ABSTRACT

Title of dissertation: EXCHANGE RATE REGIMES AND RISK PREMIA UNDER ALTERNATIVE WAGE STRUCTURE

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This paper analyzes the relationship between risk premium and exchange rate regimes. I conclude that fixed exchange regime is preferred to flexible regime, and risk premium is lower under fixed regime. I analyze this problem with the friction where there are two types of wages; a conventional wage available to the current period consumption and a deferred wage paid at the end of period. When deferred wage increases, the real exchange rate and capital used for the next period production is higher under the flexible exchange regime. Since production in the current period can be defined as a negative function of real exchange rate, higher increase of real exchange rate leads into lower production when a positive deferred wage shock occurs under flexible regime. As a result, fixed regime is preferred thanks to lower volatility in consumption. In addition, remaining wealth is further reduced. The reduce of remaining wealth, increase of real exchange rate, and a surge of capital lead into the increase of leverage ratio. Therefore, the risk premium under the flexible regime is higher. When I replace a deferred wage shock with technology shock and world interest rate shock, still risk premium under flexible regime is higher

than under fixed regime. The addition of the asset holders with the assumption of exogenous segmented asset market does not change these results.

The second chapter utilizes a uniques high-frequency database to measure how exchange rates in nine emerging markets react to macroeconomic news in the U.S. and domestic economies from 2000 to 2006. We find that major U.S. macroeconomic news have a strong impact on the ruturns and volatilities of emerging market exchange rates, but many domestic news do not. Emerging market currencies have become more sensitive to U.S. news in recent years. We also find that market sentiment could sway the impact of news on these currencies sustematically, as good (bad) news seems to matter more when optimism (pessimism) prevails. Market uncertainty also interacts with macroeconomic news in a statistically significant way, but its role varies across currencies and news.

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by

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Chapter 1

Exchange Rate Regimes and Risk Premia under Alternative Wage Structure

1.1 Introduction

As financial markets have developed, various financial goods are designed for emerging market countries in order to overcome country specific risk. One of the examples is the country default swap, which measures relative risk of a country compared with the bond return of a so called riskless country. These financial goods provide some insurance against a country's default risk to bond holders by paying a premium to the counterpart while it has an obligation to buy the bond usually at par value when country issuing the bond declares default. However, the concept of measuring the risk factor of a country from the financial market is not new at all. For instance, J.P. Morgan provided the Emerging Market Bond Index Plus (EMBIG+) spreads for widespread countries for the same purpose in the mid 1980s. This index displays the difference between a developing country's bond return and the U.S. Treasury bond adjusting some factors such as maturity and dividends. Although there are some minor differences[1], both indices are widely used to check

[1]For example, there is a counterpart risk in the credit default swap, the risk that the insurer may go bankrupt when it is forced to buy the defaulted bond. The demise of AIG during recent worldwide crisis illustrates this risk.

how some countries face default risks.

Since those indices, notably credit default swap are actively traded in the Over-The-Counter (OTC) market, it has become more convenient to obtain high frequency data. Considering the fact that the defaults of a sovereign country are rare, these indices are treated as a good proxy to measure the default risk of emerging markets. Therefore, a lot of work to analyze country risk turned their attention from the default events itself to the factors that affect these indices. This also contributes to broaden our knowledge by including some other countries who are rarely or never defaulted.[2] In addition, this issue is very attractive for both analysts in the financial markets and economists in the academic world. Analysts have a great incentive to precisely estimate the price of the financial derivatives to get the arbitrage chances, and economists have a better tool to understand the nature of crises.

From regression results, which will be discussed in detail in section 5, I find out that risk premium under the fixed regime is lower than under flexible one. For the case of crawling regime, risk premium is lower but not significant. When emerging countries went into the free falling, then risk premium increases sharply. Under the free falling regime risk premium is high since the country is experiencing economic devastation. However, there is no tangible answer that explains the difference of risk premium between fixed and flexible regimes. This empirical result may be caused

[2]Before Asian crises in late 1990s, the default events analyzed widely is the cases of Latin American countries such as Mexico, Argentina, and Brazil who frequently defaulted their debt in order to have relevant data for the defaults. Even in those cases, there are always some critiques how those events provides general aspects.

by a lot of economic factors, but I focus on the low level of financial development in emerging countries to explain this phenomenon.

Table 1.1: Relations between log EMBIG+ spread and Exchange regime

Regime	Coefficient
Fixed	-0.16***
Crawling	-0.06
Free Falling	0.55***

There are some factors that should be considered in order to overcome the equivalent response of risk premium under various exchange regimes, as in CCV (2004). In developing countries, the access to the international financial market is heavily restricted as a tool for savings. This may be caused by various reasons: the government may prohibit this access in order to satisfy the economy's need of capitals. Since developing countries are suffering lack of fixed capitals to increase production, capital control is usually one of tools used to avoid capital outflows. Transaction costs are another factor hampering access. Considering that the amounts of savings in developing countries are relatively small, transaction costs that is acceptable in developed countries can be a major obstacle to facilitate holding foreign assets in developing countries. Therefore in developing countries, a relatively small number of people can go to the financial market for savings. This idea is the basic cornerstone of segmented asset market models. According to Lahiri et al. (2007), in the United States as a developed country "as of 1989, ... 59 percent of

U.S. households did not hold any interest bearing assets". Lahiri et al. also commented that 25 percent of households do not have checking account. We can easily imagine that the financial situation of developing countries are well behind that of the U.S. For example, Jeon and Lim (2008) state, according to Korean Retirement and Income Study (KReIS) panel data, only 50.18 percent of households who joined the survey in 2005 have savings for the purpose of retirement. [3]

Considering this low ratio of asset market participants in developing countries, it is critical to analyze economic behavior without any saving tools except wage. Using this setup, I illustrate the following properties: first, the response of risk premia among exchange regimes vary. The response of risk premium under the fixed exchange regime is smaller in response to a positive deferred wage shock. That under the flexible regime with inflation target is higher. Second, the fixed regime is preferred to the flexible exchange regime. Next, the order of exchange regimes based on the response of risk premium does not change when other real shocks are applied. When it is assumed that there exist some asset holders in the economy with a segmented asset market model, the results do not change with only smaller magnitude of response of risk premium among exchange regimes.

What causes this difference among exchange regimes? Based on the different definitions of exchange regimes, in which nominal exchange rate is set to be constant

[3]The reader may be surprised this relatively low percentage of savings in Korea. According to National Statistics Office in Korea, the share of financial account holders in households is about 98.6 percent in 2007. However, the share of the households that hold accounts for the investment is surprisingly low, 39.6 percent.

under the fixed regime while domestic price is assumed to be constant under the flexible regime, the slopes of IS and BP curve are steeper under the flexible regime. Also, the difference of definitions causes higher magnitude of impact from a positive deferred wage shock. Therefore, real exchange rate and capital used for the next period's production is higher under the flexible exchange regime than under the fixed regime. Since the production at the current period is a negative function of real exchange rate, depreciation in real exchange rate leads into lower level of production at the current period. After the shock, the production is higher under the flexible regime. However, this is not enough to cover initial loss of welfare. Furthermore this means that the volatility of both production of final goods and consumption is higher under the flexible regime.

