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UNEMPLOYMENT RATE AND STOCK MARKET RETURNS: A STUDY ON OECD COUNTRIES*

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ABSTRACT

Unemployment is one of the major macroeconomic factors which has always been a big issue for an economy as it has a direct influence on living condition of citizens and is helpful in ensuring a sound and growing economic system. Based on logical concept, it can be said that employment rate states the financial soundness of citizens, specifies their spending capacities, saving and investment behavior in real and financial assets; thus related to stock market activities.

The researchers decided to conduct the study on unemployment; only a factor of macro economy considering its significance in research area that has been started with a good number of studies done by different researchers based on different countries on different periods, but this study is different from previous studies from some point of views: 1) It will cover a huge number of countries with several economic classes; 2) This study will represent the relationship between unemployment and stock market returns of the countries under a single study which are significant from world perspective because of having power to influence the activities of other countries; 3) This study will help researchers, policy makers and learners to get a clear idea about the interrelationship among these two components over a wide range of countries. The study will be conducted on all the member countries (35 countries) of the OECD and will use Panel Data analysis for the period of 2008 – 2017.

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STRUCTURED ABSTRACT

Generally, unemployment denotes the situation when despite of having sufficient labor force in the economy, there is lack of work opportunities for citizens. The U.S. Bureau of Labor Statistics defines a person as unemployed if he/she is not working but is willing and able to work. It is one of the major macroeconomic factors which has always been a big issue for an economy as it has a direct influence on living condition of citizens and is helpful in ensuring a sound and growing economic system. Another factor that contributes to economic development of every country is the Stock Market. It is a mechanism through which funds are transferred from the surplus unit to the deficit units of an economy through a buying and selling process among the participating parties. Based on the logical concept, it can be said that as employment rate states the financial soundness of citizens, specifies their spending capacities, saving and investment behavior in real and financial assets; is thus related to stock market activities. Therefore, this study aims to measure the relationship between unemployment news/rate and stock market returns: two important elements in an economy. It is known that in every country along with internal components (Stock market, Macro-micro economic factors, and National institutions) there exist some external components (foreign aids, loans, support of different international organizations) too which also contribute to ensure the economic development of that particular country. As mentioned, different organizations play a pivotal role in this regard; the OECD is one of those that holds a significant position in this aspect, as it performs multifarious activities to ensure economic development and promotion of business activities worldwide. The study aims to conduct the study on OECD countries considering three objectives to be served together. They are:

- 1) A large number of countries will come under consideration to be studied together;
- 2) Results will show the relationship status between two integral factors of countries with different economic classes;
- 3) To see the impact of unemployment on stock returns of the countries aiming to ensure economic progress worldwide regardless of concentrating on themselves individually.

An extensive review of previous literatures reveals that a bulk of studies have been conducted before considering a number of macro-economic variables together like- money supply, interest rate, industrial production, unemployment, inflation, exchange rate etc. We have decided to conduct the study on unemployment; only one factor of macro economy considering its significance in research area that has been started with a good number of studies done by different researchers based on different countries on different periods. This study is different from previous studies from some point of views. First, It will cover larger number of countries with several economic classes; Second, This study will represent the relationship between unemployment and stock market returns of the countries under a single study which are significant from world perspective because of having power to influence the activities of other countries; and Third, This study will help researchers, policy makers and learners to get a clear idea about the interrelationship among

these two components over a wide range of countries. This study is based on the member countries of the OECD including 35 countries in total. We use Panel Data in our study ranging from 2008 to 2017. We employ Pairwise Dumitrescu Hurlin Panel Causality Test as our data analysis tool to measure the causality effect of the sample variables (unemployment rate and stock market returns). We use both the variables at their first differenced form, as the data are stationary at their first difference form. The results of our study states that Stock market return is the granger cause of unemployment, i.e. stock market return has a causal effect on unemployment. On the other hand, unemployment is not the granger cause of the stock market return. It means that unemployment does not have a causal effect on stock market returns. This result is also similar to studies of Singh, T. et al. (2011), Şerife, Ö. & Ugur, E. (2012) and Tangjitprom (2011) done on Taiwan, Turkey and Thailand respectively stating that unemployment doesn't have any significant influence on stock returns. Our study finds a unidirectional causality between the variables. In the long-run, the stock market is the determinant of unemployment but not vice versa. The cointegration will tell us the relationship of long run and short among these two while causality indicates either unemployment has a causal effect on stock market returns or stock market return has a causal effect on unemployment or either both variables have a causal effect with each other.

