The Impact of the 2008 Global Financial Crisis on Non-Financial Firms Profitability: A Case from the USA

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ABSTRACT

No doubt USA has greatest economy on the globe and the 2008 global financial crisis originated from the US subprime mortgage market. As a consequence of the crisis, most of the countries in worldwide experienced financial and economy crisis. The essential objective of this thesis is to investigate the impact of the 2008 global financial crisis on the profitability of US non-financial firms as well as to examine the determinants of the profitability of US non-financial firms. To do so, panel data methodology has been implemented. The sample of 42 non-financial firms from 8 different sectors has been considered, the sample has been chosen from NYSE and NASDAQ listed companies. The time interval has been determined from 2004 to 2011. To run the two sample hypothesis tests for two different means, the period has been divided into two broad periods, pre-crisis from 2004 to 2007 and post-crisis from 2008 to 2011. Regarding the 1st, 2nd, and 3rd hypotheses to investigate the changes in the profitability of the sampled firms, the time interval considered as pre and post crisis. However, the hypothesis 4 to 8 of the study that investigates the impact of explanatory variables on the explained variable has been tested over the entire period of 2004-2011. The variables of this thesis are fetched from literature accordingly NI, ROA, and ROE are the profitability measurements and represent the dependent variables, on the other hand the explanatory variables are size, growth opportunity, liquidity, leverage, and tangibility of assets.

Statistics and econometrics techniques that used in this research are descriptive statistics, two-sample hypothesis test, correlation matrix, multicollinearity,

homoscedasticity, autocorrelation, panel unit root test, and OLS regression analysis with fixed effect.

The study has shown that net income of non-financial firms has increased significantly after the crisis. However, return on assets of our sample decreased significantly after the crisis but the return on equity decreased by a big volume, however, this decrease is found to be not significant statistically. Findings also suggest statistically significant and negative effect of size and tangibility on the profitability. However, leverage is positively and significantly related to profitability. The study also proposes that liquidity and growth are positively but not significantly related to the profitability.

Keywords: 2008 Global Financial Crisis, US Non-Financial Firms, Profitability, Determinants of Profitability

ÖZ

Ekonomik bakımdan Amerika Birleşik Devletleri'nin diğer Dünya Uluslarından daha iyi bir durumda olduğu bahsedilmektedir. Ancak 2008 yılında gerçekleşen küresel finansal krizin diğer Dünya devletlerine olan etkisinin Amerika Birleşik Devletleri'ndeki ipotekli konut pazarında meydana gelen krizden kaynaklanması göz ardı edilemez bir gerçektir. Mevcut çalışmanın esas amacı 2008 yılında gerçekleşen küresel finansal krizin Amerika Devletleri sınrlarında faaliyet gösteren Reel Firmaların karlılığı üzerine olan etkisi ile firmaların karlılığına katkı koyan etkenler üzerine olan etkisini test etmektir. Mevcut tezde veri toplama methodu olarak panel veri yöntemi kullanılmıştır. Çalışmanın örneklemini NYSE ve NASDAQ listesinde yer alan 8 farklı sektörden seçilmiş toplamda ise 42 adet Reel firma temsil etmektedir**.**Mevcut çalışmada zaman dilimi olarak 2004-2007 dönemi ve 2008-2011 dönemi göz önünde tutulmuştur. 2004-2007 zaman dilimi Küresel Kriz öncesi dönemi 2008-2011 ise Küresel Kriz sonrası olan dönemi kapsamaktadır.Ancak çalışmanın varsayımları oluşurulurken 2004-2011 yıllarını kapyasan zaman dilimi göz önünde tutulmuştur. Mevcut araştırma da NI; Net geliri, ROA; Net Aktif Oranını, ROE ise Öz Sermaye karlılık oranını temsil edip, karlılık değişkenleri, bağımlı değişkenler olarak da nitelendirilmektedirler. Bununla birlikte mevcut tezde, firmanın büyüklüğü, büyüme olanakları, likit, getiri ve somut varlıkları da açıklayıcı(bağımsız) değişkenler olarak ifade edilmiştir.Mevcut çalışmada 1'den 3 'e kadar olan varsayımlar Küresel Finansal Krizin , seçilmiş reel firmaların karlılığı üzerine olan etkisini ölçmek amacı ile oluşturulmuş olup zaman dilimi olarak Kriz Öncesi zaman dilimi(2004-2007) ile Kriz Sonrası(2007-2011) dönemi göz önünde tutulmuştur. Bununla birlike 4'ten 8'e kadar olan varsayımlar ise bağımsız

değişkenlerin bağımlı değişkenler üzerine olan etkisini 2004-2011 dönemini kapsayan dönemde test edecektir. Mevcut çalışmada betimsel istatistik, iki örneklemli hipotez testi, ilgileşim dizeyi, eşit yayılım, kendiyle ilgileşim, panel birim kök testi,çoklu eş doğrusallık, sabit etkili olağan en küçük kareler bağlaşım analizi, ekonometrik analiz yöntemleri olarak uygulanmış ve çalışmanın bulguları bu yöntemler ışığında şekillenmiştir.

Mevcut çalışmada elde edilen bulgular reel firmaların kriz sonrası dönemde net gelirlerinin yükselmeye devam ettiğini ancak seçilmiş firmaların net aktif oranının kriz döneminde düşüş gösterdiği ve olumsuz etkilendiğini bununla öz sermaye karlılık oranlarında da kriz döneminde düşüş gösterdiğini bu düşüsün istatistiksel olarak anlamlı olmadığını belirtmiştir. Ayrıca çalışmanın bulguları ,2004-2011 döneminde ise firma büyüklüğünün ve somut varlıkların karlılığa istatistiksel olarak anlamlı ve olumsuz bir etkisinin olduğunu, getiri ile karlılığın arasında olumlu ve istatistiksel olarak anlamlı bir ilişkinin olduğunu ve likit ile büyümenin karlılık üzerine olumlu ancak istatistiksel olarak anlamlı bir ilişkinin olmadığına değinmiştir.

Anahtar Kelimeler: 2008 Küresel Finansal Kriz, ABD Reel Firmalar, Karlılık, Karlılık etkenleri.

To My Parents

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ABBREVIATIONS

DW	Durbin-Watson
GRTH	Growth
LQD	Liquidity
LVGE	Leverage
NI	Net Income
OLS	Ordinary Least Squared
ROA	Return on Assets
ROE	Return on Equity
SME	Small and Medium Enterprises
TANG	Tangibility
V 4	Visegrad Group

Chapter 1

INTRODUCTION

1.1 Background of the Study

1.1.1 The 2008 Financial Crisis and It's Affect

Bordo and Landon-Lane (2010) provide a narrative about the history of financial crisis starting from 1825, and follows gold standard era and finally 2007 global financial crisis. Accordingly every financial crisis has a significant impact on the financial and non-financial sector as well as the overall economy of many countries.

Helleiner (2011) consider the 2007-2008 global financial crises as the most severe crisis since the Great Depression of the 1930s. The biggest well-known financial institutions collapsed while many others survived only with massive support. The crisis affected financial centers in the worldwide, international trade collapsed, and all economies around the globe involved. Reinhart and Rogoff (2009). In the Study of the influence of financial crisis 2007-2008, and Tong and Wei (2008) profess that the crisis started from US subprime mortgage but quickly metamorphosed to other countries in the world where many financial institutions lurched to the edge of bankruptcy as well as non-financial firms to spiral downward.

Evidence from empirical studies indicating the influence of financial crisis of 2008 on the performance and profitability of financial institutions and non-financial firms, for instance, Dietrich and Wanzenried (2010) examined the Swiss banks profitability

before and during the 2008 global financial crisis, and they found that the crisis has extremely influenced the bank industry in Switzerland. However, Dencic-Mihajlov (2014) in the other study have investigated the profitability of Serbian companies during the financial crisis of 2008 found that the Serbian firms profitability significantly suffered during the crisis that appeared because they could not adapt to the new market conditions. In the current study, we will figure out the effect of the global financial crisis on the profitability of non-financial firms in the USA as well as the determinants of profitability of US non-financial firms.

1.1.2 Determinants of Profitability of non-Financial Firms

Innocent and Mary, and Matthew (2013) State that the investors, savers, and companies are most concern with the profitability of the firms, profitability ratios reflect the company's overall management efficiency and performance thus the major goals of the financial manager is to increase shareholders equity. According to Yazdanfar (2013) Firm's profitability considered as a precondition factor for long-term firm survival and success; moreover increasing competition, efficiency growth, and price pressure, firms are experiencing much difficulty to achieve the required profitability.

Yazdanfar (2013) states that:

> The variables that might explain firm profitability can be classified into three main categories: firm-specific characteristics, industry variables, and market-related variables. Many attempts have been made to investigate the roles of these variables in explaining firm profitability (pp. 151)

Various researchers studied the profitability of firms in different sectors and ran the different dependent variables to find the significance of them at which by how much

they explain the profitability of the companies from a particular area, and consequently some variables were significant and some were not. This study's concern is the non-financial company's profitability.

Carvalho and Serrasqueiro, and Maçãs Nunes (2013) considered the independent variables of the determinant of profitability of Portuguese fitness SMEs as the size, age, liquidity, long-term debt, growth opportunities, and risk and found that all variables except growth opportunity and risk are positive effect of determinants of profitability. However, Steinerowska-Streb (2012) examined the firm size, owner-manager, and market range as a determinant of profitability of SMEs. Kouser et al., (2012) in the study of the relationship between profitability, growth, and size of non-financial firms in Pakistan found that the profitability has a positive relationship with the growth of the firms, but size has less significant impact on it. Based on literature and conceptual framework variables has been examined in this study are; the return on assets, return on equity as a dependent variable and (company size, company growth opportunities, liquidity, tangibility of assets and leverage) as independent variables in my model.

1.2 Motivation and Objective of the Study

The United States is one of the most developed countries and therefore, it is strongly motivated to understand the behavior of non-financial firms in this country. Profit has been always the fundamentals for all businesses, investors, and all stakeholders in different sectors. Investors are always seeking for the opportunity of making money even globally or domestically. Various researches have been conducted about the profitability of banking sector and financial and sector in the worldwide but still a

few of them is about non-financial forms and the effect of 2008 financial crisis on US non-financial firms as it has been titled to this thesis.

The main objectives of this study are to find out whether the 2008 financial crisis has influenced the firm's profitability or not. Moreover, to figure out how the determinants of profitability are influencing non-financial firms' profitability and to state whether the influential powers of each determinant vary or not.

1.3 Research Questions

In respect of our objectives following questions has been addressed the as the research question:

- How did the 2008 financial crisis affect the US non-financial firm's profitability?
- What are the determinants of profitability of non-financial firms?

1.4 Research Hypotheses

Based on the Research Questions the following hypotheses have been developed:

H0: 1 the average Net Income of the US non-financial firms is the same before and after the 2008 financial crisis.

H0: 2 the average ROA of the US non-financial firms is the same before and after the 2008 financial crisis.

H0: 3 the average ROE of the US non-financial firms is the same before and after the 2008 financial crisis.

H0: 4 there is a positive relationship between firm's size and (ROA & ROE) of non-financial firms in the USA.

H0: 5 there is a positive relationship between growth opportunity and (ROA & ROE) of non-financial firms in the USA.

H0: 6 there is a negative relationship between Leverage and (ROA & ROE) of non-financial firms in the USA.

H0: 7 there is a positive relationship between liquidity and (ROA & ROE) of non-financial firms in the USA.

H0: 8 there is a positive relationship between Tangibility and (ROA & ROE) of non-financial firms in the USA

1.5 Scope of the Study and Limitations

This study investigates the impact of the 2008financial crisis on non-financial US firms based on a sample of 42 firms in the USA from 8 different sectors. The research based on cross-sectional and panel data of 42 non-financial firms and time horizon considered from 2004 to 2011 at which represent the period of before and after the crisis. However, due to the availability of firms' data, the scope of this study is limited to US non-financial firms at which listed in NASDAQ and NYSE since 2004 and earlier.

1.6 Data and Methodology

Cross-sectional data collected from 42 non-financial firms in US and period is 2004-2011 to compare the profitability and determinant of profitability between pre and post-crisis periods. Data has been obtained from world scope and Thomson Reuters' Data Stream. Variables in this study are dependent variables (NI, ROE, and ROA) and independent variable which are; company size, company growth opportunities, leverage, liquidity, and tangibility of assets. The descriptive statistic has been employed to present the average of profitability and control variables before and after the crisis. For reliability of our sample t-test statistic has been conducted to find the significance of our sample statistically. For determinant of the relation between variables the correlation matrix and the econometric tool of OLS regression analysis

has been employed. To investigate the stationary of the regression model, panel unit root test has been employed. Multicollinearity, autocorrelation, and heteroscedasticity of the dataset have been detected. To conduct statistics techniques and econometrics tools, Microsoft Excel and E-views software have been used.

1.7 Key Terms

The key terms at which will frequently repeat in this study will be described to provide a better understanding. The key terms are:

- *Financial Crisis* refers to a circumstance in which the value of financial instruments or financial institutions collapses rapidly. As a result, banks face the rush of withdrawal of money, investors face difficulty liquidity of the asset and lack of viability or reliability of information.

  (http://lexicon.ft.com/Term?term=global-financial-crisis

  retrieved.24.09.2015)

- *Profitability Ratio* McMahon and Stanger (1995) argue that profitability is a ratio of the measurement of success of the business and its financial management's responsibility to maximize shareholder's equity. However, a business may not generate profit soon because of initial investment costs. The most common profitability ratios are Return on Asset and Return on Equity.

1.8 Disposition

The following sections contain five chapters;

Chapter two; which is titled investigates as Global Financial Crisis of 2008; we review the historical background of financial crisis up to 2008 financial crisis as well as its origins, causes, and consequences of the macroeconomic and microeconomic factors financially and economically.

Chapter three; literature review, the conceptual framework and relevant literature has been reviewed. This chapter includes the description of optimization issue, as well as determinants of profitability, will be discussed**.**

Chapter four; data and research methodology addressed in this chapter. The sampled firm categories will be presented. Furthermore, the choice of variables of our study will be explored as well as the models and the hypotheses or the study will be developed.

Chapter five; empirical results and finding, in this chapter the descriptive statistics, correlation analyzes, multicollinearity, autocorrelation, heteroscedasticity and regression results, will be presented. Finally, the outcomes will be analyzed.

Chapter six; which is the last chapter outlines the conclusion and summary of the empirical study. In this chapter, the determinants that have more effect on profitability will be identified the impact of the financial crisis on the profitability between pre and post crisis period will be compared. Moreover, the limitation and suggestions of the study will be argued.

Chapter 2

GLOBAL FINANCIAL CRISIS OF 2008

2.1 Historical Background of Financial Crisis

In their study of global financial crisis Bordo and Landon-Lane (2010) present a narrative about the history of the global financial crisis, accordingly the bellow table contain the occurrence years, the territories where crises generated.

Table 2.1: History of Financial Crisis (Bordo and Landon-Lane, 2010, pp 4-9)

Global Financial Crisis	**Occurrence**
London	1825
London stock market crashes	1837,1839, 1847, 1857
Germany and Austria	1873
England and other European Countries (gold standard era)	1890
The extension of previous crisis (gold standard era)	1893
USA (gold standard era)	1907
First world war (gold standard era)	1914
The interwar period	1920-1925 1929-1933
Bretton Woods	1944-1973
Latin American crisis	1982
European banks crisis	1990-1991
The Tequila crisis Mexico, US, and other Latin countries	1994
The Asia crisis	1997-1998
Mortgage subprime crisis from US	2007-2008

Sayek and Taskin (2014) argue that financial crises is not new and have a long history at which every country in worldwide has experienced economy and financial crises. Moreover in their study of investigating the relationship between old and new financial crises they found that regarding global factors the crisis face and economy factors the old crisis significantly varies from the new crises, however in term of pre-crisis vulnerability old and new crisis are not different and match statistically.

2.2 Global Financial Crisis of 2008

Demyanyk and Van Hemert (2008) mention that the subprime mortgage market was booming while 2001-2006 and mortgage-backed-securities had no any credit risk protections by the government. On the other hand, investors were looking for higher profit and kept increasing demand for mortgage backed-securities, the global financial crisis of 2008 generated from this phenomenon. However Leclair and Jo, and Knoll (2011) and Helleiner (2012) state that the global financial crisis 2008 happen rarely but still it could have been avoided if International Political Economic thinkers had spent more time and effort to identify the causes the crisis before it happens.

The key factors contributing to the global financial crisis of 2008, according to Russo and Katzel (2011)

> "is the dramatic growth in aggregate household indebtedness, in the United States and other parts of the world, both on an aggregate basis and relative to household income this growth in household indebtedness was the result in large part of a significant and sustained expansion in residential mortgage lending, the growth in residential mortgage lending was facilitated, in turn,

by a significant loosening of underwriting standards, including a dramatic lowering of the average amount of down payment required".

Obstfeld and Rogoff (2009) in the study of causes of the crisis argue that what caused the global financial crisis of 2008 are:

- *First* increasing value and demand for real estate all over the world particularly in the largest economy in the world (United States).
- *Second* rising current account deficit in many different countries including the United States.
- *Third* leverage had reached to extraordinary level in various sectors across the world.

However according to Russo and Katzel (2011) causes of the global financial crisis are:

1. Overleveraged individuals.
2. Overeager lenders and financial institutions searching for yield.
3. Complicit governments: central banks, regulators, and legislatures.
4. The role of the rating agencies
5. Nonfinancial businesses also indulged in debt.

Finally to resolve the crisis which covers all the world, trillions of dollars has been dedicated, to restore the confidence in the international banking system and financial markets in term of liquidity, nine US banks have been partially nationalized and many reforms in dept and insurance system has been applied, as well as federal reserve has decreased interest rate to 0-0.25 %.

Despite all reforms and effort to restore the confidence of the financial sector but it suffered from high level of volatility. Nissan Ke (2010)

2.3 The Aftermath of Global Financial Crisis of 2008

Various crises ensue the global financial crisis of 2008 in which can be categorized into two categories; Macroeconomic Effects, and other Microeconomic Effects.

2.3.1 Macroeconomic Effects

Since our focus is not Micro- oriented here a few studies have been reviewed. In the study of the consequences of the global financial crisis of 2008 on the countries, Reinhart and Rogoff (2009) found that unemployment rose, and house prices declined for six years respectively, however, output decrease for only two years on average. They are also mentioning about a significant increase in government dept and a decrease in GDP of countries.

Jones (2010) presents the variations after of the global financial crisis 2008 in the economy of US in more detailed, accordingly GDP has declined by -0.8%, Nonfarm Employment has decreased by -2.6% and Unemployment Rate increased by 2.7%, Consumption has fallen by -1.5%, Investment by -9.8%, Exports by -1.8% & Imports by -7.1%, however, Government Purchases has increased by 3.3%. The inflation rate rose from 2% to 5.5%. On average outcomes of the crisis Jones (2010) provides information on number as; Housing prices -35%, Equity prices -56%, Unemployment +7 percentage points, Duration of rising unemployment 4.8 years, Real GDP -9.3%, Duration of falling GDP 1.9 years, Increase in real government debt +86%.

