# The Impact of Macroeconomic Variables on Equity Risk Premium: Evidence from Sectoral Analysis in Vietnam using Bounds Testing Approach

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**Abstract**

*This study investigates the impact of change of macroeconomic variables on equity risk premium of Ho Chi Minh stock market and some important sectors for period January 2007- September 2015. The paper applies bounds testing approach to cointegration to find the long run and short run relationships. The results show that there are long run relationships between equity risk premium for both market and sectoral analysis with some selected macroeconomic variables. In the long run, inflation rate exert negative impact on excess returns except for the financial sector. However, in the short run, an increase in exchange rate volatility significantly reduces equity risk premium of market and all sectors. These findings shed some light for monetary authorities to implement monetary policy.*

**Keywords:** Equity risk premium, Bounds testing approach, Cointegration, Macroeconomic variables, Vietnam.

**JEL codes:** G32, G34, M12

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## 1. Introduction

The relationship between macroeconomic variables and stock market performance is dynamic and well-documented in numerous researches both in economics and finance. Under the standard discounted present value model, it is expected that macro changes affect firms' future cash flows and their discounting rates. Vietnam, an increasingly open economy and heavily credit-dependent corporate financial structure, Vietnamese firms' share prices and stock returns are strongly linked to changes in several macroeconomic factors, such as inflation rates, exchange

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rates, money supply, GDP growth. Academic researches on the complex dependency between macro variables and stock returns of Vietnam have been limited to the impacts of macro factors on the stock market index as well as equity risk premium (or excess returns). On the other hand, financial researches published by securities companies have focused narrowly on short-term macro influences on specific share returns and lack of long run perspective. In addition, the selection of the portfolio needs to take into consideration the excess returns of stocks across sectors. Hence, for both policy designers and financial investors, it is very important to understand the complex linkages between macro issues and equity risk premium in both short run and long run to gain insight into this relationship to devise appropriate strategies.

Various researches on similar influences have been carried on emerging markets whose risks and returns are particularly higher than those of developed markets (Claessens et al., 1993; Harvey, 1995), hence, the effects differ significantly from those of developed ones (Bilson et al., 2001). Thanks to the growing financial and academic interests in emerging markets, the scarcity of empirics on impact of macro variables on equity risk premium of emerging markets encourages more resources to put into this area. To fill in this gap, this paper extends the current literature to Vietnam and to address what extent macroeconomic variables influence equity risk premium. To be more specific, this paper investigates the effects of monthly macro variables such as consumer price index (a measure of inflation), money supply (a broad measure of money supply), and exchange rate of VND against USD (the market exchange rate of local currency) on excess returns of various sectors during the period from 2007 to 2015.

During these above periods, the Vietnam economy has undergone numerous global and local macroeconomic shocks that propelled the Vietnam market stock index (VNIDEX) from 200 points (2006) to 1200 points (2007) and later catapulted it down to the range of 400 – 600 points (2009 – 2016). Compared to other emerging markets, the Vietnam stock market is rather underdeveloped? in terms of capitalization (only $66 billion, equivalent to 28% of GDP, in August 2016) and representation (without the biggest public companies namely Vietnam Agriculture Bank, Viettel Group, Vietnam Electricity, Petro Vietnam, etc). In addition, the market is more vulnerable to speculative activities, government regulations, and restrictions of foreign investors. As a result, the effects of macro variables on stock behaviors are expected to have certain lags, entail various transmission mechanisms, and differ substantially across sectors. For those reasons, the paper employs a technique of ARDL (Autoregressive Distributed Lags) to

cointegration which is the best to examine the long-run relationship between macro issues and sectorial excess returns by employing monthly data from January 2007 to September 2015. The model is believed to be the first attempt so far to delve into details of relationship between macro factors and stock sectorial risk premium in Vietnam.

This paper is organized as follow. Section 2 provides a brief overview of empirical as well as the theoretical literature that outline the reasoning behind why the change of macroeconomic variables might hurt or help risk premium. Section 3 shows an appropriate approach for cointegration relationship introduced by Pesaran *et al*. (2001). Empirical results are discussed in section 4. Conclusion remarks are outlined in section 5.

