	0.0779
_RM_RF_	0.971944	0.016035	60.61323	0.0000

R-squared	0.793176	Mean dependent var	-0.217105
Adjusted R-squared	0.792960	S.D. dependent var	0.043746
S.E. of regression	0.019905	Akaike info criterion	-4.993578
Sum squared resid	0.379581	Schwarz criterion	-4.983438
Log likelihood	2398.917	Hannan-Quinn criter.	-4.989716
F-statistic	3673.964	Durbin-Watson stat	1.893210
Prob(F-statistic)	0.000000		



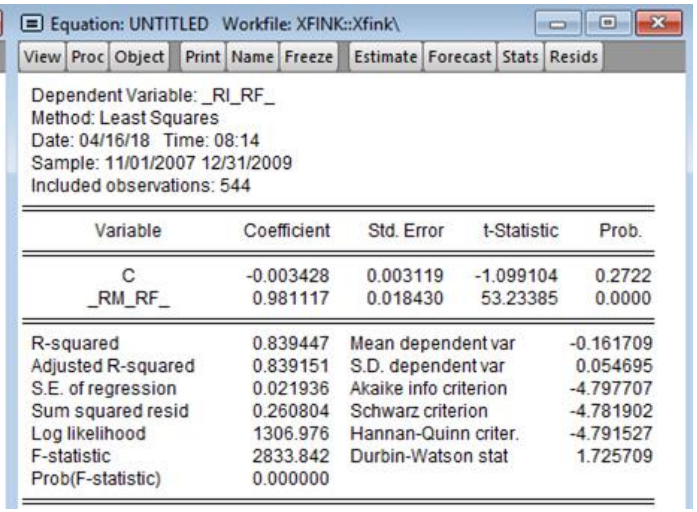
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 08:11
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 960 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.008617	0.015053	0.572432	0.5672
_RM_RF_	1.108974	0.135871	8.161992	0.0000
_RM_RF_^2	0.305478	0.300775	1.015636	0.3101

R-squared	0.793399	Mean dependent var	-0.217105
Adjusted R-squared	0.792967	S.D. dependent var	0.043746
S.E. of regression	0.019905	Akaike info criterion	-4.992571
Sum squared resid	0.379172	Schwarz criterion	-4.977362
Log likelihood	2399.434	Hannan-Quinn criter.	-4.986780
F-statistic	1837.558	Durbin-Watson stat	1.892236
Prob(F-statistic)	0.000000		



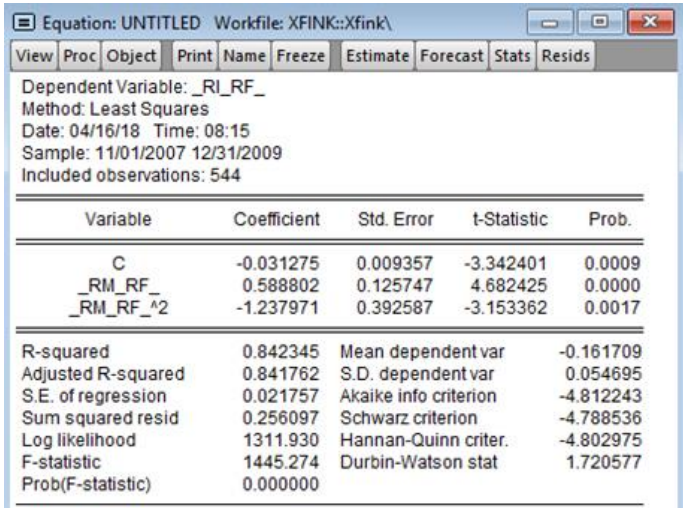
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 08:14
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.003428	0.003119	-1.099104	0.2722
_RM_RF_	0.981117	0.018430	53.23385	0.0000

R-squared	0.839447	Mean dependent var	-0.161709
Adjusted R-squared	0.839151	S.D. dependent var	0.054695
S.E. of regression	0.021936	Akaike info criterion	-4.797707
Sum squared resid	0.260804	Schwarz criterion	-4.781902
Log likelihood	1306.976	Hannan-Quinn criter.	-4.791527
F-statistic	2833.842	Durbin-Watson stat	1.725709
Prob(F-statistic)	0.000000		



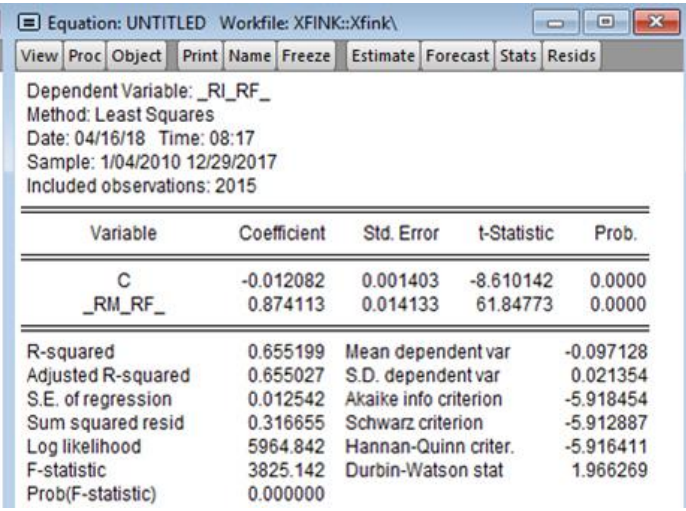
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 08:15
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.031275	0.009357	-3.342401	0.0009
_RM_RF_	0.588802	0.125747	4.682425	0.0000
_RM_RF_^2	-1.237971	0.392587	-3.153362	0.0017

R-squared	0.842345	Mean dependent var	-0.161709
Adjusted R-squared	0.841762	S.D. dependent var	0.054695
S.E. of regression	0.021757	Akaike info criterion	-4.812243
Sum squared resid	0.256097	Schwarz criterion	-4.788536
Log likelihood	1311.930	Hannan-Quinn criter.	-4.802975
F-statistic	1445.274	Durbin-Watson stat	1.720577
Prob(F-statistic)	0.000000		



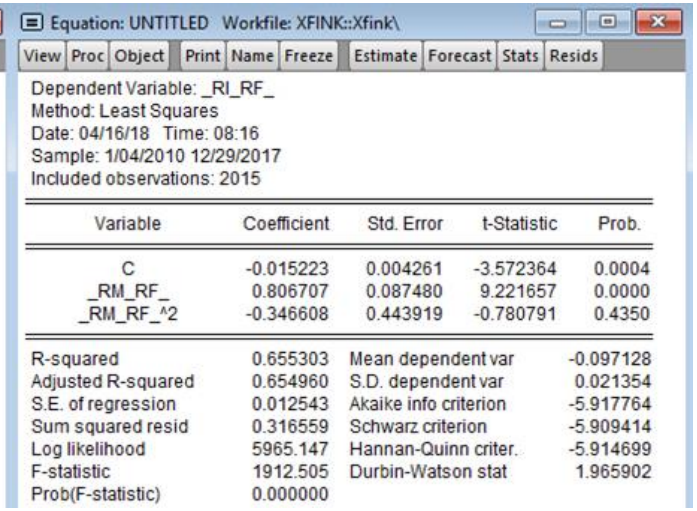
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 08:17
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.012082	0.001403	-8.610142	0.0000
_RM_RF_	0.874113	0.014133	61.84773	0.0000

R-squared	0.655199	Mean dependent var	-0.097128
Adjusted R-squared	0.655027	S.D. dependent var	0.021354
S.E. of regression	0.012542	Akaike info criterion	-5.918454
Sum squared resid	0.316655	Schwarz criterion	-5.912887
Log likelihood	5964.842	Hannan-Quinn criter.	-5.916411
F-statistic	3825.142	Durbin-Watson stat	1.966269
Prob(F-statistic)	0.000000		



Equation: UNTITLED Workfile: XFINK::Xfink\

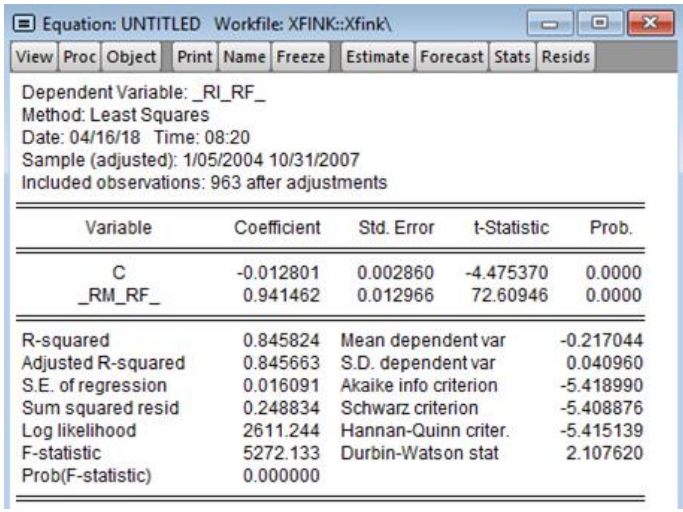
View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 08:16
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.015223	0.004261	-3.572364	0.0004
_RM_RF_	0.806707	0.087480	9.221657	0.0000
_RM_RF_^2	-0.346608	0.443919	-0.780791	0.4350

R-squared	0.655303	Mean dependent var	-0.097128
Adjusted R-squared	0.654960	S.D. dependent var	0.021354
S.E. of regression	0.012543	Akaike info criterion	-5.917764
Sum squared resid	0.316559	Schwarz criterion	-5.909414
Log likelihood	5965.147	Hannan-Quinn criter.	-5.914699
F-statistic	1912.505	Durbin-Watson stat	1.965902
Prob(F-statistic)	0.000000		

APPENDIX 5: XGIDA



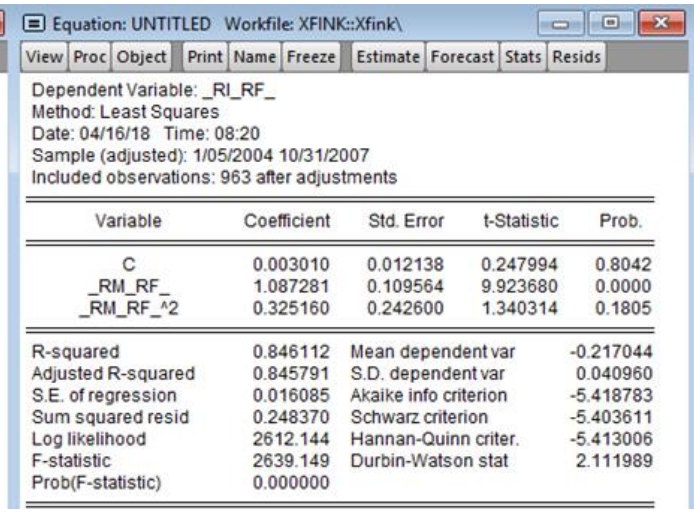
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 08:20
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.012801	0.002860	-4.475370	0.0000
_RM_RF_	0.941462	0.012966	72.60946	0.0000

R-squared	0.845824	Mean dependent var	-0.217044
Adjusted R-squared	0.845663	S.D. dependent var	0.040960
S.E. of regression	0.016091	Akaike info criterion	-5.418990
Sum squared resid	0.248834	Schwarz criterion	-5.408876
Log likelihood	2611.244	Hannan-Quinn criter.	-5.415139
F-statistic	5272.133	Durbin-Watson stat	2.107620
Prob(F-statistic)	0.000000		



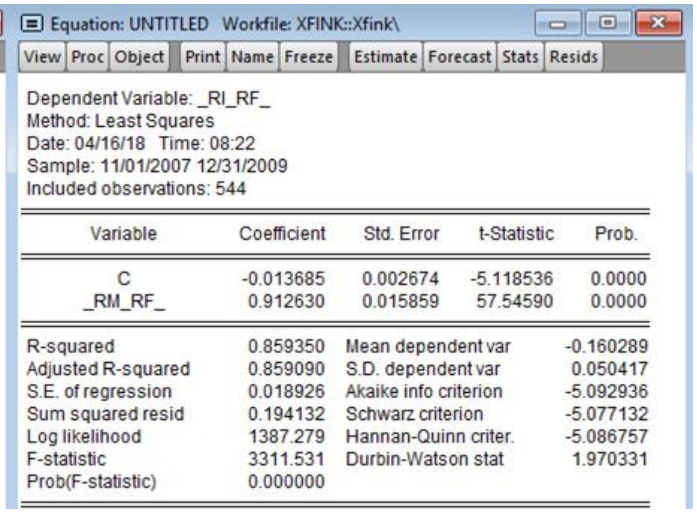
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 08:20
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.003010	0.012138	0.247994	0.8042
_RM_RF_	1.087281	0.109564	9.923680	0.0000
_RM_RF_^2	0.325160	0.242600	1.340314	0.1805

R-squared	0.846112	Mean dependent var	-0.217044
Adjusted R-squared	0.845791	S.D. dependent var	0.040960
S.E. of regression	0.016085	Akaike info criterion	-5.418783
Sum squared resid	0.248370	Schwarz criterion	-5.403611
Log likelihood	2612.144	Hannan-Quinn criter.	-5.413006
F-statistic	2639.149	Durbin-Watson stat	2.111989
Prob(F-statistic)	0.000000		



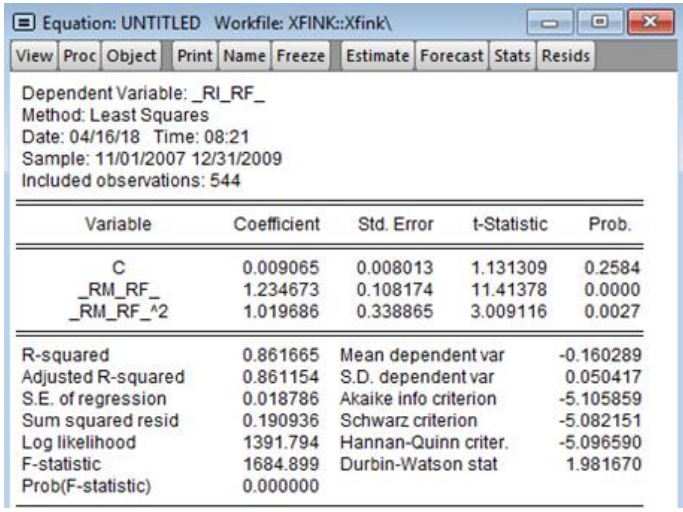
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 08:22
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.013685	0.002674	-5.118536	0.0000
_RM_RF_	0.912630	0.015859	57.54590	0.0000

R-squared	0.859350	Mean dependent var	-0.160289
Adjusted R-squared	0.859090	S.D. dependent var	0.050417
S.E. of regression	0.018926	Akaike info criterion	-5.092936
Sum squared resid	0.194132	Schwarz criterion	-5.077132
Log likelihood	1387.279	Hannan-Quinn criter.	-5.086757
F-statistic	3311.531	Durbin-Watson stat	1.970331
Prob(F-statistic)	0.000000		



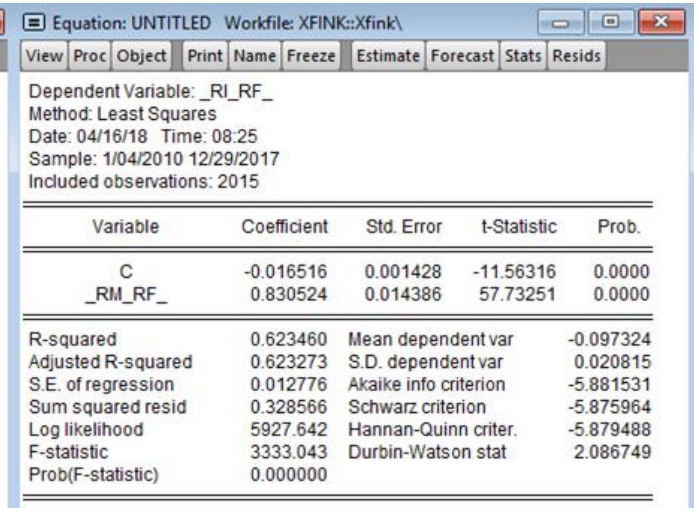
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 08:21
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.009065	0.008013	1.131309	0.2584
_RM_RF_	1.234673	0.108174	11.41378	0.0000
_RM_RF_^2	1.019686	0.338865	3.009116	0.0027

R-squared	0.861665	Mean dependent var	-0.160289
Adjusted R-squared	0.861154	S.D. dependent var	0.050417
S.E. of regression	0.018786	Akaike info criterion	-5.105859
Sum squared resid	0.190936	Schwarz criterion	-5.082151
Log likelihood	1391.794	Hannan-Quinn criter.	-5.096590
F-statistic	1684.899	Durbin-Watson stat	1.981670
Prob(F-statistic)	0.000000		



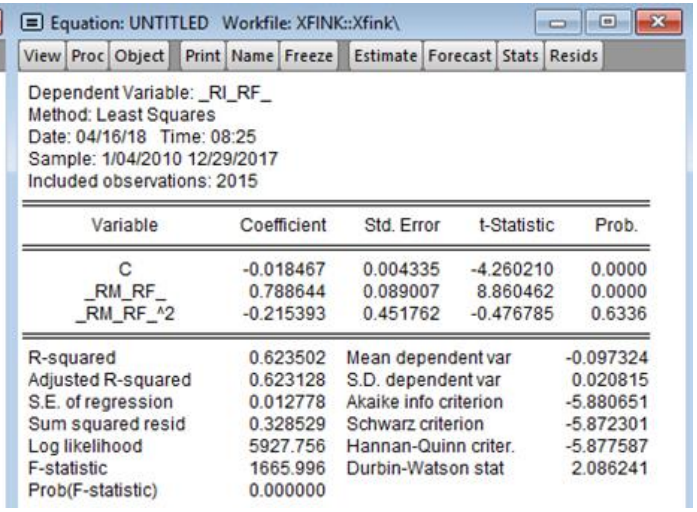
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 08:25
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.016516	0.001428	-11.56316	0.0000
_RM_RF_	0.830524	0.014386	57.73251	0.0000