Keywords: Unemployment Rates, Stock Market, Stock Market Returns, OECD Countries.

JEL classification: E24, E44, C58

İŞSİZLİK ORANLARI VE HİSSE SENEDİ GETİRİLERİ: OECD ÜLKELERİ ÜZERİNE BİR ÇALIŞMA

ÖZ

Hanehalklarının yaşam standartlarını doğrudan etkilemesi, sağlıklı büyüyen bir ekonomik sistem için elzem olması ve her ekonomi için her zaman çözülmesi gereken bir problem olarak kendine yer edinmesi nedeniyle işsizlik en önemli makroekonomik unsurlar arasında yer almaktadır. Mantıksal bir varsayım ile işsizlik oranları ile hanehalklarının finansal sağlamlıkları, harcama kapasiteleri, tasarruf oranları, reel veya finansal yatırım davranışları arasında bir ilişkinin varlığından söz edilebilir. Buradan hareketle finansal yatırımlar ile hisse senedi yatırımları ile işsizlik oranları arasında bir ilişkinin varlığı sorgulanmalıdır.

Araştırmacılar işsizlikle hisse senedi getirisi arasındaki ilişkinin varlığı ile ilgili araştırmalarında genel itibarıyla farklı ülkelerde farklı dönemlerde genellikle yalnızca bir makroekonomik faktörü ele almışlardır. Bu çalışma önceki çalışmalardan şu yönleriyle ayrılmaktadır: Bu çalışma, 1) çeşitli ekonomik sınıflara sahip çok sayıda ülkeyi kapsamaktadır; 2) diğer ülkelerin faaliyetlerini etkileme gücüne sahip olmaları nedeniyle, dünya perspektifinden önemli olan tek bir

çalışma kapsamında ülkelerin işsizlik ve borsa getirileri arasındaki ilişkiyi temsil edecektir; 3) araştırmacılara, politika yapıcılara ve öğrencilere, bu iki bileşen arasındaki geniş bir yelpazedeki ülkeler arasındaki ilişki hakkında net bir fikir edinmelerinde yardımcı olacaktır. Çalışma, OECD'nin tüm üye ülkeleri (35 ülke) üzerinde gerçekleştirilmiş olup ve 2008-2017 dönemi için Panel Veri analizi kullanılmıştır.

Anahtar Kelimeler: İşsizlik Oranı, Borsa, Borsa Getirileri, OECD Ülkeleri.

JEL sınıflandırması: E24, E44, C58

Introduction

The various economic activities of a country influence stock market returns (Liu and Shrestha, 2008). For this reason, many studies have been conducted to examine the relationship between the stock market and macroeconomic factors. Those studies witness the existence of the relationship between stock market and macroeconomic factors. Unemployment is one of the major macroeconomic factors. It has always been a big issue for an economy as it has a direct influence on living condition of citizens and is helpful in ensuring a sound and growing economic system. Based on logical concepts it can be said that a country's employment rate states the financial soundness of citizens, specifies their spending capacities, saving and investment behavior in real and financial assets; thus related to stock market activities. Besides institutional investors, only employed persons can contribute and to invest in the stock market freely and can influence stock prices through creating demand for shares of companies. The scope to invest money in the stock market is comparatively narrower for unemployed people if no other exception occurs. Moreover, an employed person can spend money in buying the products of companies, helps to increase productivity, increase in demand for funds and high demand for funds results in high stock returns and stock prices. From this viewpoint the existence of an interrelationship between stock market and unemployment is certain/easily understandable, but it is also important to measure the relationship between employment rate and stock returns statistically. As we know some factors affect economic activity strongly but some do not. Therefore, unemployment factor may have significant impact on some economies but little or no in other economies which we can also witness with the results of previous studies that had been done on different countries. Review of literature done by researchers also reveal that in some countries unemployment has significant impact, but in some countries it has insignificant impact on stock market returns.