## 2. Literature Reviews

### 2.1 Theoretical framework

Arbitrage Pricing Theory (APT) is the most common theory to define asset's expected return. It is developed by Ross (1976) that specifies the return on an asset as a function of a number of risk factors common to that asset class rather than a single market risk premium as in CAPM. The model assumes that investors can and will take advantage of arbitrage opportunities from the broader market; thus, an asset's rate of return is a function of the return on alternative investments and other risk factors. The APT in contrast to CAPM acknowledges several sources of risk that may affect an asset's expected return. The model is presented as follows:

$$r_a = r_f + \beta_1 r_{p1} + \beta_2 r_{p2} + ... + \beta_n r_{pn} \qquad (1)$$

where, $r_a$ : expected return of an asset

$r_f$ : the risk-free rate

$\beta$ : the sensitivity of the asset to the particular factor

$r_p$ : the risk premium associated with the particular factor

From the original equation, we transform it as

$$r_a - r_f = \beta_1 r_{p1} + \beta_2 r_{p2} + ... + \beta_n r_{pn} \qquad (2)$$

The left hand side represents for return of asset in excess of risk-free rate or risk premium. The model shows us that risk premium for a market in general and risk premium for an asset in particular depends on various factors.

According to Damodaran (2012), the five main risks that comprise the risk premium are business risk, financial risk, liquidity risk, exchange-rate risk and country-specific risk. These five risk factors all have the potential to harm returns and, therefore, require that investors are adequately compensated for taking them on.

*Business Risk*

This is the risk associated with the uncertainty of a company's future profit, which are affected by the operations of the company and the environment in which it operates. The more volatile a company's future profit, the more it must compensate investors.

The risk in equities as a class comes from more general concerns about the health and predictability of the overall economy. Put in more intuitive terms, the equity risk premium should be lower in an economy with predictable inflation, economic growth than in one where these variables are volatile. **Inflation** implies depreciation of money, causing changes of consumption and investment of households. Experiences from developed countries have shown that there is positive relationship between inflation and risk premium. The main reason is that inflation trend defines nature of economic growth. Increasing inflation is often an indicator of unsustainable growing economy in which many bubbles expands and contains high risk. Specifically, as inflation rises, due to monetary depreciation, people would not hold cash in hand or in bank account by transferring it into gold, real estate or strong foreign currency, leading to enormous immovable capital. The firms find consequently difficult to mobilize capital in order to expand production. The growth of firms in particular and economy in general becomes slow. As a result, in stock market, because free risk rate is usually fixed, investors see lower rate of return, which induces lower risk premium. By contrast, if inflation is decreasing but not too low (if inflation declines too low, this is usually a signal of deflation – which is never a good news for stock market), real return of financial assets supposedly increases. In such situation, investors see higher risk premium.

*Financial Risk*

This is the risk associated with the uncertainty of a company's ability to manage the financing of its operations. Essentially, financial risk is the company's ability to pay off its debt obligations. The more obligations a company has, the greater the financial risk and the more compensation is needed for investors. In other words, risk premium closely connected to volume of debt. Among financial factors affecting debt obligation, interest rate significantly defines it. High interest rate

usually entails high debt obligation; by contrast, low interest rate usually entails low debt obligation. Specifically, high interest rate reduces profit of firms which promises lower rate of return in stock market or in other words lower risk premium and vice versa.

*Liquidity Risk*

This is the risk associated with the uncertainty of convertibility from financial assets to cash or ability to exit an investment. In macro-level of economy, money supply controlled by central bank is the decisive factor that affects liquidity of financial assets including stock.

If **money supply** is expanded by central bank, demand for consumption and investment including investment in stock exchange will rise because there are more credits supplied in the economy. As a result, liquidity of financial assets increases leading to increase of return rate of stock. If money supply is contracted by central bank, higher interest rate reduces demand for investment in stock exchange. As a result, liquidity of financial assets decreases leading to decrease of return rate of stock. In other words, money supply and risk premium has positive relationship through liquidity factor. However, the relationship may exist in the short run when in the long run changes of money supply will affect expected inflation; the factor that also defines risk premium causing the total effect is unclear.