R-squared	0.623460	Mean dependent var	-0.097324
Adjusted R-squared	0.623273	S.D. dependent var	0.020815
S.E. of regression	0.012776	Akaike info criterion	-5.881531
Sum squared resid	0.328566	Schwarz criterion	-5.875964
Log likelihood	5927.642	Hannan-Quinn criter.	-5.879488
F-statistic	3333.043	Durbin-Watson stat	2.086749
Prob(F-statistic)	0.000000		



Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 08:25
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.018467	0.004335	-4.260210	0.0000
_RM_RF_	0.788644	0.089007	8.860462	0.0000
_RM_RF_^2	-0.215393	0.451762	-0.476785	0.6336

R-squared	0.623502	Mean dependent var	-0.097324
Adjusted R-squared	0.623128	S.D. dependent var	0.020815
S.E. of regression	0.012778	Akaike info criterion	-5.880651
Sum squared resid	0.328529	Schwarz criterion	-5.872301
Log likelihood	5927.756	Hannan-Quinn criter.	-5.877587
F-statistic	1665.996	Durbin-Watson stat	2.086241
Prob(F-statistic)	0.000000		

APPENDIX 6: XGMYO

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 08:37
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.009319	0.002183	-4.268840	0.0000
_RM_RF_	0.957883	0.009896	96.79437	0.0000

R-squared	0.906971	Mean dependent var	-0.217125
Adjusted R-squared	0.906875	S.D. dependent var	0.040245
S.E. of regression	0.012281	Akaike info criterion	-5.959394
Sum squared resid	0.144949	Schwarz criterion	-5.949279
Log likelihood	2871.448	Hannan-Quinn criter.	-5.955542
F-statistic	9369.150	Durbin-Watson stat	1.947091
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 08:38
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.016410	0.009270	-1.770228	0.0770
_RM_RF_	0.892490	0.083673	10.66634	0.0000
_RM_RF_^2	-0.145819	0.185272	-0.787052	0.4314

R-squared	0.907031	Mean dependent var	-0.217125
Adjusted R-squared	0.906838	S.D. dependent var	0.040245
S.E. of regression	0.012284	Akaike info criterion	-5.957962
Sum squared resid	0.144856	Schwarz criterion	-5.942790
Log likelihood	2871.759	Hannan-Quinn criter.	-5.952185
F-statistic	4683.030	Durbin-Watson stat	1.941935
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 08:42
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.006504	0.001916	-3.394916	0.0007
_RM_RF_	0.962127	0.011365	84.66064	0.0000

R-squared	0.929696	Mean dependent var	-0.161059
Adjusted R-squared	0.929567	S.D. dependent var	0.051101
S.E. of regression	0.013562	Akaike info criterion	-5.759442
Sum squared resid	0.099687	Schwarz criterion	-5.743637
Log likelihood	1568.568	Hannan-Quinn criter.	-5.753263
F-statistic	7167.425	Durbin-Watson stat	1.871471
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 08:41
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.009040	0.005746	1.573171	0.1163
_RM_RF_	1.182164	0.077575	15.23896	0.0000
_RM_RF_^2	0.696705	0.243012	2.866958	0.0043

R-squared	0.930749	Mean dependent var	-0.161059
Adjusted R-squared	0.930493	S.D. dependent var	0.051101
S.E. of regression	0.013472	Akaike info criterion	-5.770844
Sum squared resid	0.098195	Schwarz criterion	-5.747137
Log likelihood	1572.670	Hannan-Quinn criter.	-5.761575
F-statistic	3635.557	Durbin-Watson stat	1.845816
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 08:43
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.003690	0.001054	-3.500812	0.0005
_RM_RF_	0.963928	0.010616	90.79879	0.0000

R-squared	0.803752	Mean dependent var	-0.097478
Adjusted R-squared	0.803654	S.D. dependent var	0.021277
S.E. of regression	0.009428	Akaike info criterion	-6.489261
Sum squared resid	0.178932	Schwarz criterion	-6.483694
Log likelihood	6539.930	Hannan-Quinn criter.	-6.487218
F-statistic	8244.420	Durbin-Watson stat	1.980500
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

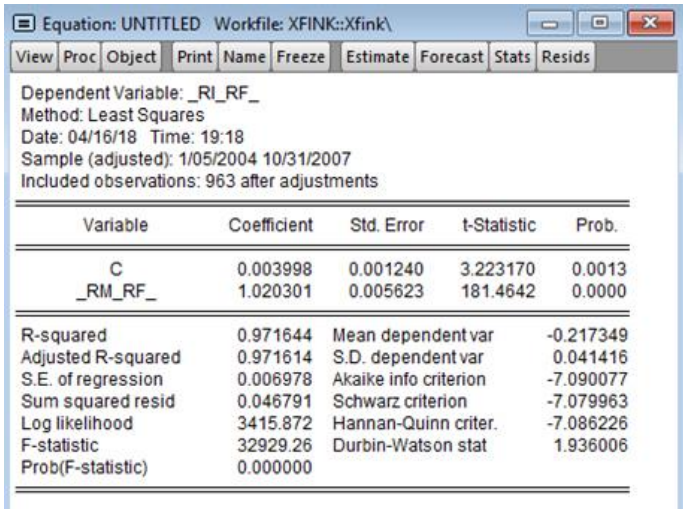
View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 08:44
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.020026	0.003176	-6.305666	0.0000
_RM_RF_	0.613339	0.065208	9.405859	0.0000
_RM_RF_^2	-1.803153	0.330969	-5.448103	0.0000

R-squared	0.806605	Mean dependent var	-0.097478
Adjusted R-squared	0.806413	S.D. dependent var	0.021277
S.E. of regression	0.009362	Akaike info criterion	-6.502913
Sum squared resid	0.176331	Schwarz criterion	-6.494563
Log likelihood	6554.685	Hannan-Quinn criter.	-6.499848
F-statistic	4195.786	Durbin-Watson stat	1.974197
Prob(F-statistic)	0.000000		

APPENDIX 7: XHOLD



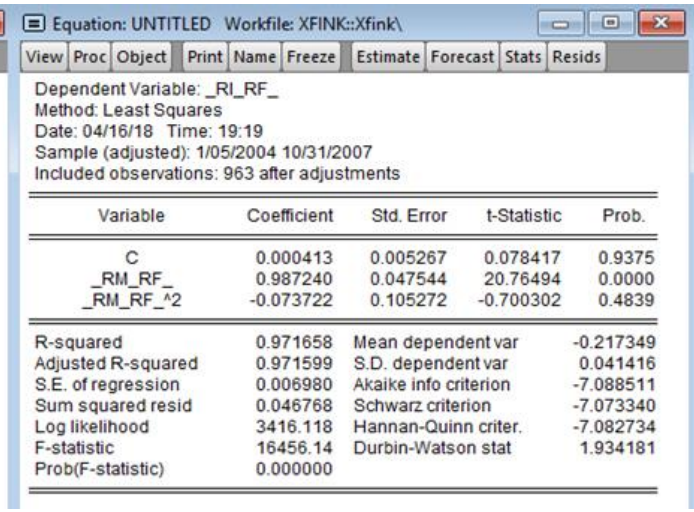
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 19:18
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.003998	0.001240	3.223170	0.0013
_RM_RF_	1.020301	0.005623	181.4642	0.0000

R-squared	0.971644	Mean dependent var	-0.217349
Adjusted R-squared	0.971614	S.D. dependent var	0.041416
S.E. of regression	0.006978	Akaike info criterion	-7.090077
Sum squared resid	0.046791	Schwarz criterion	-7.079963
Log likelihood	3415.872	Hannan-Quinn criter.	-7.086226
F-statistic	32929.26	Durbin-Watson stat	1.936006
Prob(F-statistic)	0.000000		



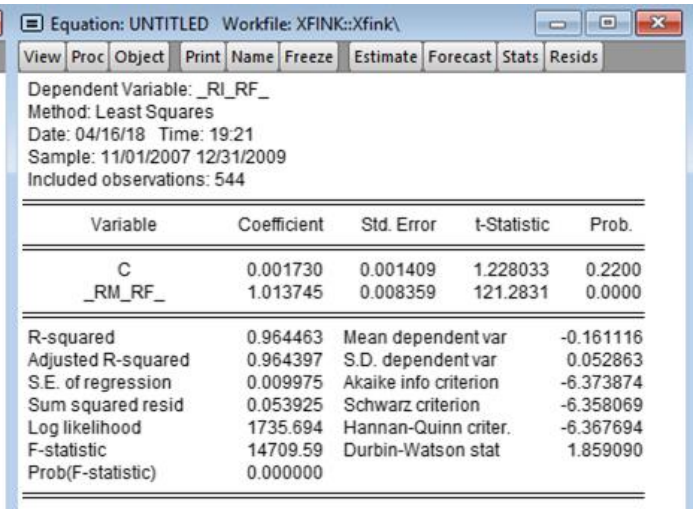
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 19:19
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000413	0.005267	0.078417	0.9375
_RM_RF_	0.987240	0.047544	20.76494	0.0000
_RM_RF_^2	-0.073722	0.105272	-0.700302	0.4839

R-squared	0.971658	Mean dependent var	-0.217349
Adjusted R-squared	0.971599	S.D. dependent var	0.041416
S.E. of regression	0.006980	Akaike info criterion	-7.088511
Sum squared resid	0.046768	Schwarz criterion	-7.073340
Log likelihood	3416.118	Hannan-Quinn criter.	-7.082734
F-statistic	16456.14	Durbin-Watson stat	1.934181
Prob(F-statistic)	0.000000		



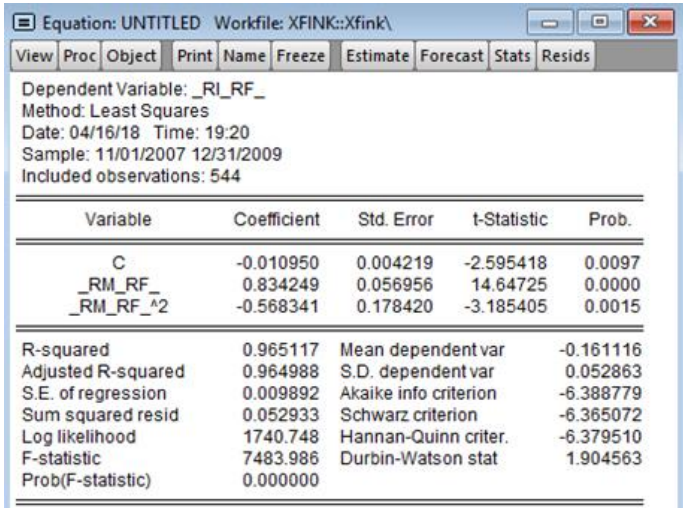
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 19:21
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.001730	0.001409	1.228033	0.2200
_RM_RF_	1.013745	0.008359	121.2831	0.0000

R-squared	0.964463	Mean dependent var	-0.161116
Adjusted R-squared	0.964397	S.D. dependent var	0.052863
S.E. of regression	0.009975	Akaike info criterion	-6.373874
Sum squared resid	0.053925	Schwarz criterion	-6.358069
Log likelihood	1735.694	Hannan-Quinn criter.	-6.367694
F-statistic	14709.59	Durbin-Watson stat	1.859090
Prob(F-statistic)	0.000000		



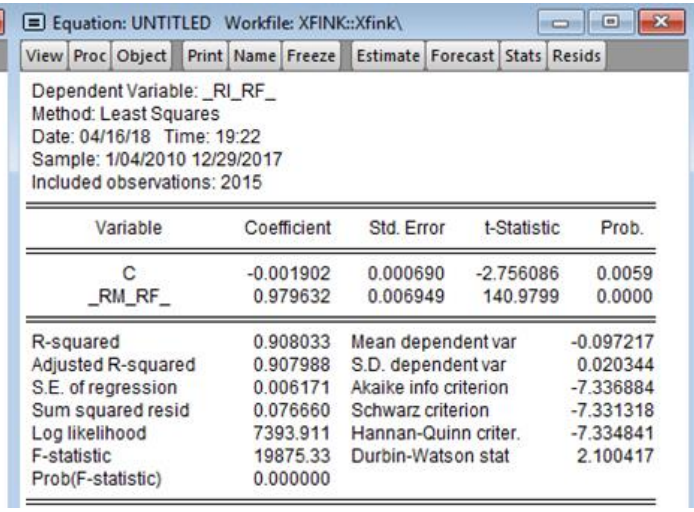
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 19:20
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.010950	0.004219	-2.595418	0.0097
_RM_RF_	0.834249	0.056956	14.64725	0.0000
_RM_RF_^2	-0.568341	0.178420	-3.185405	0.0015

R-squared	0.965117	Mean dependent var	-0.161116
Adjusted R-squared	0.964988	S.D. dependent var	0.052863
S.E. of regression	0.009892	Akaike info criterion	-6.388779
Sum squared resid	0.052933	Schwarz criterion	-6.365072
Log likelihood	1740.748	Hannan-Quinn criter.	-6.379510
F-statistic	7483.986	Durbin-Watson stat	1.904563
Prob(F-statistic)	0.000000		



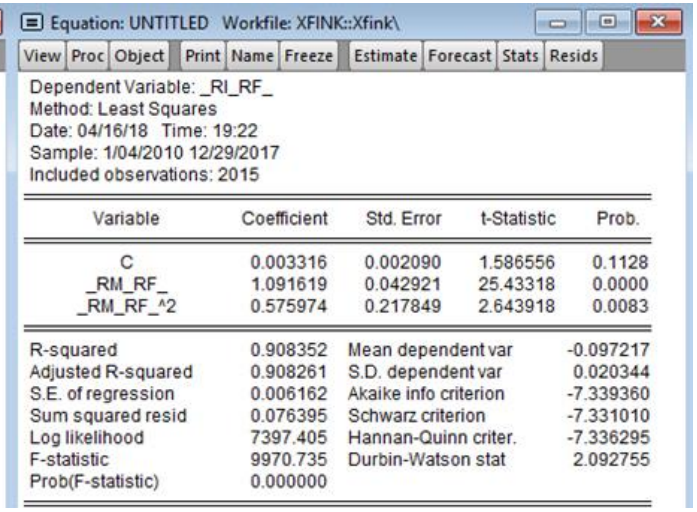
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 19:22
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.001902	0.000690	-2.756086	0.0059
_RM_RF_	0.979632	0.006949	140.9799	0.0000

R-squared	0.908033	Mean dependent var	-0.097217
Adjusted R-squared	0.907988	S.D. dependent var	0.020344
S.E. of regression	0.006171	Akaike info criterion	-7.336884
Sum squared resid	0.076660	Schwarz criterion	-7.331318
Log likelihood	7393.911	Hannan-Quinn criter.	-7.334841
F-statistic	19875.33	Durbin-Watson stat	2.100417
Prob(F-statistic)	0.000000		



Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 19:22
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.003316	0.002090	1.586556	0.1128
_RM_RF_	1.091619	0.042921	25.43318	0.0000
_RM_RF_^2	0.575974	0.217849	2.643918	0.0083

R-squared	0.908352	Mean dependent var	-0.097217
Adjusted R-squared	0.908261	S.D. dependent var	0.020344
S.E. of regression	0.006162	Akaike info criterion	-7.339360
Sum squared resid	0.076395	Schwarz criterion	-7.331010
Log likelihood	7397.405	Hannan-Quinn criter.	-7.336295
F-statistic	9970.735	Durbin-Watson stat	2.092755
Prob(F-statistic)	0.000000		

APPENDIX 8: XILTM

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 19:27
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.001036	0.003283	-0.315683	0.7523
_RM_RF_	0.994643	0.014884	66.82757	0.0000

R-squared	0.822920	Mean dependent var	-0.216817
Adjusted R-squared	0.822736	S.D. dependent var	0.043872
S.E. of regression	0.018471	Akaike info criterion	-5.143131
Sum squared resid	0.327880	Schwarz criterion	-5.133017
Log likelihood	2478.418	Hannan-Quinn criter.	-5.139280
F-statistic	4465.924	Durbin-Watson stat	1.928354
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 19:28
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.010604	0.013941	0.760658	0.4470
_RM_RF_	1.102001	0.125838	8.757332	0.0000
_RM_RF_^2	0.239396	0.278633	0.859182	0.3905

R-squared	0.823056	Mean dependent var	-0.216817
Adjusted R-squared	0.822687	S.D. dependent var	0.043872
S.E. of regression	0.018474	Akaike info criterion	-5.141823
Sum squared resid	0.327628	Schwarz criterion	-5.126651
Log likelihood	2478.788	Hannan-Quinn criter.	-5.136046
F-statistic	2232.723	Durbin-Watson stat	1.925665
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 19:30
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.011085	0.002757	-4.020176	0.0001
_RM_RF_	0.931132	0.016355	56.93198	0.0000

R-squared	0.856737	Mean dependent var	-0.160660
Adjusted R-squared	0.856473	S.D. dependent var	0.051518
S.E. of regression	0.019517	Akaike info criterion	-5.031345
Sum squared resid	0.206465	Schwarz criterion	-5.015540
Log likelihood	1370.526	Hannan-Quinn criter.	-5.025166
F-statistic	3241.250	Durbin-Watson stat	1.952292
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 19:30
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.003560	0.008305	0.428595	0.6684
_RM_RF_	1.138433	0.112125	10.15322	0.0000
_RM_RF_^2	0.656380	0.351244	1.868730	0.0622

R-squared	0.857656	Mean dependent var	-0.160660
Adjusted R-squared	0.857130	S.D. dependent var	0.051518
S.E. of regression	0.019473	Akaike info criterion	-5.034103
Sum squared resid	0.205141	Schwarz criterion	-5.010395
Log likelihood	1372.276	Hannan-Quinn criter.	-5.024834
F-statistic	1629.823	Durbin-Watson stat	1.982385
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 19:32
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.014455	0.001339	-10.79797	0.0000
_RM_RF_	0.853600	0.013483	63.30979	0.0000

R-squared	0.665677	Mean dependent var	-0.097509
Adjusted R-squared	0.665511	S.D. dependent var	0.020704
S.E. of regression	0.011974	Akaike info criterion	-6.011156
Sum squared resid	0.288620	Schwarz criterion	-6.005590
Log likelihood	6058.240	Hannan-Quinn criter.	-6.009113
F-statistic	4008.129	Durbin-Watson stat	1.941903
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 19:33
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.016251	0.004063	-3.999814	0.0001
_RM_RF_	0.815069	0.083421	9.770497	0.0000
_RM_RF_^2	-0.198172	0.423412	-0.468036	0.6398

