2. Theoretical Background of the study

2.1 Definition of Exchange Rate Exposure

Financial theory suggests that a firm’s future cash flows are sensitive to unexpected changes in exchange rates and therefore the value of the firm is affected by unpredictable fluctuations in exchange rates. Exchange rate exposure refers to the extent to which the value of the firm is affected by unexpected changes in exchange rates (Adler & Dumas, 1984). This specification assumes that the stock market operates efficiently and current market prices are assumed to have already incorporated currency fluctuations that were anticipated. Hence, only the unanticipated or innovated components should affect stock returns. The exchange rate exposure is theoretically classified into three broad categories (Eun & Resnick, 2014). The first is Transaction Exposure, which is defined as the sensitivity of “realized” domestic currency values of the firm’s contractual cash flows denominated in foreign currencies to unexpected exchange rates. Whenever the firm has foreign currency denominated assets and liabilities (such as accounts receivables, accounts payables, foreign loans or foreign deposits), it is subject to transaction exposure and their settlements are likely to affect the firm’s cash flow position. The magnitude of transaction exposure is equal to the amount of foreign currency that is receivable or payable.

The second is Economic Exposure, which is defined as the extent to which future cash flows are affected by unanticipated changes in exchange rates. The changes in exchange rates can have a profound effect on the firm’s competitive position in the world market and thus on its future expected operating cash flows and market value. For example, a domestic firm that manufactures and sells locally will also be exposed to the appreciating currency as competing imports become relatively cheap.

The third is Translation Exposure, which refers to the potential that the firm’s consolidated financial statements can be affected by changes in exchange rates. When the exchange rates
change, the value of a foreign subsidiary’s assets and liabilities denominated in a foreign currency change when they are viewed from the perspective of the parent firm. The translation exposure does not result in a change in the current cash flows because the translation gain or loss is unrealized. However, the reported true earnings which are not distorted by translation issues help investors to value the firm accurately. Figure 1 depicts how changes in exchange rate affect the value of the firm through various channels postulated in the theory of international finance.
Figure 1: The theoretical relationship between changes in exchange rate and the value of the firm
2.2 Central Bank Intervention, Exchange Rates and Exposure

This study explores the role of central bank intervention for estimating exchange rate exposure of firms. There are a few reasons why intervention by the central bank in foreign exchange market might affect firms’ exchange rate exposure. First, intervention by central bank affects the level of exchange rates and exchange rate volatility, which might expose firms to exchange rate risk. There has been an enormous amount of literature exploring the influence of intervention by central bank in foreign exchange market on exchange rates (Broto, 2013; Disyatat & Galati, 2007; Mohanty & Berger, 2013). Foreign exchange market intervention is defined as any transaction, announcement or other policy changes by an official agent of a government that is intended to influence the value of an exchange rate (Dominguez, 1998; Neely, 2000). The intervention in the form of direct foreign exchange transactions such as sale and purchase of foreign currency in the foreign exchange market is termed as direct intervention. However, as mentioned by Neely (2000), intervention also refers to other policies designed to influence exchange rates indirectly. These policies include capital controls—taxes or restrictions on international transactions in assets like stocks or bonds—or exchange controls—the restriction of trade in currencies (Dooley, Mathieson, & Rojas-Suarez, 1997; Neely, 1999; Evrensel, 2013). The effect of these indirect interventions on exchange rates depends on the nature of policy changes. For example, if a country imposes a tariff on imports from another country, the import-imposing country’s currency appreciates, everything else remaining constant. Similarly, the increasing limits on foreign direct investment attract capital inflows and thus lead to currency appreciation.

The direct intervention could be sterilized or non-sterilized, depending upon the change in the monetary base. The intervention is called non-sterilized when the effects of foreign exchange transactions are not offset by open market operations. Traditional economic theory suggests that non-sterilized intervention affects exchange rates through the monetary channel in which
foreign exchange transactions affect the money supply and interest rates. If the purchase of foreign currency by a central bank is not offset by contractionary open market operations, it increases money supply that reduces the rate of interest and increases demand. This leads to capital outflow and an increase in import demand. As a result, there is an increase in the demand for foreign currency leading to depreciation of exchange rate.

The intervention is sterilized when it does not change the monetary base. The sterilized intervention affects exchange rates through three channels namely portfolio channel, signalling channel and noise trading channel. The portfolio channel works when investors consider foreign and domestic assets as imperfect substitutes. The purchase of foreign currency by a central bank creates excess demand for foreign currency assets and therefore the investors holding domestic currency assets should be compensated by higher return. This might affect the level of exchange rates.

The signalling channel proposed by Mussa (1981) works on the information asymmetry between the central bank and market participants. Sterilized intervention is expected to convey a signal to market participants about the inside information of future fundamentals. If market participants consider the signals of the central bank to be credible, they will change their expectations of future fundamentals even though today’s fundamentals remain unchanged. When the market participants revise their expectations of future fundamentals, they also reassess their expectations of the future spot exchange rate, which brings about a change in the current rate. For instance, a sale of foreign currency against domestic currency in the foreign exchange market by the central bank will lead to a local currency appreciation because it signals a contractionary monetary policy (i.e. higher interest rates) in future.