Huge number of organizations are working world wide to boost the economic conditions of member countries or all countries of the world through co- operating with each other by providing necessary help and support. The OECD is one of them which was formed to motivate economic progress and trade all over the world, working towards the achievement of their goals with different policies and strategies. Countries with different economic classes have come under one umbrella through its formation to ensure combined economic progress throughout the world. This study has been conducted on OECD countries considering three objectives to be served together. They are:

- 4) A large number of countries will come under consideration to be studied together;
- 5) Results will show the relationship status between two integral factors of countries with different economic classes;
- 6) To see the impact of unemployment on stock returns of the countries aiming to ensure economic progress worldwide regardless of concentrating on themselves individually.

With an extensive review of literature, it has been found that a bulk of studies have been conducted before considering a number of macro-economic variables together like- money supply,

interest rate, industrial production, unemployment, inflation, exchange rate etc. The researchers decided to conduct the study on unemployment; only one factor of macro economy considering its significance in research area that has been started with a good number of studies done by different researchers based on different countries on different periods. This study is different from previous studies from some point of views: 1) It will cover larger number of countries with several economic classes; 2) This study will represent the relationship between unemployment and stock market returns of the countries under a single study which are significant from world perspective because of having power to influence the activities of other countries; 3) This study will help researchers, policy makers and learners to get a clear idea about the interrelationship among these two components over a wide range of countries. The study has been conducted on all the member countries (35 countries) of OECD and finds that unemployment is no the granger cause of Stock Market. There is unidirectional causality between variables. In the long run, the stock market is the determinant of unemployment but not vice versa.

The remaining parts of the paper includes a brief discussion on concepts related to study in section 2, review of previous literatures in section 3, methodology in section 4, analysis, findings and recommendations have been structured in section 5. A conclusion has been drawn in section 6, providing a brief of the total study, followed by the limitation(s) of the study and possible future research guideline.

Conceptual Details of Related Key Components

Generally, unemployment denotes the situation when despite of having sufficient labor force in the economy, there is lack of work opportunities for citizens. The U.S. Bureau of Labor Statistics defines a person as unemployed if he/she is not working but is willing and able to work. More precisely, unemployment is when the labor force is seeking employment but cannot find it. Having a good idea about unemployment, it is important to know about unemployment rate and formula to calculate it.

The unemployment rate is the percentage of the labor force that is unemployed. General formula to calculate unemployment rate is:

$$\text{Unemployment Rate} = \frac{\text{Number of unemployed persons}}{\text{Labor force}}$$

Employment rate or unemployment rate is considered to be one of the factors that influence economy; more or less; directly or indirectly. Another factor that contributes to economic development of every country is the Stock Market. It is a mechanism through which funds are transferred from the surplus unit to the deficit units of an economy through a buying and selling process among the participating parties. It basically exists to perform several functions to contribute to economic expansion of a country, working as an economic barometer to read the prevailing economic condition of the country, helping to determine the value of securities, ensuring a safe way of transaction between buyers and sellers, contributing to economic growth, promoting saving and investment, helping companies raise funds, helping to allocate funds in better ways; last but not least, providing a platform to liquidate fund easily and quickly.

In every country along with internal components (Stock market, Macro-micro economic factors, and National institutions) there exist external components (foreign aids, loans, support of different international organizations) that also contribute to ensure economic development of that particular country. Different organizations play a pivotal role in this regard. The OECD holds a significant position in this aspect, as it performs multifarious activities to ensure economic development and promotion of business activities worldwide. Its major functions include: helping governments of member countries in solving universal problems, organizing policies and comparing their policy experiences, monitoring economic trends including trade, technology, environment, taxation and agriculture, providing statistics intellectual findings, offering peer reviews to member countries and offering helps through expertise

and ideas to more than 100 non-member countries to improve their economic conditions. Therefore, the functions of the OECD clearly declare its long term commitment and contribution for overall economic development of countries all over the world, it is also continuously working to achieve its goal in more innovative way, with more appropriate policies and strategies.