R-squared	0.665714	Mean dependent var	-0.097509
Adjusted R-squared	0.665381	S.D. dependent var	0.020704
S.E. of regression	0.011976	Akaike info criterion	-6.010273
Sum squared resid	0.288589	Schwarz criterion	-6.001923
Log likelihood	6058.350	Hannan-Quinn criter.	-6.007208
F-statistic	2003.397	Durbin-Watson stat	1.941005
Prob(F-statistic)	0.000000		

APPENDIX 9: XKAGT

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 19:36
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.004444	0.002133	-2.083971	0.0374
_RM_RF_	0.981733	0.009667	101.5516	0.0000

R-squared	0.914758	Mean dependent var	-0.217424
Adjusted R-squared	0.914669	S.D. dependent var	0.041071
S.E. of regression	0.011998	Akaike info criterion	-6.006162
Sum squared resid	0.138326	Schwarz criterion	-5.996048
Log likelihood	2893.967	Hannan-Quinn criter.	-6.002311
F-statistic	10312.73	Durbin-Watson stat	1.995999
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 19:37
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.014211	0.009053	-1.569874	0.1168
_RM_RF_	0.891654	0.081713	10.91196	0.0000
_RM_RF_^2	-0.200866	0.180932	-1.110174	0.2672

R-squared	0.914867	Mean dependent var	-0.217424
Adjusted R-squared	0.914690	S.D. dependent var	0.041071
S.E. of regression	0.011996	Akaike info criterion	-6.005368
Sum squared resid	0.138149	Schwarz criterion	-5.990197
Log likelihood	2894.585	Hannan-Quinn criter.	-5.999592
F-statistic	5158.230	Durbin-Watson stat	2.001069
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 19:38
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.008474	0.002271	-3.730955	0.0002
_RM_RF_	0.949309	0.013472	70.46352	0.0000

R-squared	0.901582	Mean dependent var	-0.160969
Adjusted R-squared	0.901400	S.D. dependent var	0.051200
S.E. of regression	0.016077	Akaike info criterion	-5.419155
Sum squared resid	0.140095	Schwarz criterion	-5.403350
Log likelihood	1476.010	Hannan-Quinn criter.	-5.412976
F-statistic	4965.108	Durbin-Watson stat	1.744992
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 19:38
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.002150	0.006846	0.314060	0.7536
_RM_RF_	1.099701	0.092429	11.89785	0.0000
_RM_RF_^2	0.476189	0.289542	1.644631	0.1006

R-squared	0.902071	Mean dependent var	-0.160969
Adjusted R-squared	0.901709	S.D. dependent var	0.051200
S.E. of regression	0.016052	Akaike info criterion	-5.420466
Sum squared resid	0.139398	Schwarz criterion	-5.396758
Log likelihood	1477.367	Hannan-Quinn criter.	-5.411197
F-statistic	2491.715	Durbin-Watson stat	1.755049
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 19:40
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.009213	0.001228	-7.504711	0.0000
_RM_RF_	0.906271	0.012364	73.29709	0.0000

R-squared	0.727438	Mean dependent var	-0.097391
Adjusted R-squared	0.727302	S.D. dependent var	0.021028
S.E. of regression	0.010981	Akaike info criterion	-6.184367
Sum squared resid	0.242718	Schwarz criterion	-6.178801
Log likelihood	6232.750	Hannan-Quinn criter.	-6.182324
F-statistic	5372.463	Durbin-Watson stat	1.858443
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 19:40
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.020300	0.003717	-5.461743	0.0000
_RM_RF_	0.668325	0.076316	8.757362	0.0000
_RM_RF_^2	-1.223806	0.387346	-3.159462	0.0016

R-squared	0.728783	Mean dependent var	-0.097391
Adjusted R-squared	0.728514	S.D. dependent var	0.021028
S.E. of regression	0.010956	Akaike info criterion	-6.188324
Sum squared resid	0.241520	Schwarz criterion	-6.179974
Log likelihood	6237.736	Hannan-Quinn criter.	-6.185259
F-statistic	2703.209	Durbin-Watson stat	1.857793
Prob(F-statistic)	0.000000		

APPENDIX 10: XKMYA

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 20:10
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.006019	0.002027	-2.969056	0.0031
_RM_RF_	0.973323	0.009189	105.9219	0.0000

R-squared	0.921103	Mean dependent var	-0.217174
Adjusted R-squared	0.921021	S.D. dependent var	0.040579
S.E. of regression	0.011404	Akaike info criterion	-6.107639
Sum squared resid	0.124978	Schwarz criterion	-6.097525
Log likelihood	2942.828	Hannan-Quinn criter.	-6.103788
F-statistic	11219.44	Durbin-Watson stat	1.896585
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 20:11
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000572	0.008607	0.066472	0.9470
_RM_RF_	1.034106	0.077696	13.30971	0.0000
_RM_RF_^2	0.135540	0.172036	0.787861	0.4310

R-squared	0.921154	Mean dependent var	-0.217174
Adjusted R-squared	0.920990	S.D. dependent var	0.040579
S.E. of regression	0.011406	Akaike info criterion	-6.106209
Sum squared resid	0.124897	Schwarz criterion	-6.091037
Log likelihood	2943.139	Hannan-Quinn criter.	-6.100432
F-statistic	5607.817	Durbin-Watson stat	1.896342
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 20:17
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.004931	0.001834	-2.687782	0.0074
_RM_RF_	0.969235	0.010881	89.07582	0.0000

R-squared	0.936059	Mean dependent var	-0.160627
Adjusted R-squared	0.935941	S.D. dependent var	0.051303
S.E. of regression	0.012985	Akaike info criterion	-5.846395
Sum squared resid	0.091385	Schwarz criterion	-5.830590
Log likelihood	1592.219	Hannan-Quinn criter.	-5.840216
F-statistic	7934.502	Durbin-Watson stat	1.815351
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 20:16
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.008134	0.005541	-1.467780	0.1427
_RM_RF_	0.923893	0.074811	12.34972	0.0000
_RM_RF_^2	-0.143567	0.234353	-0.612609	0.5404

R-squared	0.936103	Mean dependent var	-0.160627
Adjusted R-squared	0.935867	S.D. dependent var	0.051303
S.E. of regression	0.012992	Akaike info criterion	-5.843412
Sum squared resid	0.091321	Schwarz criterion	-5.819704
Log likelihood	1592.408	Hannan-Quinn criter.	-5.834143
F-statistic	3962.866	Durbin-Watson stat	1.813536
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 20:18
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.007063	0.001048	-6.738444	0.0000
_RM_RF_	0.924451	0.010557	87.56950	0.0000

R-squared	0.792076	Mean dependent var	-0.097010
Adjusted R-squared	0.791973	S.D. dependent var	0.020556
S.E. of regression	0.009375	Akaike info criterion	-6.500467
Sum squared resid	0.176938	Schwarz criterion	-6.494901
Log likelihood	6551.221	Hannan-Quinn criter.	-6.498424
F-statistic	7668.418	Durbin-Watson stat	1.918563
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

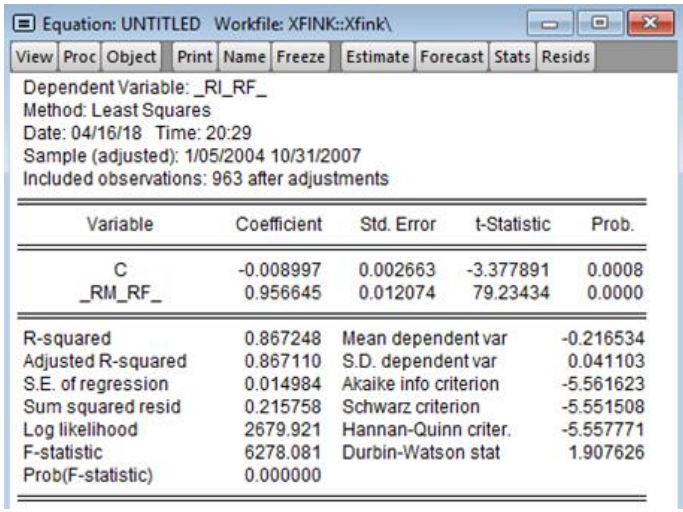
View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 20:19
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.010223	0.003180	-3.214251	0.0013
_RM_RF_	0.856642	0.065302	13.11806	0.0000
_RM_RF_^2	-0.348759	0.331447	-1.052232	0.2928

R-squared	0.792190	Mean dependent var	-0.097010
Adjusted R-squared	0.791984	S.D. dependent var	0.020556
S.E. of regression	0.009375	Akaike info criterion	-6.500025
Sum squared resid	0.176841	Schwarz criterion	-6.491675
Log likelihood	6551.775	Hannan-Quinn criter.	-6.496960
F-statistic	3834.967	Durbin-Watson stat	1.917949
Prob(F-statistic)	0.000000		

APPENDIX 11: XMANA



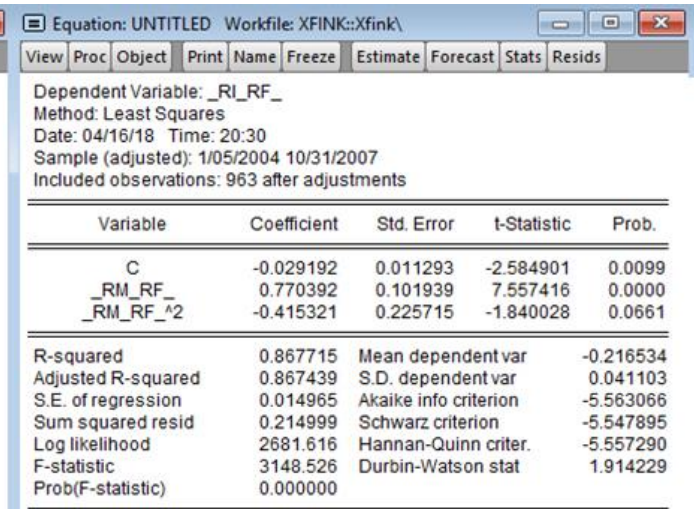
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 20:29
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.008997	0.002663	-3.377891	0.0008
_RM_RF_	0.956645	0.012074	79.23434	0.0000

R-squared	0.867248	Mean dependent var	-0.216534
Adjusted R-squared	0.867110	S.D. dependent var	0.041103
S.E. of regression	0.014984	Akaike info criterion	-5.561623
Sum squared resid	0.215758	Schwarz criterion	-5.551508
Log likelihood	2679.921	Hannan-Quinn criter.	-5.557771
F-statistic	6278.081	Durbin-Watson stat	1.907626
Prob(F-statistic)	0.000000		



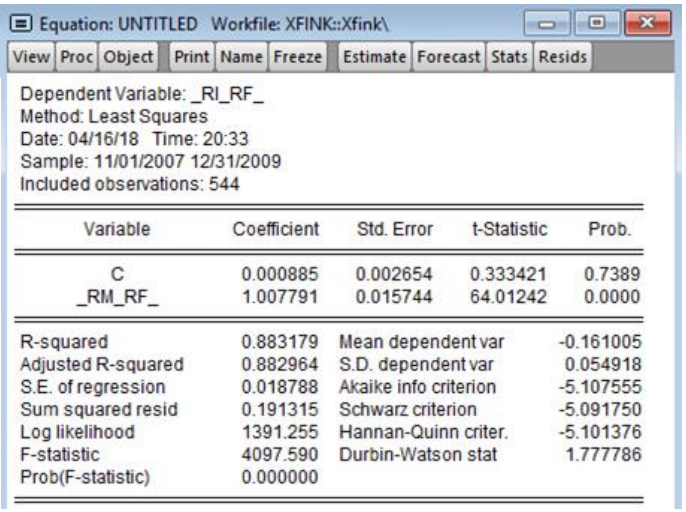
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 20:30
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.029192	0.011293	-2.584901	0.0099
_RM_RF_	0.770392	0.101939	7.557416	0.0000
_RM_RF_^2	-0.415321	0.225715	-1.840028	0.0661

R-squared	0.867715	Mean dependent var	-0.216534
Adjusted R-squared	0.867439	S.D. dependent var	0.041103
S.E. of regression	0.014965	Akaike info criterion	-5.563066
Sum squared resid	0.214999	Schwarz criterion	-5.547895
Log likelihood	2681.616	Hannan-Quinn criter.	-5.557290
F-statistic	3148.526	Durbin-Watson stat	1.914229
Prob(F-statistic)	0.000000		



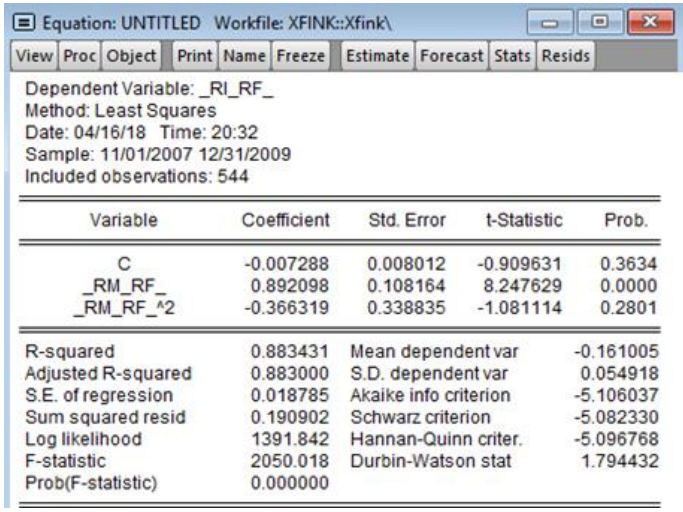
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 20:33
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000885	0.002654	0.333421	0.7389
_RM_RF_	1.007791	0.015744	64.01242	0.0000

R-squared	0.883179	Mean dependent var	-0.161005
Adjusted R-squared	0.882964	S.D. dependent var	0.054918
S.E. of regression	0.018788	Akaike info criterion	-5.107555
Sum squared resid	0.191315	Schwarz criterion	-5.091750
Log likelihood	1391.255	Hannan-Quinn criter.	-5.101376
F-statistic	4097.590	Durbin-Watson stat	1.777786
Prob(F-statistic)	0.000000		



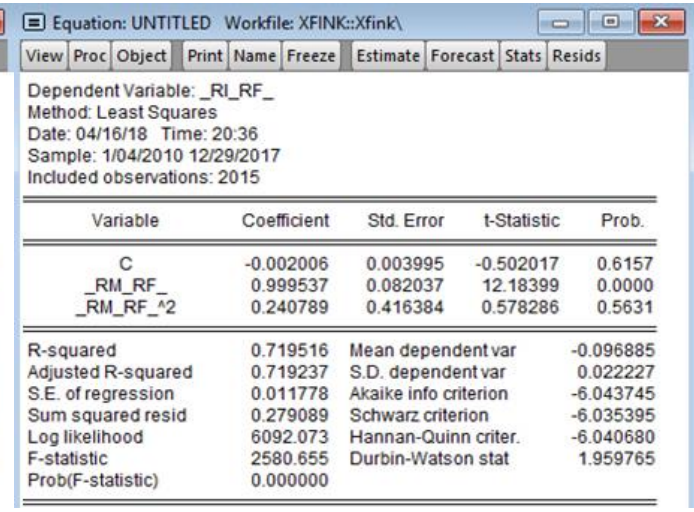
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 20:32
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.007288	0.008012	-0.909631	0.3634
_RM_RF_	0.892098	0.108164	8.247629	0.0000
_RM_RF_^2	-0.366319	0.338835	-1.081114	0.2801

R-squared	0.883431	Mean dependent var	-0.161005
Adjusted R-squared	0.883000	S.D. dependent var	0.054918
S.E. of regression	0.018785	Akaike info criterion	-5.106037
Sum squared resid	0.190902	Schwarz criterion	-5.082330
Log likelihood	1391.842	Hannan-Quinn criter.	-5.096768
F-statistic	2050.018	Durbin-Watson stat	1.794432
Prob(F-statistic)	0.000000		



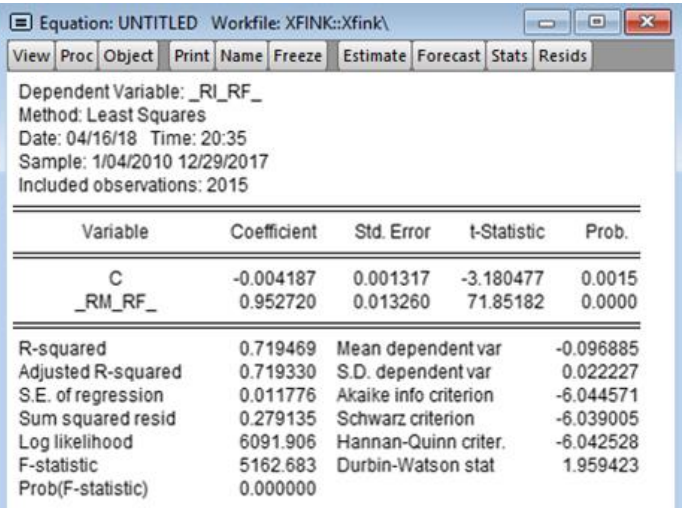
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 20:36
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.002006	0.003995	-0.502017	0.6157
_RM_RF_	0.999537	0.082037	12.18399	0.0000
_RM_RF_^2	0.240789	0.416384	0.578286	0.5631

R-squared	0.719516	Mean dependent var	-0.096885
Adjusted R-squared	0.719237	S.D. dependent var	0.022227
S.E. of regression	0.011778	Akaike info criterion	-6.043745
Sum squared resid	0.279089	Schwarz criterion	-6.035395
Log likelihood	6092.073	Hannan-Quinn criter.	-6.040680
F-statistic	2580.655	Durbin-Watson stat	1.959765
Prob(F-statistic)	0.000000		