*Country-Specific Risk*

This is the risk associated with the political and economic uncertainty of the foreign country in which an investment is made. These risks can include major policy changes, overthrown governments, economic collapses and war. Developed countries such as the United States and Canada are seen as having very low country-specific risk because of their relatively stable nature. Developing countries, such as Viet Nam, are thought to pose a greater risk to investors especially history of high inflation. In Vietnam, due to experiences of high inflation in the past, people tends to accumulate precious assets such as gold and US dollar instead of money whose value is frequently eroded.

In terms of **foreign exchange rate**, the correlation between foreign exchange rate and stock price or risk premium has been examined by enormous number of research. However, researchers have not provided a definite conclusion for the correlation. The reason is that in such widely integrated world, most of firms, whose stocks are posted in stock market, have operations relevant to export or import. As foreign exchange rate fluctuates, some of them enjoy benefits, whereas others suffer loss. For instance, if domestic currency depreciates, export-led firms will

have advantages, while import-led firms will have disadvantages. Thereby, risk premium associated with export-led firms increases and risk premium associated with import-led firmsdecreases. In total, we do not know risk premium of the stock market alters in which direction. Therefore, the correlation between foreign exchange and stock price is essentially empirical question. Empirical research in different countries will bring different outcomes. It could be positive relation or negative relation or even no firm relation between the two objects.

**2.2 Empirical Studies**

Apergis et al (2011) investigated the relationship between excess stock returns and the macroeconomic environment for a sample of emerging economies. Their results indicate that inflation is a factor that has a positive impact on excess stock returns in our emerging economies sample. Moreover, their empirical findings report a positive association between income and excess stock returns. Their empirical findings also display a positive relationship between excess stock returns and money supply. The empirical results of this study reveal a positive association between government deficits and excess stock returns, implying that in emerging economies these deficits act as a boost-up mechanism for the economy, thus, leading to higher stock returns. The empirical results recommend that potential investors should pay attention to information emerging from the macroeconomic environment.

By using a VAR analysis, Goto and Valkanov (2002) show that unexpected monetary policy results in a negative correlation between excess returns and inflation. In fact, during the 1966-2000 period, between 20% and 25% of the covariance of inflation and excess returns can be explained by monetary supply shocks. To reach this conclusion, they assume that monetary policy shocks are identified in a recursive system, where the Fed follows a simple interest rate rule. More specifically, the policy instrument of the central bank is the Federal Funds rate, which responds systematically to inflation, output growth, and is subject to exogenous policy shocks. Then, they introduce a covariance decomposition which allows them to find the percentage of the inflation/excess returns covariance that is explained by those shocks. To explain why a monetary shock causes a negative returns/inflation correlation, they look at the separate effect of a Federal Funds rate shock on excess returns and inflation. Unexpected contractionary policy leads to a decrease in excess returns, as is to be expected if monetary shocks have real effect and as stocks are claims against real assets.

There is no dispute about the theoretical justifications between the macroeconomic and stock

returns. In addition monetary portfolio theory have explained how changes in money supply can be used to vary the equilibrium position of money, thus altering the composition and price of assets in an investor's portfolio (Ahmed, 2011). Numerous studies link monetary conditions to stock market returns and some studies have established a link between stock price movements with knowledge of past and potential money supply changes (Maitra and Mukhopadhyay, 2011).

Changes in money supply have been considered as a risk factor to stock returns. For example, Ahmed (2011) examined the long run relationship between money supply and selected macroeconomic factors in Sudan and established causality between money supply and macroeconomic variables. The study used a Granger causality test to establish the causality. The study concluded that money supply variability is one of four other macroeconomic factors that showed significant influence on expected stock market returns.