Literature Review

The stock market plays a significant role in forming and strengthening the economic infrastructure of an economy. It is an instrument through which seekers of funds and providers of fund meet together and ensure reciprocal benefits among themselves as well as work together in ensuring economic soundness of the respective countries. The stock market, being the most significant source of funds in boosting up industrial growth is subject to performance risk because of the presence of some macroeconomic variables prevalent in an economy. So, it has always been a matter of concern to the researchers that whether these macro-economic variables have any relationship with stock market, if it has, to what extent and/ or what kind. A huge number of research has been made on this topic covering different countries of the world. Countries belonging to the higher income group are USA, UK, Japan, China, Taiwan etc. (World Bank data, 2018). Studies in some of these countries reveal different sets of results. Such for example: In Japan, Mukherjee and Naka (1995) found that exchange rate, money-supply, industrial production, call money rates have positive relation, but inflation, long term government bond rates have negative relation with TSE. Liu and Shrestha (2008) mentioned that in China, IP and MS are positively but inflation, interest rate and currency value are negatively related to stock prices. Singh, T. et al. (2011) showed a negative relationship between selected macroeconomic variables (inflation rate, exchange rate, money supply) and stock returns in Taiwan.

Along with developed countries, a number of studies have been conducted on upper and lower middle countries. Şerife, Ö. & Ugur, E. (2012) found that GDP and exchange rate have great impact on portfolios of companies in Turkey. Kotha, K.K. & Sahu, B. (2016) discloses the presence of long run relation between the BSE Sensex and select macroeconomic indicators viz., Exchange Rate, wholesale price index, T-bill rates and M3 in their study in India. Pal & Mittal (2011) & Gunasekarage et al. (2004) also showed a significant relationship between macroeconomic variables and stock returns, but a different outcome has been observed in the study of Tangjitprom (2011) who found insignificant relationship between Interest rate, exchange rate and stock returns in his study on Thailand.

Tangjitprom (2011) cited unemployment rate as a factor that represents general business condition and business cycle of a country. Chen et al., (1986) suggested a number of factors in their study that can be analyzed while observing stock returns, unemployment rate is one of them. It clearly states the significance of this factor to be studied to learn the impact of macroeconomic factors on the stock market.

Previous literature reveals that a number of studies have been done coving unemployment as one of the important factors of macro economy. Different results came into existence. For instance, Gonzalo,J & Taamout,A (2017) investigated the short-run impact of anticipated and unanticipated unemployment rates on stock prices in USA during 1950-2014. Using nonparametric Granger causality and quantile regression analysis, concluded that only anticipated unemployment rate has a strong impact on stock prices and considered unemployment rate as a good news for stock prices. Brooks and Tsolacos (1999) in their study also confirmed the existence of significant relationship between some macroeconomic factors including unemployment and property returns in UK in their study during 1985-1998. Chen et al. (2005) investigated the relationship between macro and non-macroeconomic factors and the hotel stock returns on the Taiwan stock exchange for the period of 1989-2003. With regression analysis they showed that among all the macro-economic factors merely money supply and the unemployment rate significantly explained the movement of hotel stock returns. On the other hand, Francisco J. & Loredana N. (2016) conducted a research study on US stock market during 2008-2014

where researchers applied Dow Jones and S&P500 indices to analyze the relationship between the US stock market and some relevant US macroeconomic factors finding that despite having positive significant result with other factors unemployment rates and interest rates have negative and statistically significant relationships with the stock market. Aktas (2011) studied the influence of 19 macroeconomic announcements on equity index options for the period between 1983 and 2002 on the Istanbul Stock Exchange (ISE) and found that balance of trade, producer price index, employment, housing starts, consumer price index, money supply and retail sales are strongly related with index option returns.

Besides these studies, there are some studies that provided different results in respect to the relationship between unemployment and stock returns. Farsio, F. & Fazel, S. (2013) conducted a research investigating the relationship between unemployment rates and stock prices in China, Japan and the USA, between 1970-2011. With Co-integration and Granger Causality tests they concluded that it would be a mistake to rely on unemployment rate data to make investment decisions in the stock market. They also demonstrated that there is no stable long term relationship between stock prices and unemployment.

Singh, T. et al. (2011) and Şerife, Ö. & Ugur, E. (2012) and Tangjitprom (2011) also found that unemployment doesn't have any significant influence on stock returns in Taiwan, Turkey and Thailand respectively. Tapa N. et al. (2016) in their study during 1994-2016 on South Africa also rejects the idea of unemployment being a good predictor for stock market returns. Also exhibits that developments in the stock market have no effect on the unemployment rate.