Equation: UNTITLED Workfile: XFINK::Xfink\

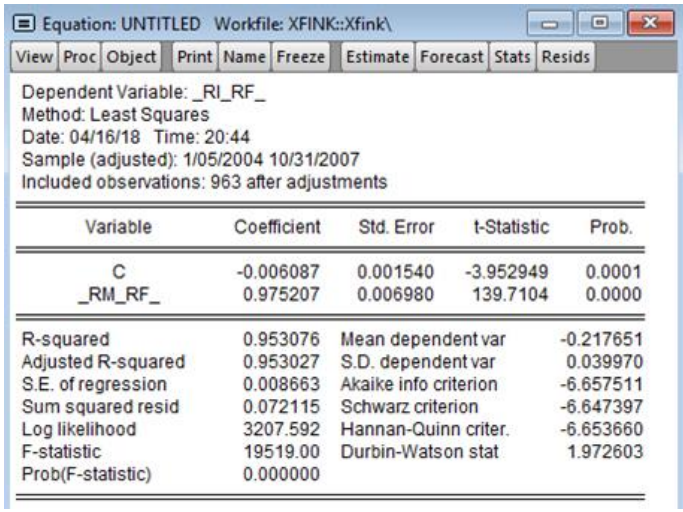
View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 20:35
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.004187	0.001317	-3.180477	0.0015
_RM_RF_	0.952720	0.013260	71.85182	0.0000

R-squared	0.719469	Mean dependent var	-0.096885
Adjusted R-squared	0.719330	S.D. dependent var	0.022227
S.E. of regression	0.011776	Akaike info criterion	-6.044571
Sum squared resid	0.279135	Schwarz criterion	-6.039005
Log likelihood	6091.906	Hannan-Quinn criter.	-6.042528
F-statistic	5162.683	Durbin-Watson stat	1.959423
Prob(F-statistic)	0.000000		

APPENDIX 12: XMESY



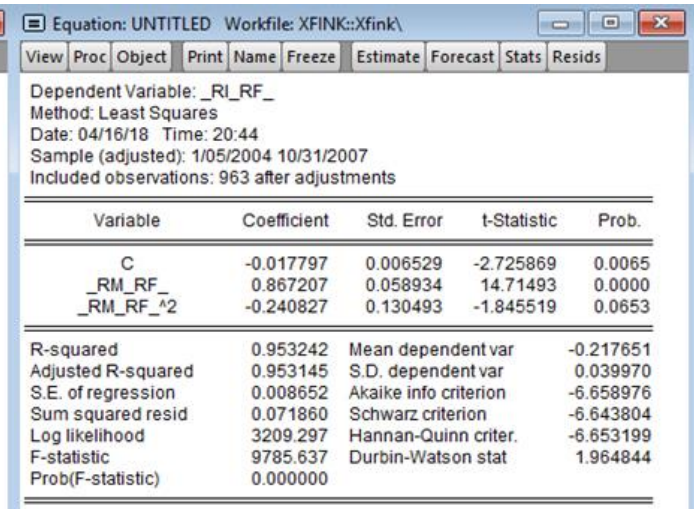
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 20:44
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.006087	0.001540	-3.952949	0.0001
_RM_RF_	0.975207	0.006980	139.7104	0.0000

R-squared	0.953076	Mean dependent var	-0.217651
Adjusted R-squared	0.953027	S.D. dependent var	0.039970
S.E. of regression	0.008663	Akaike info criterion	-6.657511
Sum squared resid	0.072115	Schwarz criterion	-6.647397
Log likelihood	3207.592	Hannan-Quinn criter.	-6.653660
F-statistic	19519.00	Durbin-Watson stat	1.972603
Prob(F-statistic)	0.000000		



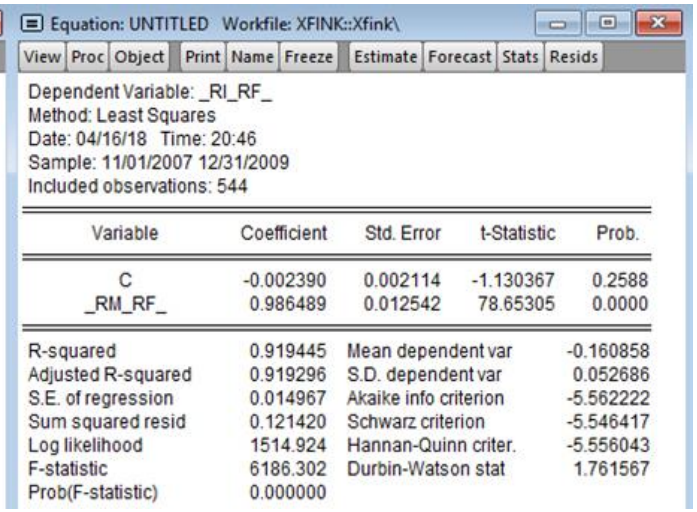
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 20:44
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.017797	0.006529	-2.725869	0.0065
_RM_RF_	0.867207	0.058934	14.71493	0.0000
_RM_RF_^2	-0.240827	0.130493	-1.845519	0.0653

R-squared	0.953242	Mean dependent var	-0.217651
Adjusted R-squared	0.953145	S.D. dependent var	0.039970
S.E. of regression	0.008652	Akaike info criterion	-6.658976
Sum squared resid	0.071860	Schwarz criterion	-6.643804
Log likelihood	3209.297	Hannan-Quinn criter.	-6.653199
F-statistic	9785.637	Durbin-Watson stat	1.964844
Prob(F-statistic)	0.000000		



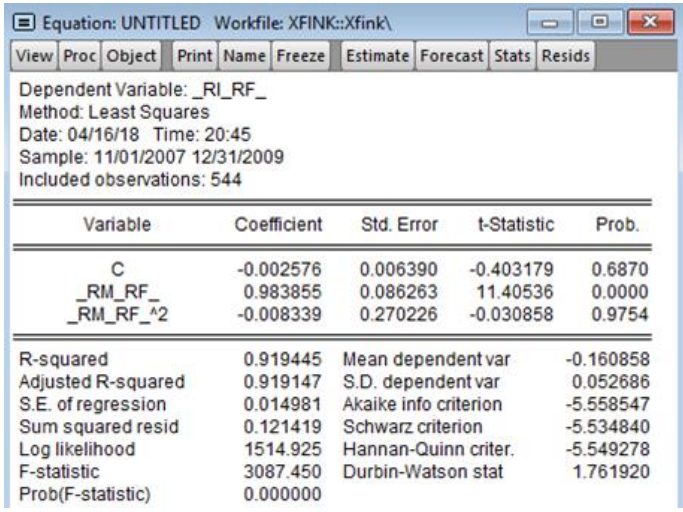
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 20:46
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.002390	0.002114	-1.130367	0.2588
_RM_RF_	0.986489	0.012542	78.65305	0.0000

R-squared	0.919445	Mean dependent var	-0.160858
Adjusted R-squared	0.919296	S.D. dependent var	0.052686
S.E. of regression	0.014967	Akaike info criterion	-5.562222
Sum squared resid	0.121420	Schwarz criterion	-5.546417
Log likelihood	1514.924	Hannan-Quinn criter.	-5.556043
F-statistic	6186.302	Durbin-Watson stat	1.761567
Prob(F-statistic)	0.000000		



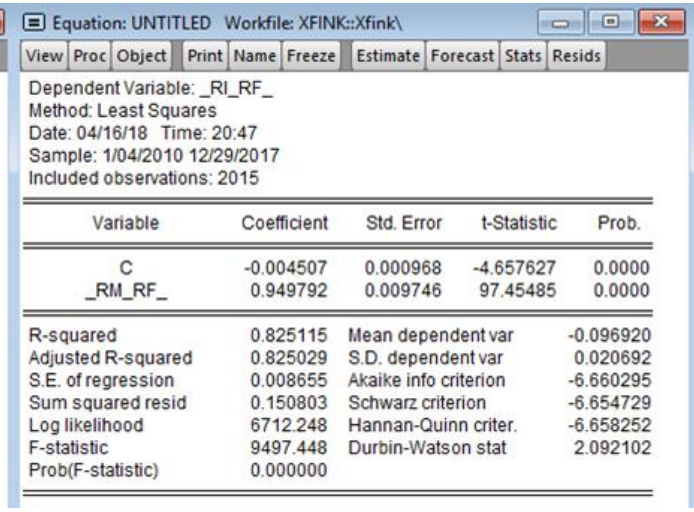
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 20:45
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.002576	0.006390	-0.403179	0.6870
_RM_RF_	0.983855	0.086263	11.40536	0.0000
_RM_RF_^2	-0.008339	0.270226	-0.030858	0.9754

R-squared	0.919445	Mean dependent var	-0.160858
Adjusted R-squared	0.919147	S.D. dependent var	0.052686
S.E. of regression	0.014981	Akaike info criterion	-5.558547
Sum squared resid	0.121419	Schwarz criterion	-5.534840
Log likelihood	1514.925	Hannan-Quinn criter.	-5.549278
F-statistic	3087.450	Durbin-Watson stat	1.761920
Prob(F-statistic)	0.000000		



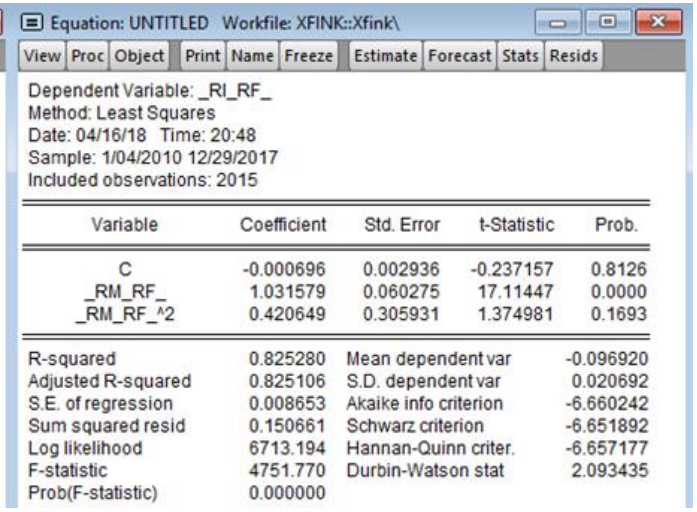
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 20:47
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.004507	0.000968	-4.657627	0.0000
_RM_RF_	0.949792	0.009746	97.45485	0.0000

R-squared	0.825115	Mean dependent var	-0.096920
Adjusted R-squared	0.825029	S.D. dependent var	0.020692
S.E. of regression	0.008655	Akaike info criterion	-6.660295
Sum squared resid	0.150803	Schwarz criterion	-6.654729
Log likelihood	6712.248	Hannan-Quinn criter.	-6.658252
F-statistic	9497.448	Durbin-Watson stat	2.092102
Prob(F-statistic)	0.000000		



Equation: UNTITLED Workfile: XFINK::Xfink\

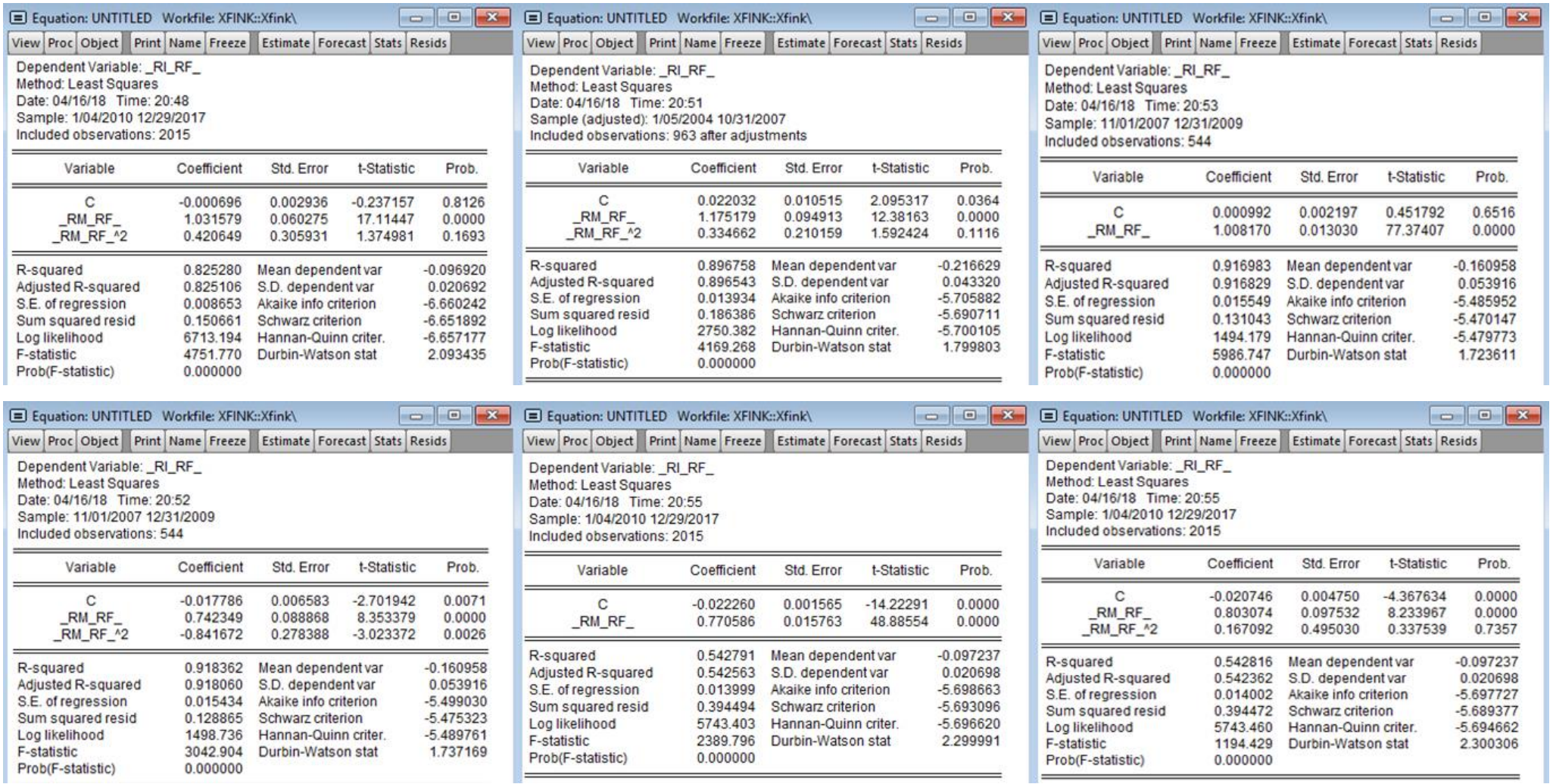
View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 20:48
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.000696	0.002936	-0.237157	0.8126
_RM_RF_	1.031579	0.060275	17.11447	0.0000
_RM_RF_^2	0.420649	0.305931	1.374981	0.1693

R-squared	0.825280	Mean dependent var	-0.096920
Adjusted R-squared	0.825106	S.D. dependent var	0.020692
S.E. of regression	0.008653	Akaike info criterion	-6.660242
Sum squared resid	0.150661	Schwarz criterion	-6.651892
Log likelihood	6713.194	Hannan-Quinn criter.	-6.657177
F-statistic	4751.770	Durbin-Watson stat	2.093435
Prob(F-statistic)	0.000000		

APPENDIX 13: XSGRT



Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 20:48
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.000696	0.002936	-0.237157	0.8126
_RM_RF_	1.031579	0.060275	17.11447	0.0000
_RM_RF_^2	0.420649	0.305931	1.374981	0.1693

R-squared	0.825280	Mean dependent var	-0.096920
Adjusted R-squared	0.825106	S.D. dependent var	0.020692
S.E. of regression	0.008653	Akaike info criterion	-6.660242
Sum squared resid	0.150661	Schwarz criterion	-6.651892
Log likelihood	6713.194	Hannan-Quinn criter.	-6.657177
F-statistic	4751.770	Durbin-Watson stat	2.093435
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 20:51
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.022032	0.010515	2.095317	0.0364
_RM_RF_	1.175179	0.094913	12.38163	0.0000
_RM_RF_^2	0.334662	0.210159	1.592424	0.1116

R-squared	0.896758	Mean dependent var	-0.216629
Adjusted R-squared	0.896543	S.D. dependent var	0.043320
S.E. of regression	0.013934	Akaike info criterion	-5.705882
Sum squared resid	0.186386	Schwarz criterion	-5.690711
Log likelihood	2750.382	Hannan-Quinn criter.	-5.700105
F-statistic	4169.268	Durbin-Watson stat	1.799803
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 20:53
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000992	0.002197	0.451792	0.6516
_RM_RF_	1.008170	0.013030	77.37407	0.0000

R-squared	0.916983	Mean dependent var	-0.160958
Adjusted R-squared	0.916829	S.D. dependent var	0.053916
S.E. of regression	0.015549	Akaike info criterion	-5.485952
Sum squared resid	0.131043	Schwarz criterion	-5.470147
Log likelihood	1494.179	Hannan-Quinn criter.	-5.479773
F-statistic	5986.747	Durbin-Watson stat	1.723611
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 20:52
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.017786	0.006583	-2.701942	0.0071
_RM_RF_	0.742349	0.088868	8.353379	0.0000
_RM_RF_^2	-0.841672	0.278388	-3.023372	0.0026

R-squared	0.918362	Mean dependent var	-0.160958
Adjusted R-squared	0.918060	S.D. dependent var	0.053916
S.E. of regression	0.015434	Akaike info criterion	-5.499030
Sum squared resid	0.128865	Schwarz criterion	-5.475323
Log likelihood	1498.736	Hannan-Quinn criter.	-5.489761
F-statistic	3042.904	Durbin-Watson stat	1.737169
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 20:55
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.022260	0.001565	-14.22291	0.0000
_RM_RF_	0.770586	0.015763	48.88554	0.0000

R-squared	0.542791	Mean dependent var	-0.097237
Adjusted R-squared	0.542563	S.D. dependent var	0.020698
S.E. of regression	0.013999	Akaike info criterion	-5.698663
Sum squared resid	0.394494	Schwarz criterion	-5.693096
Log likelihood	5743.403	Hannan-Quinn criter.	-5.696620
F-statistic	2389.796	Durbin-Watson stat	2.299991
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 20:55
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.020746	0.004750	-4.367634	0.0000
_RM_RF_	0.803074	0.097532	8.233967	0.0000
_RM_RF_^2	0.167092	0.495030	0.337539	0.7357