The noise trading channel hypothesis proposed by Hung (1997) says that sterilized intervention may be intended to increase or decrease exchange rate volatility to manage the exchange rate level. This channel assumes that there are investors (i.e. noise traders) in the
market whose demand for currency is affected by beliefs or sentiments that are not fully consistent with macroeconomic fundamentals. These traders (also called chartists) rely on past price patterns to predict the future path of exchange rates. The noise trading hypothesis acknowledges that these traders as a group can move exchange rates away from the fundamental equilibrium values and amplify exchange rate fluctuations. Central banks can use well designed intervention strategies to induce noise traders to buy or sell a currency in such a way that the otherwise temporary effect of sterilized intervention is maintained. For example, when the central bank considers the domestic currency as overvalued and decides to lower it. If intervention is conducted secretly in a thin market, then noise traders, unable to discern the sources of supply of domestic currency, may incorporate the latest downward pressure on the currency into their trend line analysis. Because of the practice of assigning significant influence to the most recent exchange rate changes in their forecast, the noise traders may interpret the effect of intervention as an early warning of a change in market direction. They may then decide to sell domestic currency assets, thereby helping to lower the domestic currency. The overall effect of sterilized intervention on the exchange rates through different transmission channels has been an issue of prime interest to researchers.

The literature also reports the relationship between central bank intervention and exchange rate volatility. Intervention by central bank helps to curb volatility arising on account of demand-supply mismatch and stabilizes the exchange rate (Fatum & King, 2006; Hoshikawa, 2008; S. Kim et al., 2006; Neely, 2000). On the other hand, a positive link between interventions and exchange rate volatility has also been reported (Chang & Taylor, 1998; Dominguez, 1998; Frenkel, Pierdzioch, & Stadtmann, 2005; Nagayasu, 2004). Volatility of exchange rate causes exchange rate exposure for firms with foreign assets, liabilities and future expected cash flows denominated in foreign currency.
The moral hazard hypothesis suggests another explanation for the impact of central bank intervention on exchange rate exposure. The efforts of the central bank to stabilize the exchange rates through foreign exchange market interventions provide an implicit government guarantee which may encourage firms to remain unhedged and may expose firms to higher exchange rate risk (Eichengreen & Huasmann, 1999).

It is likely, therefore, that intervention by central bank, through its effects on exchange rates, has a major impact on the level of firms’ exchange rate exposure. This study addresses this issue by incorporating the effects of interventions in the estimation model of exchange rate exposure of firms which is largely ignored in prior literature. Figure 2 presents how intervention by central bank affects exchange rates and firms’ exchange rate exposure.
Figure 2: The effects of central bank intervention on exchange rates and exchange rate exposure
2.3 Firm-level Internal Governance and Exchange Rate Exposure

Theoretical and empirical literature has consensus on the negative relationship between currency exposure and hedging. However, motives behind the hedging activities of managers are influenced by the agency conflicts associated with equity. Theoretical literature which explains the real motives of hedging can be classified under two main groups.

The first group of theories suggest that hedging creates value and reduces risk optimally if it mitigates the costs associated with market imperfections such as underinvestment, external financing, financial distress and taxes. Corporate hedging could mitigate the underinvestment costs by reducing the volatility of firm value (Myers, 1977). Hedging decreases the sensitivity of debt claim value to incremental investment and allows shareholders to capture a significant part of the incremental benefit from new investment (Bessembinder, 1991). In this way, it reduces incentives to underinvest by firms. Hedging can also reduce the cost of external financing by lowering the cash flow volatility so that the firm can have access to internal funds for investment (Froot, Scharfstein, & Stein, 1993). Hedging lowers the probability of financial distress by reducing the volatility of firm value and thus reduces the cost of financial distress (Smith & Stulz, 1985). If the firm has a convex tax schedule, that is if taxes increase more than proportionally with taxable income, volatile taxable income results in a higher tax burden than stable pre-tax income. Corporate hedging stabilizes taxable income, as savings from higher income states exceed additional taxes from lower income states, thus lowering the average corporate tax burden (Smith & Stulz, 1985). These shareholder value theories assume that there are no agency costs associated with equity.

The second group of theories indicate that in the presence of agency costs, there are managerial reasons for hedging related to contractual factors that induce managers to indulge in non-value maximising hedging and sub-optimal risk reduction activities. These reasons are selective hedging/speculation, manager’s lack of portfolio diversification and the reduction of
informational asymmetry about managers’ performance among the outside investors and board of directors. Selective hedging strategies are based on the forecasts of future exchange rates in which managers attempt to time the market and hedge only a small part of the exposure (Stulz, 1996). This strategy involves a speculation element, increases the cash flow volatility, and therefore does not add value to the firm (Brown, Crabb, & Haushalter, 2006). Managerial risk aversion motives and lack of portfolio diversification may lead managers to hedge to protect themselves and not necessarily to benefit shareholders (Smith & Stulz, 1985). Also, hedging can reduce the “noise” in earnings contributed by macroeconomic factors and lessen the asymmetric information in the market regarding managerial ability and firm value (Breeden & Viswanathan, 1998). This indicates that managers with inferior abilities may have incentives not to hedge properly. Therefore, in the presence of agency conflicts, the managerial reasons of hedging activities subsume other incentives, and hedging does not create value by reducing the risk sub-optimally.

Corporate governance environment of the firm plays a central role in determining the extent to which the interests of owners and managers are aligned. At the firm-level, a strong corporate governance environment reduces managerial agency conflicts and helps in the alignment of the interests of managers with those of shareholders. Also, a higher monitoring of managerial activities restricts managers to incorporate their personal subjective views and benefits into the firm’s risk management policies. Therefore, lower agency and monitoring problems encourage managers to conduct value-enhancing hedging activities and to manage risk optimally. Empirical evidence also confirms that strong corporate governance with lower agency costs and monitoring problems induce managers to engage in value-enhancing risk management activities (Allayannis et al., 2012; Fauver & Naranjo, 2010; Lel, 2012; Rossi, 2013). Therefore, it is expected that a strong firm-level internal corporate governance environment, in which agency costs and monitoring problems are lower, is associated with
reduced level of exchange rate exposure because managers are more indulged in value enhancing and optimal hedging activities. The potential relationship between firm-level internal corporate governance and exchange rate exposure has not received attention in prior literature and is investigated in this study.