2.3.2 Microeconomic Effects

Many studies have been employed to examine the effects of the global financial crisis on the performance of financial institutions such as banks and non-financial firms, here some of them have been reviewed which are relevant to the topic of this thesis.

A study by Prasad and Puri, and Jain (2015) discuss the time interval at which firms need to return to profitability after the financial crisis, they examined the sample of thousands of companies from Korea, Thailand, and Indonesia in the Asia Financial Crisis of 1997. They found that the Asia Financial Crisis of 1997 immediately decreased the profitability of Asian countries, but this result was not statistically significant. They also state that the time interval which firms need to go back to profitability varies from a country to another country; firms in Korea and Thailand are more adjustable to the circumstance to return to profitability rather than firms in Indonesia. Technical analysis in stock market used by investors in terms of speculation to make profit in this matter Kung and Wong (2009) conducted their study in Singapore stock market to figure out the effect of Asia Financial Crisis 1997 on the profitability of technical analysis; the empirical results show that the intervention and reforms applied by Monetary Authority of Singapore resulted in less profit for the investors who use technical rules for trading stocks, further results show that on average of the three trading rules (single moving average, dual moving average, and trading range breakout) generate higher profitability in pre-crisis period than those in post-crisis period. Further, study on the aftermath of Asia Financial Crisis of 1997.Coulibaly and Millar (2015) employed their research to investigate the dynamics of corporate fixed investment in Asian developed countries; they found that it declined by 12 percent in post-crisis comparing to the pre-crisis period.

In her master thesis, Gheydari (2013) has examined the influence of the crisis on the capital structure of German non-financial firms; she found that (profitability) is significantly contributing to determine the capital structure of the firms after the crisis.

Another research by Dietrich and Wanzenried (2011) in determinants of Swiss banks profitability before and during the crisis, as a result, they state that "The results outlined in this paper provide some evidence that the financial crisis did indeed have a significant impact on the Swiss banking industry and bank profitability in particular." Similarly in the study of impact of the global financial crisis of 2008 on the Jordanian bank, financial, insurance, and real estate sector, Alnajjar et al., (2012) argue that financial sector of Jordan has been affected by the crisis but actually less than developed countries, all banking, financial, insurance, and real estate sectors indexes were declining after the crisis. However, Alzboon and Abu Orabi (2013) examined the influence of the crisis on insurance industry of Jordan, they found that there was no significant difference of company asset, equity, and liabilities on net income pre and post global financial crisis, in contrast, there was a significant difference of company investments on net income before and after the crisis. Dencic-Mihajlov (2014) in the study of profitability during the financial crisis found that firms of the Republic of Serbia are hugely influenced by the crisis.

Furthermore, to investigate the profitability of pharmacy community in Romania within the Global Financial Crisis of 2008 context, Boboia et al., (2014) argue that break-even of the firms varied as a result of the crisis, the study propose that the firms in 2009 should increase sale and should also increase investment by 100 % of the income to restore its financial balance.

In another study from different perspective Geyt and Cauwenberge, and Bauwhede (2013) examined the impact of Global Financial Crisis of 2008 on insider trading in Belgium, the result of that study shows that; the size of the transactions significantly and positively affect the profit of the trading, however, the book-to-market value of the company has a significant and inverse effect on the profitability of insider trading, in contrast, the financial structure, and concentrated ownership structure has not any major impact on the magnitude of insiders earning.

Another study examined the impact of Global Financial Crisis of 2008 on the evolution of profitability of Romanian listed companies in Bucharest stock exchange at which conducted by Siminica and Stefan (2011), finding of the study propose that the crisis affected the companies from various sectors differently, the result is indicating a significant evolution in pharmaceutical and oil industry after the crisis, however chemical industry and food industry registered negative value during and after the crisis, the device manufacturing sector had ascending evolution during and after the crisis, 4 other industries has examined and the result shows a significant variation in their profitability return prior and post of the crisis.

Lopez et al., (2011) studied the impact of the Global Financial Crisis of 2008 on the profitability of SMEs in Spain, the result of their study shows that the crisis caused a visual decrease in demand for consuming goods and services which led to fall in the profitability of SMEs, in other words, the crisis resulted in negative impact on the ROA and ROE of the SMEs in Spain.

In another study by Kočišová (2014) examined bank specific characteristics and macroeconomic factors affecting the profitability of (V 4) countries during the

Global Financial Crisis of 2008, the study found that bank's profitability fundamentally influenced by liquidity, capitalization, quality of credit portfolio, market structure, and operational efficiency during the crisis, however, the effect of bank size, GDP, and inflation wasn't significant on the profitability during the crisis.

Al-Malkawi and Pillai (2013) examined the impact of the Global Financial Crisis of 2008 on real estate and construction sector in UAE, they found that the crisis caused a drop in liquidity, leverage, profitability and activity positions of the firms comparing to before the crisis.

Finally in another research Cole (2012) examined the effect of Global Financial Crisis of 2008 on small business lending in United States, the result was bank lending to small businesses significantly declined after the crisis in compared to big businesses, the research also indicates for strong negative relationship between bank size and business loans as well as bank profitability and business lending, last result is that there is high positive result between de novo banks and business lending.

Chapter 3

REVIEW OF LITERATURE

3.1 Profitability and its Measurements

Al-Jafari and Al Samman (2015) state that:

> "The magic word "Profitability" refers to earnings of companies that are generated from revenues and after deducting all expenses incurred during a given period. It is considered one of the most important goals that management of every company strives to achieve and without it companies will ceased".

Bhutta and Hasan (2013) argue that profitability play a significant and efficient role in the structure and evolution of firm, thus, maximization of the profit is a key goal of the managers whether they explicitly state or not. Innocent et al., (2013) also State that the investors, savers, and firms are most concerns with the profitability of the firms, profitability ratios reflect the company's overall management efficiency and performance thus the major goals of the financial manager is to increase shareholder's equity. McMahon and Stanger (1995) discuss that profitability is an indicator to investigate whether the business was successful or not.

Various measurements of profitability have been used to study firm's performance financially; the most common measurements are Return on Asset, Return on Equity and Net Profit Margin, which used as independent variables to find the effect of each

of them on the growth of firms by Heikal and khaddafi, and Ummah (2014). Another measurement is Net Income, which refers to net profit after tax and diverse of expenses this measure used by Cho (1999) in a study of the effect of price cut on profitability.

3.2 Significant Determinants of Profitability

Study of profitability and the determinants of firm profitability have warranted attention in the literature on diverse areas of knowledge, but particularly in finance.

Khandoker and Raul, and Rahman (2012) Investigated factors determining the net income of non-bank financial institutions in Bangladesh, they realized that Total Asset, Total Equity, Total Liability, Term Deposit, Operating Revenue, and Operating Expense are significantly affecting the Net Profit of non-bank financial sector in Bangladesh.

Size, the tangibility of asset, liquidity, leverage, and company growth has been addressed in this study as determinants of profitability or firm's specific factors based on several previous studies which are reviewed in this section. Vatavu (2014), Innocent et al. (2013), Carvalho et al., (2013), Steinerowska-Streb (2012), Dave (2012), Yazdanfar (2013), Kouser et al., (2012), Hirsch et al., (2014), Khandoker et al., (2012), Crespo and Clark (2012), Janda and Rausser, and Strielkowski (2013), Parveen and Mohideen (2014), Ehi-Oshio et al., (2013), Sivathaasan et al ., (2013), Ongore and Kusa (2013), Niresh and Velnampy (2014), Al-Jafari and Samman (2015), Bøhren (2010), Loi and Khan (2012), Bhutta and Hasan (2013), Dogan (2013) and McDonald (1999) are studied the determinant of profitability in various sectors and industries, they have examined size, tangibility of asset, liquidity,

leverage, and company growth as well as less or further factors as determinants of profitability of financial and non-financial institutions to find the relationship between these variables and profitability of firms.

3.2.1 Size

The size of the company has been measured in various ways in the literature. Firm size can be measured by total assets, total profit and the number of employees (Kouser et al., 2012). Size can be also measured by total assets, total Sale and the number of employees Dogan (2013). As an indicator for the size for the firm in another study by Niresh and Velnampy (2014) total asset and total sale have been utilized. However, Similarly Carvalho et al., (2013) and Bhutta and Hasan (2013) measured size as a Logarithm to sales.

Both Yazdanfar (2013) and Sivathaasan et al., (2013) in their research found that company size is positively related to the company profitability.

Furthermore, studies have examined the impact of the size of firms on firm's performance; Vatavu (2014) in the study of profitability of Romanian companies figured out that size has a positive impact on return on assets, the higher the firm's size, the higher the profit.

According to Gschwandtner (2004) firm size is a principal factor for the increase in profit because provides more ability to create an economy of scale, greater size firms have a greater capacity to diversify activities and products and also have the greater ability for implementation of new strategies in a competitive environment against rivals and new entries to the market. Similarly, Carvalho et al., (2013) in the study of determinants of profitability of Portuguese fitness SMEs confirm that firms size are

positively correlated with profitability. Another study by Steinerowska-Streb (2012) examined the profitability of enterprises during the economy activity reduction, mentions that significantly affect the profitability and large firms are more exposed to a decrease in profitability rather than small firms. Ehi-Oshio et al., (2013) studied the determinants of profitability in developed economies. They included size as an explanatory variable of profitability; the result shows a positive impact of size on profitability but insignificant statistically.

However, Kouser et al., (2012) in the study of the interrelationship between size and profitability in Pakistani non-financial firms found that size has a negative and insignificant impact on the profitability. Ozgulbas et al., (2006) have investigated the impact of firm's size on the performance of listed companies in Istanbul Stock Exchange between years of 2000-2005. As a result, of their study, they explore that big size firms have higher performance comparing to small size companies.

Moreover, Niresh and Velnampy (2014) investigate the effect of firm size on the profitability of manufacturing firms in Sri Lanka between the years of 2008-2012, they argue that there is no significant relationship between firm size and profitability, in other words, firm size has no impact on profitability.

Dogan (2013) investigated the influence of firms size on the profitability of Turkish firms, the study includes 200 active companies from Istanbul Stock Exchange between years of 2008-2011 which means during and after Global Financial Crisis of 2008, result of the study reveals that firms size at which measures by Total Asset, Total Sale and Number of Employees is positively and significantly related to profitability in all cases.

3.2.2 Growth opportunity

In the study of the determinant of profitability of Swedish listed companies Yazdanfar (2013) examined growth as a dependent variable of profitability the result shows that growth is positively and significantly related to profitability. Similarly, Al-Jafari and Al Samman (2015) investigated the determinant of profitability of manufacturing sector; the result presents a positive and significant relationship between growth and profitability. In another study Bhutta and Hasan (2013) investigated the impact of firm's specific factors on firm's profitability in the food sector, the examined growth in term of percentage of total assets; they confirm a positive and significant relation between growth and profitability. Furthermore they state that an increase in total asset causes a higher level of growth at which results in higher profit for the firms. Bøhren (2010) studied the relationship between growth and profitability of more than one thousand companies in Norway the result exhibits a positive and linear relationship between income growth and future profitability.

Although some studies could not find any significant relationship between growth and profitability or found a negative relationship between them, growth considered as one of the major objectives of the firm Kouser et al., (2012). According to the authors growth and profitability are strongly interrelated they confirmed this result in the study of the interrelationship between growth and profitability. They conduct their research on non-financial firms in Pakistan, and they found that growth and profitability are positively and significantly related.

However, Sivathaasan et al., (2013) in the study of determinants of profitability of manufacturing companies in Sri Lanka found that growth and profitability are

negatively and insignificantly related. Similarly, Reid (1995) states that profitability negatively affected by growth.

3.2.3 Liquidity

Liquidity management has become a major concern of firms and managers particularly after the Global Financial Crisis of 2008. In the Study of the relationship between liquidity management and corporate profitability of Nigerian manufacturing companies has been stated that corporate profitability is significantly affected by liquidity management in terms of company credit policy, cash flow management and cash conversion cycle Owolabi and Obida (2012).

Carvalho et al., (2013) argue that higher liquidity level results in higher profitability because the high level of liquidity makes firms be more effective to cope potential unexpected changes in marketplace moreover firms will be less stressed in managing financial resources. They also examined the determinants of profitability of Portuguese fitness SMEs; they used liquidity as an explanatory variable, and the result indicates for existing positive impact of liquidity on the profitability of the firms. In the study of bank profitability determinants by Ongore and Kusa (2013) in Kenya, the relationship of liquidity and bank profitability concluded to be positive.

In contrary, the relation between liquidity and profitability found to be negative in the study of determinants of corporate profitability in developed economies by Ehi-Oshio et al., (2013).

3.2.4 Leverage

In recent years, much research on the impact of leverage on firm's performance has been done. The impact of capital structure on firms performance is not argued clearly Vatavu (2014).

Carvalho et al., (2013) discuss that less leverage ratio of firm contributes to increasing profitability. The authors also state that long-term debt is positively related to the profitability of fitness SMEs in Portugal. Similarly, Sivathaasan et al., (2013) showed that leverage as the capital structure has statistically significant and positive impact on the profitability. In another study of the determinant of profitability Al-Jafari and Al Samman (2015) studied industrial companies listed on Muscat Security Market in the interval of 2006-2013 found that leverage significantly and negatively related to profitability.

Moreover, Bhutta and Hasan (2013) illustrated that according to pecking order theory firms prefer internal funding rather than external financing; thus, profitable firms are more likely to have less extent of leverage. Their result was not consistent with their discussion as there is a significant and negative relationship between debt to equity ratio (leverage) and profitability.

However, there is an inconsistency in previous arguments given Vatavu (2014) investigated the determinant of profitability of Romanian listed companies the result of the study shows that a higher proportion of borrowing by the firm will influence the return on asset negatively the study also propose that companies should rely on their assets rather than leverage.

Similarly, Dave (2012) studied the determinants of profitability in pharma sector in India and showed that long-term debt to total equity ratio has a negative effect on profitability, but this result is not statistically significant. Ehi-Oshio et al., (2013) showed that relationship between leverage and profitability of corporates is negative and statistically significant.

3.2.5 Tangibility of Asset

For several years considerable effort has been devoted to the study the relationship of tangibility of assets and financial performance in various sectors. Firms use the tangible asset as collateral, a higher level of tangible asset indicates a positive signal to the creditors to be ensured about the liquidation of these assets in case of loan default. Moreover borrowing money is less costly than issuing securities because of asymmetric information as well as because of time-saving Kariuki and Kamau (2014). Furthermore, firms with a larger amount of tangible asset can raise profitability indirectly by borrowing money at relatively lower interest rate Shan and Khan (2007).

Further studies in recent years deal with the same issue of tangibility of assets, for instance, Vatavu (2014) argues that a higher proportion of tangible asset decreases the return on asset of the firm, however, Bhutta and Hasan (2013) study of determinants of profitability of food sector noted that firms with large amount of fixed assets tend to be more profitable because of higher asset value, they also found that tangibility of asset is significantly and positively related to profitability. In another study of firm-specific factors that determine the profitability of insurance companies, Mehari and Amiro (2013) examined tangibility of asset as an explanatory variable which determines the profitability. The result shows that tangibility is significantly and positively related to return on asset of insurance companies.

However Carvalho et al., (2013) state that intangible assets do not contribute to profitability. Similarly, in his master thesis Alahyari (2014) deals with determinants

of profitability of airline industry exhibits that the finding indicates a significant and negative relationship between tangibility of asset and profitability.

Galbreath and Galvin (2008) have a study of firm factors, industry structure, and performance variation whereby used tangibility of asset as a substantial factor. They found that tangible resources have insignificant relation with performance variation, in other words, tangible resources do not explain performance variations.

Chapter 4

DATA AND METHODOLOGY

In this chapter research design, data, choice of variables, and the approach to obtain the result from data have been presented.

4.1 Research Design

This study is being outlined to follow two main objectives: Firstly, it attempts to test the influence of global financial crisis of 2008 on the profitability of US non-financial firms which is measured by NI, ROA and ROE and secondly, the determinants of profitability of US non-financial firms whereby measured by size, growth, liquidity, leverage, and tangibility and the impact of the crisis on the influential power of each of them.

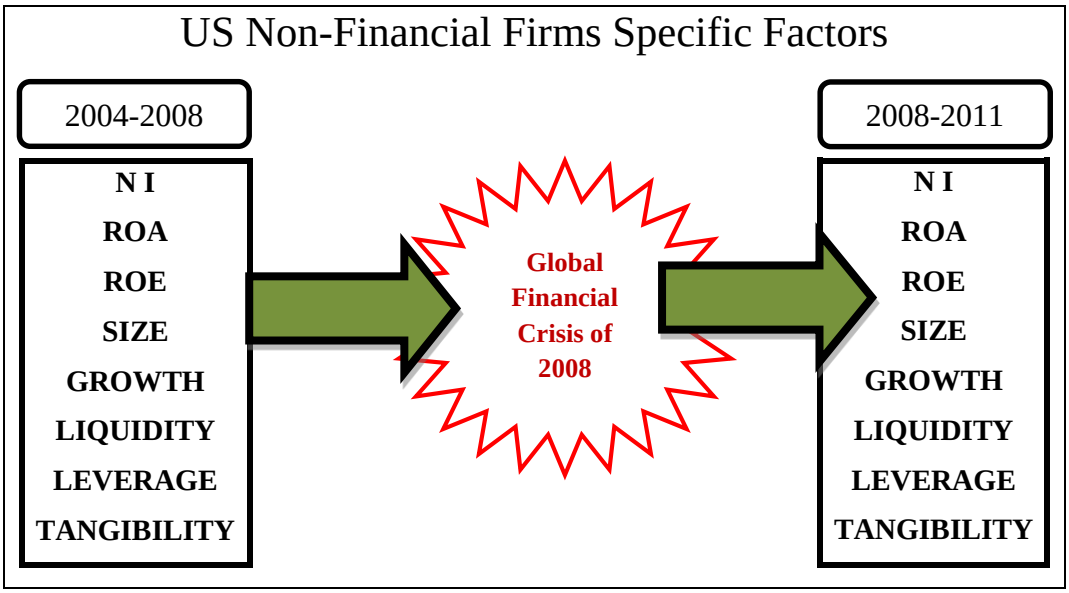

Figure 4.1: Research Design Summaries

4.2 Data

4.2.1 Sample Description

The US is considered as the largest economy on the world, in the other hand, the Global Financial Crisis of 2008 has been generated from the US; thus, it is highly motivated to investigate the consequences of the crisis on US firms.

This study approached pure quantitative research in a way that cross-sectional data has been gathered from a relatively random sample of 42 non-financial firms in the US in seven different sectors. On the other hand, cross-sectional data collected in a time interval of pre and post of Global Financial Crisis of 2008 more precisely from 2004 to 2011which denoted time series methodology.

Since data constitute both cross-sectional and time series, panel data or pooled data fits better to this study. Bond (2002) states that panel data is a very efficient method to quantitative study it allows for more "variation to be used in constructing parameter estimates, as well as permitting the use of relatively simple econometrics techniques."