R-squared	0.542816	Mean dependent var	-0.097237
Adjusted R-squared	0.542362	S.D. dependent var	0.020698
S.E. of regression	0.014002	Akaike info criterion	-5.697727
Sum squared resid	0.394472	Schwarz criterion	-5.689377
Log likelihood	5743.460	Hannan-Quinn criter.	-5.694662
F-statistic	1194.429	Durbin-Watson stat	2.300306
Prob(F-statistic)	0.000000		

APPENDIX 14: XSPOR

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 21:23
Sample (adjusted): 4/05/2004 10/31/2007
Included observations: 902 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.003714	0.004369	0.850130	0.3955
_RM_RF_	1.000196	0.000203	4931.647	0.0000

R-squared	0.999963	Mean dependent var	-21.30918
Adjusted R-squared	0.999963	S.D. dependent var	3.173235
S.E. of regression	0.019314	Akaike info criterion	-5.053794
Sum squared resid	0.335716	Schwarz criterion	-5.043140
Log likelihood	2281.261	Hannan-Quinn criter.	-5.049725
F-statistic	24321147	Durbin-Watson stat	1.883464
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 21:24
Sample (adjusted): 4/05/2004 10/31/2007
Included observations: 902 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.026985	0.026983	1.000076	0.3175
_RM_RF_	1.002411	0.002542	394.3252	0.0000
_RM_RF_^2	5.15E-05	5.90E-05	0.873956	0.3824

R-squared	0.999963	Mean dependent var	-21.30918
Adjusted R-squared	0.999963	S.D. dependent var	3.173235
S.E. of regression	0.019316	Akaike info criterion	-5.052426
Sum squared resid	0.335431	Schwarz criterion	-5.036446
Log likelihood	2281.644	Hannan-Quinn criter.	-5.046322
F-statistic	12157382	Durbin-Watson stat	1.885016
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 21:28
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.010280	0.004465	-2.302439	0.0217
_RM_RF_	0.999299	0.000268	3723.151	0.0000

R-squared	0.999961	Mean dependent var	-16.05153
Adjusted R-squared	0.999961	S.D. dependent var	4.362053
S.E. of regression	0.027301	Akaike info criterion	-4.360148
Sum squared resid	0.403964	Schwarz criterion	-4.344343
Log likelihood	1187.960	Hannan-Quinn criter.	-4.353969
F-statistic	13861850	Durbin-Watson stat	1.885370
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 21:27
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.004134	0.024219	0.170679	0.8645
_RM_RF_	1.001380	0.003447	290.4713	0.0000
_RM_RF_^2	6.86E-05	0.000113	0.605512	0.5451

R-squared	0.999961	Mean dependent var	-16.05153
Adjusted R-squared	0.999961	S.D. dependent var	4.362053
S.E. of regression	0.027317	Akaike info criterion	-4.357149
Sum squared resid	0.403691	Schwarz criterion	-4.333442
Log likelihood	1188.145	Hannan-Quinn criter.	-4.347880
F-statistic	6922826.	Durbin-Watson stat	1.885787
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 21:29
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.001856	0.002929	0.633612	0.5264
_RM_RF_	1.000235	0.000296	3373.771	0.0000

R-squared	0.999823	Mean dependent var	-9.770011
Adjusted R-squared	0.999823	S.D. dependent var	1.468394
S.E. of regression	0.019531	Akaike info criterion	-5.032664
Sum squared resid	0.767857	Schwarz criterion	-5.027098
Log likelihood	5072.409	Hannan-Quinn criter.	-5.030621
F-statistic	11382329	Durbin-Watson stat	1.843878
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

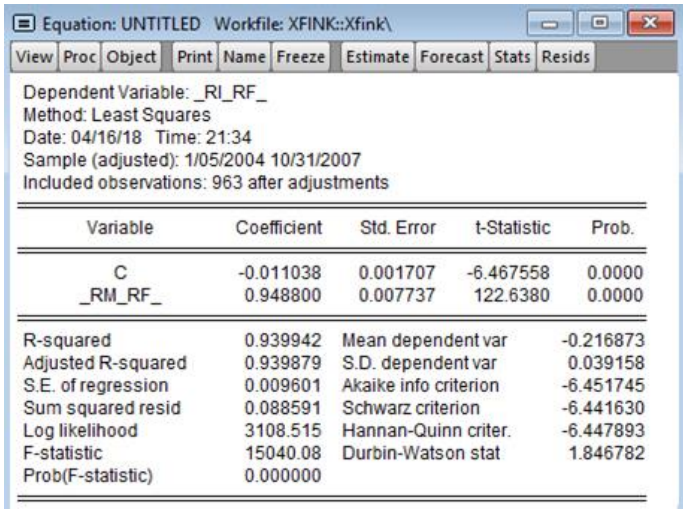
View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 21:29
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.012199	0.017501	-0.697020	0.4859
_RM_RF_	0.997312	0.003601	276.9720	0.0000
_RM_RF_^2	-0.000149	0.000182	-0.814549	0.4154

R-squared	0.999823	Mean dependent var	-9.770011
Adjusted R-squared	0.999823	S.D. dependent var	1.468394
S.E. of regression	0.019532	Akaike info criterion	-5.032001
Sum squared resid	0.767604	Schwarz criterion	-5.023652
Log likelihood	5072.741	Hannan-Quinn criter.	-5.028937
F-statistic	5690214.	Durbin-Watson stat	1.844300
Prob(F-statistic)	0.000000		

APPENDIX 15: XTAST



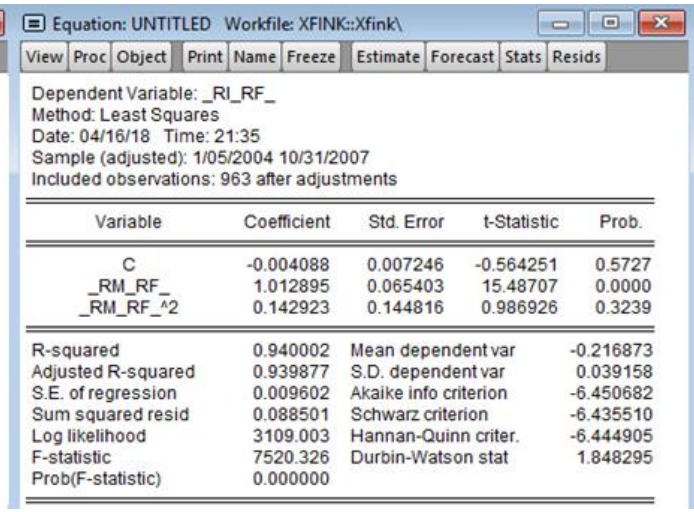
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 21:34
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.011038	0.001707	-6.467558	0.0000
_RM_RF_	0.948800	0.007737	122.6380	0.0000

R-squared	0.939942	Mean dependent var	-0.216873
Adjusted R-squared	0.939879	S.D. dependent var	0.039158
S.E. of regression	0.009601	Akaike info criterion	-6.451745
Sum squared resid	0.088591	Schwarz criterion	-6.441630
Log likelihood	3108.515	Hannan-Quinn criter.	-6.447893
F-statistic	15040.08	Durbin-Watson stat	1.846782
Prob(F-statistic)	0.000000		



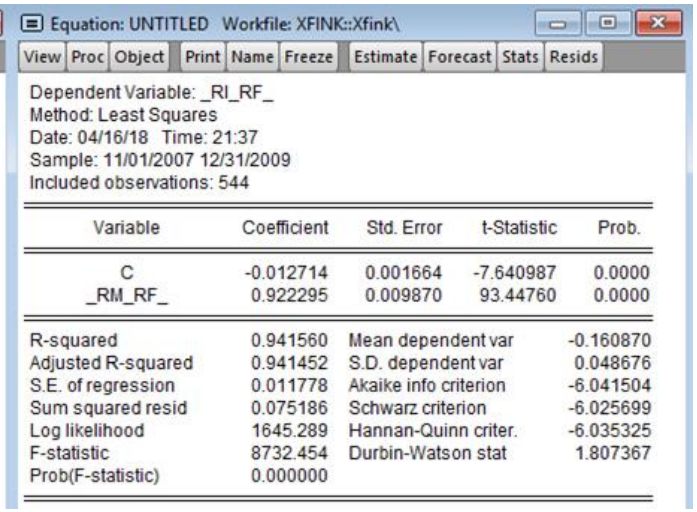
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 21:35
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.004088	0.007246	-0.564251	0.5727
_RM_RF_	1.012895	0.065403	15.48707	0.0000
_RM_RF_^2	0.142923	0.144816	0.986926	0.3239

R-squared	0.940002	Mean dependent var	-0.216873
Adjusted R-squared	0.939877	S.D. dependent var	0.039158
S.E. of regression	0.009602	Akaike info criterion	-6.450682
Sum squared resid	0.088501	Schwarz criterion	-6.435510
Log likelihood	3109.003	Hannan-Quinn criter.	-6.444905
F-statistic	7520.326	Durbin-Watson stat	1.848295
Prob(F-statistic)	0.000000		



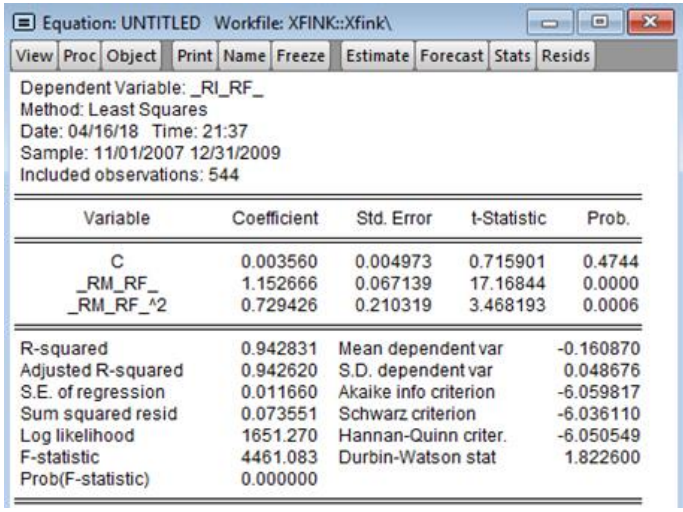
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 21:37
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.012714	0.001664	-7.640987	0.0000
_RM_RF_	0.922295	0.009870	93.44760	0.0000

R-squared	0.941560	Mean dependent var	-0.160870
Adjusted R-squared	0.941452	S.D. dependent var	0.048676
S.E. of regression	0.011778	Akaike info criterion	-6.041504
Sum squared resid	0.075186	Schwarz criterion	-6.025699
Log likelihood	1645.289	Hannan-Quinn criter.	-6.035325
F-statistic	8732.454	Durbin-Watson stat	1.807367
Prob(F-statistic)	0.000000		



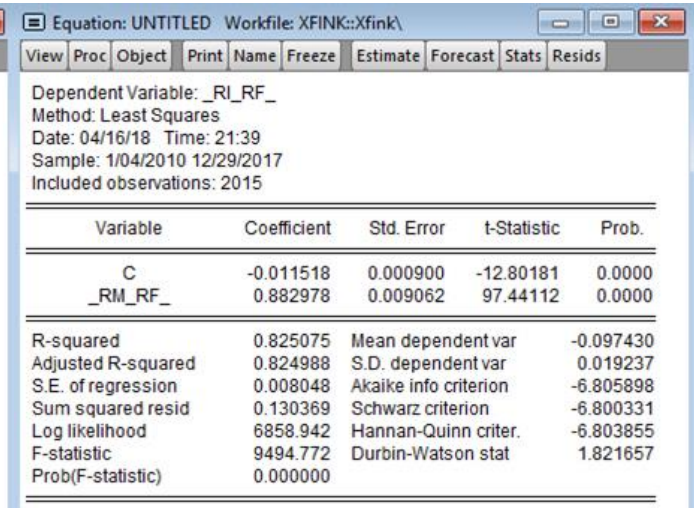
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 21:37
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.003560	0.004973	0.715901	0.4744
_RM_RF_	1.152666	0.067139	17.16844	0.0000
_RM_RF_^2	0.729426	0.210319	3.468193	0.0006

R-squared	0.942831	Mean dependent var	-0.160870
Adjusted R-squared	0.942620	S.D. dependent var	0.048676
S.E. of regression	0.011660	Akaike info criterion	-6.059817
Sum squared resid	0.073551	Schwarz criterion	-6.036110
Log likelihood	1651.270	Hannan-Quinn criter.	-6.050549
F-statistic	4461.083	Durbin-Watson stat	1.822600
Prob(F-statistic)	0.000000		



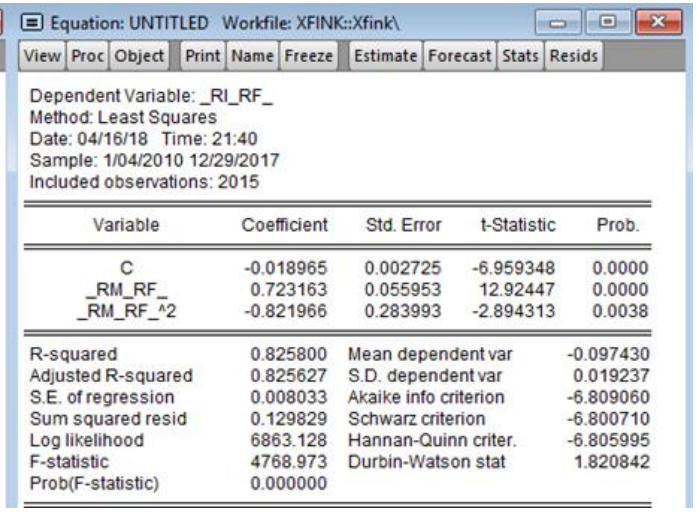
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 21:39
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.011518	0.000900	-12.80181	0.0000
_RM_RF_	0.882978	0.009062	97.44112	0.0000

R-squared	0.825075	Mean dependent var	-0.097430
Adjusted R-squared	0.824988	S.D. dependent var	0.019237
S.E. of regression	0.008048	Akaike info criterion	-6.805898
Sum squared resid	0.130369	Schwarz criterion	-6.800331
Log likelihood	6858.942	Hannan-Quinn criter.	-6.803855
F-statistic	9494.772	Durbin-Watson stat	1.821657
Prob(F-statistic)	0.000000		



Equation: UNTITLED Workfile: XFINK::Xfink\

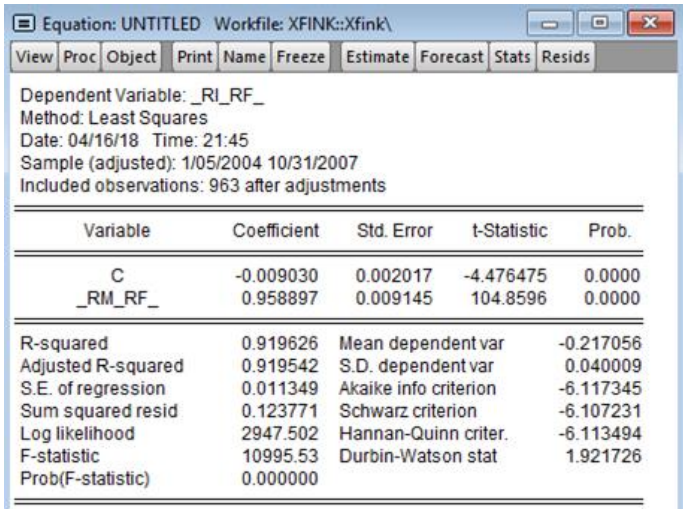
View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 21:40
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.018965	0.002725	-6.959348	0.0000
_RM_RF_	0.723163	0.055953	12.92447	0.0000
_RM_RF_^2	-0.821966	0.283993	-2.894313	0.0038

R-squared	0.825800	Mean dependent var	-0.097430
Adjusted R-squared	0.825627	S.D. dependent var	0.019237
S.E. of regression	0.008033	Akaike info criterion	-6.809060
Sum squared resid	0.129829	Schwarz criterion	-6.800710
Log likelihood	6863.128	Hannan-Quinn criter.	-6.805995
F-statistic	4768.973	Durbin-Watson stat	1.820842
Prob(F-statistic)	0.000000		

APPENDIX 16: XTCRT



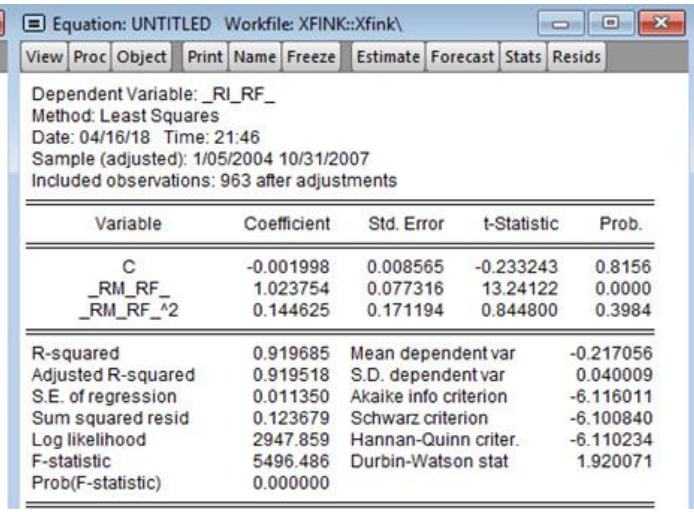
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 21:45
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.009030	0.002017	-4.476475	0.0000
_RM_RF_	0.958897	0.009145	104.8596	0.0000

R-squared	0.919626	Mean dependent var	-0.217056
Adjusted R-squared	0.919542	S.D. dependent var	0.040009
S.E. of regression	0.011349	Akaike info criterion	-6.117345
Sum squared resid	0.123771	Schwarz criterion	-6.107231
Log likelihood	2947.502	Hannan-Quinn criter.	-6.113494
F-statistic	10995.53	Durbin-Watson stat	1.921726
Prob(F-statistic)	0.000000		