On the other hand, the reduce of output at the current period has a side effect. Coupled with higher increase of real exchange rate under the flexible regime, the lower level of final goods production causes lower level of remaining wealth that will be used for the next period capital production. This will increase the leverage ratio by borrowing more from the international capital market, which results in higher level of risk premium under flexible regime.

This paper is related to a lot of previous work. From the empirical point of view, Longstaff et al. (2007) states the relation between credit default swap and major economic variables. Longstaff et al. (2007) insist that the excess returns from investing in sovereign credit are largely compensation for bearing global risk, and there is little or no country-specific credit risk premium. Their focus is on how country specific factors may affect the credit default swap, so the authors ran

the regression on country by country basis. Also, the authors did not consider the possibility of exchange rate regimes as a main factor. In my work, I use panel data to check these relations, and include exchange rate regime to check the difference of the impact on risk premium. Jahjah and Yue (2007) is more related to the exchange rate regime. They show that spreads depend on exchange rate regime and that bond spread are the highest when the exchange regime is a hard peg. One of the interesting point in Jahjah and Yue (2007) is that exchange regime each country declares is not so relevant, therefore exchange rate regime classification is important to investigate actual impact of exchange rate. Talvas et al. (2008) tackle the problem of *de facto* regime codings in this regard.

On theoretical front, Lahiri et al. (2007) and Cespedes et al. (CCV, 2004) should be noted. Based on the "financial accelerator" from Bernanke et al. (1999), CCV investigate how exchange rate policies affect the small open economy under rigid wage. The authors claim that the conventional idea of preferring a flexible regime to a fixed one survives with financial imperfection and balance sheet effects. This is because under a fixed regime real devaluation drops real wage as does the production while a flexible regime successfully insulate real shocks. Two things are worth mentioning: first, their model does not provide any distinction of risk premia across exchange rate policies. As mentioned in the working paper version, this is contrary to the recent policy literature. Second, the worker is passive in the sense that the response to the economic shock is restricted only to the demand of consumption goods and supply of labor. There is no financial asset in this model so it is not possible to assess how the financial market for worker affects the economy.

On the other hand, Lahiri et al. suggest that under a fixed regime the volatility of consumption for non-asset holders is lower since they can pool the risk intertemporarily. As a result, the fixed regime is preferred under the general condition where share of asset holders are large. Since they assumed explicit output shock without production, it is not possible to investigate the role of balance sheet effects.

There are other works on exchange rate regime comparison. Aghion et al. (2009) suggest that financial development level is important in the sense that a fixed exchange rate regime is beneficial for an economy with a lower financial development level. Devereux et al. (2006) insist that the degree of exchange rate pass-through for import goods is critical for the assessment of monetary rules. However, they conclude exchange rate pass-through degree does not affect welfare ranking for exchange rate regimes so that flexible regime is always preferred. Choi and Cook (2004) have a different opinion on the comparison issue. They argue that when the default risk premium depends on domestic banks' balanced sheets due to asymmetric information, a fixed regime stabilizes bank balance sheets and so offers greater stability than flexible regimes. Devereux et al. (2006) suggest that openness of the economy may affect the implication of exchange rate regime from their empirical studies. Magud (2010) shows that with high level of external debt, small open economies are better off with flexible regimes to the extent that they are sufficiently open. In the case of relatively closed economies his conclusion is that "fixed regimes are better real shock observers".

The structure of this paper is as follows: in section 2, I provide theoretical model that generates different response of risk premium to real exchange rate

changes under various exchange regimes. It is followed by simulation results and implications in section 3. In section 4, the reader may find out extended model where the assumption of no foreign bond holdings is loosened such that there are fixed proportion of asset holders. Section 5 provides empirical evidence that supports lower level of risk premium under the fixed regime. Section 6 concludes. In addition, Source of data and technical issues are summarized in the appendix.

1.2 Model

1.2.1 Basic Model

The main objective of this model is to study how the change of two wages, that is conventional wage and deferred wage, affects the economy according to the exchange regimes. When the share of a deferred wage that can be used for the next period consumption increases, the conventional wage that can be used for the current period consumption is reduced. Furthermore, the definition of flexible regime that make domestic goods price constant affects the larger magnitude of response from the shock, which is discussed later. Therefore, there is a difference in response of the real sector in the sense that volatility of the real variables under the flexible regime is higher.

In order to connect this fluctuation of real economy with risk premium I follow the model from CCV, where the risk premium is generated by random profit level of individual capital producer. In this setup, the source of risk premium is that individual capitalist producing capital for the final goods production may go

bankrupt since its profitability is a random variable and it is realized after financial transaction. Since foreign investors know the distribution of profit and possibility of defaults in some of invested money, their required return should be higher than riskless interest rate in order to compensate the loss from defaults.

However, the model from CCV does not generate different risk premium level as exchange regime varies. The main source of making risk premium different among the exchange rate regimes is distinction in real variables behavior when those are faced with a positive deferred wage shock. When the volatility of real variables are higher under the flexible regime, then the behaviors of financial variables such as capital, debt, and remaining wealth are different as well. This logic is well known as a balance sheet effect, but this is not the only source of the higher risk premium. The volatility of real variables is the core that initiates this effect in the balance sheet.

In this model, the core assumption is that households receive two different types of earnings, wage and deferred wage. As a compensation of labor supplying, households receive wages at the current period. At the end of the period after the production and all market clears, the producer will provide a deferred wage that is a fixed share of firms' revenue. This deferred wage cannot be used for the current period's consumption, but will be used for the next period. It is assumed that households provide labor and receive conventional wages during the period and deferred wage at the end of the period. In addition, it is also assumed that they do not hold financial asset (or debt). Finally, their consumptions are restricted by Cash-In-Advance constraint.

There are four different types of players in this model; households, capitalist, final goods producer, and government. Households provide labor to final goods producer in order to produce final consumption goods. They receive wages that consists of two parts, wage and deferred wage. Wage is provided to the households at the same period so that they can use this salary for the current period consumption. At the end of the period, final goods producer provide deferred wagees to the households that can be used for the next period consumption. The deferred wage is a fraction of total revenue of production. Even though the households have the information of deferred wage, they cannot adjust their current consumption level based on the amount of deferred wagees since they are subject to the Cash-In-Advance constraint.

Capitalists produce capital that will be used for the next period production of final goods. The idea of capitalist adopted in this model is exactly the same as those from Bernanke, Gertler, and Gilchrist (1999, hereinafter BGG) and Cespedes, Chang, and Velasco (2004, hereinafter CCV).

Household's Utility depends on consumption and labor. Since it is assumed that consumption is restricted on the money holdings as in cash-in-advance constraint, the money holdings are not included in the utility function.

$$V_t = \mathbb{E}_t \left[\sum_{s=t}^{\infty} \beta^{s-t} u\left(C_s, L_s\right) \right] \tag{1.1}$$

Utility function on each period follows GHH utility function, where $\chi > 1$ represents the elasticity of labor and σ measures risk averseness of the households.

$$u\left(C_s, L_s\right) = \frac{\left(C_s - \frac{1}{\chi} L_s^{\chi}\right)^{1-\sigma}}{1-\sigma} \tag{1.2}$$

It is assumed that there are two goods for consumption; home goods and foreign goods (imports). Since it is also my interest to understand the behavior of exchange rate, it is indispensible to include two goods so that it is possible to define the real exchange rate as the relative price between those two goods. And the composite goods are defined as follows:

$$C_s = \frac{\left(C_{H,s}\right)^{\gamma} \left(C_{F,s}\right)^{1-\gamma}}{\gamma^{\gamma} \left(1-\gamma\right)^{1-\gamma}} \tag{1.3}$$

The imported good has a fixed price, normalized to one, in terms of a foreign currency. It is freely traded internationally and the Law of One Price holds, so that the local price of a unit of imports is equal to the nominal exchange rate, S_t, per foreign currency.