In order to maximize investment-returns decisions, investors constantly exploit relevant published monetary data and reports about stock prices. According to Becher, Jensen and Mercer (2008), investors' expectations on information instantly impounds into security prices without the lag effect of money supply developments. Studies on the extent of efficiency of GSE about money supply are scanty. Maitra and Mukhopadhyay (2011) examined the causal link between money supply and exchange rate in India. The study was carried out under the basket peg and market determination regimes in India and found that inflation rate is directly related to the growth of money supply; an increase in money supply may result in an increase in inflation and consequently the discount rate. This implies, monetary growth policy resulting from economic stimulus will have negative consequences on stock prices and invariably stock returns. Dovern and Welsser (2011) examined the relationship between money, output and stock prices. The study tested six different indices of stock exchange including money supply (both M1 and M2) and GDP as a proxy of output. The study reported a significant efficiency in the informational content of selected macroeconomic variables.

Using a structural time series analysis Maitra and Mukhopadhyay (2011) analyzed how money supply responds to macroeconomic indicators and reported that the covariance between inflation triggered by equity prices and shocks resulting from policy accounts for the response of stock markets to monetary policy. There is evidence of some studies having focused on the effects of macroeconomic events on prices of diverse financial assets, like stocks, T-Bills, or exchange rates. Some researchers have used microstructure models as a dominant framework for the

generation and application of high-frequency data. Several models and studies have been conducted to find how important effects of news and implications for price level as measured by the CPI, monetary policy variables on the price formation process of financial assets (Ahmed, 2011).

The effects of inflation on the stock market performance greatly influence the prices of financial instruments (assets). Kimani and Mutuku (2013) obtained data from the central bank of Kenya and used quarterly data for the period between December 1998 and June 2010. They measured inflation by the arithmetic mean on consumer basket and computed an index based on the geometric mean of stock prices for some selected top performing listed firms on the Kenya market. Kimani and Mutuku (2013) then used a unit root test based on the formal ADF test procedures and the Johansen-Juselius VAR based cointegration test procedure. The cointegration model showed an inverse relationship between inflation and stock market performance in Kenya.

Bordo et al.,(2008), while using latent Variable VAR to estimate the impact of inflation and other macroeconomic variable on stock market conditions, found that inflation have large negative impact on stock market conditions, apart from their real effects on real asset prices. The study employed a hybrid model that allowed the data to partly identify market conditions guided by their initial classifications of periods of exceptionally rapid and prolonged increase in real stock prices as booms and periods of significant declines as busts. Reddy (2012), contended that a reduction in inflation rate resulted in increased stock prices. The author used a regression analysis which showed that the variable accounted for up to 95.6% of the variations in stock prices for the period of 1997-2009.

Sharpe (2002) examined stock valuation and inflation for the time period of 1965-2001 to check this he collects monthly historical annual operating income for S&P500 from I/B/E/S International. The negative relation between equity valuations and expected inflation was found to be the result of two effects: a rise in expected inflation coincides with both lower expected real earnings growth and higher required real returns. The earnings channel mostly reflects a negative relation between expected long-term earnings growth and expected inflation. The effect of expected inflation on required (long-run) real stock returns is also substantial. He run the simple regression and concluded that there is strong negative relationship between stock returns and inflation. However, positive inflation that is: when inflation rate is higher than expected, which is economically bad news implies meaningful impact of stock returns in Spanish stock market

(Diaz and Jareno, 2009). Mittal and Pal (2011) drew a similar conclusion regarding the Indian stock return volatility. They employed a VAR model examining Indian stock returns during the period of 1995–2008 (Quarterly data) and demonstrated that inflation rate has notable influences in major stock markets of India.

In terms of the relationship between stock market returns and exchange rate, Johnson and Soenen (1998) state depreciation may cause the cost of imports to increase, leading to domestic price level increases, which would expectedly have a negative impact on stock prices. Morley and Pentecost (2000) also confirm that stock markets and exchange rates are linked, and note that this connection is through a common cyclical pattern rather than a common trend.

Jamil and Ullah (2013) examined the impact of foreign exchange rates on stock prices for Pakistan by employing Co-integration Technique and Vector Error Correction Mechanism (VECM). Using monthly data from 1998 to 2009, they found that relationship exists between exchange rates and stock market returns, both in the short run and long run. The short run period was found to have a positive but significant relationship, while the long run relationship is not significant. The short run sensitivity of stock market returns to exchange rates indicates that the investments in the stock market are short term and most investors liquidate their stock within one year. Aurangzeb (2012) arrived at the same conclusion when the author examined the factors affecting performance of stock markets of South Asian countries using monthly data for the period of 1997 to 2010 of 3 South Asian countries namely, Pakistan, India and Sri Lanka. The study employed descriptive statistic method for the analysis. The result indicated that Exchange rates have significant positive impact on the performance of stock markets of the three markets of South Asia.