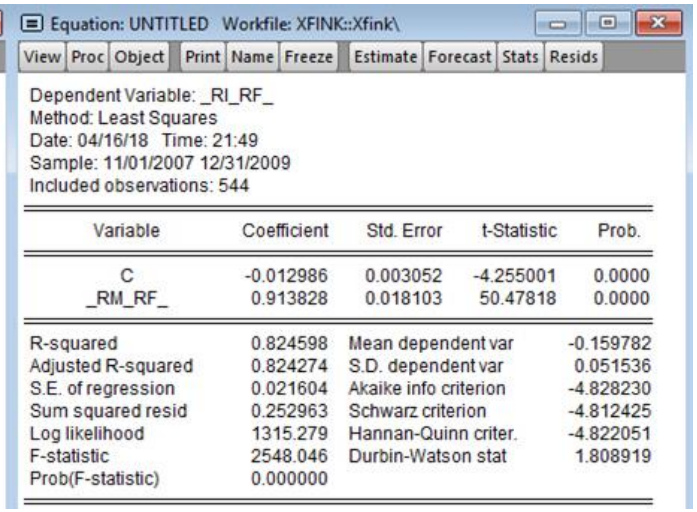
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 21:46
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.001998	0.008565	-0.233243	0.8156
_RM_RF_	1.023754	0.077316	13.24122	0.0000
_RM_RF_^2	0.144625	0.171194	0.844800	0.3984

R-squared	0.919685	Mean dependent var	-0.217056
Adjusted R-squared	0.919518	S.D. dependent var	0.040009
S.E. of regression	0.011350	Akaike info criterion	-6.116011
Sum squared resid	0.123679	Schwarz criterion	-6.100840
Log likelihood	2947.859	Hannan-Quinn criter.	-6.110234
F-statistic	5496.486	Durbin-Watson stat	1.920071
Prob(F-statistic)	0.000000		



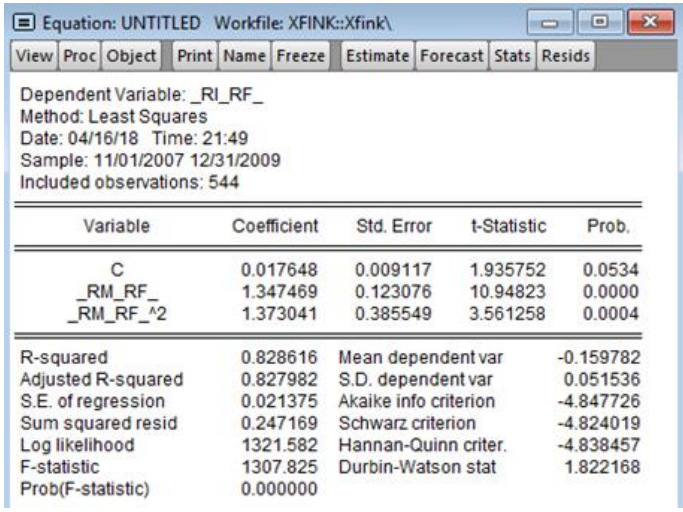
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 21:49
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.012986	0.003052	-4.255001	0.0000
_RM_RF_	0.913828	0.018103	50.47818	0.0000

R-squared	0.824598	Mean dependent var	-0.159782
Adjusted R-squared	0.824274	S.D. dependent var	0.051536
S.E. of regression	0.021604	Akaike info criterion	-4.828230
Sum squared resid	0.252963	Schwarz criterion	-4.812425
Log likelihood	1315.279	Hannan-Quinn criter.	-4.822051
F-statistic	2548.046	Durbin-Watson stat	1.808919
Prob(F-statistic)	0.000000		



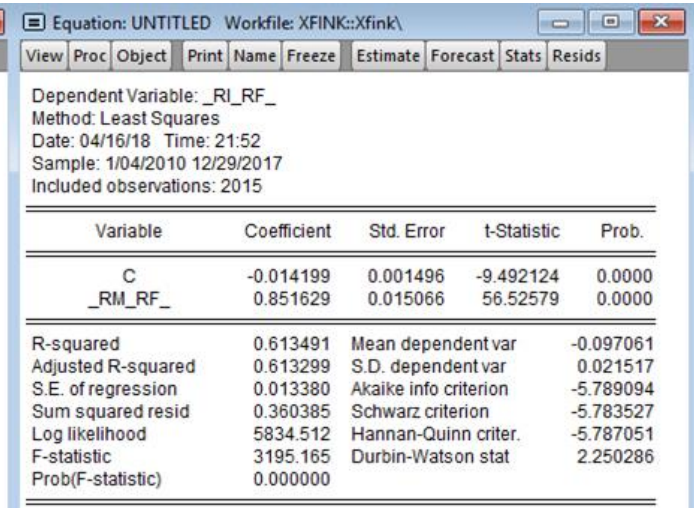
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 21:49
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.017648	0.009117	1.935752	0.0534
_RM_RF_	1.347469	0.123076	10.94823	0.0000
_RM_RF_^2	1.373041	0.385549	3.561258	0.0004

R-squared	0.828616	Mean dependent var	-0.159782
Adjusted R-squared	0.827982	S.D. dependent var	0.051536
S.E. of regression	0.021375	Akaike info criterion	-4.847726
Sum squared resid	0.247169	Schwarz criterion	-4.824019
Log likelihood	1321.582	Hannan-Quinn criter.	-4.838457
F-statistic	1307.825	Durbin-Watson stat	1.822168
Prob(F-statistic)	0.000000		



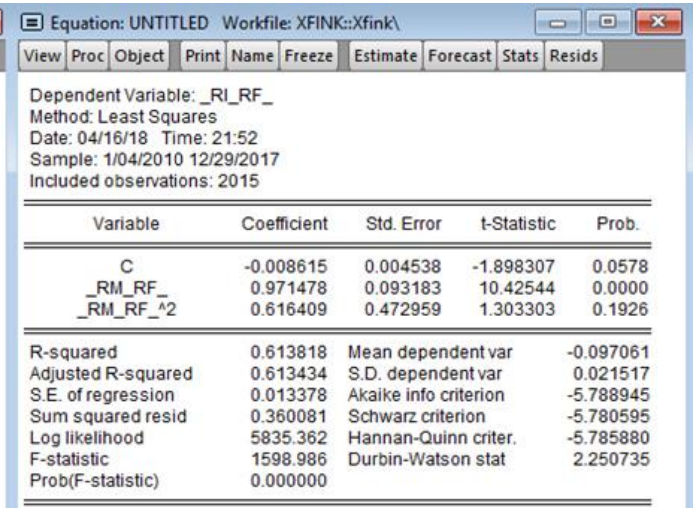
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 21:52
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.014199	0.001496	-9.492124	0.0000
_RM_RF_	0.851629	0.015066	56.52579	0.0000

R-squared	0.613491	Mean dependent var	-0.097061
Adjusted R-squared	0.613299	S.D. dependent var	0.021517
S.E. of regression	0.013380	Akaike info criterion	-5.789094
Sum squared resid	0.360385	Schwarz criterion	-5.783527
Log likelihood	5834.512	Hannan-Quinn criter.	-5.787051
F-statistic	3195.165	Durbin-Watson stat	2.250286
Prob(F-statistic)	0.000000		



Equation: UNTITLED Workfile: XFINK::Xfink\

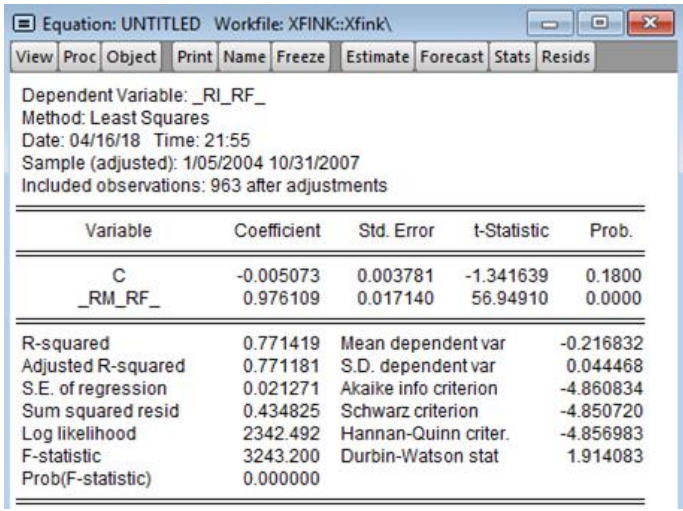
View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 21:52
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.008615	0.004538	-1.898307	0.0578
_RM_RF_	0.971478	0.093183	10.42544	0.0000
_RM_RF_^2	0.616409	0.472959	1.303303	0.1926

R-squared	0.613818	Mean dependent var	-0.097061
Adjusted R-squared	0.613434	S.D. dependent var	0.021517
S.E. of regression	0.013378	Akaike info criterion	-5.788945
Sum squared resid	0.360081	Schwarz criterion	-5.780595
Log likelihood	5835.362	Hannan-Quinn criter.	-5.785880
F-statistic	1598.986	Durbin-Watson stat	2.250735
Prob(F-statistic)	0.000000		

APPENDIX 17: XTRZM



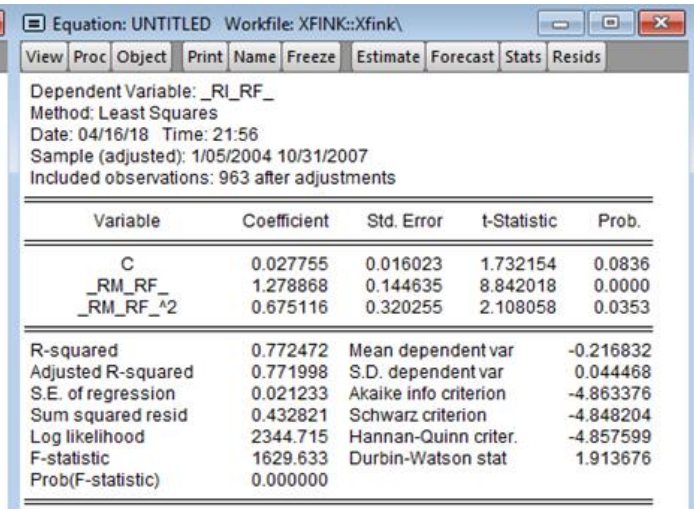
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 21:55
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.005073	0.003781	-1.341639	0.1800
_RM_RF_	0.976109	0.017140	56.94910	0.0000

R-squared	0.771419	Mean dependent var	-0.216832
Adjusted R-squared	0.771181	S.D. dependent var	0.044468
S.E. of regression	0.021271	Akaike info criterion	-4.860834
Sum squared resid	0.434825	Schwarz criterion	-4.850720
Log likelihood	2342.492	Hannan-Quinn criter.	-4.856983
F-statistic	3243.200	Durbin-Watson stat	1.914083
Prob(F-statistic)	0.000000		



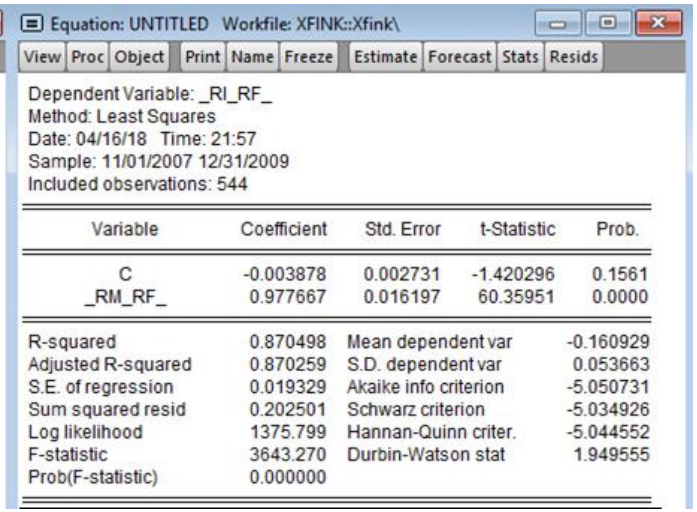
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 21:56
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.027755	0.016023	1.732154	0.0836
_RM_RF_	1.278868	0.144635	8.842018	0.0000
_RM_RF_^2	0.675116	0.320255	2.108058	0.0353

R-squared	0.772472	Mean dependent var	-0.216832
Adjusted R-squared	0.771998	S.D. dependent var	0.044468
S.E. of regression	0.021233	Akaike info criterion	-4.863376
Sum squared resid	0.432821	Schwarz criterion	-4.848204
Log likelihood	2344.715	Hannan-Quinn criter.	-4.857599
F-statistic	1629.633	Durbin-Watson stat	1.913676
Prob(F-statistic)	0.000000		



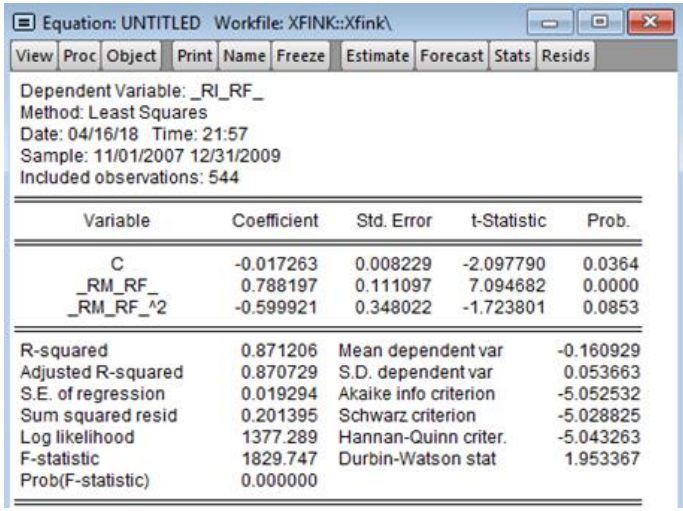
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 21:57
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.003878	0.002731	-1.420296	0.1561
_RM_RF_	0.977667	0.016197	60.35951	0.0000

R-squared	0.870498	Mean dependent var	-0.160929
Adjusted R-squared	0.870259	S.D. dependent var	0.053663
S.E. of regression	0.019329	Akaike info criterion	-5.050731
Sum squared resid	0.202501	Schwarz criterion	-5.034926
Log likelihood	1375.799	Hannan-Quinn criter.	-5.044552
F-statistic	3643.270	Durbin-Watson stat	1.949555
Prob(F-statistic)	0.000000		



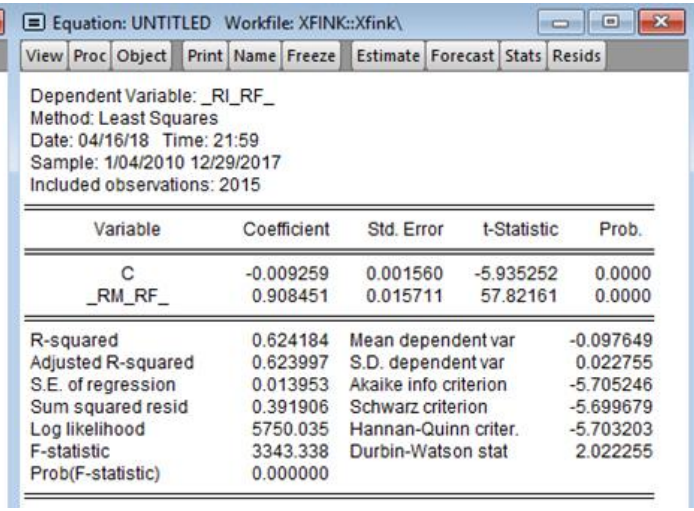
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 21:57
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.017263	0.008229	-2.097790	0.0364
_RM_RF_	0.788197	0.111097	7.094682	0.0000
_RM_RF_^2	-0.599921	0.348022	-1.723801	0.0853

R-squared	0.871206	Mean dependent var	-0.160929
Adjusted R-squared	0.870729	S.D. dependent var	0.053663
S.E. of regression	0.019294	Akaike info criterion	-5.052532
Sum squared resid	0.201395	Schwarz criterion	-5.028825
Log likelihood	1377.289	Hannan-Quinn criter.	-5.043263
F-statistic	1829.747	Durbin-Watson stat	1.953367
Prob(F-statistic)	0.000000		



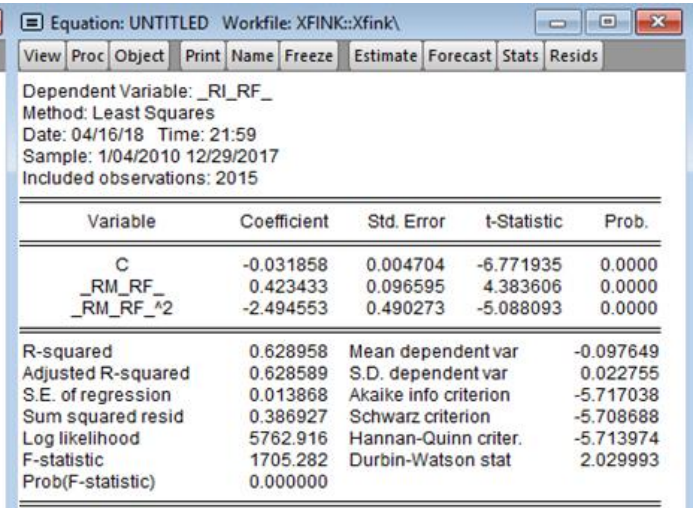
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 21:59
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.009259	0.001560	-5.935252	0.0000
_RM_RF_	0.908451	0.015711	57.82161	0.0000

R-squared	0.624184	Mean dependent var	-0.097649
Adjusted R-squared	0.623997	S.D. dependent var	0.022755
S.E. of regression	0.013953	Akaike info criterion	-5.705246
Sum squared resid	0.391906	Schwarz criterion	-5.699679
Log likelihood	5750.035	Hannan-Quinn criter.	-5.703203
F-statistic	3343.338	Durbin-Watson stat	2.022255
Prob(F-statistic)	0.000000		



Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 21:59
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.031858	0.004704	-6.771935	0.0000
_RM_RF_	0.423433	0.096595	4.383606	0.0000
_RM_RF_^2	-2.494553	0.490273	-5.088093	0.0000

R-squared	0.628958	Mean dependent var	-0.097649
Adjusted R-squared	0.628589	S.D. dependent var	0.022755
S.E. of regression	0.013868	Akaike info criterion	-5.717038
Sum squared resid	0.386927	Schwarz criterion	-5.708688
Log likelihood	5762.916	Hannan-Quinn criter.	-5.713974
F-statistic	1705.282	Durbin-Watson stat	2.029993
Prob(F-statistic)	0.000000		