1.2.2 Timing

The timing issue should be clear in this model since there are many participants in this economy. At the start of period t, labor market opens with the knowledge of a shock to the share of deferred wage, where final goods producers and households join to determine the equilibrium level of labor and wage with predetermined level of capital at the previous period t-1. As a result of labor market transaction, the equilibrium level of labor is used for final goods production. The households can use the conventional wage at the current period and the deferred wage that is paid

at the end of the last period for the consumption in the current period.

Then, it turns into the payment time. First of all, final goods producers pay wages to households, and provide interest rates to capitalists. The capitalists pay back the debt from the last period with an interest rate, consumes foreign goods only to simplify goods market clearing, and leave some of the money for the next period of capital production as a remaining wealth. Based on this remaining wealth, the capitalist decide the level of capital for the next period and borrow money from foreign investors in order to prepare capital production that will be used in the next periods. Households consume final composite goods with wage and the deferred wage that is given at the end of last period. At the end of the period when all the markets clear, final goods producer provide households the deferred wage that will be used for the next period consumption. This deferred wage does not provide interest since this is given to the households at the end of the period.

1.2.3 Households

Following the assumption households do not hold foreign assets, the wealth for the current period's consumption is based on money holdings from the previous period and wage earned from current period labor. For the convenience of analysis, it is assumed that the households take the deferred wage, denoted by M_t as given.[4]

[4]Even though it looks too restrictive, this assumption does not change the results which is suggested later. For instance, it is more reasonable to consider that the deferred wage is exogenous if it is defined as a portion of total revenue of final goods producer. Under this definition, the risk premium under the fixed regime is still less than under the flexible regime with a real shock.

Cash-in-advance Constraint is provided by the following equation:

$$M_t + (1 - v_t)w_t L_t = P_t C_{H,t} + S_t C_{F,t} \tag{1.4}$$

where P_t is the price level of home product, S_t is the price of foreign product, that is the same as nominal exchange rate.

In equation (1.4), v_t is the share of the deferred wage from total wage income. So, the total deferred wage that is paid at the end of the period is the share v_t times total wage income.

$$M_{t+1} = v_t w_t L_t \tag{1.5}$$

Then the price level of composite goods is denoted by Q_t such that

$$Q_t = (P_t)^{\gamma} (S_t)^{1-\gamma} \tag{1.6}$$

Then, the right handed side of (1.4) can be rearranged into a multiplication of composite price and consumption by simple calculation with first order conditions of home and foreign goods consumptions.

$$M_t + (1 - v_t)w_t L_t = Q_t C_t \tag{1.7}$$

Using utility function suggested above and (1.7), Lagrangian is

$$\mathcal{L} = \mathbb{E}_t \left[\sum_{s=t}^{\infty} \beta^{s-t} \frac{(C_s - \frac{1}{\chi}(L_s)^{\chi})^{1-\sigma}}{1-\sigma} + \sum_{s=t}^{\infty} \mu_s \beta^{s-t} (M_s + (1 - v_s)w_s L_s - Q_s C_s) \right] \tag{1.8}$$

, and first order conditions are as follows:

$$\left(C_t - \frac{1}{\chi}(L_t)^{\chi} \right)^{-\sigma} = \mu_t Q_t \tag{1.9}$$

$$(C_t - \frac{1}{\chi}(L_t)^{\chi})^{-\sigma}(L_t)^{\chi-1} = \mu_t(1-v_t)w_t \tag{1.10}$$

By solving utility maximization problem, consumption and labor level will be determined as follows:

$$C_t = \frac{M_t + (1-v_t)w_t L_t}{Q_t} \tag{1.11}$$

$$(1-v_t)w_t = Q_t\,(L_t)^{\chi-1} \tag{1.12}$$

There are nothing particular but the deferred wage shock in those equations. In equation (1.67), the reader may easily understand that labor supply depends on the portion of real wage, w_t/Q_T, that can be consumed in current period. Since the households take the deferred wage as given and are bound to the cash-in-advance constraint, the consumption in the current period is governed by the real value of deferred wage from last period and a portion of real wage.

1.2.4 Capitalists

In this model, capitalists produce physical capital and sell it to final home good producer. They need home goods and foreign goods as sources for capital production. To finance investment, he can use his own money that was left at the last period or borrow money denominated as foreign currency from abroad. For reference, this capitalist setup is adopted from Cespedes et al. (2004).

There are some reasons why capitalists should be included in the model. First of all, it is capitalists who may go bankrupt in the model rather than governments. In the model suggested here, there exist individual capitalists with mass 1 who are

identified with random profitability. Based on this random variable, that is profitability, each individual may go bankrupt if the realized profit level is below the level of debt repayments. As a result, it is possible to define risk premium in the model without any government default based on budget deficits. Second, it is easier to adopt capitalists in order to add a nature of financial crisis. One of the core reasons that lead into financial crisis is financial accelerator in the sense that the value of debt repayment may be higher when devaluation (or depreciation under flexible exchange regime) occurs. Without capitalists, banking sector and government decision should be included to take this nature into consideration. Finally, it should be noted that the model suggested here is based on the shock of wage structure. This shock directly affects on the demand and supply of labor, so that the level of capital will change indirectly. As a result, the behavior of risk premium will be passive if capitalists do not exist in the model.

Physical Capital production is defined as the same fashion as the composite consumption goods:

$$K_t = \frac{(X_{H,t})^{\gamma} (X_{F,t})^{1-\gamma}}{\gamma^{\gamma} (1-\gamma)^{1-\gamma}} \tag{1.13}$$

where X_H and X_F mean home goods and foreign goods, respectively. Also, it is assumed that physical capital is entirely depreciated after the final home good production. Due to the structure of the production function of physical capital, the cost of a unit of capital is Q_t, as presented above in (1.6). Then the budget constraint of the capitalist is

$$P_t N_t + S_t D_{t+1} = Q_t K_{t+1} \tag{1.14}$$

where D_{t+1} is borrowing from abroad, and K_{t+1} means investment in period t+1 capital.