Table 4.1: Sample Category

Number	**Sector**	**Number of Firms**
1	Petroleum	5 (12%)
2	Retail and Store	10 (24%)
3	Health Care and Pharmaceutical	10 (24%)
4	Telecommunication	4 (10 %)
5	Technology and Software	6 (13%)
6	Automotive	1 (2.5 %)
7	Aircraft	4 (10 %)
8	E-commerce	2 (4.5%)
Total		**42 (100%)**

4.2.2 Limitation and Source of Data

Due to the availability of firms data, the scope of this study is limited to US non-financial firms at which listed in NASDAQ and NYSE since 2004 and earlier from eight various sectors as well as time interval of 2004-2011. However numerical variables have been fetched from Worldscope and Thomson Reuters' Data Stream.

4.3 Choice of Variables

As it has been mentioned before this study is a quantitative study aimed to investigate the impact of Global Financial Crisis of 2008 on the profitability of US non-financial firms as well as the determinants of profitability of the firms, to arrive the objectives of the study some variables have been used and tested. In this section, both dependent and independent variables have been described.

4.3.1 Dependent Variables

I. Net Income

NI is the amount of profit earned by the firm after deducting all operational costs including depreciation, tax and interest.

II. ROA

Return on Asset is the ratio of net income to total assets. ROA is the most common criterion for measuring profitability for both financial and non-financial firms. It shows how firms generate profit from its asset as well as measures the ability of the firm to turn assets into profit. The higher the ratio indicates for the better performance. Weston and Brigham (1997).

III. ROE

Return on Equity is the ratio of net income to net worth. It reflects the efficiency of firm's efficiency in generating income from shareholders capital that has been invested in the firm. The higher ratio the most effective

performance that firm has. ROE is the most important ratio from investor's point of view. Gul and Irshad, and Zaman (2011)

4.3.2 Independent Variables

IV. Size

If the size of the firm increases the ability of the firm to make profit rises. [Akhavein and Berger and Humphrey (1997); Smirlock (1985)]. As it has been mentioned in previous chapter firm size in most of the studies, affect the profitability positively can be measured by total asset, total sale, total profit, and the number of employees. In this study size has been utilized as log natural of total asset.

V. Growth Opportunity

Bhutta and Hasan (2013) argue that "better growing firm increases the profitability." Moreover, firm with high growth level prefer to have a low rate of long-term debt to minimize potential restriction enforced by lenders and maximize potential profit. In this study growth opportunity of firms has been computed in term of growth in revenue.

VI. Liquidity

High level of current assets will pay off the short-term liabilities of the firms as well as allow the firms for quick response to unexpected variations in the marketplace. Liquidity refers to the ratio of current ratio Mateev and Anastasov (2010).

VII. Leverage

The higher levels of leverage, the lower profit will the firm have Sivathaasan et al., (2013). They also discuss that most previous studies observe an inverse

relation between leverage level and profitability of the firm. Leverage in this study has been measured by the ratio of total liability over total equity.

VIII. Tangibility

Bhutta and Hasan (2013) said that:

> "A firm with a large amount of fixed asset tends to be more profitable because of increasing its future assets value. But leverage is positively related to tangibility and is negatively related to profitability because profitability has a negative relationship with tangibility. Thus, we expect a negative correlation between tangibility of assets and profitability".

However, in the current study, the tangibility of assets has been measured as a ratio of fixed assets divided by total assets.

Table 4.2: Summary of Variables

Variables	**Abbreviations**	**Kind of Variable**	**Measurements**
Net Income	NI	Independent	*Revenue – Costs*
Return on Assets	ROA	Independent	$\frac{Net\ Income}{Total\ Assets}$
Return on Equity	ROE	Independent	$\frac{Net\ Income}{Total\ Equity}$
Size	SIZE	Dependent	$Log\ Natural\ of\ Total\ Assets$
Growth Opportunity	GRTH	Dependent	$\frac{Revenue 1 - Revenue\ 0}{Revenue\ 0}$
Liquidity	LQD	Dependent	$\frac{Current\ Assets}{Current\ Liabilities}$
Leverage	LVGE	Dependent	$\frac{Total\ Liability}{Total\ Equity}$
Tangibility of Asset	TANG	Dependent	$\frac{Fixed\ Assets}{Total\ Assets}$

4.4 Research Questions, Hypotheses, and Models

I. Research Question

To capture the objectives of the study the bellow questions has been addressed:

- How did the 2008 financial crisis affect the US non-financial firm's profitability?
- What are the determinants of profitability of non-financial firms and how did the 2008 financial crisis affect them?

II. Research Hypotheses

After research question has been addressed the hypothesis based on the research question has been developed in to answer the research questions:

The hypothesis concern the first research questions are:

H0: 1 the average Net Income of the USA non-financial firms is the same before and after the 2008 financial crisis.

H0: 2 the average ROA of the USA non-financial firms is the same before and after the 2008 financial crisis.

H0: 3 the average ROE of the USA non-financial firms is the same before and after the 2008 financial crisis.

H0: 4 there is a positive relationship between firm's size and (ROA & ROE) of non-financial firms in the USA.

H0: 5 there is a positive relationship between growth opportunity and (ROA & ROE) of non-financial firms in the USA.

H0: 6 there is a negative relationship between Leverage and (ROA & ROE) of non-financial firms in the USA.

H0: 7 there is a positive relationship between liquidity and (ROA & ROE) of non-financial firms in the USA.

H0: 8 there is a positive relationship between Tangibility and (ROA & ROE) of non-financial firms in the USA

III. Model Specifications

This study uses the linear regression with seven different variables. Since the dependent variables are two variables, then two separate equations have been applied in a way that in the first equation ROA is dependent variable and in the second equation ROE is a dependent variable. Each equation aims to explain the effect of explanatory variables on dependent variable individually and in the group. According to the equations, the hypotheses of the study have been tested.

Based on our panel data the equation takes the bellow form:

$$Y_{it} = a + \beta X_{it} + u_{it}$$

Where:

Y_{it}	Stands for explained variable in the model
a	Represents the intercept of the equation
β	Represents the coefficient
X_{it}	Stands for explanatory factor (i) at (t) time
u	is the error term of the model
i	Shows the cross-sectional dimension
t	Shows the time series dimension

The empirical model to be used in this study for both ROA & ROA as explained variables and pre and post crisis are presented as follow:

$$ROA_{it} = \beta 0 + \beta 1\ SIZE_{it} + \beta 2\ GRTH_{it} + \beta 3\ LQD_{it} + \beta 4\ LVGE_{it} + \beta 5\ TANG_{it} + u_{it}$$

ROE *it* = β0 + β1 SIZE *it* + β2 GRTH *it* + β3 LQD *it* + β4 LVGE *it* + β5 TANG *it* + u *it*

Where:

ROA *it* = return on asset ratio of firm *i* at time *t*

ROE *it* = return on equity ratio of firm *i* at time *t*

β1 SZ *it* = logarithm of total asset of firm *i* at time *t*

β2 GRTH *it* = growth in revenue of firm *i* at time *t*

β3 LQD *it* = ratio of current assets over current liability of firm *i* at time *t*

β4 LVG *it* = ratio of total liability over equity

β5 TANG *it* = ratio of fixed assets to total assets of firm *i* at time *t*

Chapter 5

EMPIRICAL RESULTS AND DISCUSSION

In this chapter, the results of the empirical tests have been presented that provide many indicators of the performance of US non-financial firms and the impact of 2008 global financial crisis on the firms, has been discussed. Moreover, the tests and analysis conducted by E-views and Microsoft Excel software.

5.1 Descriptive Statistics

Descriptive statistic provides the basic understanding of the variables that have been discussed in previous chapters. In this thesis by descriptive statistic we mean (mean and standard deviation). The summary of the dependent and independent variables of US non-financial firms presented in the bellow table for a time interval of 2004-2011, as well as pre and post crisis independently.

As it can be observed from the bellow table regarding the dependent variables, the average net income of the sampled firms before the crisis is $3886272 million but it increases to $4742916 million after the crisis this finding is consistent with Alzboon and Abu Qrabi (2013) that found there is no significant impact of the financial crisis of 2008 on the net income of insurance firms of Jordan, however during the whole eight years the mean of net income is $ 4314633 million. The average return on assets of the sampled firms before the crisis is reported to be 30.31% but it decreased by more than 50% to 13.48% after the crisis this result is also found by Al-Malawi and Pillai (2013). However, the average of the ratio in the interval of all

8 years is 21.89%. Likewise, the average on return of equity before the crisis is 194.13% but it decreased significantly to 20.46% after the crisis, and it has 107.3% during the entire period of 8 years from 2004 to 2011.

The net incomes are much volatile after the crisis but in contrary both ROA and ROE are less volatile after the crisis. The average size of the firms is larger after the crisis meaning that companies have to either invest more capital or borrow more money after the crisis. The growth of the firms is decreasing after the crisis. The liquidity is relatively constant before and after the crisis. The leverage is increasing significantly after the crisis, indicating that the firms borrowed about 39% extra rather than they did before the crisis. The tangible asset is relatively constant meaning that it did not affect by the crisis.

Table 5.1: Descriptive Statistic

Variables		2004-2007 **168 Observations**	2008-2011 **168 Observations**	2004-2011 **336 Observations**
NI	**Mean**	3886272	4742916	4314633
	STD.	6659125	7757152	7230863
ROA	**Mean**	0.303183	0.134800	0.218991
	STD.	1.510479	0.531149	1.133629
ROE	**Mean**	1.941370	0.204648	1.073009
	STD.	9.240252	1.990896	10.31037
SIZE	**Mean**	46677075	65232571	58193737
	STD.	56634444	72903708	69547330
GRTH	**Mean**	0.131786	0.079226	0.111842
	STD.	3.059051	24.55968	0.196289
LQD	**Mean**	1.442143	1.451310	1.467054
	STD.	0.985850	0.586290	0.627346
LVGE	**Mean**	1.106786	1.525417	1.424643
	STD.	-3.050723	24.55968	18.18751
TANG	**Mean**	0.445587	0.435298	0.451607
	STD.	-2.099877	0209890	0.219277

5.2 Profitability

Here the first research question has been answered. As it has been mentioned before the firm's profitability in this study has been measured by NI, ROA, and ROE.

I. Net Income

Year	Average Net Income $m.
2004	3233653
2005	3824610
2006	3976358
2007	4510465
2008	4166600
2009	3636115
2010	5238419
2011	5930532

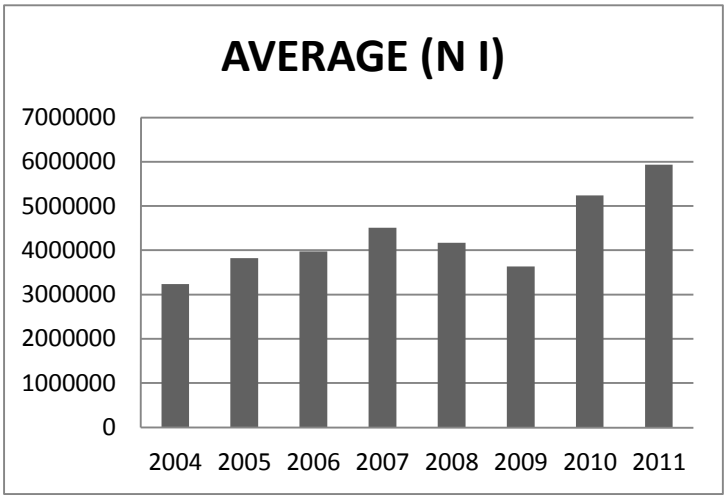

Figure 5.1: Average of Net Income from 2004 to 2011

II. Return On Assets

Year	Average ROA
2004	33%
2005	33%
2006	30%
2007	25%
2008	19%
2009	12%
2010	12%
2011	11%

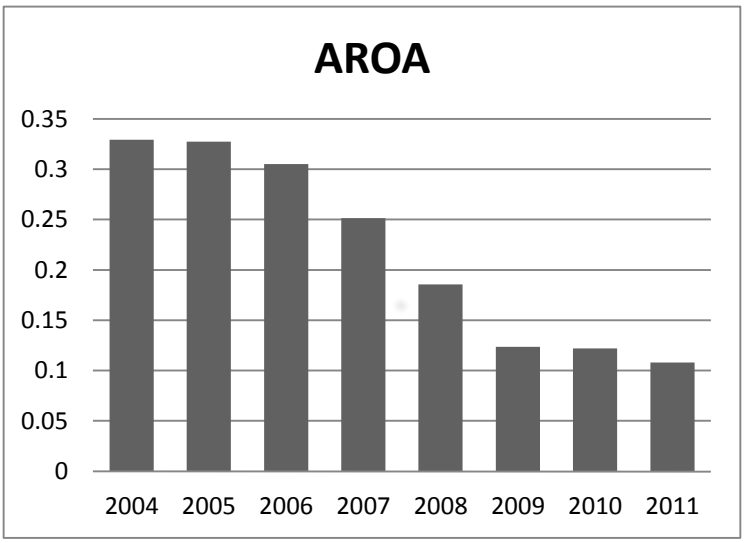

Figure 5.2: Average of Return on Assets from 2004 to 2011

III. Return on Equity

Year	Average ROE
2004	26%
2005	387%
2006	256%
2007	107%
2008	26%
2009	17%
2010	11%
2011	29%

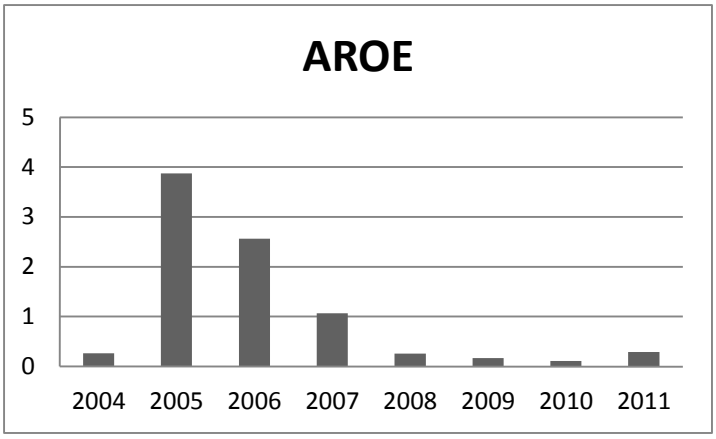

Figure 5.3: Average of Return on Equity from 2004 to 2011

The variations of the profitability measurements have been presented in both numbers and graphs above. Furthermore, the two-sample hypothesis test has been applied for each profitability indicator variable to find the significance of the variations of the variables between pre and post crisis individually.

5.2.1 Two Sample Mean Hypothesis T-Tests

The variations of Profitability indexes for the sample has been Clarified in the descriptive statistic table; here the hypothesis t-test has been employed for testing the significance of the variation statistically. As it has been shown in the table 5.2 the result of the tests that the net income of the sampled firms increased significantly at 0.05 level of alpha which reflect la efficiency of US firms kept making profit despite the crisis, this result supported by Alzboon and Abu Qrabi (2013), however, ROA has decreased significantly at 0.05 level of significance, this result can be because of increase in leverage and cost of borrowing, the outcome is consistent with Siminica and Stefan (2011), although ROE of the sampled firms decreased by about ninety percent but the result is not significant statistically. The high rate of ROE before the crisis and the insignificant decrease of it after the crisis is because of some extreme values in the dataset of the current study, the sampled firms such as

Amazon corporation that had an average of ROE (735%) before and (940%) after the crisis. The decrease of ROE after the financial crisis is also found by Prasad et al,. (2015), Siminica and Stefan (2011), and Al-Malawi and Pillai (2013).

Table 5.2: Two Sample Mean Hypothesis T-Tests

Profitability Measurements	**2004-2007**	**2008-2011**	**t-Stat.**
Average Net Income	$ 3886271 m.	$ 4742916 m.	-2.259211**
Average Return on Assets	30.32%	13.48%	2.132632**
Average Return on Equity	194.14%	20.46%	1.64916

Null Hypothesis: Mean is the same before and after the crisis.
Asterisks (**) denotes 5 % significant level.

5.3 Correlation Analysis

Table 5.3: Correlation Matrix from 2004 to 2011

	ROA	**ROE**	**LNSIZE**	**GRTH**	**LQD**	**LVGE**	**TANG**
ROA	1.000000						
ROE	0.787215	1.000000					
LNSIZE	-0.153605	-0.125524	1.000000				
GRTH	0.132851	0.073493	0.015681	1.000000			
LQD	0.009421	0.000180	-0.319497	-0.022753	1.000000		
LVGE	0.004921	0.055222	-0.048222	0.044576	-0.046790	1.000000	
TANG	-0.168816	-0.138256	0.158637	0.080893	0.456217	-0.220250	1.000000

Table 5.4: Correlation Matrix from 2004 to 2007

	ROA	**ROE**	**LNSIZE**	**GRTH**	**LQD**	**LEVG**	**TANG**
ROA	1.000000						
ROE	0.798617	1.000000					
LNSIZE	-0.097689	-0.057622	1.000000				
GRTH	0.238286	0.165180	0.152100	1.000000			
LQD	0.300403	0.188568	-0.356161	-0.073368	1.000000		
LVGE	-0.179393	-0.143238	-0.129203	0.052855	-0.057271	1.000000	
TANG	0.352785	0.284184	0.055062	0.033221	0.466946	0.314251	1.000000

Table 5.5: Correlation Matrix from 2008 to 2011

	ROA	ROE	LNSIZE	GRTH	LQD	LVGE	TANG
ROA	1.000000						
ROE	0.814520	1.000000					
LNSIZE	-0.069968	-0.097774	1.000000				
GRTH	0.203673	0.126671	0.026120	1.000000			
LQD	0.006844	0.049737	-0.316289	-0.056416	1.000000		
LVGE	-0.010524	0.148044	-0.073047	0.052955	-0.054975	1.000000	
TANG	0.006095	0.006289	0.216686	0.099866	0.477544	-0.333542	1.000000

Pearson's correlation model is one of the most common methods to detect multicollinearity problem. According to the tables 5.3, 5.4 and 5.5, the data sets reported the magnitude of the correlation between explanatory variables of the model of this study. Multicollinearity problem refers to a situation that two or more independent variable in the regression model are highly correlated thus the result will be misguided. Gheydari (2013) argues that the multicollinearity problem can be solved by increasing the sample size, omitting one of the highly correlated variables or by combining the correlated variables through developing new proxy. The rule of thumb is that if correlations are not higher than 0.80, the multicollinearity will not show up, accordingly the regression model of this study has no multicollinearity problem since the highest correlation between explanatory variables not exceed 0.50.

5.4 Heteroscedasticity

Homoscedasticity refers to a situation that the dataset has equal variance; however for investigating the issue of heteroscedasticity E-views does not allow the option of the white test because this study applies panel data methodology. To do so, the data re-imported to E-views in an unstructured format that allows running heteroscedasticity diagnosis. As it presented in Appendix C the result of the

Breusch-Pagan-Godfrey test, the observed R squared reported to be significant, thus, the null hypothesis that states (there is homoscedasticity) has been rejected for both ROA and ROE model.

5.5 Autocorrelation

The disturbance values supposed to be not correlated systematically, in other words, they would not be correlated negatively or positively (Gujarati 2004 pp.70). Rule of thumb; if Durbin-Watson value is between 1 and 3, there is no concern for autocorrelation problem.