APPENDIX 18: XUHIZ

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 22:05
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.007326	0.001505	-4.869166	0.0000
_RM_RF_	0.966147	0.006820	141.6583	0.0000

R-squared	0.954299	Mean dependent var	-0.216924
Adjusted R-squared	0.954252	S.D. dependent var	0.039573
S.E. of regression	0.008464	Akaike info criterion	-6.703870
Sum squared resid	0.068848	Schwarz criterion	-6.693755
Log likelihood	3229.913	Hannan-Quinn criter.	-6.700018
F-statistic	20067.06	Durbin-Watson stat	1.774240
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 22:06
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.008142	0.006391	-1.274034	0.2030
_RM_RF_	0.958621	0.057685	16.61820	0.0000
_RM_RF_^2	-0.016782	0.127728	-0.131390	0.8955

R-squared	0.954300	Mean dependent var	-0.216924
Adjusted R-squared	0.954205	S.D. dependent var	0.039573
S.E. of regression	0.008469	Akaike info criterion	-6.701811
Sum squared resid	0.068847	Schwarz criterion	-6.686639
Log likelihood	3229.922	Hannan-Quinn criter.	-6.696034
F-statistic	10023.28	Durbin-Watson stat	1.774527
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 22:08
Sample: 11/02/2007 12/31/2009
Included observations: 543

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.010954	0.001621	-6.757209	0.0000
_RM_RF_	0.929310	0.009621	96.58905	0.0000

R-squared	0.945190	Mean dependent var	-0.160136
Adjusted R-squared	0.945089	S.D. dependent var	0.048938
S.E. of regression	0.011468	Akaike info criterion	-6.094901
Sum squared resid	0.071145	Schwarz criterion	-6.079074
Log likelihood	1656.766	Hannan-Quinn criter.	-6.088712
F-statistic	9329.445	Durbin-Watson stat	1.784350
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 22:07
Sample: 11/02/2007 12/31/2009
Included observations: 543

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.009670	0.004805	2.012551	0.0447
_RM_RF_	1.221269	0.064867	18.82728	0.0000
_RM_RF_^2	0.924572	0.203228	4.549427	0.0000

R-squared	0.947213	Mean dependent var	-0.160136
Adjusted R-squared	0.947018	S.D. dependent var	0.048938
S.E. of regression	0.011264	Akaike info criterion	-6.128830
Sum squared resid	0.068519	Schwarz criterion	-6.105089
Log likelihood	1666.977	Hannan-Quinn criter.	-6.119547
F-statistic	4844.909	Durbin-Watson stat	1.853695
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 22:09
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.010543	0.000753	-14.00448	0.0000
_RM_RF_	0.891522	0.007582	117.5821	0.0000

R-squared	0.872905	Mean dependent var	-0.097286
Adjusted R-squared	0.872842	S.D. dependent var	0.018883
S.E. of regression	0.006734	Akaike info criterion	-7.162415
Sum squared resid	0.091273	Schwarz criterion	-7.156848
Log likelihood	7218.133	Hannan-Quinn criter.	-7.160371
F-statistic	13825.54	Durbin-Watson stat	1.857956
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

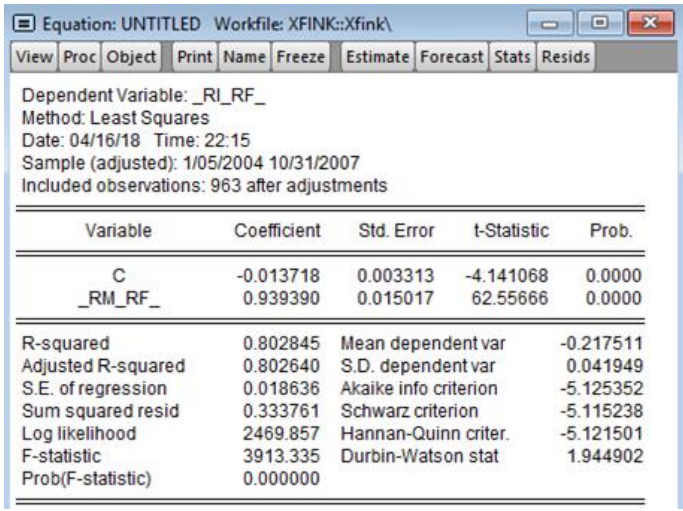
View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 22:10
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.012202	0.002285	-5.341321	0.0000
_RM_RF_	0.855906	0.046908	18.24655	0.0000
_RM_RF_^2	-0.183184	0.238084	-0.769410	0.4417

R-squared	0.872942	Mean dependent var	-0.097286
Adjusted R-squared	0.872816	S.D. dependent var	0.018883
S.E. of regression	0.006734	Akaike info criterion	-7.161716
Sum squared resid	0.091246	Schwarz criterion	-7.153366
Log likelihood	7218.429	Hannan-Quinn criter.	-7.158651
F-statistic	6911.666	Durbin-Watson stat	1.856215
Prob(F-statistic)	0.000000		

APPENDIX 19: XULAS



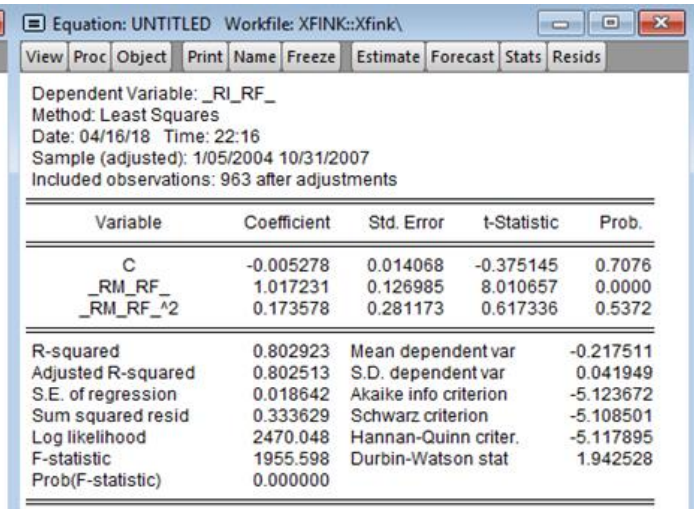
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 22:15
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.013718	0.003313	-4.141068	0.0000
_RM_RF_	0.939390	0.015017	62.55666	0.0000

R-squared	0.802845	Mean dependent var	-0.217511
Adjusted R-squared	0.802640	S.D. dependent var	0.041949
S.E. of regression	0.018636	Akaike info criterion	-5.125352
Sum squared resid	0.333761	Schwarz criterion	-5.115238
Log likelihood	2469.857	Hannan-Quinn criter.	-5.121501
F-statistic	3913.335	Durbin-Watson stat	1.944902
Prob(F-statistic)	0.000000		



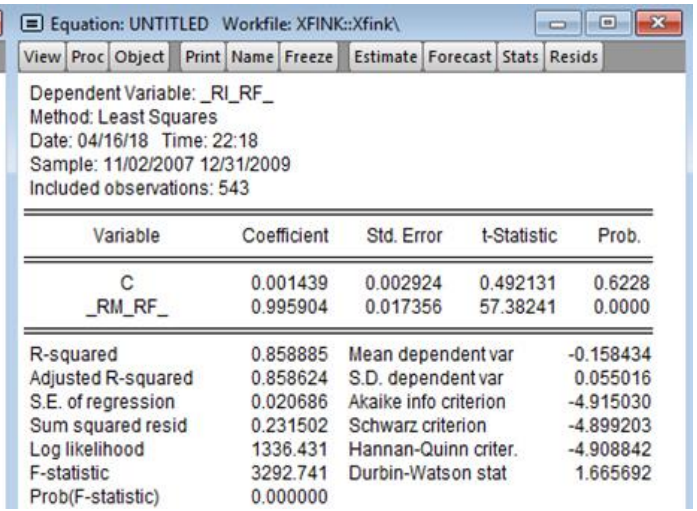
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 22:16
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.005278	0.014068	-0.375145	0.7076
_RM_RF_	1.017231	0.126985	8.010657	0.0000
_RM_RF_^2	0.173578	0.281173	0.617336	0.5372

R-squared	0.802923	Mean dependent var	-0.217511
Adjusted R-squared	0.802513	S.D. dependent var	0.041949
S.E. of regression	0.018642	Akaike info criterion	-5.123672
Sum squared resid	0.333629	Schwarz criterion	-5.108501
Log likelihood	2470.048	Hannan-Quinn criter.	-5.117895
F-statistic	1955.598	Durbin-Watson stat	1.942528
Prob(F-statistic)	0.000000		



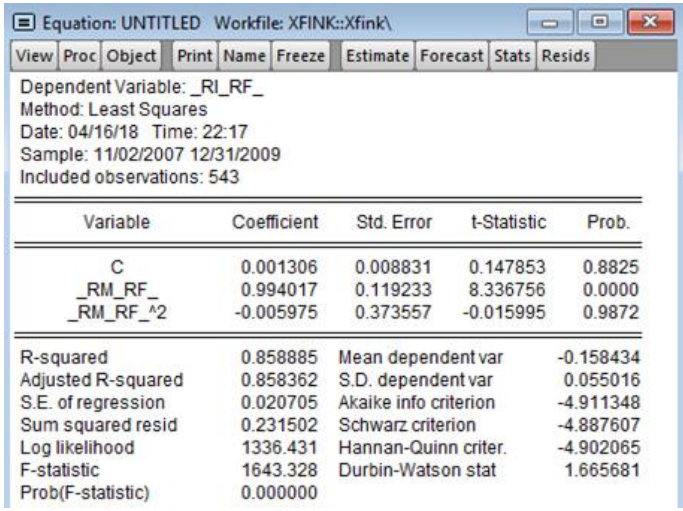
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 22:18
Sample: 11/02/2007 12/31/2009
Included observations: 543

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.001439	0.002924	0.492131	0.6228
_RM_RF_	0.995904	0.017356	57.38241	0.0000

R-squared	0.858885	Mean dependent var	-0.158434
Adjusted R-squared	0.858624	S.D. dependent var	0.055016
S.E. of regression	0.020686	Akaike info criterion	-4.915030
Sum squared resid	0.231502	Schwarz criterion	-4.899203
Log likelihood	1336.431	Hannan-Quinn criter.	-4.908842
F-statistic	3292.741	Durbin-Watson stat	1.665692
Prob(F-statistic)	0.000000		



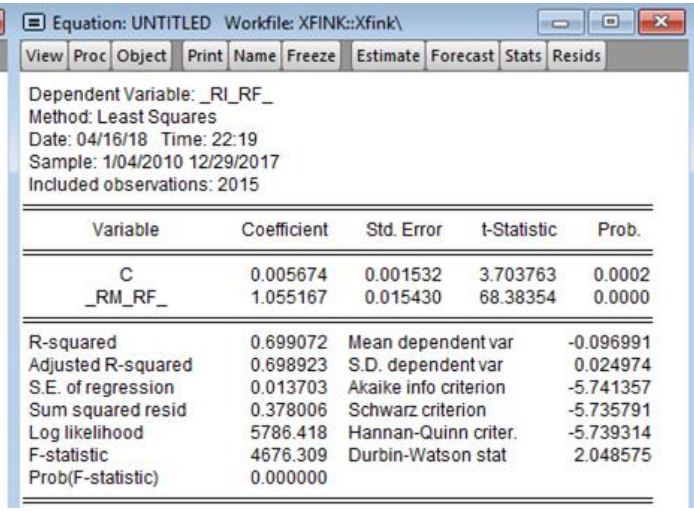
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 22:17
Sample: 11/02/2007 12/31/2009
Included observations: 543

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.001306	0.008831	0.147853	0.8825
_RM_RF_	0.994017	0.119233	8.336756	0.0000
_RM_RF_^2	-0.005975	0.373557	-0.015995	0.9872

R-squared	0.858885	Mean dependent var	-0.158434
Adjusted R-squared	0.858362	S.D. dependent var	0.055016
S.E. of regression	0.020705	Akaike info criterion	-4.911348
Sum squared resid	0.231502	Schwarz criterion	-4.887607
Log likelihood	1336.431	Hannan-Quinn criter.	-4.902065
F-statistic	1643.328	Durbin-Watson stat	1.665681
Prob(F-statistic)	0.000000		



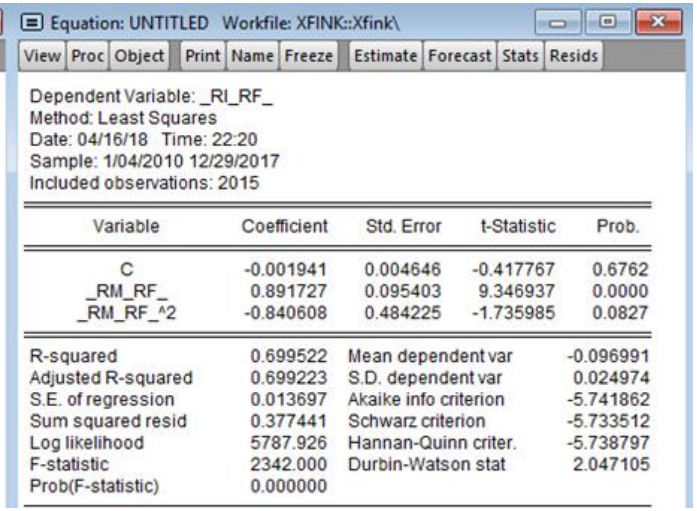
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 22:19
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.005674	0.001532	3.703763	0.0002
_RM_RF_	1.055167	0.015430	68.38354	0.0000

R-squared	0.699072	Mean dependent var	-0.096991
Adjusted R-squared	0.698923	S.D. dependent var	0.024974
S.E. of regression	0.013703	Akaike info criterion	-5.741357
Sum squared resid	0.378006	Schwarz criterion	-5.735791
Log likelihood	5786.418	Hannan-Quinn criter.	-5.739314
F-statistic	4676.309	Durbin-Watson stat	2.048575
Prob(F-statistic)	0.000000		



Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 22:20
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.001941	0.004646	-0.417767	0.6762
_RM_RF_	0.891727	0.095403	9.346937	0.0000
_RM_RF_^2	-0.840608	0.484225	-1.735985	0.0827

R-squared	0.699522	Mean dependent var	-0.096991
Adjusted R-squared	0.699223	S.D. dependent var	0.024974
S.E. of regression	0.013697	Akaike info criterion	-5.741862
Sum squared resid	0.377441	Schwarz criterion	-5.733512
Log likelihood	5787.926	Hannan-Quinn criter.	-5.738797
F-statistic	2342.000	Durbin-Watson stat	2.047105
Prob(F-statistic)	0.000000		

APPENDIX 20: XUMAL

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 22:25
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.006725	0.000800	8.402568	0.0000
_RM_RF_	1.030468	0.003628	284.0367	0.0000

R-squared	0.988229	Mean dependent var	-0.216828
Adjusted R-squared	0.988216	S.D. dependent var	0.041477
S.E. of regression	0.004502	Akaike info criterion	-7.966338
Sum squared resid	0.019481	Schwarz criterion	-7.956223
Log likelihood	3837.792	Hannan-Quinn criter.	-7.962486
F-statistic	80676.86	Durbin-Watson stat	1.761172
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 22:25
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.003150	0.003397	0.927151	0.3541
_RM_RF_	0.997498	0.030666	32.52757	0.0000
_RM_RF_^2	-0.073518	0.067902	-1.082709	0.2792

R-squared	0.988243	Mean dependent var	-0.216828
Adjusted R-squared	0.988218	S.D. dependent var	0.041477
S.E. of regression	0.004502	Akaike info criterion	-7.965481
Sum squared resid	0.019457	Schwarz criterion	-7.950310
Log likelihood	3838.379	Hannan-Quinn criter.	-7.959704
F-statistic	40346.25	Durbin-Watson stat	1.758866
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 22:31
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.007798	0.000954	8.170872	0.0000
_RM_RF_	1.049164	0.005661	185.3409	0.0000

R-squared	0.984467	Mean dependent var	-0.160738
Adjusted R-squared	0.984438	S.D. dependent var	0.054152
S.E. of regression	0.006755	Akaike info criterion	-7.153329
Sum squared resid	0.024733	Schwarz criterion	-7.137524
Log likelihood	1947.705	Hannan-Quinn criter.	-7.147149
F-statistic	34351.25	Durbin-Watson stat	1.650778
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 22:30
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.005318	0.002821	-1.885045	0.0600
_RM_RF_	0.863500	0.038088	22.67127	0.0000
_RM_RF_^2	-0.587870	0.119314	-4.927085	0.0000

R-squared	0.985134	Mean dependent var	-0.160738
Adjusted R-squared	0.985079	S.D. dependent var	0.054152
S.E. of regression	0.006615	Akaike info criterion	-7.193547
Sum squared resid	0.023671	Schwarz criterion	-7.169840
Log likelihood	1959.645	Hannan-Quinn criter.	-7.184278
F-statistic	17925.37	Durbin-Watson stat	1.669307
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 22:32
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.006486	0.000689	9.416339	0.0000
_RM_RF_	1.068064	0.006938	153.9520	0.0000

R-squared	0.921716	Mean dependent var	-0.097434
Adjusted R-squared	0.921678	S.D. dependent var	0.022015
S.E. of regression	0.006161	Akaike info criterion	-7.340078
Sum squared resid	0.076416	Schwarz criterion	-7.334511
Log likelihood	7397.128	Hannan-Quinn criter.	-7.338035
F-statistic	23701.21	Durbin-Watson stat	2.341000
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

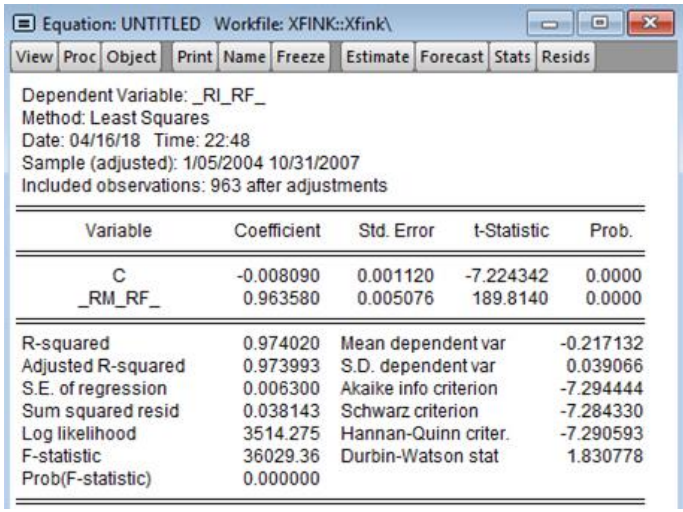
View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 22:32
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.005293	0.002090	2.532213	0.0114
_RM_RF_	1.042465	0.042923	24.28684	0.0000
_RM_RF_^2	-0.131661	0.217859	-0.604340	0.5457