Adarmola(2012) found a similar findings when the author studied the exchange rate volatility and stock market behaviour in Nigeria, applied Johansen‟s Cointegration Technique and Error correction mechanism using quarterly data for the period of 1985 to 2009 and found that Exchange rate exerts significant impact on Nigerian stock market both in the short and in the long run. The study showed that in the short run, exchange rate had a positive significant impact on stock market performance; however, the results also showed that in the long run, the relationship is significantly negative.

Nieh and Lee (2001) did not establish a significant long run relationship between stock market returns and exchange rates for the G-7 countries from 1993 to 1996. They reported that the

German currency depreciated as a result of a fall in stock market prices; the Canadian and United Kingdom stock returns experienced an upward stock returns in response to currency depreciation, however, within the same period in the United States, no relationship was found between stock market returns and currency exchange rates.

In other developing economies outside sub-Saharan Africa, there are only a few studies that have examined the impact of exchange rate volatilities on stock returns. For example, Nucu (2011) examined the relationship between stock prices and exchange in Romanian stock markets and reported that stock market returns was inversely responsive to the domestic currency depreciation. Jain, Narayan, and Thomson (2011), used an EGARCH-X model to examine the relationship between stock returns and exchange rates and established a nexus between selected macroeconomic variables and stock market returns.

*Studies on Vietnam*

Khaled and Le (2008) examined the impact of domestic and international macroeconomic indicators on Vietnamese stock prices. Their paper provides the first empirical evidence that there are statistically significant associations among the domestic production sector, money markets, and stock prices in Viet Nam. Another novel finding is that the US macroeconomic fundamentals significantly affect Vietnamese stock prices. Finally, the results show that the influence of the US real sector is stronger than that of the money market. In particular, they found that the industrial production has a positive effect on Vietnamese stock prices. They also found that the long- and short-term interest rates are not affecting stock prices in the same direction. Finally, they found that the US real production activity has stronger effect on Vietnamese share prices that in comparison with the US money market.

Hussainey and Ngoc (2009) also examine the macroeconomic indicator that industrial production and interest rates effects on Vietnamese stock prices. They also studied how Vietnamese stock prices influenced by the US macroeconomic indicators using time series data during the period of January 2001 to April 2008. They found notable relations among stock prices, money market and domestic industrial productions in Vietnam and the United States real production activity has stronger effects on stock prices of Vietnam.

**3. Empirical Model**

In order to investigate the effects, our model hypothesizes Money Supply (MS), Consumer Price Index (CPI), and Nominal VND/USD Exchange Rate (ER) to be macroeconomic variables that could influence excess sectoral stock behaviour returns. Due to the heavy reliance of Vietnam Corporate Financing on Bank Loans as well as Strong usage of Margin by Stock Investors, we believe that Money Supply, a measure of liquidity and credit, would play an important role in determining excess stock returns – especially sectors with high leverage ratios. Since Vietnam Central Bank pays great attention to inflation threat, figures of current as well as expected future CPIs would soon influence Central Bank's decisions on interest rates and credit growth, thus indirectly influencing companies' cash flows and investors' opportunity costs. While high inflation environment would reduce general firms' revenues and impose higher discount rate on firms' future cash flows, low inflation is apparently conducive to firms' growths in sales and helps limit increases in input costs. Last but not least, nominal VND/USD exchange rate matters notably to foreign investors as a large depreciation of domestic currency could wipe out returns and prompt their exits of the stock markets. Moreover, sectors that rely on import will underperform during the period of significant currency depreciation.