This study employs OLS regression analysis six times based on different dependent variables and time intervals, as it has been given in Appendix E, the regression output reports DW between 1 and 3 in five cases. Hence, it can be concluded that the data of this study has no autocorrelation problem.

5.6 Panel Unit Root Tests

Before running a regression analysis, the data should be checked whether they are stationary or not. Data is stationary when the mean, variance, and covariance are not changing over time. Panel unit root test has been adapted to this study to investigate the stationary of the dataset at level. In this respect, various criteria such as Augmented Dicky Fuller, Philip Pheronas, and Levin Lin Chu, etc. has been used. Based on the output of Augmented Dicky Fuller, Philip Pheronas and Levin tests, hence the null hypothesis has been rejected, and it can be concluded that the data of this study is stationary at level.

Table 5.6: Panel Unit Root Tests

Variables		Levin Lin Chu	Breitung t-test	IPS W stat	ADF Fisher Chi square	PP Fisher Chi square
ROA	τ_T	-21.8330 *	-----	-7.05667*	213.480*	273.216*
		-24.4088*	-	-2.70021*	179.883*	295.025*
τ_μ		-6.42324*	1.69339*	------	141.105*	164.030*
	τ		* -----			
ROE	τ_T	-18.3495*	-----	-6.88274*	218.023*	221.811*
		-24.8239*	-	-	140.552*	240.866*
τ_μ		-5.10589 *	1.66309*	1.82512*	184.137*	181.779*
	τ		* -----	* -----		
SIZE		-27.9470*	------	-5.27574*	93.0182	120.479*
τ_T		-36.1375*	3.42814	-	122.475*	195.860*
	τ_μ	-40.8896*	-----	2.16578*	236.298*	257.523*
	τ			* -------		
GRTH	τ_T	-23.5260*	------	-4.62768*	154.896*	163.353*
		-12.1400*	-2.41723*	-0.16440	95.3314	159.153*
τ_μ		-8.54001*	-----	------	211.591*	220.279
	τ					
LQD	τ_T	-33.2774*	-----	-7.50339*	157.364*	161.160*
		-22.9496*	0.18964	-1.12689	109.336*	187.206*
τ_μ		-2.68293*	-----	------	*	99.5331
	τ				75.3856	
LVGE	τ_T	-15.4215*	-----	-2.56538*	136.541*	125.166*
		-35.1493*	-	-2.55297*	147.016*	244.749*
τ_μ		-17.3415*	2.06945*	------	340.739*	350.030*
	τ		* ------			
TANG	τ_T	-14.1918*	------	-2.57303*	133.797*	113.366*
		-20.3662*	-2.53632*	-1.08477	127.460*	*
τ_μ		-	-----	-----	125.298*	233.456*
	τ	1.62922**				159.338*
		*				

Notes:

- Null Hypothesis: Data Has Unit Root or is not Stationary.
- Asterisks (***), (**) & (*) denotes 10%, 5% & 1% significant level. .
- τ_T represents the most general model with a drift and trend; τ_μ is the model with a drift and without trend; τ is the most restricted model without a drift and trend. Optimum lag lengths are selected based on Schwartz Criterion.

5.7 Regression Analysis

Table 5.7: ROA Regression Model

Variables	2004-2007	2008-2011	2004-2011
C			
Coefficient	0.387810	10.21878	11.25065
t-Statistic	1.909677	5.038273	6.878545
Prob. Value	0.0611	0.0000	0.000000
SIZE			
Coefficient	-0.461976	-0.592638	-0.608831
t-Statistic	-1.809501	-5.057216	-6.495600
Prob. Value	0.0756	0.0000	0.000000
GRTH			
Coefficient	0.357436	0.388922	0.181746
t-Statistic	1.321131	2.562838	1.058342
Prob. Value	0.1916	0.0116	0.3131
LQD			
Coefficient	-0.157830	0.013376	0.049288
t-Statistic	-0.803510	0.144549	0.473855
Prob. Value	0.4250	0.8853	0.6360
LVGE			
Coefficient	-0.001361	0.0000235	0.001905
t-Statistic	-0.017073	0.264991	1.058342
Prob. Value	0.9864	0.7915	0.2908
TANG			
Coefficient	0.250404	0.289489	-1.524395
t-Statistic	0.531386	0.613848	-4.319409
Prob. Value	0.5972	0.5405	0.0000
Other Outputs			
R^2	0.971668	0.865830	0.797893
Adjusted R^2	0.959482	0.814823	0.765724
F-Stat.	79.61959	16.97480	24.80297
Prob. F-Stat.	0.000000	0.000000	0.000000
Durbin-Watson	1.322317	1.184681	0.338466

Table 5.8: ROE Regression Model

Variables	2004-2007	2008-2011	2004-2011
C			
Coefficient	-48.18698	21.80442	96.67822
t-Statistic	-3.309996	0.938493	3.834673
Prob. Value	0.7577	0.0549	0.0002
SIZE			
Coefficient	3.619505	-1.231135	-5.257753
t-Statistic	0.400367	-1.894368	-3.639179
Prob. Value	0.6902	0.0606	0.0003
GRTH			
Coefficient	-5.019345	0.269077	0.481127
t-Statistic	-00524272	0.319722	0.173530
Prob. Value	0.6021	0.7497	0.8610
LQD			
Coefficient	-8.294415	-0.245264	0.280999
t-Statistic	-1.193296	-0.477929	0.175261
Prob. Value	0.2376	0.6336	0.8610
LVGE			
Coefficient	-1.702728	0.023827	0.050933
t-Statistic	-0.603749	4.845692	1.835705
Prob. Value	0.5484	0.0000	0.0674
TANG			
Coefficient	12.11753	0.031305	-13.28183
t-Statistic	0.726681	0.011970	-2.441550
Prob. Value	0.4703	0.9905	0.0152
Other Outputs			
R^2	0.614584	0.706292	0.419485
Adjusted R^2	0.448456	0.594634	0.327084
F-Stat.	3.699468	6.325506	4.539857
Prob. F-Stat.	0.000020	0.000000	0.000000
Durbin-Watson	2.898196	1.384478	1.767007

Before running OLS regression analysis, the Hausman test has been implemented for both ROA and ROE models at three different time intervals; pre and post crisis as well as entire period of 2004-2011. The result of Hausman test suggested rejecting the null hypothesis (random effect), thus, the alternative hypothesis has

been confirmed at which states that fixed effect approach is appropriate for our models in all the cases.

Table 5.7 and 5.8 presents the summary of the regression test results, accordingly it can be observed that the coefficient correlations for both ROA and ROE models in the period of 2004 to 2011 reported to be the same, in contrary many fluctuations in can be noted in the coefficient correlations between control variables and dependent variables in pre and post crisis period. Following sections will contain the discussion of the regression analysis in detail including the study's hypothesis tests. It is important to be mentioned that the decisions regarding the hypotheses of this study based on the result over the entire eight years from 2004 to 2011.

5.7.1 R-squared and F-Statistics Test Discussion

R-squared measures how data fits the regression equation. In other words, how well the explanatory variables response or explain the variation of the dependent variable in the model. In this study, for ROA model R-squared measures are (97%, 85.5%, and 79.7%) and for ROE model R-squared measures are (61%, 70.6%, and 42%) in pre-crisis, post-crisis and entire eight years including the global financial crisis respectively. The results are acceptable and provide robust evidence to support our model particularly for the ROA model that its able to explain the variations in the dependent variables.

F-statistics test indicates whether all coefficients in the regression model is the same or not, in this respect, the null hypothesis states that all coefficients are equal to zero but having F-prob. The value of (0.0000) for both models and over the different periods, means that null hypothesis is rejected, meaning that the coefficients of all control variables are not the same. Finally, it can be concluded that the explanatory

variables of this study can impact explained variables jointly, and the regression equation has some validity in fitting the data.

5.7.2 Size

In contrast to most earlier findings, however, a few evidence of negative relationship between size and profitability has been detected, the conclusion of this study suggest a negative and significant relation between size and profitability (ROA & ROE) during the entire period of 2004-2011, similar results found for pre and post crisis except the relationship in pre-crisis period in ROE model which is positive and significant. Negative relation between size and profitability are found by Becker et al., (2010) in the study of relationship between size and profitability of US manufacturing firms in the period of 1987-2002, according to their study the reason might be because of cost of capital, similarly negative relationship between size and profitability found by Kouser et al., (2012). However, positive relationship between size and profitability indicates the ability of the firm to generate the economies of scale and then increase profitability. The positive relation has been found by Yazdanfar (2013), Vatavu (2014), Sivathaasan et al., (2013), and Gschwandtner (2004).*Thus, the H0: 4 is rejected*.

5.7.3 Growth Opportunity

In the current study, growth has been measured by the percentage change in revenue. The coefficient of growth is positive but not statistically significant in both ROA and ROE model for the whole period, as well as for pre and post crisis period except the case of ROE in the post-crisis period. The positive relationship between growth and profitability result is consistent with Yazdanfar (2013), Jafari and Al Samman (2015), and Kouser et al., (2012). As it has been clarified in the literature review growth is considered as one of the major objectives in business organizations.

However, the negative relationship result is consistent with Reid (1995) and Sivathaasan et al., (2013). *Thus, H0: 5 confirmed or not rejected.*

5.7.4 Liquidity

Findings of this study reported a positive and insignificant relationship between liquidity and profitability in both ROA and ROE model in the entire period. The increase in liquidity results in decreasing liquidity risk and finally increases in profitability. Moreover, high level if liquid asset allows the firms quick response to short-term debt obligations as well as to response to unanticipated events that change market condition effectively. This result is in line with Dogan (2013), Mehari and Amiro (2013), Carvalho et al., (2013), and Dencic-Mihajlov (2014).

However, liquidity found to be negatively related to ROA and ROE in pre and post crisis period except the after crisis period in case of ROA. The negative impact of liquidity is consistent with Oshio et al., (2013), Gitman (2003) and Vatavu (2014). According to Vatavu (2014) the negative impact of liquidity on profitability can be because the sample firms did not invest the internal fund over short-run, companies deduct their assets because of limited operational activities, the firms are keeping large stocks in respect to defective inventory or operational capacity or low demand for their product. It can be concluded that *we are unable to reject the H0: 6.*

5.7.5 Leverage

Leverage has been measured by the ratio of total liability over total shareholders' equity. As it is apparent from Table 5.1 that leverage increased by a significant volume after the crisis, and regression output reports a weak negative and insignificant relationship between leverage and (ROA and ROE) in pre-crisis period which is supported by Vatavu (2014). This finding is in good agreement with

pecking order theory firms prefer internal funding rather than external financing, thus profitable firms are more likely to have less extent of leverage. However, after the crisis and over the entire period the regression analysis indicates weak positive and significant relationship between leverage and profitability. These results concur with Al-Jafari and Al Samman (2015), Bhutta and Hasan (2013), and Dave (2012). *Therefore, we reject H0: 7 and conclude that there is a significant positive relation between leverage and profitability.*

5.7.6 Tangibility of Assets

The regression result shows weak positive and insignificant coefficient between tangibility and profitability in both models for the period's pre and post crisis separately. It may be the case that firms use the tangible asset as collateral, and a higher level of tangible asset indicates a positive signal to the creditors to be ensured about the liquidation of these assets in case of loan default. Moreover borrowing money is less costly than issuing securities because of asymmetric information as well as because of time-saving. Furthermore, firms with a larger amount of tangible asset can raise profitability indirectly by borrowing money at the relatively lower interest rate; this result is supported by Bhutta and Hasan (2013), Kariuki and Kamau (2014) and Shan and Khan (2007).

Unlike the previous result, the regressions analysis reports a negative and significant relationship between tangibility and profitability for both ROA and ROE model over the entire period which is consistent with Vatavu (2014).) If the firms are financing through direct internal financing, the investment in tangible assets over a long time will have the direct impact on the firm's performance. The negative relationship

could provide evidence that the sampled firms were not able to manage efficiently their tangible assets Vatavu (2014). So thus, H0*: 8 rejected.*

Chapter 6

CONCLUSION AND SUGGESTIONS

6.1 Summary of Findings

As it has been presented earlier, this study focuses on the impact of 2008 global financial crises on the profitability of US non-financial firms and investigation of determinants of profitability of non-financial firms. The sample of 42 firms from 8 different sectors considered in the time horizon of 2004-2011 that has been divided into two periods pre and post crisis. Based on the nature of the study, panel data methodology fixed effect of OLS regression analysis has been conducted.

Findings reports increase in net income of the firms after the crisis comparing to pre-crisis period from *$3886272* million to *$4742916* million, this change is statistically significant however return on assets decreased by seventeen percent from 30% to 13%, this decline found to be statistically significant, moreover, the return on equity decreased as well from 194% to 20% but this decline is statistically not significant. It can be concluded that the US non-financial firms were able to keep the income in a constant level, but it cost them to invest more shareholders capital and to borrow more money to be able to survive.

Determinants of profitability considered in this thesis are size, growth, liquidity, leverage, and tangibility. The hypotheses regarding the determinants of profitability have been tested based on the whole period from 2004 to 2011. The result presents;

the significant and negative impact on the size and tangibility on profitability, positive and significant impact of leverage on profitability, and positive but not significant impact on growth and liquidity on profitability.

It can be observed from the current study that over the longer time the sample data can provide more precise result rather than short time, although there is much variability in regression analysis results over the pre and post crisis period, the output shows high-level similarities in the coefficient of control variables over the entire period for both ROA and ROE model.

6.2 Limitations and Suggestions

The current study applied panel data methodology. The present study deals with the impact of 5 control variables where macro factors are neglected, further study can be conducted by adding more micro factors such as age and market to book ratio as well as adding macro factors. The time series is divided between pre and post crisis; it can be split into three parts, to investigate the performance of the firms during the crisis. The sampled firms are limited to US non-financial firms, where further study can be employed in investigating the impact of the crisis on the performance of a particular sector or various countries.

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APPENDICES

Appendix A: Descriptive Statistic

	A	B	C	D	E	F	G	H	I
1	Date: 12/02/15 Time: 21:27								
2	Sample: 2004 2011								
3									
4		NI	ROA	ROE	SIZE	GRTH	LQD	LVGE	TANG
5									
6	Mean	4314633.	0.218991	1.073009	58193737	0.111842	1.467054	1.424643	0.451607
7	Median	1786500.	0.063112	0.161391	28611500	0.090000	1.330000	1.285000	0.440000
8	Maximum	45220000	11.10366	156.7602	3.27E+08	1.490000	4.710000	176.7100	1.020000
9	Minimum	-14672000	-0.316125	-10.20824	335744.0	-0.570000	0.400000	-243.6400	-0.690000
10	Std. Dev.	7230863.	1.133629	10.31037	69547330	0.196289	0.627346	18.18751	0.219277
11	Skewness	2.568950	8.187380	12.81757	1.825356	2.014015	1.268632	-4.793992	-0.396073
12	Kurtosis	12.30205	72.37301	178.4466	5.569368	14.71055	5.287081	126.2913	6.227028
13									
14	Jarque-Bera	1580.966	71130.47	440141.6	279.0109	2147.069	163.3583	214097.5	154.5768
15	Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
16									
17	Sum	1.45E+09	73.58102	360.5310	1.96E+10	37.57890	492.9300	478.6800	151.7400
18	Sum Sq. Dev.	1.75E+16	430.5137	35611.73	1.62E+18	12.90730	131.8436	110813.2	16.10753
19									
20	Observations	336	336	336	336	336	336	336	336

	A	B	C	D	E	F	G	H	I
1	Date: 12/02/15 Time: 20:25								
2	Sample: 2004 2007								
3									
4		NI	ROA	ROE	SIZE	GRTH	LQD	LVGE	TANG
5									
6	Mean	3886272.	0.303183	1.941370	46677075	0.131786	1.442143	1.106786	0.445587
7	Median	1537000.	0.071433	0.174526	26039500	0.090000	1.350000	1.345000	0.420000
8	Maximum	40610000	11.10366	156.7602	2.76E+08	1.490000	3.620000	3.090000	0.880000
9	Minimum	-12613000	-0.316125	-0.597429	373462.0	-0.450000	0.400000	-4.950000	-0.690000
10	Std. Dev.	6659125.	1.510479	14.41399	56634444	0.233373	0.619172	1.082428	0.233202
11	Skewness	2.965629	6.468195	9.240252	1.986805	3.059051	0.985850	-3.050723	-2.099877
12	Kurtosis	15.41847	43.75065	91.72440	7.323260	17.38369	4.294810	16.48956	11.85970
13									
14	Jarque-Bera	1325.787	12795.76	57494.84	120.6805	855.1258	19.47446	767.1853	336.4627
15	Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000059	0.000000	0.000000
16									
17	Sum	6.53E+08	50.93469	326.1501	3.92E+09	11.07000	121.1400	92.97000	37.42930
18	Sum Sq. Dev.	7.41E+15	381.0182	34696.44	2.66E+17	4.520432	31.82001	97.24703	4.513808
19									
20	Observations	168	168	168	84	84	84	84	84
21									

	A	B	C	D	E	F	G	H	I
1	Date: 12/02/15 Time: 21:11								
2	Sample: 2008 2011								
3									
4		NI	ROA	ROE	SIZE	GRTH	LQD	LVGE	TANG
5									
6	Mean	4742916.	0.134800	0.204648	65232571	0.079226	1.451310	1.525417	0.435298
7	Median	2029500.	0.055144	0.143696	33394000	0.060000	1.280000	1.370000	0.420000
8	Maximum	45220000	5.437018	16.62238	3.27E+08	1.180000	3.390000	176.7100	1.020000
9	Minimum	-14672000	-0.198205	-10.20824	335744.0	-0.570000	0.530000	-243.6400	-0.030000
10	Std. Dev.	7757152.	0.531149	1.990896	72903708	0.196286	0.586290	24.55968	0.209890
11	Skewness	2.260248	7.776692	2.396519	1.625931	1.297014	1.085130	-3.747798	0.436698
12	Kurtosis	10.19773	69.07116	39.20533	4.739131	10.66920	3.716355	75.66715	3.877720
13									
14	Jarque-Bera	505.6951	32251.14	9336.593	95.19425	458.8195	36.56232	37356.89	10.73249
15	Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.004672
16									
17	Sum	7.97E+08	22.64633	34.38092	1.10E+10	13.31000	243.8200	256.2700	73.13000
18	Sum Sq. Dev.	1.00E+16	47.11384	661.9324	8.88E+17	6.434199	57.40391	100730.7	7.356985
19									
20	Observations	168	168	168	168	168	168	168	168

Appendix B: Two Sample Mean Hypothesis T-Tests

NET INCOME	PRE CRISIS	POST CRISIS
Mean	3886271.619	4742915.214
Variance	4.4344E+13	6.01734E+13
Observations	168	168
Pearson Correlation	0.777868628	
Hypothesized Mean Difference	0	
df	167	
t Stat	-2.259211649	
P(T<=t) one-tail	0.012581736	
t Critical one-tail	1.654029128	
P(T<=t) two-tail	0.025163472	
t Critical two-tail	1.974270957	