R-squared	0.921731	Mean dependent var	-0.097434
Adjusted R-squared	0.921653	S.D. dependent var	0.022015
S.E. of regression	0.006162	Akaike info criterion	-7.339267
Sum squared resid	0.076402	Schwarz criterion	-7.330917
Log likelihood	7397.311	Hannan-Quinn criter.	-7.336202
F-statistic	11847.05	Durbin-Watson stat	2.341811
Prob(F-statistic)	0.000000		

APPENDIX 21: XUSIN



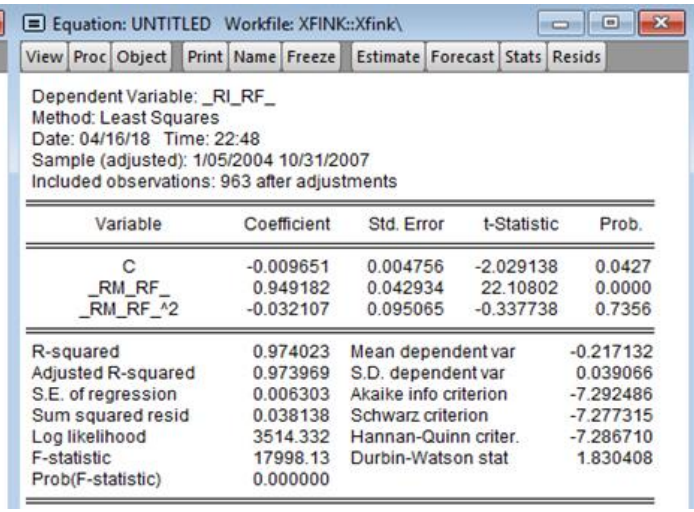
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 22:48
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.008090	0.001120	-7.224342	0.0000
_RM_RF_	0.963580	0.005076	189.8140	0.0000

R-squared	0.974020	Mean dependent var	-0.217132
Adjusted R-squared	0.973993	S.D. dependent var	0.039066
S.E. of regression	0.006300	Akaike info criterion	-7.294444
Sum squared resid	0.038143	Schwarz criterion	-7.284330
Log likelihood	3514.275	Hannan-Quinn criter.	-7.290593
F-statistic	36029.36	Durbin-Watson stat	1.830778
Prob(F-statistic)	0.000000		



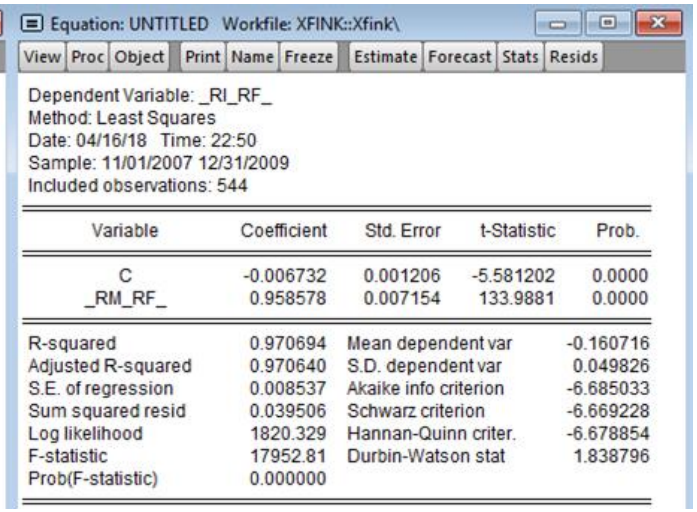
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 22:48
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.009651	0.004756	-2.029138	0.0427
_RM_RF_	0.949182	0.042934	22.10802	0.0000
_RM_RF_^2	-0.032107	0.095065	-0.337738	0.7356

R-squared	0.974023	Mean dependent var	-0.217132
Adjusted R-squared	0.973969	S.D. dependent var	0.039066
S.E. of regression	0.006303	Akaike info criterion	-7.292486
Sum squared resid	0.038138	Schwarz criterion	-7.277315
Log likelihood	3514.332	Hannan-Quinn criter.	-7.286710
F-statistic	17998.13	Durbin-Watson stat	1.830408
Prob(F-statistic)	0.000000		



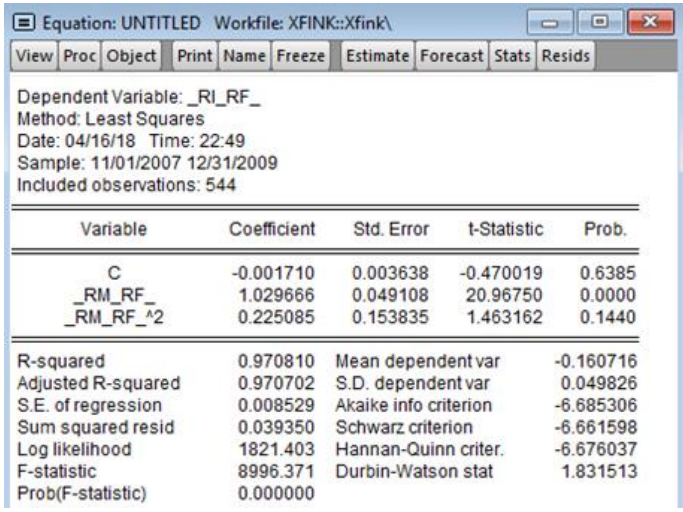
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 22:50
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.006732	0.001206	-5.581202	0.0000
_RM_RF_	0.958578	0.007154	133.9881	0.0000

R-squared	0.970694	Mean dependent var	-0.160716
Adjusted R-squared	0.970640	S.D. dependent var	0.049826
S.E. of regression	0.008537	Akaike info criterion	-6.685033
Sum squared resid	0.039506	Schwarz criterion	-6.669228
Log likelihood	1820.329	Hannan-Quinn criter.	-6.678854
F-statistic	17952.81	Durbin-Watson stat	1.838796
Prob(F-statistic)	0.000000		



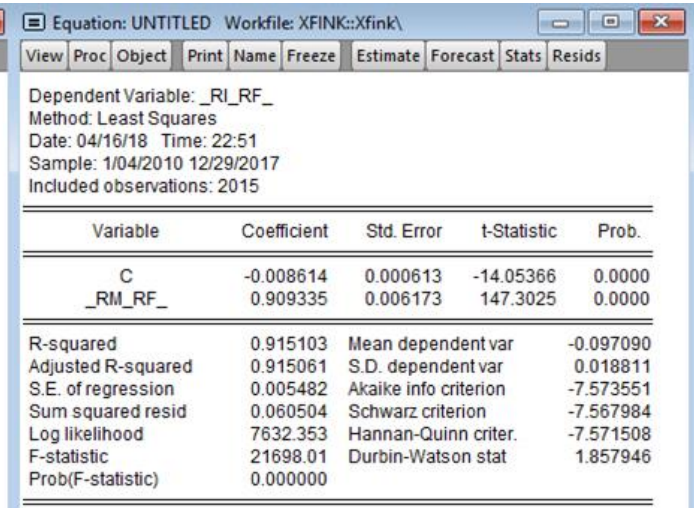
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 22:49
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.001710	0.003638	-0.470019	0.6385
_RM_RF_	1.029666	0.049108	20.96750	0.0000
_RM_RF_^2	0.225085	0.153835	1.463162	0.1440

R-squared	0.970810	Mean dependent var	-0.160716
Adjusted R-squared	0.970702	S.D. dependent var	0.049826
S.E. of regression	0.008529	Akaike info criterion	-6.685306
Sum squared resid	0.039350	Schwarz criterion	-6.661598
Log likelihood	1821.403	Hannan-Quinn criter.	-6.676037
F-statistic	8996.371	Durbin-Watson stat	1.831513
Prob(F-statistic)	0.000000		



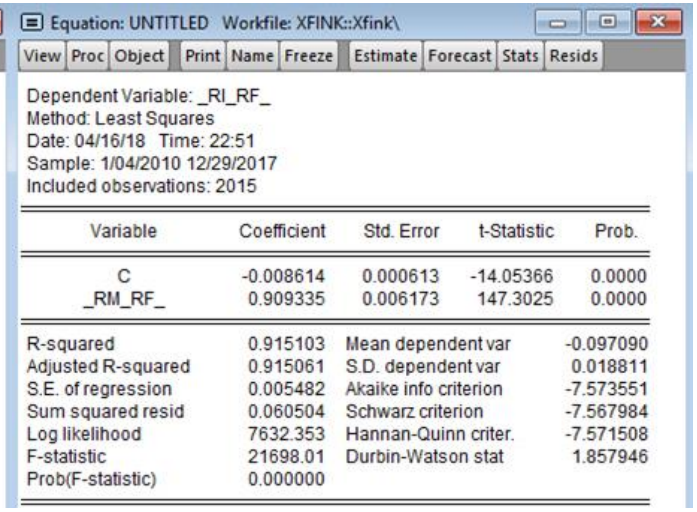
Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 22:51
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.008614	0.000613	-14.05366	0.0000
_RM_RF_	0.909335	0.006173	147.3025	0.0000

R-squared	0.915103	Mean dependent var	-0.097090
Adjusted R-squared	0.915061	S.D. dependent var	0.018811
S.E. of regression	0.005482	Akaike info criterion	-7.573551
Sum squared resid	0.060504	Schwarz criterion	-7.567984
Log likelihood	7632.353	Hannan-Quinn criter.	-7.571508
F-statistic	21698.01	Durbin-Watson stat	1.857946
Prob(F-statistic)	0.000000		



Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 22:51
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.008614	0.000613	-14.05366	0.0000
_RM_RF_	0.909335	0.006173	147.3025	0.0000

R-squared	0.915103	Mean dependent var	-0.097090
Adjusted R-squared	0.915061	S.D. dependent var	0.018811
S.E. of regression	0.005482	Akaike info criterion	-7.573551
Sum squared resid	0.060504	Schwarz criterion	-7.567984
Log likelihood	7632.353	Hannan-Quinn criter.	-7.571508
F-statistic	21698.01	Durbin-Watson stat	1.857946
Prob(F-statistic)	0.000000		

APPENDIX 22: XUTEK

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 22:53
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.006076	0.002244	-2.707207	0.0069
_RM_RF_	0.976103	0.010174	95.93714	0.0000

R-squared	0.905459	Mean dependent var	-0.217835
Adjusted R-squared	0.905361	S.D. dependent var	0.041045
S.E. of regression	0.012627	Akaike info criterion	-5.903917
Sum squared resid	0.153218	Schwarz criterion	-5.893803
Log likelihood	2844.736	Hannan-Quinn criter.	-5.900066
F-statistic	9203.935	Durbin-Watson stat	1.947070
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 22:54
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.026190	0.009510	-2.753903	0.0060
_RM_RF_	0.790601	0.085843	9.209828	0.0000
_RM_RF_^2	-0.413647	0.190076	-2.176218	0.0298

R-squared	0.905923	Mean dependent var	-0.217835
Adjusted R-squared	0.905727	S.D. dependent var	0.041045
S.E. of regression	0.012602	Akaike info criterion	-5.906762
Sum squared resid	0.152466	Schwarz criterion	-5.891590
Log likelihood	2847.106	Hannan-Quinn criter.	-5.900985
F-statistic	4622.226	Durbin-Watson stat	1.941723
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 22:55
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.003304	0.002063	-1.601640	0.1098
_RM_RF_	0.975913	0.012237	79.75044	0.0000

R-squared	0.921474	Mean dependent var	-0.160073
Adjusted R-squared	0.921329	S.D. dependent var	0.052064
S.E. of regression	0.014603	Akaike info criterion	-5.611490
Sum squared resid	0.115583	Schwarz criterion	-5.595685
Log likelihood	1528.325	Hannan-Quinn criter.	-5.605311
F-statistic	6360.133	Durbin-Watson stat	1.787796
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 22:55
Sample: 11/01/2007 12/31/2009
Included observations: 544

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.013324	0.006188	2.153201	0.0317
_RM_RF_	1.211296	0.083540	14.49965	0.0000
_RM_RF_^2	0.745295	0.261696	2.847938	0.0046

R-squared	0.922633	Mean dependent var	-0.160073
Adjusted R-squared	0.922347	S.D. dependent var	0.052064
S.E. of regression	0.014508	Akaike info criterion	-5.622694
Sum squared resid	0.113875	Schwarz criterion	-5.598987
Log likelihood	1532.373	Hannan-Quinn criter.	-5.613425
F-statistic	3225.843	Durbin-Watson stat	1.804211
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 22:56
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.008930	0.001439	-6.204612	0.0000
_RM_RF_	0.901020	0.014496	62.15633	0.0000

R-squared	0.657444	Mean dependent var	-0.096598
Adjusted R-squared	0.657274	S.D. dependent var	0.021990
S.E. of regression	0.012874	Akaike info criterion	-5.866252
Sum squared resid	0.333624	Schwarz criterion	-5.860686
Log likelihood	5912.249	Hannan-Quinn criter.	-5.864209
F-statistic	3863.409	Durbin-Watson stat	1.840027
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 22:57
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.015317	0.004366	-3.508479	0.0005
_RM_RF_	0.763946	0.089641	8.522255	0.0000
_RM_RF_^2	-0.705002	0.454981	-1.549521	0.1214

R-squared	0.657852	Mean dependent var	-0.096598
Adjusted R-squared	0.657512	S.D. dependent var	0.021990
S.E. of regression	0.012869	Akaike info criterion	-5.866452
Sum squared resid	0.333227	Schwarz criterion	-5.858103
Log likelihood	5913.451	Hannan-Quinn criter.	-5.863388
F-statistic	1934.249	Durbin-Watson stat	1.838580
Prob(F-statistic)	0.000000		

APPENDIX 23: XUTEKS

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 23:04
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.013847	0.001996	-6.937225	0.0000
_RM_RF_	0.939452	0.009049	103.8225	0.0000

R-squared	0.918144	Mean dependent var	-0.217655
Adjusted R-squared	0.918059	S.D. dependent var	0.039230
S.E. of regression	0.011230	Akaike info criterion	-6.138439
Sum squared resid	0.121187	Schwarz criterion	-6.128325
Log likelihood	2957.658	Hannan-Quinn criter.	-6.134588
F-statistic	10779.10	Durbin-Watson stat	1.855899
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 23:05
Sample (adjusted): 1/05/2004 10/31/2007
Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.004999	0.008474	-0.589927	0.5554
_RM_RF_	1.021059	0.076487	13.34945	0.0000
_RM_RF_^2	0.181976	0.169359	1.074496	0.2829

R-squared	0.918242	Mean dependent var	-0.217655
Adjusted R-squared	0.918072	S.D. dependent var	0.039230
S.E. of regression	0.011229	Akaike info criterion	-6.137564
Sum squared resid	0.121042	Schwarz criterion	-6.122393
Log likelihood	2958.237	Hannan-Quinn criter.	-6.131787
F-statistic	5390.995	Durbin-Watson stat	1.853129
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 23:06
Sample: 11/02/2007 12/31/2009
Included observations: 543

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.011714	0.002141	-5.471212	0.0000
_RM_RF_	0.925989	0.012708	72.86577	0.0000

R-squared	0.907528	Mean dependent var	-0.160363
Adjusted R-squared	0.907357	S.D. dependent var	0.049764
S.E. of regression	0.015147	Akaike info criterion	-5.538370
Sum squared resid	0.124120	Schwarz criterion	-5.522542
Log likelihood	1505.667	Hannan-Quinn criter.	-5.532181
F-statistic	5309.420	Durbin-Watson stat	1.719065
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 23:05
Sample: 11/02/2007 12/31/2009
Included observations: 543

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.009105	0.006466	-1.408291	0.1596
_RM_RF_	0.962924	0.087290	11.03127	0.0000
_RM_RF_^2	0.116968	0.273481	0.427700	0.6690

R-squared	0.907559	Mean dependent var	-0.160363
Adjusted R-squared	0.907217	S.D. dependent var	0.049764
S.E. of regression	0.015158	Akaike info criterion	-5.535025
Sum squared resid	0.124078	Schwarz criterion	-5.511284
Log likelihood	1505.759	Hannan-Quinn criter.	-5.525742
F-statistic	2650.792	Durbin-Watson stat	1.721404
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 23:07
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.010238	0.001256	-8.151614	0.0000
_RM_RF_	0.891238	0.012649	70.45797	0.0000

R-squared	0.711494	Mean dependent var	-0.096953
Adjusted R-squared	0.711351	S.D. dependent var	0.020909
S.E. of regression	0.011234	Akaike info criterion	-6.138812
Sum squared resid	0.254031	Schwarz criterion	-6.133246
Log likelihood	6186.853	Hannan-Quinn criter.	-6.136769
F-statistic	4964.326	Durbin-Watson stat	1.918322
Prob(F-statistic)	0.000000		

Equation: UNTITLED Workfile: XFINK::Xfink\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: _RI_RF_
Method: Least Squares
Date: 04/16/18 Time: 23:07
Sample: 1/04/2010 12/29/2017
Included observations: 2015

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.035388	0.003765	-9.398608	0.0000
_RM_RF_	0.351463	0.077312	4.546054	0.0000
_RM_RF_^2	-2.776177	0.392401	-7.074846	0.0000

R-squared	0.718497	Mean dependent var	-0.096953
Adjusted R-squared	0.718217	S.D. dependent var	0.020909
S.E. of regression	0.011099	Akaike info criterion	-6.162393
Sum squared resid	0.247864	Schwarz criterion	-6.154043
Log likelihood	6211.611	Hannan-Quinn criter.	-6.159328
F-statistic	2567.676	Durbin-Watson stat	1.916514
Prob(F-statistic)	0.000000		