The way macroeconomic factors effect an economy depends on the state of economy. Orphanides (1992) mentioned that stock price response to macroeconomic news depends on state of economy. Blanchard (1981) has mentioned in his study that in equilibrium the same news can sometimes be good and sometimes be bad for financial assets, depending on the economic condition of an economy, i.e. Expansion or contraction state of economy. John H. B. et al. (2002), Boyd et al. (2005) and McQueen and Roley (1993) also ran research on the US economy. They looked at the impact of unemployment on stock prices and specified that rising unemployment has a negative impact on stock prices during contractions but has a positive impact during expansion in the economy. Researches statements are evidence on the issue that whether macroeconomic factors bring good or bad news for stock market it depends on economic condition of a particular country. A blessing during economic expansion can be a curse during economic contractions.

Being motivated by the previous studies showing the relationship between unemployment and stock returns, we are also willing to conduct our study measuring the relationship between those factors; but choosing OECD countries to conduct the research makes our study unlike others because to the best of our knowledge no studies have been done previously covering all those countries together.

Methodology

The question of whether to detrend or to difference a time series prior to further analysis depends on whether the time series is TSP (trend-stationary process) or DSP (difference-stationary process).

- A time series is said to have a unit root if we can write it as

$$Y_t = DT_t + u_t$$

$$u_t = \phi u_{t-1} + \epsilon_t$$

with $\phi = 1$, ϵ_t stationary and DT_t a deterministic component.

u_t is stationary and Y_t is stationary around the change in the deterministic part. In this case $Y_t \sim I(1)$.

At the last stage of the analyses Dumitrescu-Hurlin (2012) panel causality test was used to determine causality relationship between variables.

$$\beta_i = \beta \text{ and } \delta_i = \delta \text{ for } i = 1, \dots, N.$$

In this equation β_i continues as. It can be change across groups. Test also allows some of the individual vectors β_i equal to 0 (non causality assumption).

Findings

Unit Root Tests Results are given in Table 1.

Unit Root Tests Results

Table 1: Unit Root Tests Results

Unit Root Tests	Variables			
	Stock Market		Unemployment	
	Level	First Difference	Level	First Difference
Levin, Lin & Chu t	-1.36864***	-28.5338*	-0.08063	-20.8011*
ADF - Fisher Chi-square	76.7271**	925.100*	48.9566	1083.90*
PP - Fisher Chi-square	34.5195	922.250*	32.7876	1451.47*

Note: *, **, and ***; indicating that the relevant variable is stationary at 1%, 5% and 10% significance levels, respectively.

According to the results of the stationarity test, both variables were determined to be stationarity in the first difference (I(1)). The first difference of the series was used for the Pairwise Dumitrescu Hurlin Panel Causality Tests. Pairwise Dumitrescu Hurlin Panel Causality Tests the results are as follows:

Table 2: Pairwise Dumitrescu Hurlin Panel Causality Tests Results

Null Hypothesis:	W-Stat.	Zbar-Stat.	Prob.
Stock Market does not homogeneously cause Unemployment	19.1706	11.8895	0.0000
Unemployment does not homogeneously cause Stock Market	8.71240	0.39229	0.6948

According to these results, the null hypothesis of “Stock Market does not homogeneously cause Unemployment” is rejected at the 5% significance level. The Stock Market is the granger cause of Unemployment. The null hypothesis of “Unemployment does not homogeneously cause Stock Market” is not rejected at the 5% significance level. Unemployment is no the granger cause of Stock Market. There is unidirectional causality between variables. In the long run, the stock market is the determinant of unemployment but not vice versa.

Results

This study measures two-way relationship between unemployment and stock market returns through using granger causality test. The results of the study states that Stock market return is the granger cause of unemployment, i.e. Stock market return has a causal effect on unemployment. On the other hand, Unemployment is not the granger cause of the Stock Market return. It means that unemployment does not have a causal effect on stock market returns. This result is also similar to studies of Singh, T. et al.(2011) and Şerife, Ö. & Ugur, E. (2012) and Tangjitprom (2011) done on Taiwan, Turkey and Thailand respectively stating that unemployment doesn't have any significant influence on stock returns. The study finds an unidirectional causality between the variables. In the long run, the stock market is the determinant of unemployment but not vice versa. The cointegration will tell us the relationship of

long run and short among these two while causality indicates either unemployment is causing Stock Market or either Stock Market is causing unemployment or either both variables are causing each other.

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