ROA	PRE CRISIS	POST CRISIS
Mean	0.30318266	0.134799611
Variance	2.281546175	0.282118774
Observations	168	168
Pearson Correlation	0.945020434	
Hypothesized Mean Di	0	
df	167	
t Stat	2.132632734	
P(T<=t) one-tail	0.017208102	
t Critical one-tail	1.654029128	
P(T<=t) two-tail	0.034416204	
t Critical two-tail	1.974270957	

ROE	PRE CRISIS	POST CRISIS
Mean	1.941369689	0.204648357
Variance	207.7630858	3.963666847
Observations	168	168
Pearson Correlation	0.442793633	
Hypothesized Mean Differenc	0	
df	167	
t Stat	1.649160339	
P(T<=t) one-tail	0.050497304	
t Critical one-tail	1.654029128	
P(T<=t) two-tail	0.100994609	
t Critical two-tail	1.974270957	

Appendix C: Heteroscedasticity

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.906643	Prob. F(5,330)	0.0927
Obs*R-squared	9.434011	Prob. Chi-Square(5)	0.0930
Scaled explained SS	766.7856	Prob. Chi-Square(5)	0.0000

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 12/14/15 Time: 22:50
Sample: 1 336
Included observations: 336

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1476.334	1045.652	1.411879	0.1589
LNSIZE	-68.66021	58.03279	-1.183128	0.2376
GRTH	423.7275	369.2895	1.147413	0.2520
LQD	82.80299	144.5813	0.572709	0.5672
LVGE	0.671044	4.069683	0.164888	0.8691
TANG	-812.8322	407.3281	-1.995522	0.0468

R-squared	0.028077	Mean dependent var	101.8770
Adjusted R-squared	0.013351	S.D. dependent var	1324.502
S.E. of regression	1315.631	Akaike info criterion	17.21972
Sum squared resid	5.71E+08	Schwarz criterion	17.28788
Log likelihood	-2886.912	Hannan-Quinn criter.	17.24689
F-statistic	1.906643	Durbin-Watson stat	1.392681
Prob(F-statistic)	0.092727		

Heteroskedasticity Test: Breusch-Pagan-Godfrey

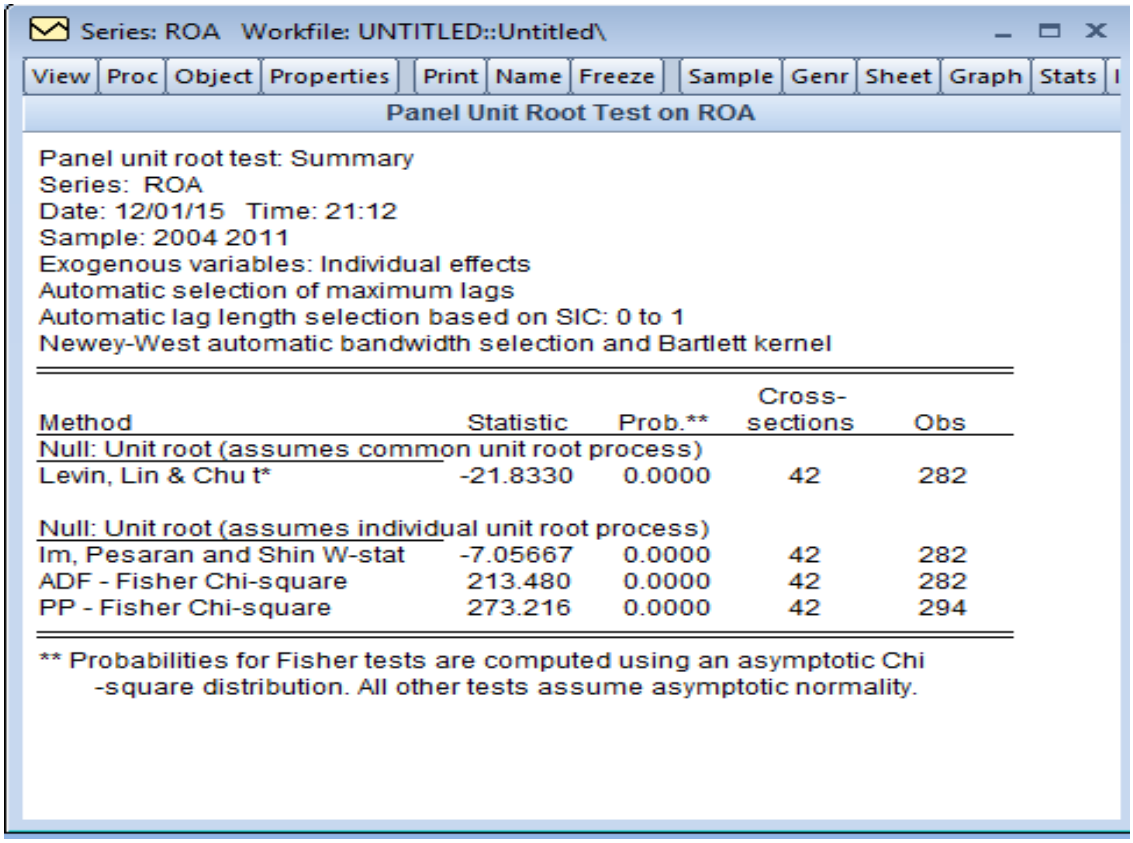
F-statistic	5.949110	Prob. F(5,330)	0.0000
Obs*R-squared	27.78215	Prob. Chi-Square(5)	0.0000
Scaled explained SS	815.0027	Prob. Chi-Square(5)	0.0000

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 12/14/15 Time: 22:29
Sample: 1 336
Included observations: 336

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	15.34706	7.121951	2.154896	0.0319
LNSIZE	-0.685762	0.395262	-1.734953	0.0837
GRTH	6.387002	2.515237	2.539325	0.0116
LQD	1.154986	0.984746	1.172877	0.2417
LVGE	-0.027506	0.027719	-0.992335	0.3218
TANG	-10.56267	2.774319	-3.807304	0.0002

R-squared	0.082685	Mean dependent var	1.188877
Adjusted R-squared	0.068786	S.D. dependent var	9.285841
S.E. of regression	8.960783	Akaike info criterion	7.241288
Sum squared resid	26497.56	Schwarz criterion	7.309451
Log likelihood	-1210.536	Hannan-Quinn criter.	7.268460
F-statistic	5.949110	Durbin-Watson stat	0.444739
Prob(F-statistic)	0.000028		

Appendix D: Panel Unit Root Tests



Series: ROA Workfile: UNTITLED::Untitled\

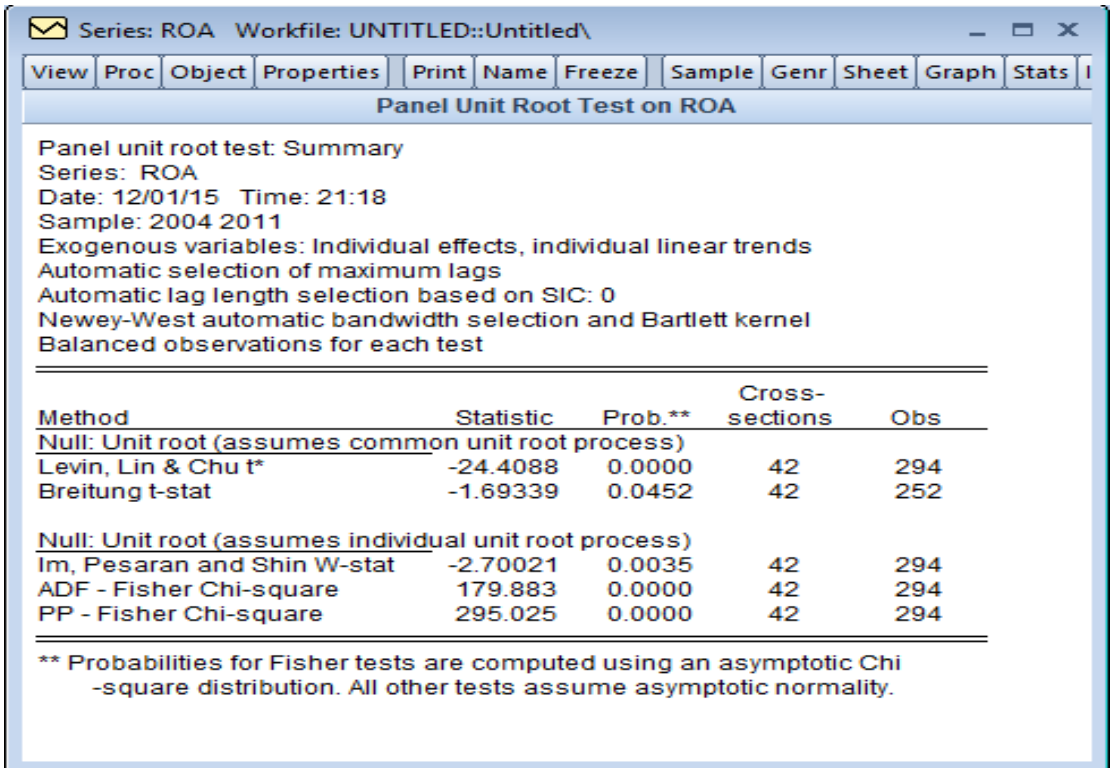
View | Proc | Object | Properties | Print | Name | Freeze | Sample | Genr | Sheet | Graph | Stats

Panel Unit Root Test on ROA

Panel unit root test: Summary
Series: ROA
Date: 12/01/15 Time: 21:12
Sample: 2004 2011
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-21.8330	0.0000	42	282
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-7.05667	0.0000	42	282
ADF - Fisher Chi-square	213.480	0.0000	42	282
PP - Fisher Chi-square	273.216	0.0000	42	294

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.



Series: ROA Workfile: UNTITLED::Untitled\

View | Proc | Object | Properties | Print | Name | Freeze | Sample | Genr | Sheet | Graph | Stats

Panel Unit Root Test on ROA

Panel unit root test: Summary
Series: ROA
Date: 12/01/15 Time: 21:18
Sample: 2004 2011
Exogenous variables: Individual effects, individual linear trends
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-24.4088	0.0000	42	294
Breitung t-stat	-1.69339	0.0452	42	252
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.70021	0.0035	42	294
ADF - Fisher Chi-square	179.883	0.0000	42	294
PP - Fisher Chi-square	295.025	0.0000	42	294

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Series: ROA Workfile: UNTITLED::Untitled\

View | Proc | Object | Properties | Print | Name | Freeze | Sample | Genr | Sheet | Graph | Stats

Panel Unit Root Test on ROA

Panel unit root test: Summary
Series: ROA
Date: 12/01/15 Time: 21:17
Sample: 2004 2011
Exogenous variables: None
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-6.24324	0.0000	42	281
Null: Unit root (assumes individual unit root process)				
ADF - Fisher Chi-square	141.105	0.0001	42	281
PP - Fisher Chi-square	164.030	0.0000	42	294

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Series: ROE Workfile: UNTITLED::Untitled\

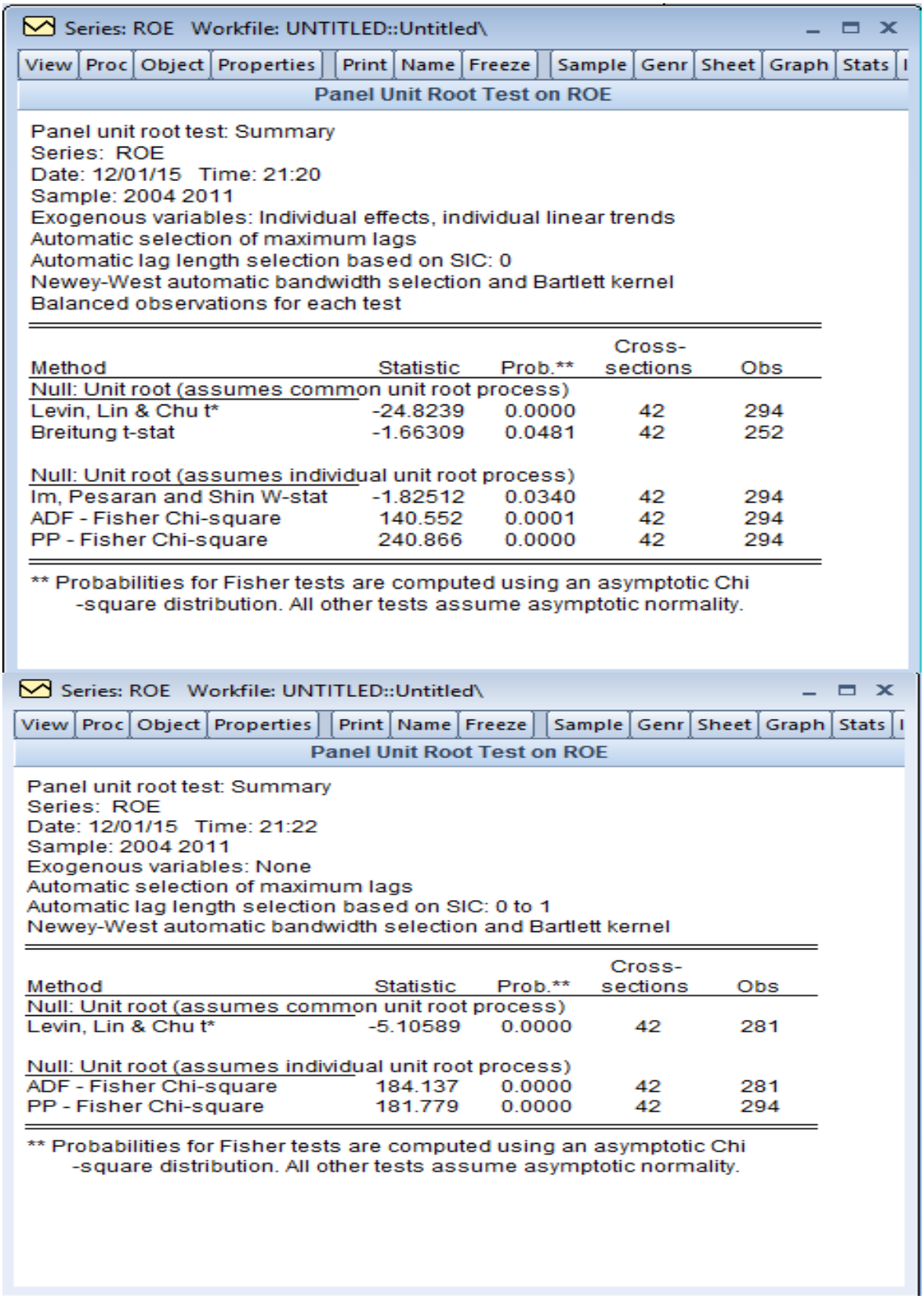
View | Proc | Object | Properties | Print | Name | Freeze | Sample | Genr | Sheet | Graph | Stats

Panel Unit Root Test on ROE

Panel unit root test: Summary
Series: ROE
Date: 12/01/15 Time: 21:18
Sample: 2004 2011
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-18.3495	0.0000	42	279
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-6.88274	0.0000	42	279
ADF - Fisher Chi-square	218.023	0.0000	42	279
PP - Fisher Chi-square	221.811	0.0000	42	294

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.



Series: ROE Workfile: UNTITLED::Untitled\

View | Proc | Object | Properties | Print | Name | Freeze | Sample | Genr | Sheet | Graph | Stats

Panel Unit Root Test on ROE

Panel unit root test: Summary
Series: ROE
Date: 12/01/15 Time: 21:20
Sample: 2004 2011
Exogenous variables: Individual effects, individual linear trends
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-24.8239	0.0000	42	294
Breitung t-stat	-1.66309	0.0481	42	252
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-1.82512	0.0340	42	294
ADF - Fisher Chi-square	140.552	0.0001	42	294
PP - Fisher Chi-square	240.866	0.0000	42	294

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Series: ROE Workfile: UNTITLED::Untitled\

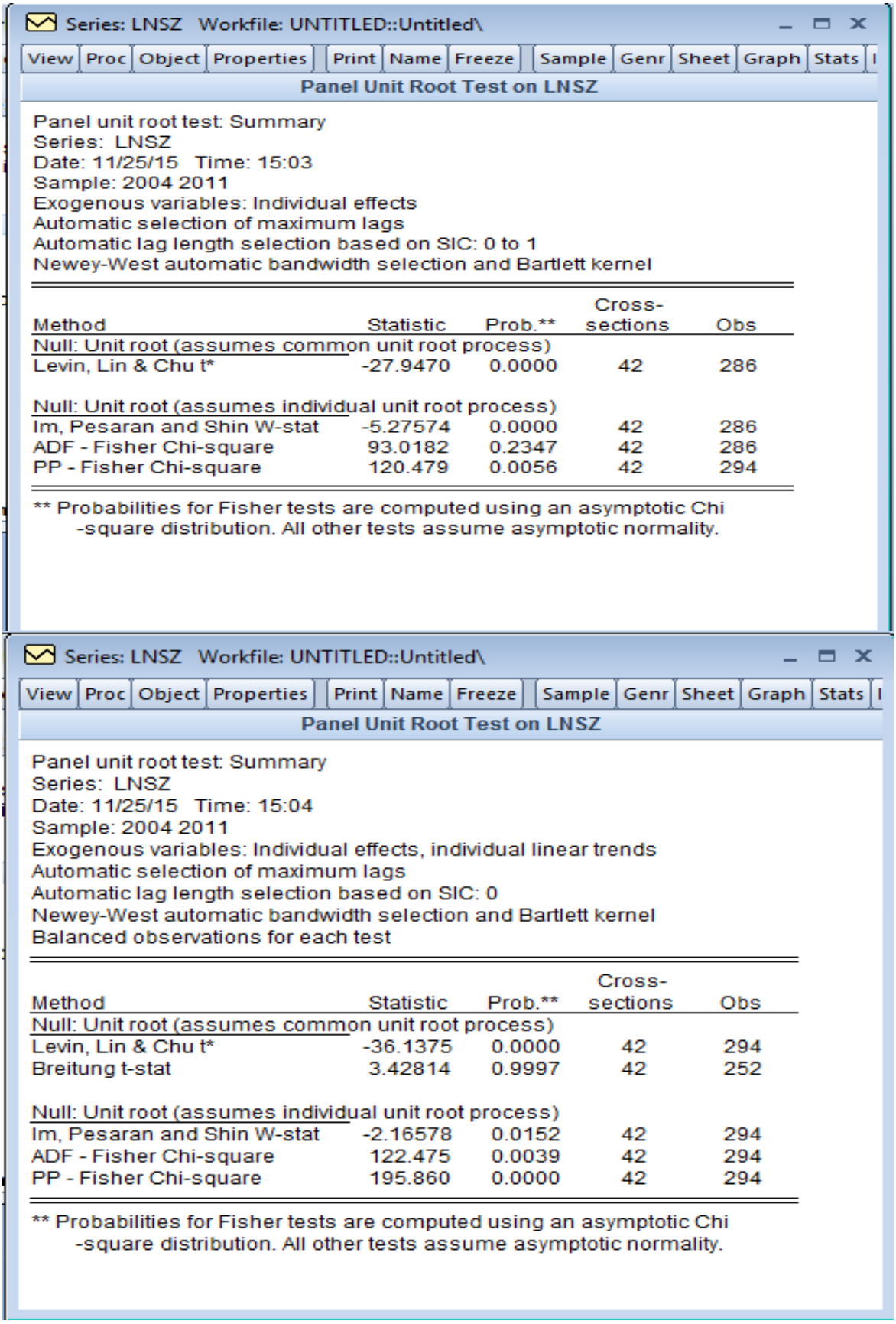
View | Proc | Object | Properties | Print | Name | Freeze | Sample | Genr | Sheet | Graph | Stats

Panel Unit Root Test on ROE

Panel unit root test: Summary
Series: ROE
Date: 12/01/15 Time: 21:22
Sample: 2004 2011
Exogenous variables: None
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-5.10589	0.0000	42	281
Null: Unit root (assumes individual unit root process)				
ADF - Fisher Chi-square	184.137	0.0000	42	281
PP - Fisher Chi-square	181.779	0.0000	42	294

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.