In this setup, the borrowing is subject to friction. Following from Bernanke et al. (1999) capitalists can go bankrupt due to the idiosyncratic disturbance attached on their ex-post gross return. In this case, it is assumed that foreign lenders will monitor the situation that the capitalists face with some costs, and seize all the remaining. This informational asymmetry is the main reason why there exists risk premium in this model. Considering risk premium, the expected return to investment is defined by

$$\frac{\mathbb{E}_t \left[R_{t+1} K_{t+1} / S_{t+1} \right]}{Q_t K_{t+1} / S_t} = (1 + r_{t+1})(1 + \eta_{t+1}) \tag{1.15}$$

where η_{t+1} is the risk premium between period t and t+1. Using producer's first order condition, this equation can be rearranged as follows, which governs demand of capital:

$$\frac{\mathbb{E}_t \left[\alpha P_{t+1} Y_{t+1} / S_{t+1} \right]}{Q_t K_{t+1} / S_t} = (1 + r_{t+1})(1 + \eta_{t+1}) \tag{1.16}$$

Bernanke et al. (1999) show that risk premium is an increasing function of the ratio of the value of investment to net wealth and risk premium. This governs the supply of capital. It should be noted that this equation is the result of the maximization of capitalists. The theorectical analysis of capitalist maximization is

provided in the Appendix A.2.

$$1 + \eta_{t+1} = F\left(\frac{Q_t K_{t+1}}{P_t N_t}\right) \tag{1.17}$$

Following CCV, it is assumed for the calibration later that $F(G) = G^{\mu}$, where $\mu > 0$. This assumption has a trade off in the analysis. Most of all, it simplifies the model so that it is possible to solve the model analytically using log linearization. Without this assumption, a group of first order conditions from the maximization problem for capitalists should be solved simultaneously, which does not provide any further insights for understanding. On the other hand, the assumption of function form will erase the impact of statistical structure of random variable for profitability. As a result, it is not possible to analyze how the economy responds to the change of random variable of capitalists. Since the model is concentrated on the respose of the economy to the change of wage structure, it is justified that the loss from this assumption is minimal.

It is assumed that capitalist consume $1 - \delta$ share of the remaining after the debt repayment, and he only consumes imports. Then the level of wealth remaining for producing capital at the next period is

$$P_t N_t = \delta\{\alpha P_t Y_t - (1 + r_t)(1 + \eta_t) S_t D_t\} \tag{1.18}$$

1.2.5 Final Goods Producer

Producer simply uses labor and capital to produce final goods with given price level of capital. Since the contract with households includes deferred wage as a fixed share of revenue as well as wage, the producer should consider this deferred wage when it maximizes its own profit level.

Production function is assumed to have standard Cobb-Douglas function form.

$$Y_t = AK_t^{\alpha} L_t^{1-\alpha} \tag{1.19}$$

Considering the return for the capital is decided by the capitalists and international investor, profit maximization problem will be as follows:

$$\Pi_t = P_t Y_t - R_t K_t - w_t L_t \tag{1.20}$$

Then, First order conditions for the capital and labor will be suggested.

$$\alpha P_t Y_t = R_t K_t \tag{1.21}$$

$$(1-\alpha) P_t Y_t = w_t L_t \tag{1.22}$$

1.2.6 Equilibrium Condition

Home goods produced by final goods producers can be consumed by households, used for the capital production by capitalists, or exported to foreigners. In order to simplify the model, the exports to the foreigner are assumed to be constant across periods. Then market clearing condition for home goods are as follows:

$$P_t Y_t = \gamma Q_t \left(K_{t+1} + C_t\right) + S_t X \tag{1.23}$$

where X denotes exports, which is constant.

1.2.7 Steady State

In order to derive steady state solution, the price level of home goods is normalized to 1, i.e. $P = 1$, without any loss of generality. Then the price of home goods can be dropped in the steady state equations. The following equations are the main results for steady state variables, where I drop the time subscript.

$$(1-\alpha)Y = Q(L)^{\chi} \tag{1.24}$$

$$\frac{\alpha Y}{QK} = (1+r)(1+\eta) \tag{1.25}$$

$$QC = wL = (1-\alpha)Y \tag{1.26}$$

$$Y = \gamma Q\left(K + C\right) + SX \tag{1.27}$$

$$N = \delta\left[\alpha Y - (1+r)(1+\eta)SD\right] \tag{1.28}$$

$$Q = S^{1-\gamma} \tag{1.29}$$

$$N + SD = QK \tag{1.30}$$

The starting point to derive steady state variables is risk premium. Plugging equation (1.25) and (1.30) into equation (1.28), it is possible to derive the following:

$$[1 - \delta(1 + r)(1 + \eta)] (QK - SD) = 0 \tag{1.31}$$

If it is assumed that remaining wealth for the capitalist is positive, then the second term in the equation cannot be zero. Therefore, the risk premium is a function of risk-free interest rate and the share of consumption for capitalist or

$$1 + \eta = \frac{1}{\delta(1 + r)}. \tag{1.32}$$

The next step is to pin down Y, S at the steady state. Plug Demand of capital (1.25) and budget constraint for households (1.26) above into (1.27), then the first equation for the (Y,S) space is derived.

$$[1 - \gamma (1 - \alpha + \alpha\delta)] Y = SX \tag{1.33}$$

For the second equation for (Y,S) space, using (1.24)

$$L = \left(\frac{(1 - \alpha)Y}{S^{1-\gamma}} \right)^{\frac{1}{\chi}} \tag{1.34}$$

And from production function,

$$\begin{aligned} K &= \left(\frac{Y}{AL^{1-\alpha}} \right)^{\frac{1}{\alpha}} \\ &= \left(\frac{Y}{A} \right)^{\frac{1}{\alpha}} \left(\frac{(1 - \alpha)Y}{S^{1-\gamma}} \right)^{\frac{\alpha-1}{\alpha\chi}} \end{aligned}$$

Then plug this equation into (1.25),

$$\alpha Y = (1 + r)(1 + \eta) S^{1-\gamma} \left(\frac{Y}{A} \right)^{\frac{1}{\alpha}} \left(\frac{(1 - \alpha)Y}{S^{1-\gamma}} \right)^{\frac{\alpha-1}{\alpha\chi}}$$

$$\frac{\alpha A^{\frac{1}{\alpha}}}{(1+r)(1+\eta)}(1-\alpha)^{\frac{1-\alpha}{\alpha\chi}} = \left(S^{1-\gamma}\right)^{\frac{\alpha(\chi-1)+1}{\alpha\chi}} Y^{\frac{(\chi-1)(1-\alpha)}{\alpha\chi}} \tag{1.35}$$

Therefore, we can derive the steady state level of a pair (Y, S) using equation (1.33) and (1.35). It can be easily shown that (1.33) has a positive slope and (1.35) has a negative slope since χ is assumed to be greater than 1, therefore these two equations provide unique pair of solutions for (Y, S). The other variables can be easily derived. The composite price level Q is driven by equation (1.29), level of labor from (1.34), and capital for production can be derived from L and Y using production function.

