

# A REVIEW OF U.S. FEDERAL FUNDS RATE IMPACT ON THE STOCK RETURN

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## บทคัดย่อ

แม้จะมีงานวิจัยหลายชิ้นได้ศึกษาผลกระทบของนโยบายทางการเงินของสหรัฐต่อราคาหุ้นภายในประเทศ แต่งานวิจัยที่เกี่ยวข้องกับผลกระทบของนโยบายทางการเงินของสหรัฐต่อราคาหุ้นต่างประเทศที่เป็นตลาดหุ้นใหม่ๆ โดยเฉพาะการศึกษาแบบลงรายละเอียดหุ้นรายตัวนั้น มีค่อนข้างน้อย วัตถุประสงค์ของการศึกษานี้เพื่อทบทวนการศึกษาในอดีตที่เกี่ยวข้องกับผลกระทบของนโยบายทางการเงินของสหรัฐต่อราคาหุ้นภายในประเทศและราคาหุ้นต่างประเทศทั้งในเชิงทฤษฎีและในเชิงการทดลอง เพื่อจะได้จุดประกายการทำวิจัยต่อไปในอนาคต

## Abstract

Although a proliferation of empirical studies has examined the impact of U.S. monetary policy action on the domestic stock price, the research on the impact of U.S. monetary policy action on the foreign stock price in the emerging financial market, especially in disaggregate level, remains relatively unexplored. The objective of this research is to review the theoretical evidence and the empirical evidence of how U.S. monetary policy decision affects the stock price both in the domestic context and in the international context in order to shed some light for further research.

## INTRODUCTION

The Efficient Market Hypothesis asserts that asset price should reflect all available information (Fama, 1970). The information flow includes the firm specific announcement (Fama, Fisher, Jensen, & Roll, 1969; Patell & Wolfson, 1984) and the macroeconomic announcement (Waud, 1970; Flannery & Protopapadakis, 2002; Boyd, Hu, & Jagannathan, 2005). There are two main findings of previous literature in examining the relationship between the macroeconomic announcements and the stock price. The first finding reveals that the stock price is significantly affected by the monetary policy announcement, rather than the non-monetary policy announcement (Hardouvelis, 1987; Connolly & Wang, 2003; Flannery & Protopapadakis, 2002). The second finding reveals that the announcement in a foreign country is more significant than the announcement in a domestic country in explaining the variation in stock price (Johnson & Schembri, 1990; Connolly &

Wang, 2003; Souki, 2008; Li, Iscan, & Xu, 2010). With a more integrated financial market, the monetary policy announcement provides the effect on the domestic financial asset price and the foreign financial asset price. The world financial markets have been raising their concerns about such impact.

Despite its importance, the impact of the U.S. monetary policy action on the foreign stock price in the emerging financial market, especially in disaggregate level, remains relatively unresearched. The objective of this paper, therefore, is to shed some light on the effect of the U.S. monetary policy decision on stock price both in the domestic context and in the international context in order to provide some room for further research.

## LITERATURE REVIEW

Monetary policy is the policy implemented by the Central Bank to maintain the stable price and

the sustainable economic growth. Bernanke & Mihov (1998) argue that the Federal Funds rate outperforms the other instrument in measuring the U.S. monetary policy action after the Greenspan era in 1988. The Federal Funds rate is widely used as a proxy of the U.S. monetary action especially after the 1994 (Bernanke & Blinder, 1992; Bernanke & Mihov, 1998; Swanson, 2006; Gurkaynak, Sack, & Swanson, 2007). Since the Federal Funds rate is a good proxy of U.S. monetary policy (Bernanke & Mihov, 1998), the information on the Federal Funds rate target provides the information on the U.S. monetary policy action. It is, therefore, necessary to understand how the monetary policy affects the stock market.

### Theoretical Evidence

The impact of the monetary policy on the stock return can be explained by the Modigliani life cycle model (Modigliani, 1971) and the Tobin Q model (Tobin, 1969). In the Modigliani life cycle model, the households' consumption depends on the real capital, the human capital and the household wealth. The households' consumption, therefore, depends on the stocks since the stock is one class of asset which determines the households' wealth (Svensson & Van Wijnbergen, 1989). A hike in interest rate increases the firm's cost of capital driving down the present value of future cash flow and the stock price. When the stock prices reduces, the wealth drops, thereby decreasing the amount of consumption. In the investment side, Tobin's Q, which equals to the stock price divided by the replacement cost, has been used as an indicator of firm's investment (Chung & Wright, 1998). If stock prices drop, the Tobin's Q and the investment reduce. There are 3 well known hypotheses in explaining the impact of monetary policy on the asset price, the Expected Real Interest Rate Hypothesis, the Expected Risk Premium Hypothesis, and the Expected Inflation Hypothesis.