Series: LNSZ Workfile: UNTITLED::Untitled\

View | Proc | Object | Properties | Print | Name | Freeze | Sample | Genr | Sheet | Graph | Stats

Panel Unit Root Test on LNSZ

Panel unit root test: Summary
Series: LNSZ
Date: 11/25/15 Time: 15:03
Sample: 2004 2011
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-27.9470	0.0000	42	286
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-5.27574	0.0000	42	286
ADF - Fisher Chi-square	93.0182	0.2347	42	286
PP - Fisher Chi-square	120.479	0.0056	42	294

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Series: LNSZ Workfile: UNTITLED::Untitled\

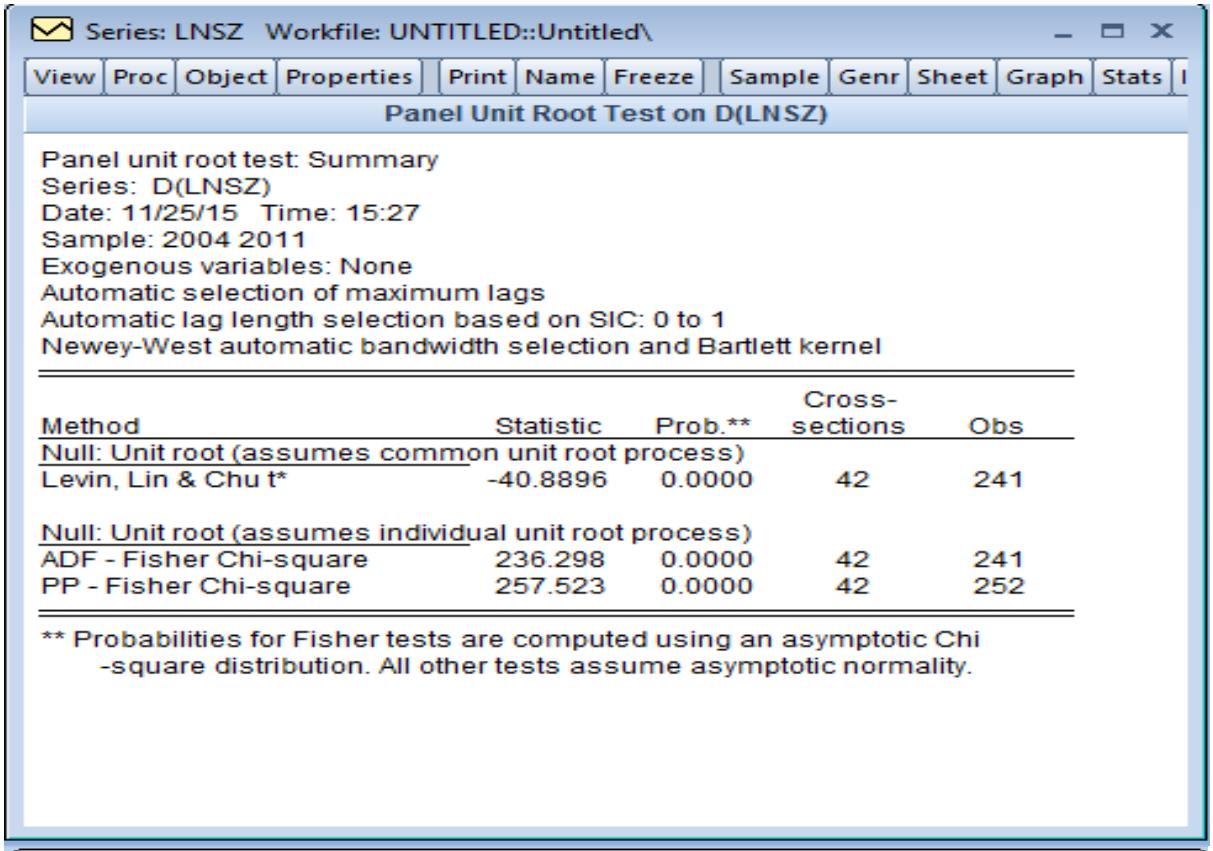
View | Proc | Object | Properties | Print | Name | Freeze | Sample | Genr | Sheet | Graph | Stats

Panel Unit Root Test on LNSZ

Panel unit root test: Summary
Series: LNSZ
Date: 11/25/15 Time: 15:04
Sample: 2004 2011
Exogenous variables: Individual effects, individual linear trends
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-36.1375	0.0000	42	294
Breitung t-stat	3.42814	0.9997	42	252
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.16578	0.0152	42	294
ADF - Fisher Chi-square	122.475	0.0039	42	294
PP - Fisher Chi-square	195.860	0.0000	42	294

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.



Series: LNSZ Workfile: UNTITLED::Untitled\

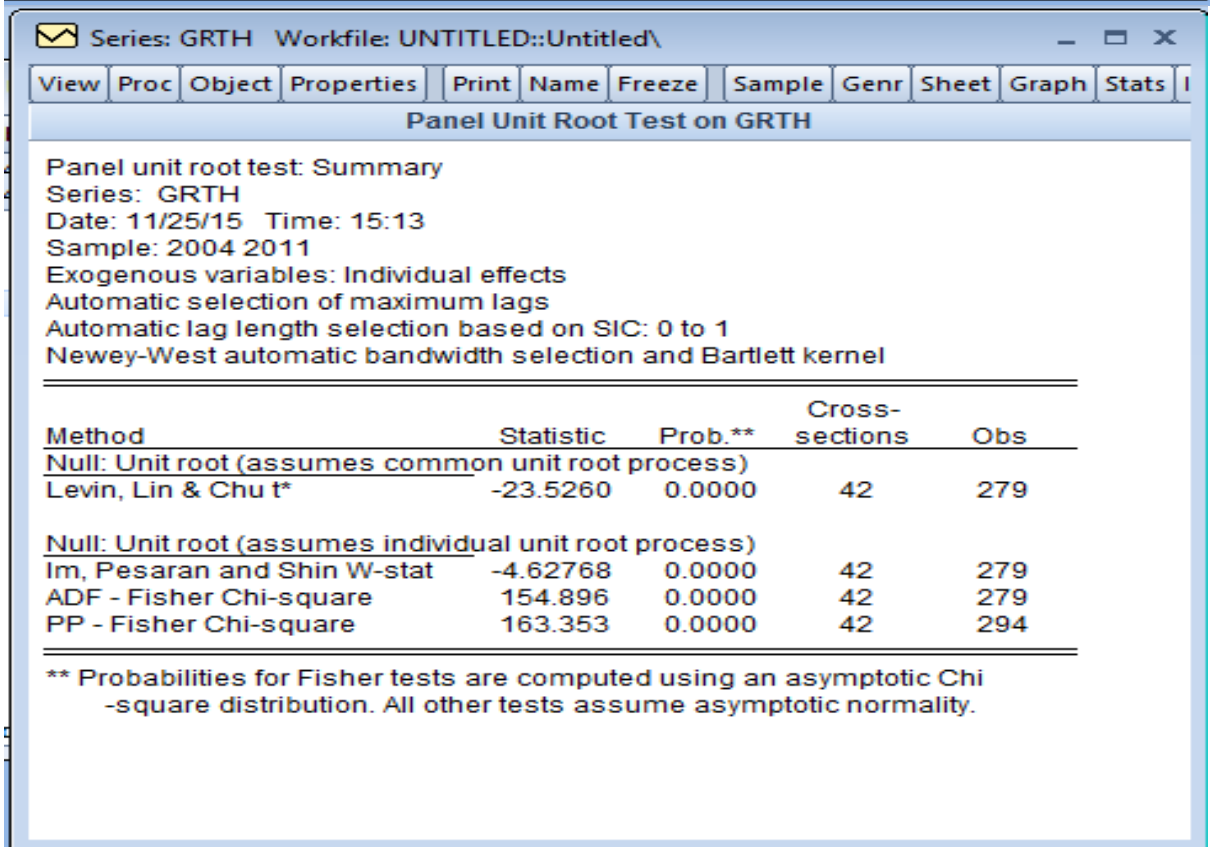
View | Proc | Object | Properties | Print | Name | Freeze | Sample | Genr | Sheet | Graph | Stats

Panel Unit Root Test on D(LNSZ)

Panel unit root test: Summary
Series: D(LNSZ)
Date: 11/25/15 Time: 15:27
Sample: 2004 2011
Exogenous variables: None
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-40.8896	0.0000	42	241
Null: Unit root (assumes individual unit root process)				
ADF - Fisher Chi-square	236.298	0.0000	42	241
PP - Fisher Chi-square	257.523	0.0000	42	252

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.



Series: GRTH Workfile: UNTITLED::Untitled\

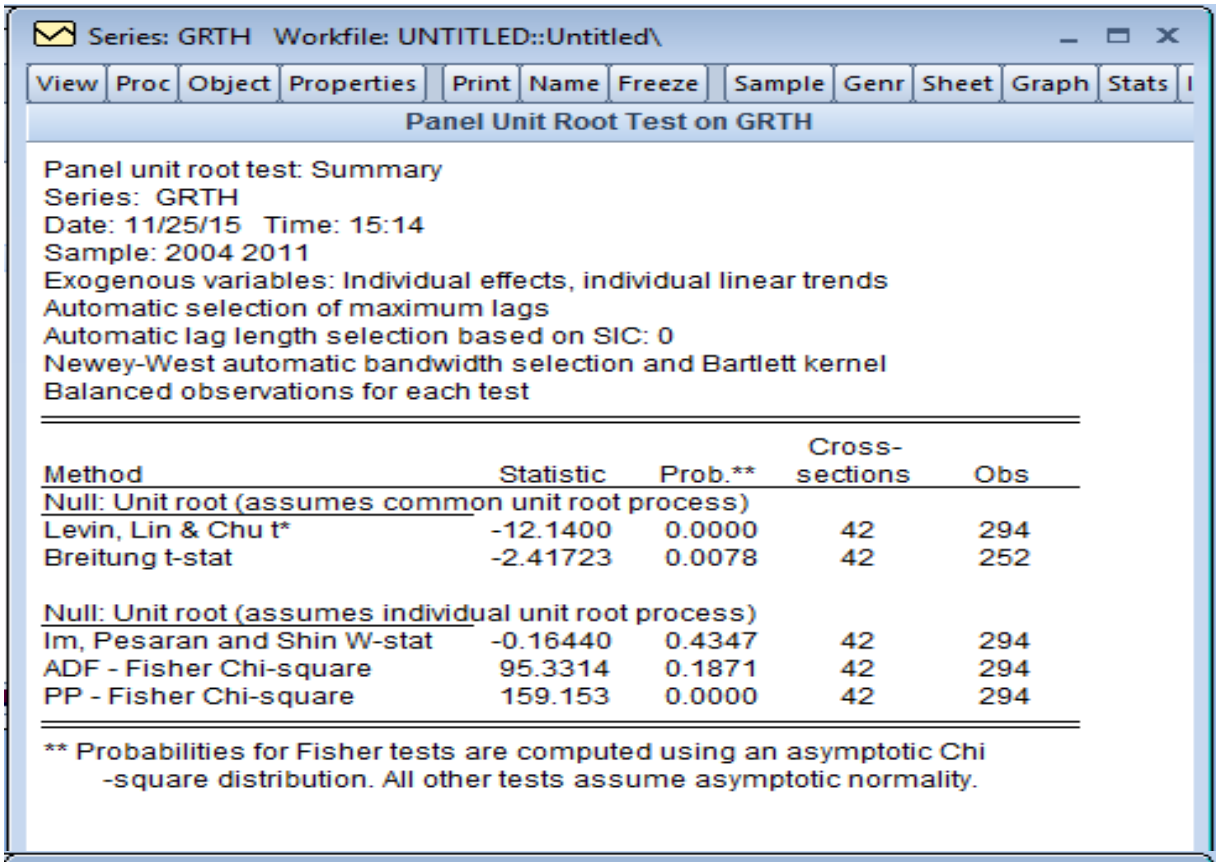
View | Proc | Object | Properties | Print | Name | Freeze | Sample | Genr | Sheet | Graph | Stats

Panel Unit Root Test on GRTH

Panel unit root test: Summary
Series: GRTH
Date: 11/25/15 Time: 15:13
Sample: 2004 2011
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-23.5260	0.0000	42	279
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-4.62768	0.0000	42	279
ADF - Fisher Chi-square	154.896	0.0000	42	279
PP - Fisher Chi-square	163.353	0.0000	42	294

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.



Series: GRTH Workfile: UNTITLED::Untitled\

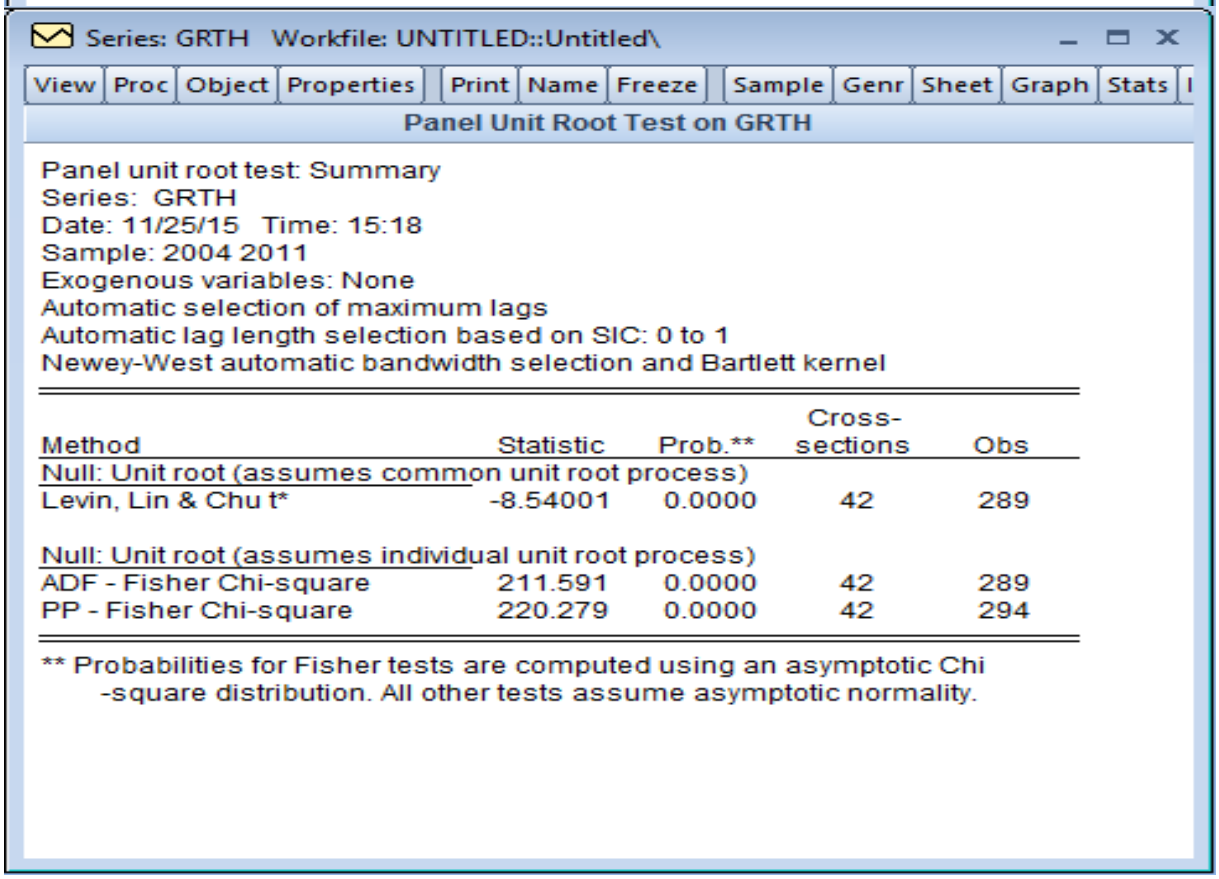
View | Proc | Object | Properties | Print | Name | Freeze | Sample | Genr | Sheet | Graph | Stats

Panel Unit Root Test on GRTH

Panel unit root test: Summary
Series: GRTH
Date: 11/25/15 Time: 15:14
Sample: 2004 2011
Exogenous variables: Individual effects, individual linear trends
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-12.1400	0.0000	42	294
Breitung t-stat	-2.41723	0.0078	42	252
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-0.16440	0.4347	42	294
ADF - Fisher Chi-square	95.3314	0.1871	42	294
PP - Fisher Chi-square	159.153	0.0000	42	294

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.