1.2.8 Fixed Exchange Regime

In order to track dynamic behavior of main variables, I use log linearization for system of equations. All the lower case letters below with time subscript mean log linearization of the variables except denoted otherwise η'_{t+1} means the log linearization of $1 + \eta_{t+1}$. It is assumed that the economy remains in the steady states before the shock in the deferred wage occurs. Since the capital level when the shock occurs is in the steady state level, it is clear that $k_t = 0$. Then, log linearized version of production function can be denoted as

$$y_t = (1-\alpha)l_t. \tag{1.36}$$

Since the real exchange rate in the model can be defined as $E_t = S_t/P_t$, the linearized version of this can be denoted as $e_t = s_t - p_t$. Then, from the definition

of composite price, Q_t, the following equation is derived.

$$q_t - p_t = (1-\gamma)e_t \tag{1.37}$$

Since the labor is governed by the demand and supply of labor, the linearized version of labor is denoted as

$$l_t = \frac{1-\gamma}{1-\alpha-\chi}e_t + \frac{v}{(1-v)}\frac{1}{(1-\alpha-\chi)}v_t. \tag{1.38}$$

From this equation, the reader can easily find out that there is negative relationship between the real exchange rate and labor under the assumption that $\chi > 1$. This means that depreciation makes labor lower under any exchange rate regime. In additioin, it should be noted that the term for a deferred wage shock, v_t, affects labor negatively since the coefficient is negative. It should be reminded that a positive deferred wage shock means drop of wage in the current period. Since the marginal wealth from additional labor supply reduces while there is no change from marginal disutility of labor supply, the equilibrium level of labor will be less than the steady state level. Since the labor is denoted as a function of real exchange rate, so is the output.

$$y_t = (1-\alpha)l_t = \frac{(1-\alpha)(1-\gamma)}{1-\alpha-\chi}e_t + \frac{v}{(1-v)}\frac{(1-\alpha)}{(1-\alpha-\chi)}v_t = \Phi e_t + \frac{v}{(1-v)}\frac{(1-\alpha)}{(1-\alpha-\chi)}v_t \tag{1.39}$$

The reader can easily find out that $\Phi < 0$. Therefore, the depreciation leads into lower final goods production in period t.

Using labor demand, equation (1.38), and the fact that $p_t = -e_t$ under the fixed regime, the linearized wage can be described as

$$w_{t,fix} = -\frac{1-\alpha\gamma-\chi}{1-\alpha-\chi}e_t - \frac{v}{(1-v)}\frac{\alpha}{(1-\alpha-\chi)}v_t. \tag{1.40}$$

The behavior of nominal wage per unit of labor depends on both real exchange rate and a deferred wage shock. Keeping in mind that $\chi > 1$, one can easily understand that nominal wage per labor is a negative function of real exchange rate and a positive function of a deferred wage shock. When we look into the behavior of total income, that is $w_t + l_t$, the meaning is clearer.

$$w_{t,fix} + l_t = (-1+\Phi)\, e_t + \frac{v}{(1-v)}\frac{(1-\alpha)}{(1-\alpha-\chi)}v_t. \tag{1.41}$$

With some simple rearrangement, it is possible to show that total labor income is a negative function of both real exchange rate and a deferred wage shock under the fixed regime. So when a positive deferred wage shock happens, total wage income will be below from the steady state level. In addition, the decrease of wage income is not only from direct effect of deferred wage shock, but also from indirect effect with depreciation.

Linearized version of equation (1.66) can be used for the response of consumption in households. Since it is derived that nominal wage and labor are functions of real exchange rate, the consumption is denoted as a function of real exchange rate and a deferred wage shock.

$$c_t = [\gamma + (1-v)(-1+\Phi)]\, e_t + v\frac{\chi}{1-\alpha-\chi}v_t = \mathbf{A}_{fix}e_t + v\frac{\chi}{1-\alpha-\chi}v_t \quad (1.42)$$

With the fact that Φ is negative and some mild restriction on parameters, consumption of household is a negative function of both real exchange rate and deferred wage shock.[5] Therefore, with a positive shock and increase of real exchange rate, consumption is lower than steady state level.

The next step is to follow final goods market using linearized equations to have IS curve. In order to track the relations, equation (1.66) is inserted into linearized version of equation (1.81) and can be rearranged into the following

$$(1-\lambda_2(1-v))\, y_t = \lambda_1(q_t + k_{t+1} - p_t) - \lambda_2 v v_t - \lambda_2 v p_t + (1-\lambda_1-\lambda_2)e_t \quad (1.43)$$

, where $\lambda_1 = \gamma QK/PY = \alpha\delta\gamma$ and $\lambda_2 = \gamma QC/PY = (1-\alpha)\gamma$ respectively. Using equation (1.39), (1.37), and the fact that $p_t = -e_t$ under the fixed regime, the equation (1.43) can be presented as a function of the real exchange rate and the capital level at the next period.

$$\Gamma_{fix}e_t = \lambda_1 k_{t+1} + \mathbf{C}_{IS}v_t \quad (1.44)$$

$$\Gamma_{fix} = \Phi - (\lambda_1+\lambda_2)(1-\gamma) - (1-\lambda_1-\lambda_2) - \lambda_2\mathbf{A}_{fix} < 0 \quad (1.45)$$

$$\mathbf{C}_{IS} = \frac{v}{(1-v)}\frac{(1-\alpha)}{(1-\alpha-\chi)}\left((1-v)\gamma\chi - 1\right) < 0 \quad (1.46)$$

[5]The restriction and sign of $\mathbf{A}_{fix}$ is discussed in appendix.

The reader may find out how the signs of Γ_{fix} and $\mathbf{C}_{IS}$ is derived with an assumption on parameters. Following those signs, the IS curve represented by the equation (1.44) has negative slope, and this curve moves upward when positive deferred wage shock occurs. The other function that covers another relationship between e_t and k_{t+1} is from following linearized equations.

$$\lambda_1(q_t + k_{t+1} - p_t - y_t) = \mathbf{B}_{fix} e_t + \mathbf{C}_{BP} v_t \tag{1.47}$$

$$\mathbf{B}_{fix} = (-1 + \Phi)\,(1 - \lambda_1 - \lambda_2(1 - v)) < 0 \tag{1.48}$$

$$\mathbf{C}_{BP} = (1 - \lambda_1 - \lambda_2(1 - v))\,\frac{v}{(1 - v)}\,\frac{(1 - \alpha)}{(1 - \alpha - \chi)} + \lambda_2 v \tag{1.49}$$

$$\eta'_{t+1} - \eta'_t = \mu\,[(q_t + k_{t+1} - p_t - y_t) + \psi\,[(e_t - \mathbb{E}_{t-1}e_t) - (y_t - \mathbb{E}_{t-1}y_t)]] \tag{1.50}$$

$$\eta'_{t+1} = -k_{t+1} + y_{t+1} - e_{t+1} + \gamma e_t \tag{1.51}$$

$$y_{t+1} - e_{t+1} = \zeta \eta'_{t+1} \tag{1.52}$$

Equation (1.47) is an rearranged version of equation (1.43), and the reader can easily find out that $\mathbf{B}_{fix}$ is negative from equation (1.48) as before. Equation (1.50) is derived from equation (1.14), (1.16), (1.17), and (1.18). the next equation (1.51) is a linearized version of equation (1.16). The last equation is from the saddle path stability, which can be found out from Appendix, where it can be seen ζ is

greater than zero and less than one. Taken the perfect foresight into consideration and $\eta_t' = 0$, the equations described above can be summarized into the following equation that governs the relationship between e_t and k_{t+1}.

$$\left[\gamma - (1-\zeta)\frac{\mu}{\lambda_1}\mathbf{B}_{fix}\right] e_t = k_{t+1} + (1-\zeta)\frac{\mu}{\lambda_1}\mathbf{C}_{BP} v_t \tag{1.53}$$

The coefficient of real exchange rate from the left handed side has positive sign because $\mathbf{B}_{fix} < 0$ and $0 < \zeta < 1$. Therefore the BP curve has positive slope and moves upward when there is a positive deferred wage shock, $v_t > 0$.