The Expected Real Interest Rate Hypothesis asserts that a tightening monetary policy increases the real interest rate, which reduces the stock price because of an increase in the real discount rate and a reduction in real earning (cash flow) (Hardouvelis, 1987; Thorbecke & Alami, 1994; He, 2006). The Expected Risk Premium Hypothesis also predicts

an inverse relationship between the tightening monetary policy and the stock price (Fama, 1984; Bernanke & Kuttner, 2005; Bredin, Hyde, Nitzsche, & O'Reilly, 2007; Ranaldo & Rossi, 2010). The risk premium consists of the market risk premium and the firm's specific beta. The current beta reflects the current information on the firm return, the market return and the risk free interest rate. If the Federal Reserve increases the target rate, the firms may have a higher financing cost, thereby resulting in the reduction in the future profit. As the uncertainty on the firm's profit increases, the investor expects a higher risk premium to compensate for the incremental risk. If the expected rate of return increases, the stock prices reduce. The Expected Inflation Hypothesis posits that an unanticipated reduction in money supply (tightening monetary policy) slows down the heat in inflation, which in turn, increasing the future real profit and the after tax real dividend. The stock price, therefore, becomes more attractive. A higher demand in stock pushes up the stock price (Pearce & Roley, 1983; Chami, Cosimano, & Fullenkamp, 1999, Flannery & Protopadakis, 2002).

The impact of the change in the U.S. monetary policy action on the foreign stock price has been increasingly examined in recent years. The change in the U.S. monetary policy action affects the stock return in the foreign country through several channels. Some channels are consistent with the impact of change in U.S. monetary policy action on the domestic stock return. There are four adjustment mechanism of how the international monetary policy transmits to the domestic stock price, where the degree of the transmission depends on the level of the real (trade) integration (Ehrmann & Fratzscher, 2006; Li et al., 2010) and the financial integration (Hausman & Wongswan, 2006; Ehrmann & Fratzscher, 2006; Wongswan, 2009).

The first adjustment mechanism is called the capital market adjustment (Bailey, 1990, Ehrmann & Fratzscher, 2006; Wongswan, 2009). The adjustment is based on the Contagion Hypothesis (King & Wadhvani, 1990; Karolyi & Stulz, 1996). It asserts that an increase in U.S. monetary policy rate push up the U.S. real interest rate. This reduces the U.S. asset price. With an increasing integrated financial market, the arbitrage mechanism will adjust

the foreign asset return move until equalization of the U.S. asset return. The foreign asset price is, therefore, dropped. The second adjustment is called the portfolio adjustment (Ehrmann & Fratzscher, 2006; Wongswan, 2009; Karim, 2009). It argues that an increase in U.S. monetary policy rate increases the market interest rate. This stimulates the capital flow from foreign market to the U.S. market. The investors will relocate their fund from foreign country to U.S., which in turn pushing the downward pressure on the foreign asset price.

The third adjustment is called the adjustment in expected cash flow (Bailey, 1990; Baks & Kramer, 1999; Ehrmann & Fratzscher, 2006; Wongswan, 2009; Karim, 2009). It relies on the Expected Real Interest Rate Hypothesis (Hardouvelis, 1987) and the trade channel of monetary transmission (Dornbusch, 1980; Stockman & Obstfeld, 1985). Baks & Kramer (1999) entitle this expected cash flow adjustment as the Push Channel since the U.S. tightening monetary policy reduces the amount of U.S. capital outflow pushed to the world economy, hence, investment in foreign country is reduced which then depresses the foreign stock price.

The last adjustment is called the inflation rate adjustment (Bailey, 1990; Baks & Kramer, 1999; Ehrmann & Fratzscher, 2006; Karim, 2009). It relies on the Expected Inflation Hypothesis (Pearce & Roley, 1983; Chami et al., 1999) and the trade channel of monetary transmission (Dornbusch, 1980; Stockman & Obstfeld, 1985). Baks and Kramer (1999) entitle this inflation adjustment as the Pull Channel since the U.S. tightening monetary policy reduces the U.S. current inflation. If the foreign investors perceive the asset price inflation is real, they will reduce the relocation of capital from foreign country to U.S., and finally enhance the foreign stock price.

## **Empirical Evidence**

The early literature examined the relationship between the change in the monetary policy action and the asset price by using the raw change in monetary policy action. The raw change in monetary policy action is the difference between the current value of monetary policy variable and the previous value of monetary policy variable. The common finding re-

veals that the raw change in the monetary policy action negatively affects the stock price (Thorbecke & Alami, 1994; Reinhart & Simin, 1997; Lobo, 2000). However, Smirlock and Yawitz (1985) and Kutter (2001) argue that the raw change in the monetary policy action should be separated into the expected component and the unexpected component and if the market is efficient, the stock price should be affected only by the unexpected component. The most widely used technique in measuring the unexpected component is using the information from the Federal Funds futures (Kutter, 2001; Bomfim, 2003; Bernanke & Kuttner, 2005; Bredin, Gavin, & O'Reilly, 2005; Gurkaynak, Sack & Swanson, 2007; Basistha & Kurov, 2008; Craine & Martin, 2008; Kurov, 2010). Kuttner (2001) initiates this measurement by relying on the logic that the futures price should incorporate all investors' price expectations. The value of the one day change in the Federal Funds futures price during the announcement date, therefore, measures the unexpected component.