Series: GRTH Workfile: UNTITLED::Untitled\

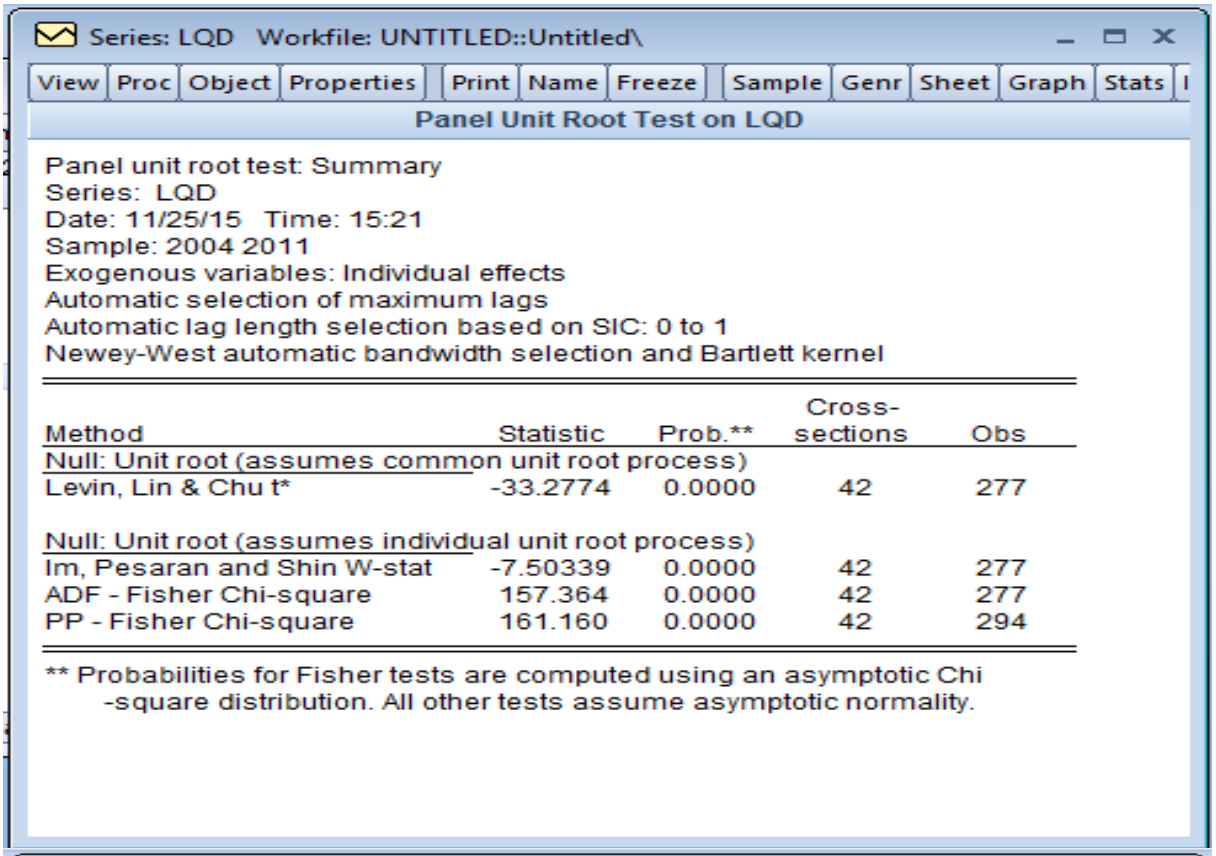
View | Proc | Object | Properties | Print | Name | Freeze | Sample | Genr | Sheet | Graph | Stats

Panel Unit Root Test on GRTH

Panel unit root test: Summary
Series: GRTH
Date: 11/25/15 Time: 15:18
Sample: 2004 2011
Exogenous variables: None
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-8.54001	0.0000	42	289
Null: Unit root (assumes individual unit root process)				
ADF - Fisher Chi-square	211.591	0.0000	42	289
PP - Fisher Chi-square	220.279	0.0000	42	294

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.



Series: LQD Workfile: UNTITLED::Untitled\

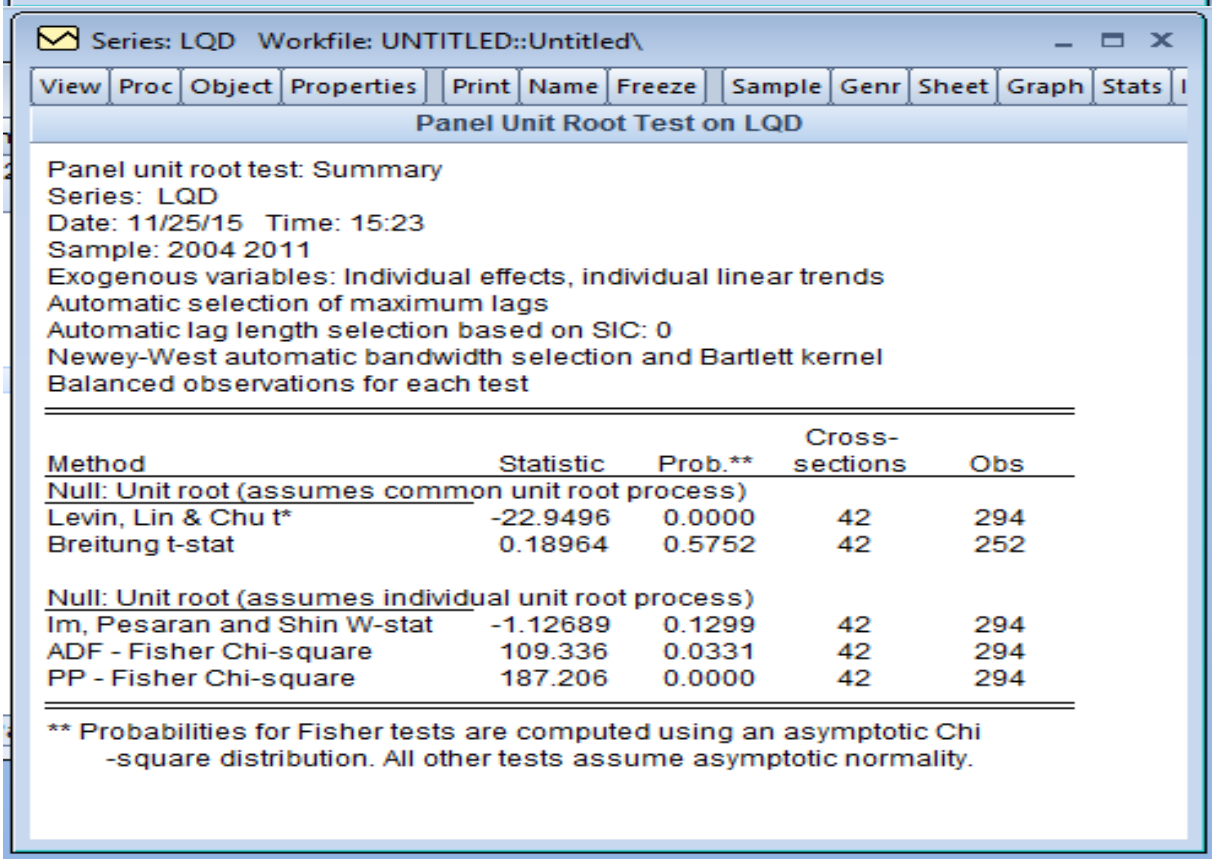
View | Proc | Object | Properties | Print | Name | Freeze | Sample | Genr | Sheet | Graph | Stats

Panel Unit Root Test on LQD

Panel unit root test: Summary
Series: LQD
Date: 11/25/15 Time: 15:21
Sample: 2004 2011
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-33.2774	0.0000	42	277
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-7.50339	0.0000	42	277
ADF - Fisher Chi-square	157.364	0.0000	42	277
PP - Fisher Chi-square	161.160	0.0000	42	294

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.



Series: LQD Workfile: UNTITLED::Untitled\

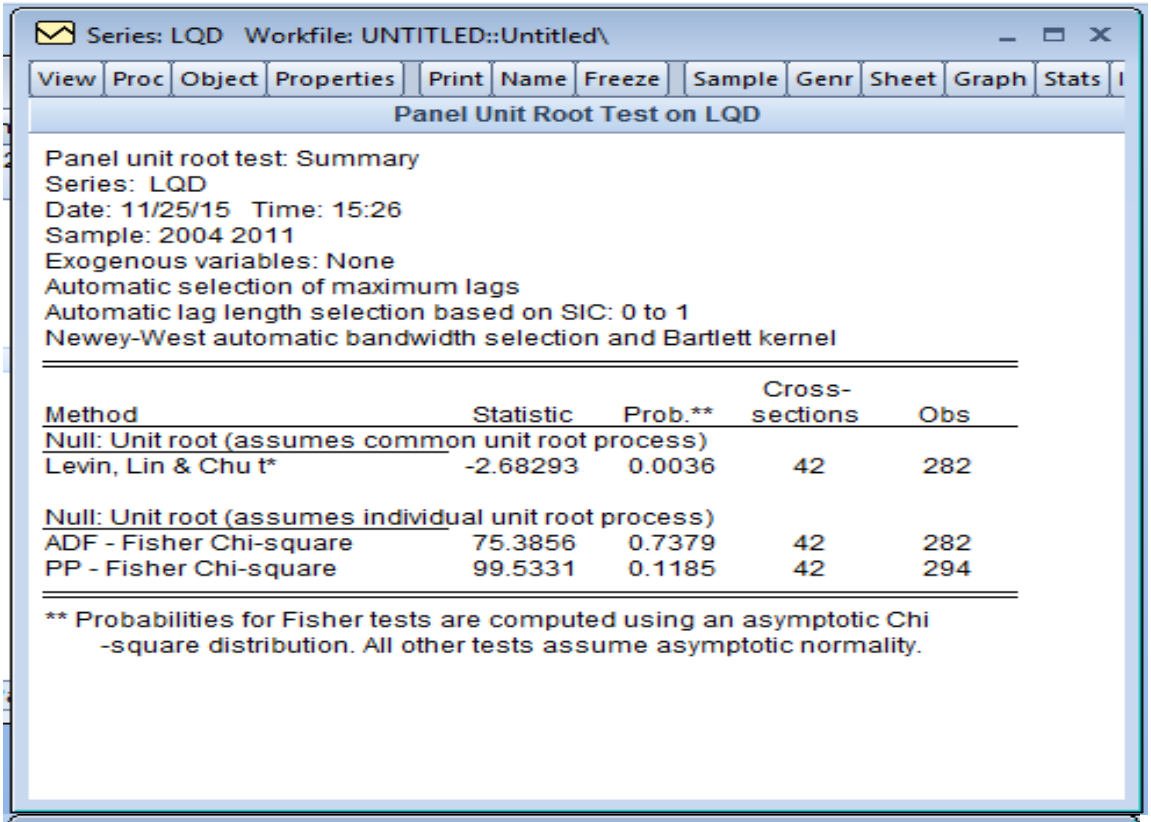
View | Proc | Object | Properties | Print | Name | Freeze | Sample | Genr | Sheet | Graph | Stats

Panel Unit Root Test on LQD

Panel unit root test: Summary
Series: LQD
Date: 11/25/15 Time: 15:23
Sample: 2004 2011
Exogenous variables: Individual effects, individual linear trends
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-22.9496	0.0000	42	294
Breitung t-stat	0.18964	0.5752	42	252
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-1.12689	0.1299	42	294
ADF - Fisher Chi-square	109.336	0.0331	42	294
PP - Fisher Chi-square	187.206	0.0000	42	294

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.



Series: LQD Workfile: UNTITLED::Untitled\

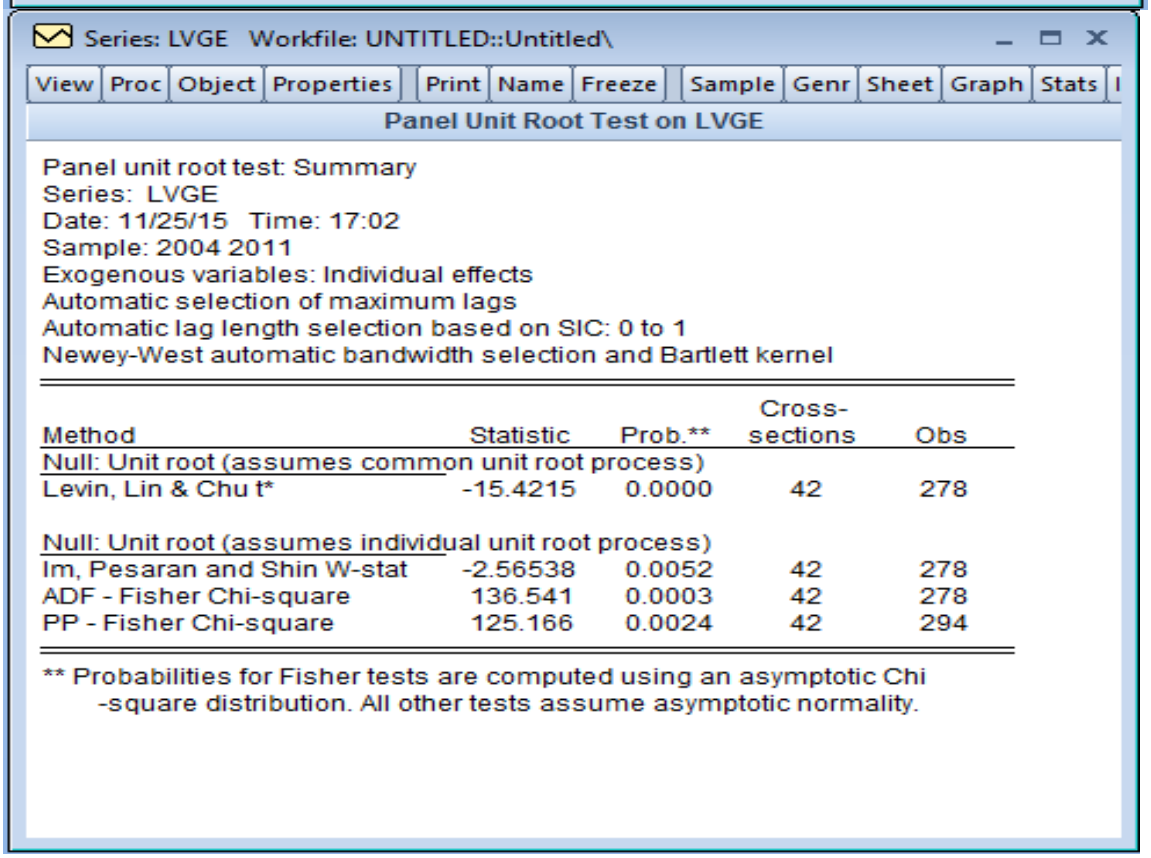
View | Proc | Object | Properties | Print | Name | Freeze | Sample | Genr | Sheet | Graph | Stats

Panel Unit Root Test on LQD

Panel unit root test: Summary
Series: LQD
Date: 11/25/15 Time: 15:26
Sample: 2004 2011
Exogenous variables: None
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-2.68293	0.0036	42	282
Null: Unit root (assumes individual unit root process)				
ADF - Fisher Chi-square	75.3856	0.7379	42	282
PP - Fisher Chi-square	99.5331	0.1185	42	294

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.



Series: LVGE Workfile: UNTITLED::Untitled\

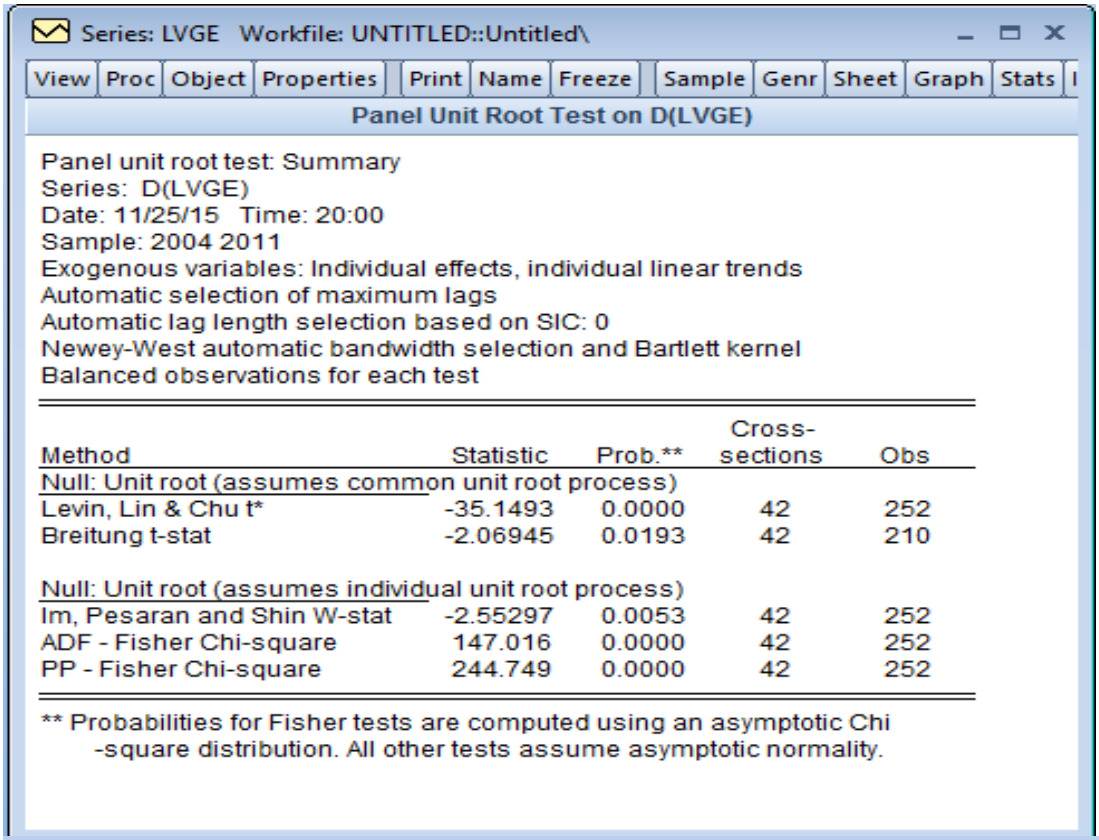
View | Proc | Object | Properties | Print | Name | Freeze | Sample | Genr | Sheet | Graph | Stats

Panel Unit Root Test on LVGE

Panel unit root test: Summary
Series: LVGE
Date: 11/25/15 Time: 17:02
Sample: 2004 2011
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-15.4215	0.0000	42	278
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.56538	0.0052	42	278
ADF - Fisher Chi-square	136.541	0.0003	42	278
PP - Fisher Chi-square	125.166	0.0024	42	294

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.



Series: LVGE Workfile: UNTITLED::Untitled\

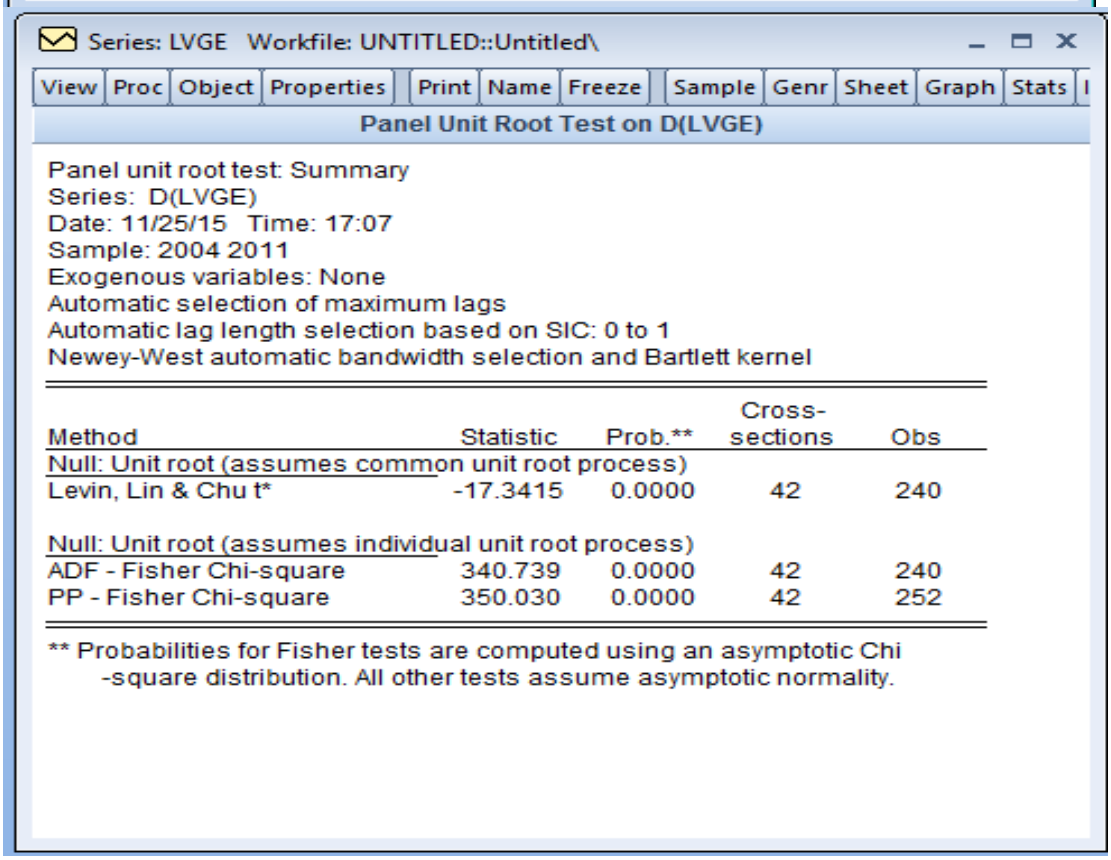
View | Proc | Object | Properties | Print | Name | Freeze | Sample | Genr | Sheet | Graph | Stats

Panel Unit Root Test on D(LVGE)

Panel unit root test: Summary
Series: D(LVGE)
Date: 11/25/15 Time: 20:00
Sample: 2004 2011
Exogenous variables: Individual effects, individual linear trends
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-35.1493	0.0000	42	252
Breitung t-stat	-2.06945	0.0193	42	210
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.55297	0.0053	42	252
ADF - Fisher Chi-square	147.016	0.0000	42	252
PP - Fisher Chi-square	244.749	0.0000	42	252

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.