Both IS and BP curve moves upward when there is a positive deferred wage shock. Under the general situations of parameter values, it can be seen that IS curve goes higher in response to the shock. Therefore, it is easy to prove that both real exchange rate for the current period and capital for the next period increase as a result. Then, using the depreciation of real exchange rate, we can verify that labor and final goods production decrease. Considering that real exchange rate increases and product decreases, the level of wealth that will be used for the next period production by the capitalist also is reduced from equation (1.18). We can find out the behavior of risk premium using equation (1.17). Three factors affect the risk premium: real exchange rate, capital for the next period, and the remaining wealth. I have already proved that both real exchange rate and capital for the next period increases, and the remaining wealth decreases. Therefore, risk premium for the next period will increase.

1.2.9 Flexible Exchange Regime

Under the flexible exchange regime, the behavior of variables including production and labor are the same as those under the fixed exchange regime. The first difference is from nominal wage per a unit of labor.

$$w_{t,flex} = -\left(\frac{\alpha(1-\gamma)}{1-\alpha-\chi}\right)e_t - \frac{v}{(1-v)}\frac{\alpha}{(1-\alpha-\chi)}v_t \tag{1.54}$$

In addition, we need to see the behavior of wage income for the clear picture as before.

$$w_{t,flex} + l_t = \Phi e_t + \frac{v}{(1-v)}\frac{(1-\alpha)}{(1-\alpha-\chi)}v_t \tag{1.55}$$

It is clear that wage income under the flexible regime is a negative function of both real exchange rate and a deferred wage shock. The difference of wage income is from the assumption that $p_t = 0$ under the flexible regime. Comparing wage incomes for both exchange regimes, we can find out that depreciation makes nominal wage income decrease less under the flexible regime. Now using nominal wage income under flexible regime, it is possible to derive consumption.

$$c_{t,flex} = \left((1-v)\,\Phi - (1-\gamma)\right)e_t + v\frac{\chi}{1-\alpha-\chi}v_t = \mathbf{A}_{flex}e_t + v\frac{\chi}{1-\alpha-\chi}v_t \tag{1.56}$$

It is clear that the coefficient of real exchange rate in this equation is negative, so the combination of depreciation of real exchange rate and a positive shock leads into lower consumption than steady state level of consumption. Furthermore, comparison of coefficients in real exchange rate shows that slope under the fixed regime

is bigger than under the flexible regime, $0 > \mathbf{A}_{fix} > \mathbf{A}_{flex}$. That means the impact of depreciation in real exchange rate causes bigger drop in consumption under the flexible regime.

Deriving IS curve for the flexible regime is almost the same as the case under the fixed regime, except that $p_t = 0$ and nominal wage suggested above are used.

$$\Gamma_{flex} e_t = \lambda_1 k_{t+1} + \mathbf{C}_{IS} v_t \tag{1.57}$$

$$\Gamma_{flex} = \Phi - (\lambda_1 + \lambda_2)(1 - \gamma) - (1 - \lambda_1 - \lambda_2) - \lambda_2 \mathbf{A}_{flex} < 0 \tag{1.58}$$

The only difference between two IS curves is the coefficient of real exchange rate in the left handed side. It can be verified that $\Gamma_{fix} - \Gamma_{flex} = -v\lambda_2 < 0$, which means that the slope of IS curve is negative for both regimes and steeper under the flexible regime. In addition, the response from positive deferred wage shock is higher under the flexible regime sinced the difference of the coefficients for real exchange rates.

$$0 < \frac{\mathbf{C}_{IS}}{\Gamma_{fix}} v_t < \frac{\mathbf{C}_{IS}}{\Gamma_{flex}} v_t \tag{1.59}$$

The same equations are used for deriving BP curve for the flexible regime with the use of other assumption, that is $p_t = 0$. Due to the difference of definition of regimes, we can find out that there is a little difference in the BP curve as we can see in the IS curve.

$$\left[\gamma - (1 - \zeta)\frac{\mu}{\lambda_1}\mathbf{B}_{flex}\right] e_t = k_{t+1} + (1 - \zeta)\frac{\mu}{\lambda_1}\mathbf{C}_{BP} v_t \tag{1.60}$$

$$\mathbf{B}_{flex} = (-1 + \Phi)(1 - \lambda_1 - \lambda_2(1 - v)) + \lambda_2 v \tag{1.61}$$

As in the case of IS curve, the only difference is the coefficient of real exchange rate. We can verify that the difference of the coefficient under fixed regime from flexible regime is $\mathbf{B}_{fix} - \mathbf{B}_{flex} = -\lambda_2 v < 0$. As a result, the slope of BP curve under the flexible regime is positive and steeper than under the fixed regime.

1.2.10 Comparison between Exchange Regimes

Using IS and BP curves in each exchange regime, it is possible to find out analytical solutions of e_t and k_{t+1} as a function of a shock v_t. Figure A.1 presents how real exchange rate and capital changes when a positive deferred wage shock occurs in the economy. Both variables stay at the origin before the shock since they are at the steady state level. Both IS and BP curve moves upward with a shock, but IS curves move higher since it is more responsive to the shock. Furthermore, IS curve under the flexible regime moves higher than under the fixed regime due to the difference of coefficients. For BP curves, there are slight difference between the regimes. Therefore, the capital and real exchange rate changes higher under the flexible regime at the period when shock occurs. For the analytical solutions, the reader may find out in the appendix for the derivation of the inequality of real exchange rates.

Finally, it is possible to compare the response of risk premium under different exchange regimes. With perfect foresight and the fact that risk premium is at the

steady state, i.e. $\eta_t = 0$, equation (1.50) can be rearranged as a function of real exchange rate and deferred wage shock.

$$\eta'_{t+1} = \mu \left(q_t + k_{t+1} - p_t - y_t \right) \tag{1.62}$$

Now using equation (1.47) and the compatible equation for the flexible regime, then it is easy to derive the difference of risk premia between fixed and flexible regime.

$$\eta'_{t+1,fix} - \eta'_{t+1,flex} = \frac{\mu}{\lambda_1} \left[\mathbf{B}_{fix} e_{t,fix} - \mathbf{B}_{flex} e_{t,flex} \right] < 0 \tag{1.63}$$

The inequality in the equation is verified in the appendix. Therefore, the risk premium under the fixed regime is less than under the flexible regime.

The workhorse in this model that brings the difference between two exchange regime are combination of definition and composite price level. Following the assumptions of policies under exchange regimes, composite price level can be denoted differently as

$$q_{t,fix} = \gamma p_t + (1-\gamma) s_t = -\gamma e_{t,fix} < 0 \tag{1.64}$$

$$q_{t,flex} = \gamma p_t + (1-\gamma) s_t = (1-\gamma) e_{t,flex} > 0. \tag{1.65}$$

According to IS-BP analysis discussed above, both real exchange rates increase in response to the positive deferred wage shock. Since the amount of money that can be used in the current period is being reduced, the demand of final goods decrease. So, the relative price of domestic goods, which is the inverse of real exchange rate

should also decrease. Under the fixed regime, the price of domestic goods is the only variable that can be adjusted. Therefore, domestic price should decrease and so should composite price level. However, the price of foreign goods should be adjusted by moving upward under the flexible regime since domestic price is set to be constant. In consequence, the composite price level should increase under the flexible regime. Taking these results in composite price into consideration as well as the decrease of nominal wage income, the consumption drop must be less under the fixed regime. Since the consumption is lower under the flexible regime, the resources used for the next period capital production will be higher. This means the capitalist needs to borrow more money from abroad to finance investment. However, due to the drop of the production and depreciation, their remaining wealth is lower under the flexible regime. Those to forces leads into higher leverage ratio, and risk premium increases higher under the flexible regime.