According to standard financial model, it would be tempted to include GDP growth and interest rate to help improve explanatory power, yet we refrain from doing so. The reasons are: (i) GDP growth data is provided on a quarter basis and is subjected to certain publication lag and substantial revision, making it unreliable and untimely for the use of market participants. ; (ii) Rather than nominal return, our model considers excess returns (i.e: stock return minus the risk-free rate) that already takes interest rate into calculation, hence, we remove interest rate to avoid multicollineartiy.

Expecting the problems of co-integration among our independent variables, we adopt the bound test approach developed by Pesaran *et al*. (2001). According to their approach, the existence of a co-integration relationship can be examined regardless of whether they are I(0) or I(1) (under the circumstance that dependent variable is I(1) and the independent variables are either I(0) or I(1)). This point is the greatest advantage of the bounds test among all the co-integration tests. Moreover, this approach can distinguish dependent and independent variables and is more appropriate than other method for small sample size (Ghorbani and Motallebi 2009; Bassam 2010).

Pesaran *et al*. (2001) suggest their method based on Autoregressive Distributed Lag (ARDL) approach. ARDL model is changed to error correction model as follows:

$$\Delta PRE\_X_t = b_0 + b_1 PRE\_X_{t-1} + b_2 INF_{t-1} + b_3 MS_{t-1} + b_4 ER_{t-1} + \sum_{j=1}^{n-1} b_5^j \Delta PRE\_X_{t-j} + \sum_{j=0}^{n-1} b_6^j \Delta INF_{t-j} + \sum_{j=0}^{n-1} b_7^j \Delta MS_{t-j} + \sum_{j=0}^{n-1} b_8^j \Delta ER_{t-j} + u_t \quad (3)$$

where *PRE_X* is equity risk premium of market or sector *X* , *INF* is inflation rate, *MS* is growth rate of broad money, *ER* is growth rate of devaluation, the disturbances $u_t$ are serially uncorrelated.

The ARDL approach uses two steps to estimate the long run relationship:

The first step is to determine whether a level relationship exist between the variables in equation (3). The null hypothesis of no level relationship among variables is tested by using the F-test for the joint significant effect of the lagged levels coefficient. Two sets of critical values are generated. One set refers to I(1) series and the other for I(0) series. Here, the critical values for I(1) series are referred to as the upper bound critical values while the critical values for I(0) series are referred to as the lower bound critical values. If the estimated F-statistics is greater than the upper bound critical values, the variables in question are cointegrated. If the estimated F-statistics falls between the lower and the upper bound critical values, cointegration among the variables involved is inconclusive. Anh if the estimated F-statistics is less than the lower critical values, the null hypothesis of no cointegration cannot be rejected.

The second step is to estimate the long-run and the short-run coefficients by using the ARDL approach if the long-run relationship is established between the variables. The lag orders of the variables are chosen using Akaike Information Criteria.

The paper considers the impact of macroeconomic variables on equity risk premium of Ho Chi Minh stock exchange market (*PRE_VNI*) and of four sectors: banking (*PRE_BANK*), finance (*PRE_FINAN*), industry (*PRE_INDUS*) and consumption goods (*PRE_CONSU*) using Stoxplus classification.

The data employed in the study are monthly closing price indices of markets and sectors obtained from Stoxplus. Other data such as CPI, money supply and exchange rate are derived from IFS of IMF. The four sectors under examination are financial, banking, industry and consumption as their market share of the market is 16.7%, 19.1%, 14.2% and 24.1%

respectively. The range of the data is from January 2007 to September 2015, which is the most available data up to the time of study as the period before bears a lot of missing variables.

## 4. Results and Discussion

### 4.1 Descriptive Statistics

Table 1 presents the summary of descriptive statistics for the selected dependent and independent variables under study. 104 monthly observations of all the variables have been examined to estimate the following statistics. The mean describes the average value in the series and Std. Deviation measures the dispersion or spread of the series. The maximum and minimum statistics measures upper and lower bounds of the variables under study during our chosen time span.