Series: LVGE Workfile: UNTITLED::Untitled\

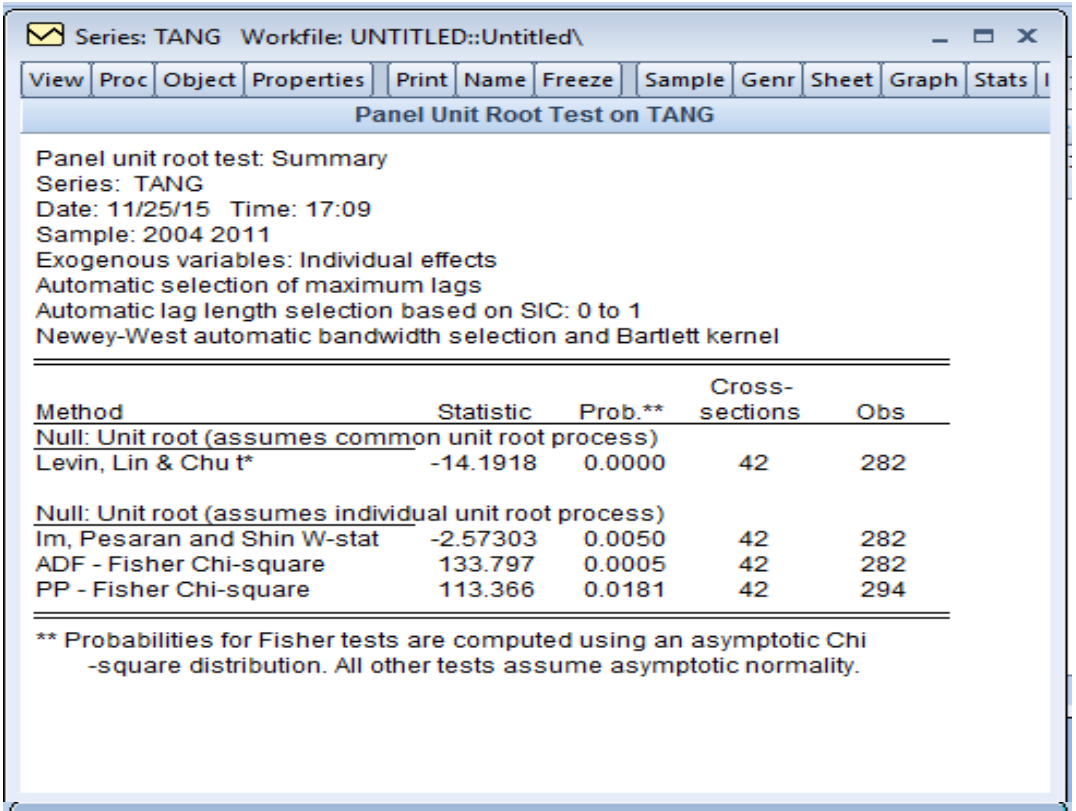
View | Proc | Object | Properties | Print | Name | Freeze | Sample | Genr | Sheet | Graph | Stats

Panel Unit Root Test on D(LVGE)

Panel unit root test: Summary
Series: D(LVGE)
Date: 11/25/15 Time: 17:07
Sample: 2004 2011
Exogenous variables: None
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-17.3415	0.0000	42	240
Null: Unit root (assumes individual unit root process)				
ADF - Fisher Chi-square	340.739	0.0000	42	240
PP - Fisher Chi-square	350.030	0.0000	42	252

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.



Series: TANG Workfile: UNTITLED::Untitled\

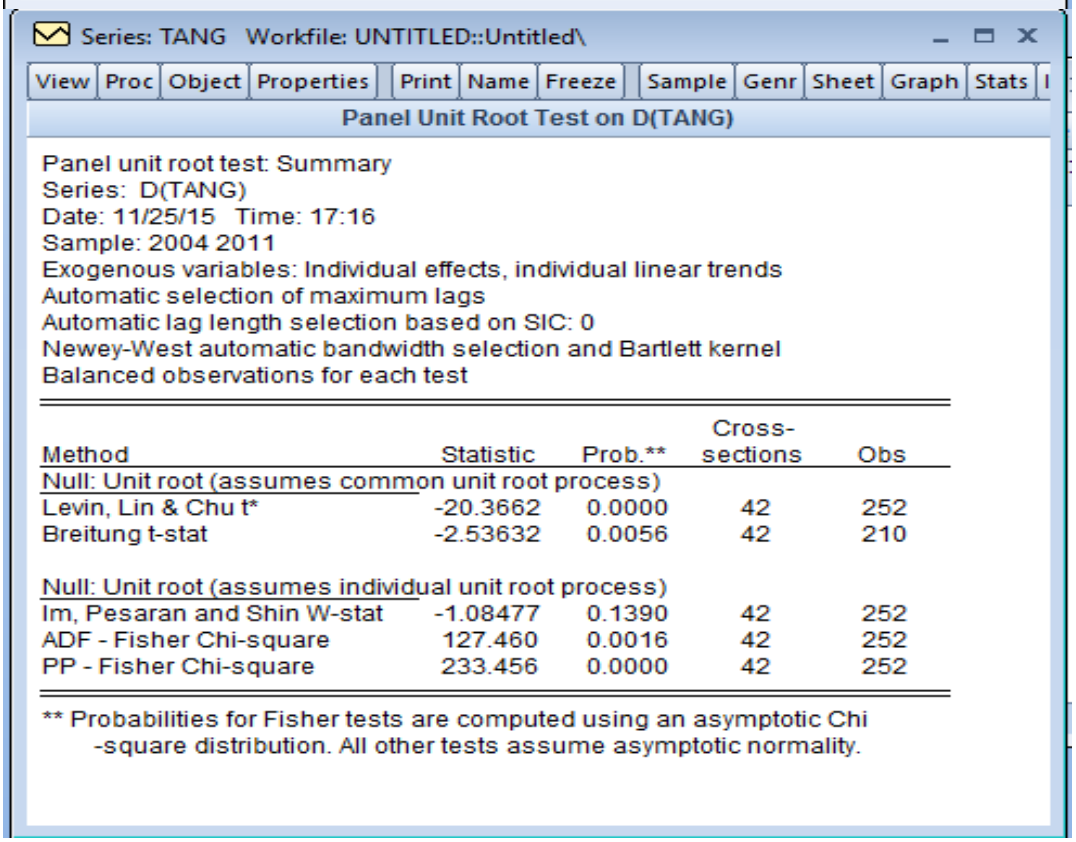
View | Proc | Object | Properties | Print | Name | Freeze | Sample | Genr | Sheet | Graph | Stats

Panel Unit Root Test on TANG

Panel unit root test: Summary
Series: TANG
Date: 11/25/15 Time: 17:09
Sample: 2004 2011
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-14.1918	0.0000	42	282
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.57303	0.0050	42	282
ADF - Fisher Chi-square	133.797	0.0005	42	282
PP - Fisher Chi-square	113.366	0.0181	42	294

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.



Series: TANG Workfile: UNTITLED::Untitled\

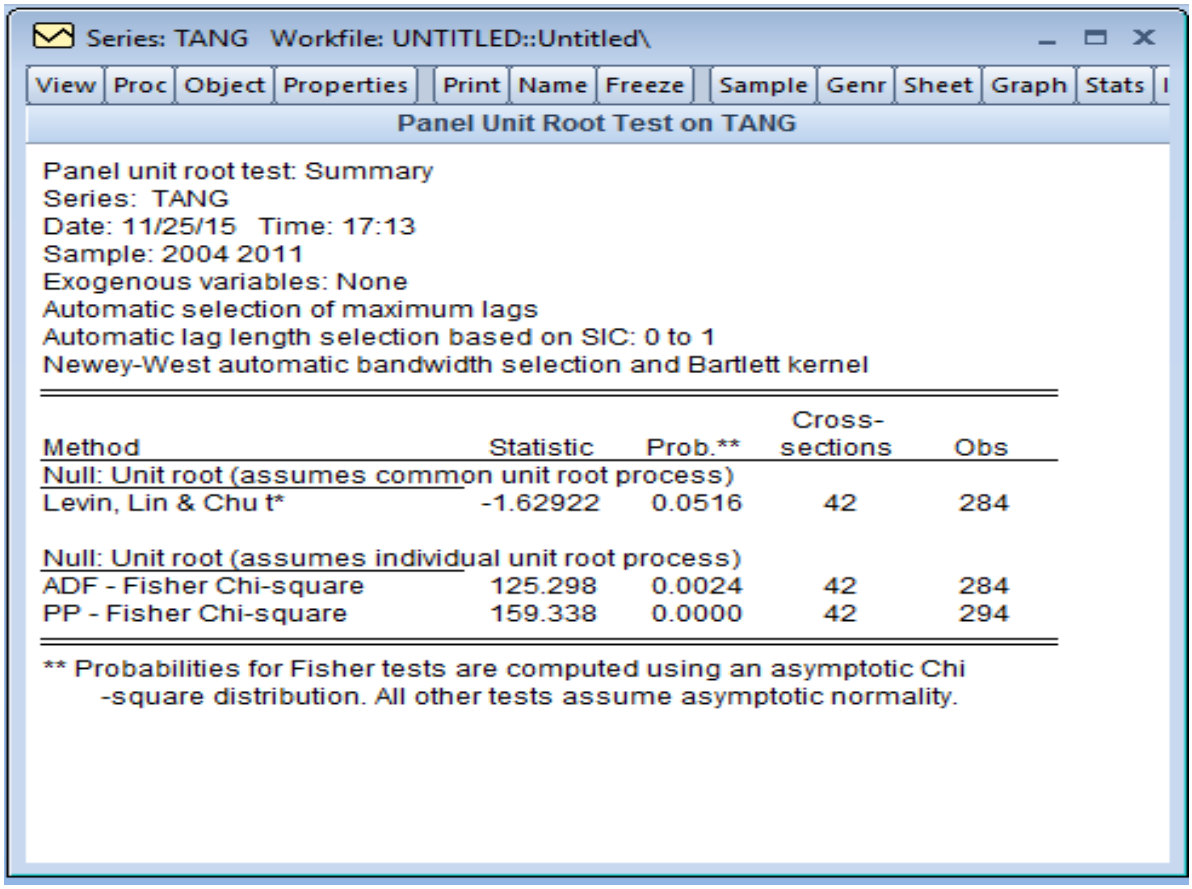
View | Proc | Object | Properties | Print | Name | Freeze | Sample | Genr | Sheet | Graph | Stats

Panel Unit Root Test on D(TANG)

Panel unit root test: Summary
Series: D(TANG)
Date: 11/25/15 Time: 17:16
Sample: 2004 2011
Exogenous variables: Individual effects, individual linear trends
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-20.3662	0.0000	42	252
Breitung t-stat	-2.53632	0.0056	42	210
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-1.08477	0.1390	42	252
ADF - Fisher Chi-square	127.460	0.0016	42	252
PP - Fisher Chi-square	233.456	0.0000	42	252

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.


Series: TANG Workfile: UNTITLED::Untitled\
View Proc Object Properties Print Name Freeze Sample Genr Sheet Graph Stats
Panel Unit Root Test on TANG
Panel unit root test: Summary
Series: TANG
Date: 11/25/15 Time: 17:13
Sample: 2004 2011
Exogenous variables: None
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel
Method Statistic Prob.** Cross-sections Obs
Null: Unit root (assumes common unit root process)
Levin, Lin & Chu t* -1.62922 0.0516 42 284
Null: Unit root (assumes individual unit root process)
ADF - Fisher Chi-square 125.298 0.0024 42 284
PP - Fisher Chi-square 159.338 0.0000 42 294
** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Appendix E: Regression Analysis

Dependent Variable: ROE
Method: Panel Least Squares
Date: 12/03/15 Time: 21:39
Sample: 2008 2011
Periods included: 4
Cross-sections included: 42
Total panel (balanced) observations: 168

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	21.80442	11.24813	1.938493	0.0549
LNSIZE	-1.231135	0.649892	-1.894368	0.0606
GRTH	0.269077	0.841598	0.319722	0.7497
LQD	-0.245264	0.513180	-0.477929	0.6336
LVGE	0.023827	0.004917	4.845692	0.0000
TANG	0.031305	2.615378	0.011970	0.9905

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.706292	Mean dependent var	0.204648
Adjusted R-squared	0.594634	S.D. dependent var	1.990896
S.E. of regression	1.267571	Akaike info criterion	3.543432
Sum squared resid	194.4151	Schwarz criterion	4.417398
Log likelihood	-250.6483	Hannan-Quinn criter.	3.898130
F-statistic	6.325506	Durbin-Watson stat	1.384478
Prob(F-statistic)	0.000000		

Dependent Variable: ROA
Method: Panel Least Squares
Date: 12/03/15 Time: 21:02
Sample: 2008 2011
Periods included: 4
Cross-sections included: 42
Total panel (balanced) observations: 168

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	10.21878	2.028230	5.038273	0.0000
LNSIZE	-0.592638	0.117187	-5.057216	0.0000
LQD	0.013376	0.092535	0.144549	0.8853
LVGE	0.000235	0.000887	0.264991	0.7915
GRTH	0.388922	0.151754	2.562838	0.0116
TANG	0.289489	0.471597	0.613848	0.5405

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.865830	Mean dependent var	0.134800
Adjusted R-squared	0.814823	S.D. dependent var	0.531149
S.E. of regression	0.228565	Akaike info criterion	0.117356
Sum squared resid	6.321265	Schwarz criterion	0.991322
Log likelihood	37.14208	Hannan-Quinn criter.	0.472054
F-statistic	16.97480	Durbin-Watson stat	1.184681
Prob(F-statistic)	0.000000		

Dependent Variable: ROA
Method: Panel Least Squares
Date: 12/03/15 Time: 21:11
Sample: 2004 2011
Periods included: 8
Cross-sections included: 42
Total panel (balanced) observations: 336

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	11.25065	1.635614	6.878545	0.0000
LNSIZE	-0.608831	0.093730	-6.495600	0.0000
GRTH	0.181746	0.179873	1.010412	0.3131
LQD	0.049288	0.104016	0.473855	0.6360
LVGE	0.001905	0.001800	1.058342	0.2908
TANG	-1.524395	0.352917	-4.319409	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.797893	Mean dependent var	0.218991
Adjusted R-squared	0.765724	S.D. dependent var	1.133629
S.E. of regression	0.548700	Akaike info criterion	1.766548
Sum squared resid	87.00976	Schwarz criterion	2.300489
Log likelihood	-249.7801	Hannan-Quinn criter.	1.979392
F-statistic	24.80297	Durbin-Watson stat	0.338466
Prob(F-statistic)	0.000000		

Dependent Variable: ROE
Method: Panel Least Squares
Date: 12/03/15 Time: 21:25
Sample: 2004 2011
Periods included: 8
Cross-sections included: 42
Total panel (balanced) observations: 336

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	96.67822	25.21159	3.834673	0.0002
LNSIZE	-5.257753	1.444764	-3.639179	0.0003
GRTH	0.481127	2.772589	0.173530	0.8624
LQD	0.280999	1.603312	0.175261	0.8610
LVGE	0.050933	0.027746	1.835705	0.0674
TANG	-13.28183	5.439920	-2.441550	0.0152

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.419485	Mean dependent var	1.073009
Adjusted R-squared	0.327084	S.D. dependent var	10.31037
S.E. of regression	8.457743	Akaike info criterion	7.237119
Sum squared resid	20673.16	Schwarz criterion	7.771060
Log likelihood	-1168.836	Hannan-Quinn criter.	7.449963
F-statistic	4.539857	Durbin-Watson stat	1.767007
Prob(F-statistic)	0.000000		

Dependent Variable: ROE
Method: Panel Least Squares
Date: 12/03/15 Time: 21:34
Sample: 2004 2007
Periods included: 4
Cross-sections included: 21
Total panel (balanced) observations: 84

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-48.18698	155.4439	-0.309996	0.7577
LNSIZE	3.619505	9.034385	0.400637	0.6902
GRTH	-5.019345	9.573940	-0.524272	0.6021
LQD	-8.294415	6.950845	-1.193296	0.2376
LVGE	-1.702728	2.820257	-0.603749	0.5484
TANG	12.11753	16.67515	0.726681	0.4703

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.614584	Mean dependent var	3.690942
Adjusted R-squared	0.448456	S.D. dependent var	20.28846
S.E. of regression	15.06742	Akaike info criterion	8.511621
Sum squared resid	13167.58	Schwarz criterion	9.264017
Log likelihood	-331.4881	Hannan-Quinn criter.	8.814078
F-statistic	3.699468	Durbin-Watson stat	2.898196
Prob(F-statistic)	0.000020		

Dependent Variable: ROA
Method: Panel Least Squares
Date: 12/03/15 Time: 21:35
Sample: 2004 2007
Periods included: 4
Cross-sections included: 21
Total panel (balanced) observations: 84

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.388710	4.392738	1.909677	0.0611
LNSIZE	-0.461976	0.255305	-1.809501	0.0756
GRTH	0.357436	0.270553	1.321131	0.1916
LQD	-0.157830	0.196426	-0.803510	0.4250
LVGE	-0.001361	0.079699	-0.017073	0.9864
TANG	0.250404	0.471228	0.531386	0.5972

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.971686	Mean dependent var	0.534288
Adjusted R-squared	0.959482	S.D. dependent var	2.115331
S.E. of regression	0.425795	Akaike info criterion	1.378956
Sum squared resid	10.51548	Schwarz criterion	2.131352
Log likelihood	-31.91615	Hannan-Quinn criter.	1.681413
F-statistic	79.61959	Durbin-Watson stat	1.322317
Prob(F-statistic)	0.000000		