1.3 Simulation

I set several parameters used in the model so that predictions of the model are empirically meaningful. For the parameters in the utility function, the coefficient of relative risk averse coefficient is set to 2 following Mendoza (1991). Also, χ (1 plus the inverse of the intratemporal elasticity of substitution in labor supply) is set to 2. I set the risk-free interest rate to 0.04 based on a 1-year constant maturity U.S. Treasury bill interest rate, and discount factor is set to the inverse of 1 plus risk-free interest rate. For composite consumption goods, share of home goods is

Table 1.2: Steady state parameter values for simulation

Parameter	Description	Value
α	Share of capital to output	0.35
δ	Proportion of income for the investment	0.92
v	Share of deferred wage from wage income	0.10
r	Risk-free interest rate	0.04
χ	Elasticity of labor	2
γ	Share of home goods in composite goods	0.6
A	Technology in production function	1
β	Discount factor	1/(1+r)
σ	Coefficient of risk averseness in utility	2
μ	Elasticity of the risk premium	0.02

set to 0.6 based on CCV. For the production function, technology coefficient is set to 1, which is widely accepted in previous literature. Capital's share in output in the production function is set to 0.35, in line with standard estimates.

I choose other variables based on the financial vulnerability case in CCV. They choose δ and μ to imply 400 basis points of risk premium and the leverage ratio as 1.2. Due to the structural difference in households, the suggested parameters cause a little bit different results in my results with the δ and μ. The risk premium at the steady state is set to 450 basis points and the leverage ration as 1.12.

The rest of the parameters that is important are the share of deferred wage from total revenue. The parameter is calculated from the enlisted companies in

Korean Stock Exchange in 2009 that clearly distinguish deferred wage from regular wage in the annual balance sheet in 2009. From that data, the ratio of deferred wage to total wage income is about 10% of conventional wage. The lower ratio of deferred wage to conventional wage does not change the main implication of the simulation results. Only the difference of variables such as risk premium between two exchange rate regimes is smaller.

The simulation results under a fixed regime can be seen from Figure A.2 for a positive deferred wage shock. As expected from dynamic analysis, the capital for the next period and real exchange rate is higher at the period when a positive deferred wage shock occurs. Depreciation of real exchange rate governs the behavior of nominal wage and output level of final goods. With depreciation and a positive shock for deferred wage share, the consumption is lower than steady state level as well when shock hits the economy. To turn our focus into financial sector, it should be noted that remaining wealth is lower than steady state level since output is reduced and real exchange rate increases. In addition, debt is above steady state level since capital is higher but remaining wealth is lower. In order to understand the behavior of risk premium, it is crucial to check the behavior of leverage ratio as in eq (1.17). The key variable governing the behavior of leverage ratio is the remaining wealth, N, which is reflected by eq (1.18). Considering the decrease of final goods production, increase of risk-free interest rate, the decrease of remaining wealth overwhelms relative increase of home goods price. As a result, the risk premium increases as well as leverage ratio. The same logic can be applied to the dynamics under the flexible regime. The only difference is the magitude of behaviors,

which is from distinctive response of wages from real exchange rateaccording to the exchange rate regimes.

Figure A.8 provide the comparisons in consumptions under each exchange rate regime. It is clear that both consumptions are lower than inital steady state level. However, the consumption under the fixed regime shows less deviation than under the flexible regime. At the next period, the consumption is higher under the flexible regime. This result is consistent since the deferred wage able to be used for the next period consumption is high from the shock. In summary, we can conclude that the volatility of consumption to a deferred wage shock is bigger under the flexible regime. In addition, it is expected that the utility will be lower under the flexible regime if it is assumed that utility is negatively affected by the volatility of consumption, as in Lahiri et al. (2007).[6]

In addition, the main difference from exchange regimes are from the dynamics of composite prices as discussed above. The reader may find out that the initial response of composite price to a positive deferred wage shock in Figure A.9. With increasing real exchange rates, the composite price under the fixed regime deviates downward from steady state level. However, the dynamics of composite price under the flexible regime jumps up in response to the shock.

For the comparison of risk premia according to the regime, Figure A.10 presents the difference according to the real shock. As expected from the result of log linearization, the risk premium under the fixed regime is lower than under the flexible

[6]It should be noted that the utility function used here does not contain volatility of consumption as a factor.

regime. Due to the sharp increase of capital and decrease of net wealth, the risk premium increases at the period when a deferred wage shock occurs. At the next period, the risk premium converges to the original steady state level with a lower speed since capital for the final goods production goes back to the steady state.

Taken this result into consideration, I checked the behaviors of risk premium with other shocks such as technology shock and world interest rate shock. It is assumed that there is a 10 % technology development in a single period for technology shock, and there is a 1 % increase in a single period for world interest rate shock. The reader can find out the results of impulse response for major variables in Figure A.4 to Figure A.7. To focus on the difference of risk premium under both exchange regime, Figure A.11 and A.12 are helpful. The result that the risk premium is lower under the fixed regime does not change at all for the other shocks. In addition, the difference of risk premium is the biggest when there is a technology shock. The risk premium under the fixed regime with technology shock seems to be quite smaller than under the flexible regime.

1.4 Extension

Considering the assumption that the households do not have foreign assets is quite strict, it is loosened by assuming there are some fixed share of households holding foreign assets, which is called trader following the terminology from Lahiri et al. (2007). Under this set-up, I can prove that the result from above does not change even though there are some asset traders in the model. For the households

who do not have an access to the asset market, who are called Non-trader, denoted by NT, the maximization problem is the same as the households analyzed in section 1.2.3. Hence, it is used with superscript NT for the equilibrium level of labor supply, deferred wage, and consumption equations to obtain:

$$C_t^{NT} = \frac{M_t^{NT} + (1 - v_t) w_t L_t^{NT}}{Q_t} \tag{1.66}$$

$$(1 - v_t) w_t = Q_t \left(L_t^{NT}\right)^{\chi - 1} \tag{1.67}$$

1.4.1 Trader

Trader goes to the asset market before production begins and adjust money holdings with deferred wage received at the end of the last period, transfer from governments, and foreign asset holdings.

$$\hat{M}_t^T = M_t^T + S_t \left(1 + r_t\right) f_t - S_t f_{t+1} + \frac{T_t}{\lambda} \tag{1.68}$$

where f_t is foreign riskless bond, and T_t means transfer from government. It is noted that only traders can join the asset market so the transfer from government is applied to only traders. Therefore, the amount of transfer is adjusted by the measure of traders, λ.