**Table 1 – Summay Statistics**

| | Mean | Maximum | Minimum | Std. Dev. | Observations |
|---|---|---|---|---|---|
| *PRE_VNI* | -1.19 | 23.93 | -28.77 | 9.00 | 113 |
| *PRE_FINAN* | -0.54 | 47.16 | -40.66 | 11.82 | 113 |
| *PRE_INDUS* | -1.30 | 32.91 | -35.04 | 10.77 | 113 |
| *PRE_CONSU* | 0.06 | 25.86 | -27.05 | 8.72 | 113 |
| *INF* | 0.75 | 3.82 | -0.75 | 0.92 | 104 |
| *MS* | 1.76 | 8.19 | -1.77 | 1.60 | 113 |
| *ER* | 0.30 | 8.80 | -1.02 | 1.15 | 104 |

### 4.1 Unit root tests

Before constructing our models, we examine the stationary characteristics of the series.. Augmented Dickey–Fuller (ADF) unit-root tests are conducted including a drift term and both with and without a trend. Table 2 shows the results from the unit-root tests.

**Table 2- ADF Tests for Unit Root**

| **Variables** | **Level** | |
|---|---|---|
| | **constant** | **constant&trend** |
| *PRE_VNI* | -8.46*** | -8.68*** |

| | | |
|---|---|---|
| *PRE_FINAN* | -8.95*** | -8.92*** |
| *PRE_BANK* | -7.96*** | -8.00*** |
| *PRE_INDUS* | -7.80*** | -8.32*** |
| *PRE_CONSU* | -8.99*** | -9.11*** |
| *INF* | -4.41*** | -4.79*** |
| *MS* | -9.12*** | -9.37*** |
| *ER* | -10.60*** | -10.59*** |

*Note: *** means null hypothesis of unit root existence is rejected at 1% significant level*

The results indicate that, all the series are stationary and the ADF test results are invariant as to whether the unit-root tests are conducted with or without a linear trend. Then, ARDL approach is suitable for investigating relationships in level of variables.

### 4.2 Bounds Testing for Long run Relationships

Table 3 gives the values of the F-statistics to test the existence of level relationships. F-tests are implemented via selected ARDL models using Akaike Information Criteria.

**Table 3 – F-statistics to test the Existence of Long Run Relationships**

| **Sectors** | *PRE_VNI* | *PRE_FINAN* | *PRE_BANK* | *PRE_INDUS* | *PRE_CONSU* |
|---|---|---|---|---|---|
| **F-statistic** | **14.40** | **15.44** | **9.87** | **13.77** | **14.82** |
| *Critical value Bounds (n=3)* | | *1%* | *5%* | *10%* | |
| | **Upper** | 4.66 | 3.67 | 3.20 | |
| | **Lower** | 3.65 | 2.79 | 2.37 | |

The values of F-statistics are higher than the upper bound critical values, hence the null hypothesis of no long run relationship are rejected at 1% significant level. Therefore, there are evidences of long run relationship in all of equity risk premium equations. We change the selected ARDL model in to error correction model to find long run and short run relationships.

### 4.3 Short-run and Long run Relationships

Table 4 describes cointegration vectors of risk premium and macroeconomic variables. These results show that inflation significantly exerts negative impact on equity risk premium of the market and all sectors except the financial sector. In other words, an increase in inflation rate reduces risk premium. Among sectors, the impact of inflation on industrial equity risk premium is the strongest. The change of inflation does not affect excess return in financial sector as Vingroup holds the biggest market share in financial sector (nearly 50%) and most of Vingroup business activities are investment in building luxury housing and trading central.

The changes of growth rate of money supply and exchange rate do not affect any risk premium of stock in long run.

**Table 4 - Long run Coefficients of Equity Risk Premium**

| **Variables** | *PRE_VNI* | *PRE_FINAN* | *PRE_BANK* | *PRE_INDUS* | *PRE_CONSU* |
|---|---|---|---|---|---|
| *INF* | -2.17 [0.08] | -1.74 [0.28] | -2.97 [0.02] | -4.55[0.00] | - 2.64 [0.00] |
| *MS* | -0.04 [0.95] | 0.82 [0.35] | 0.85 [0.36] | 0.12[0.87] | - 0.07 [0.91] |
| *ER* | -1.57 [0.11] | 1.42 [1.26] | -1.05 [0.28] | -1.29[0.23] | 0.57 [0.74] |
| *Constant* | 0.66 [0.74] | -0.52 [0.84] | 0.08 [0.96] | 1.75 [0.42] | 1.84 [0.36] |

Note: P-values are in brackets.