Many previous studies measured the effect of U.S. monetary policy action on the global stock market by focusing on the market index return of each country (Johnson & Jensen, 1993; Ehrmann & Fratzscher, 2006; Hausmann & Wongswan, 2006; Wongswan, 2009). Some studies examine the effect of U.S. monetary policy action only on the stock market in European countries (Bailey, 1989; Connolly & Wong, 2003; Baks & Kramer, 1999; Ehrmann, Fratzscher, & Rigobon, 2005; Konrad, 2009). Only a few studies examined the effect of U.S. monetary policy action on the Asian stock return (Bailey, 1990; Goodhart, Mahadeva, & Spicer, 2003; Craines & Martin, 2008; Karim, 2009). The common finding reveals that the world stock return is negatively affected by the raw change in the U.S. monetary policy action (Johnson & Jensen, 1993; Baks & Kramer, 1999; Chanchaoenchai, Dibooglu, & Mathur, 2005). If the semi-strong form market efficiency holds, the world stock return is negatively affected only by the unexpected U.S. tightening monetary policy (Johnson & Jensen, 1993; Ehrmann et al., 2005; Hausman & Wongswan, 2006; Ehrmann & Fratzscher, 2006; Craine & Martin, 2008; Wongswan, 2009; Karim, 2009; Li et al., 2010).

The imperfect market condition is added into the domestic evidence in examining whether there is the effect of market imperfection on the domestic stock market response to the change in domestic monetary policy action. The imperfect market condition implies that some firms have the limited ability in accessing the funding source due to the different in the net worth position (Calomiris & Hubbard, 1990). The domestic stock return with a high level of market imperfection is more negatively affected by the change in the domestic monetary policy action than the domestic stock return with a low level of market imperfection (Thorbecke, 1997; Ehrmann & Fratzscher, 2004; Basistha & Kurov, 2008). The firm characteristic is a major determinant in explaining the stock market response to the change in monetary policy action.

The firm's characteristic is also added into the international evidence in examining the impact of the change in the international monetary policy action on the domestic stock price (Karim, 2009). However, Karim (2009) focuses only on the firm's size and the firm's cash flow. The result shows that the firms with large sized and high cash flow are more negatively affected by the unexpected change in the U.S. monetary policy action since these firms are usually able to raise their funding sources in the international market. Since the capital market adjustment (Bailey; 1990, Ehrmann & Fratzscher, 2006; Wongswan, 2009) asserts that an unexpected increase in U.S. monetary policy rate stimulates an increase in the global interest, which in turn increases the cost of capital. The firm with a high debt ratio, therefore, should be more affected by the change in international monetary action than the firm with a low debt ratio. Additionally, the credit channel literature uses the firm's debt ratio as a measure of the financial constrained condition of the firm (Peersman & Smets, 2005; Bougheas, Mizen & Yalcin, 2006). However, the impact of firm's leverage on the domestic stock return response to the change in the international monetary policy action still remains unexplored.

The domestic evidence includes the Financial Accelerator Theory in explaining the impact of the change in the domestic monetary policy action on the domestic stock return under the different economic period (Andersen, Bollerslev, Diebold, &

Vega, 2007; Basistha & Kurov, 2008; Farka, 2009; Rinaldo & Rossi, 2010). There are three widely used economic periods, which are the period in different business cycles, the period in different credit condition and the period in different monetary stance. The international evidence also includes the Financial Accelerator Theory into the framework. However, only the period in different business cycle has been examined (Konrad, 2009). The period in different credit condition and the period in different monetary stance are still unexplored, and therefore, it will be interesting to fill the above mentioned gap in examining the impact of change in the Federal Funds rate target on the stock return in the emerging stock markets in deeper detail.

## CONCLUSION

The impact of change in the monetary policy action on the stock market has been extensively investigated in many years. However, the impact of change in the international monetary policy action on the domestic stock market is unexplored with several gaps. One gap relies on the firm's characteristic. The other gap relies on the period in different economic condition. Since the impact of the change in the international monetary policy action on the domestic stock return is important for the academicians, the investors, and the policy makers, the above mentioned gaps should be filled. The investor can improve the corporate financing decision and the asset allocation decision by incorporating such impact into the information. The investors also gain a diversification benefit by including the stocks which absorb the different impacts. The policy maker can improve the efficiency in formulating the policy. If the change in the international monetary policy action affects the domestic stock market, the domestic policy maker should include such impact into consideration. Otherwise, it implies that the domestic policy maker can implement the independent monetary policy action.

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