However, for the short run relationships showed in Table 4, the rate of depreciation of Vietnamese currency against the USD becomes more important. An increase in depreciation of exchange rate has negative impact on excess returns. These results are foresight to understand because financial market in Vietnam is underdeveloped. Therefore, exchange rate volatility is associated with higher transaction cost. Moreover, Vietnam is a dollarized economy, the degree of dollarization in Vietnam is higher than other countries in Southeast Asia such as Thailand, Malaysia and Indonesia due to massive flow of remittance and foreign investment and increased export earnings over the past years (base on the ratio of foreign deposit currency and M2 from IFS data). Hence, fluctuations in exchange rate level constitute potential risks for business as they affect the balance sheets of banks and enterprises where foreign debt tends to be denominated in foreign currency. Moreover, foreign currency is also considered as another asset in Vietnam, therefore stock price could decline if investors sell stock massively and transfer to hold foreign currency which they believe to have higher return.

The short run and long run analysis assume that a change in money supply does not significantly impact excess stock market return. It means the use of money supply growth as intermediate

targeting in running money policy is not efficient and the stock market is not an effective way to transmit monetary policy. This result confirms the finding of Nguyen (2015).

Table 5 provides the results of the error correction representation of estimated ARDL models. The results indicate that the error correction terms, $EC_{t-1}$ have the correct sign (negative) and are statistically significant. These are evidences of cointegration relationships among variables in the models. The estimated value of error correction terms imply that the speed of adjustment to the long run equilibrium in response to the disequilibrium caused by short run shocks of the previous period is about 80 per cent. Among sectors, the speed of adjustment of banking sector is faster than the others. It shows that market power is the lowest in the banking sector and the rate in the market capitalization of the listed companies are substantially equal.

**Table 5 - The ECM for the Selected ARDL Model**

| **Variables** | *PRE_VNI* (1,0,0,0) | *PRE_FINAN* (1,0,0,0) | *PRE_BANK* (3,0,1,0) | *PRE_INDUS* (1,0,0,0) | *PRE_CONSU* (1,1,0,2) |
|---|---|---|---|---|---|
| $\Delta PRE\_X_{t-1}$ | | | 0.23** | | |
| $\Delta PRE\_X_{t-2}$ | | | 0.22** | | |
| $\Delta$ *INF* | -0.53 | -0.40 | -1.24 | -2.24 | -0.18 |
| $\Delta$ *MS* | -0.17 | 0.33 | -0.13 | 0.09 | -0.25 |
| $\Delta$ *ER* | -1.53*** | -1.36* | -1.46** | -1.28** | -1.08* |
| $\Delta ER_{t-1}$ | | | | | -1.51*** |
| $EC_{t-1}$ | -0.81*** | -0.85*** | -0.97*** | -0.84*** | -0.82*** |

Note: *, **, and *** are respectively significant of 10%, 5%, and 1%. $EC_{t-1}$ is error correction term

**5. Conclusions**

This study investigates the impact of change of macroeconomic variables on equity risk premium of Ho Chi Minh stock market and some important sectors namely banking, finance, industry, consumption for the period from January 2007 to September 2015. We apply bounds testing approach to cointegration to find both the long run and the short run relationships.

The empirical results show that there are existences of long run relationships in equity risk premium equations for both market and sectoral analysis. In the long run, among three macroeconomic variables such as inflation rate, growth rate of broad money and exchange rate, inflation rate has significantly exert negative impact on equity risk premium except financial

sector. But in the short run, an increase in exchange rate volatility reduces significantly equity risk premium of market and all examined sectors.

These findings shed some light on better conduct regulatory framework design for policy makers, especially monetary ones. In the short run, controlling exchange rate is very important to stabilize the stock market and in the long run, controlling inflation rate is necessary for good performance in stock market. Moreover, this study also confirms that broad money is not useful to transmit monetary policy through asset channel.

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