Trader is also governed by Cash-In-Advance constraint.

$$\hat{M}_t^T + (1 - v_t) w_t L_t^T = P_t C_{H,t}^T + S_t C_{F,t}^T \tag{1.69}$$

From (1.68) and (1.69),

$$M_t^T + \frac{T_t}{\lambda} + (1 - v_t) w_t L_t^T = P_t C_{H,t}^T + S_t C_{F,t}^T + S_t f_{t+1} - S_t \left(1 + r_t\right) f_t \tag{1.70}$$

At the end of the period, deferred wage as a fraction of total revenue is provided to traders and this is used for the next period consumption. For the next period t+1,

$$M_{t+1}^T = v_t w_t L_t^T \tag{1.71}$$

Considering that $P_t C_{H,t}^T + S_t C_{F,t}^T = Q_t C_t^T$, The lagrangian will be

$$\begin{aligned}\mathcal{L} = \mathbf{E}_t \Bigg[& \sum_{s=t}^{\infty} \beta^{s-t} u\left(C_s^T, L_s\right) \\ & + \sum_{s=t}^{\infty} \beta^{s-t} \mu_s \left[M_s^T + \frac{T_t}{\lambda} + (1-v_t) w_t L_s^T - Q_s C_s^T + S_s f_{s+1} - S_s \left(1+r_s\right) f_s \right] \Bigg]\end{aligned} \tag{1.72}$$

First order conditions are as follows:

$$\left(C_t^T - \frac{1}{\chi} (L_t^T)^{\chi} \right)^{-\sigma} = \mu_t^T Q_t \tag{1.73}$$

$$\left(C_t^T - \frac{1}{\chi} (L_t^T)^{\chi} \right)^{-\sigma} (L_t^T)^{\chi-1} = \mu_t^T w_t \tag{1.74}$$

$$\mu_t^T S_t = \beta \mathbf{E}_t \{ \mu_{t+1}^T S_{t+1} \left(1 + r_{t+1}\right) \} \tag{1.75}$$

From (1.73) and (1.74),

$$w_t = Q_t (L_t^T)^{\chi-1} \tag{1.76}$$

This is labor supply function from traders. Since GHH utility function is assumed, the labor supply does not depend on wealth effect. Therefore, the labor supply of trader has the same functional form as that of non-trader described in (1.67).

The euler equation is derived from (1.73) and (1.75).

$$\frac{1}{\left(C_t^T - \frac{1}{\chi} L_t^{\chi} \right)^{\sigma}} = \beta \mathbf{E}_t \left[\left(1 + r_{t+1}\right) \frac{Q_t}{Q_{t+1}} \frac{S_{t+1}}{S_t} \frac{1}{\left(C_{t+1}^T - \frac{1}{\chi} L_{t+1}^{\chi} \right)^{\sigma}} \right] \tag{1.77}$$

This equation means that marginal utility of current period should be equal to that of next period when adjusted by price changes.

1.4.2 Government

Government can use various tools to stabilize economy under the different FX regimes. Under the fixed exchange regime, $S_t = \bar{S}$, it can use nominal money to balance the economy. Under the flexible exchange regime, There are two policy tools for government to follow: government can fix nominal money supply $M_t = \bar{M}$, or it can fix price of home goods $P_t = \bar{P}$, which is usually called inflation target policy. Under the constant nominal money supply, the change of the production level due to the exogenous shock will lead into the change of price level, so the amount of bonus that households will receive at the end of the period will be the same. In the case of inflation target policy, the change of output level will directly result in the change of bonus amount since the price never changes.

$$S_t h_{t+1} - (1 + r_t) S_t h_t + T_t = M_{t+1} - M_t \tag{1.78}$$

where h is foreign asset holdings.

For the next step, the behaviors of capitalist and final goods producers are the same as before, as defined in sections 1.2.4 and 1.2.5 respectively.

1.4.3 Equilibrium Condition

Since the trader in households is added in the model, the equilibrium conditions should be adjusted accordingly. Since the share of trader is assumed to be fixed at λ, money market clearing condition should be the sum of money from traders and non-traders:

$$M_t = \lambda M_t^T + (1-\lambda) M_t^{NT} \tag{1.79}$$

Also, since the labor supplies are from both households, the labor market clearing condition should be defined.

$$L_t = \lambda L_t^T + (1-\lambda) L_t^{NT} \tag{1.80}$$

Finally, home goods market clearing condition should be adjusted accordingly:

$$P_t Y_t = \gamma Q_t \left(K_{t+1} + \lambda C_t^T + (1-\lambda) C_t^{NT} \right) + S_t X \tag{1.81}$$

From deferred wage payment, it is possible to construct quantity theory equation.

$$M_{t+1} = \lambda M_{t+1}^T + (1-\lambda) M_{t+1}^{NT} = v_t w_t L_t = v_t (1-\alpha) P_t Y_t \tag{1.82}$$

From (1.70), (1.78), (1.82), and defining $g_t = h_t + \lambda f_t$, the flow constraint of the economy can be obtained:

$$\frac{g_{t+1}}{\lambda} - (1+r_t)\frac{g_t}{\lambda} = \frac{(\alpha v_t + (1-\alpha)) P_t Y_t}{S_t} - \frac{Q_t}{S_t} C_t^T + \left(\frac{1-\lambda}{\lambda}\right)\left(\frac{M_{t+1} - M_t}{S_t}\right) \tag{1.83}$$

Using this flow budget constraint and first order conditions, it is possible to

pick up the consumption level of traders. It should be noted that the last term of right handed side in (1.83) is the source of the redistribution of this economy, as suggested in Lahiri et al (2007). Since the deferred wage is the sole money in this economy at the end of the period, any change of money will belong to the trader from the participation of the asset market. As $\lambda \rightarrow 1$ meaning households are all asset holders, this term goes zero. This implies that this channel only exists when there is an asset market segmentation.

In this extension with exogenously segmented asset market model, the reader may find out that the same logic applies for the real variable movements. As you can find out from Figure A.15, the responses of composite price differ in direction between exchange regime, and so does the wealth effect. As a result, it can be seen that the risk premia under the fixed regime is lower than under the flexible regime in Figure A.16.[7]

1.5 Data

The main focus is to check if there is any difference in risk premium according to exchange rate regimes. In order to check if there is any difference of risk premium under various exchange rate regimes, I include dummy variables for exchange rate regimes as explanatory variables except flexible regime. One of the problems that arose when the CCV model was adopted was data availability. Since the CCV model assumes the default possibility of individual capitalist, it is consistent to use

[7]In order to handle unit root problem in the model, I used endogenous discount factor in simulating the extension model with asset holder.

firm level data in the empirical study suggested above. However, data availability problems arise when the firm level behavior is analyzed. First, it is extremely difficult to discover firms in developing countries that have regularly issue U.S. dollar denominated bonds. Second, even though some firms in developing countries issued foreign currency denominated bonds, the issue size of bond issued are so small that the financial market for firm level bonds are not well developed. On the other hand, the firm should have high (at least investment grade level) grades from credit rating companies. This may cause some bias in profitability distribution. Finally, the reader may think of Credit Default Swap (CDS) market data to overcome this problem. Unfortunately, the time series of CDS data for firm level have been too short until now[8]. Considering all the restrictions related to using micro-level data to obtain risk premium, it is still widely accepted to use risk premium from government issues bonds.

Here, I provide detailed information for the variables used in the model. In order to check the relation between risk premium of developing countries and exchange regimes, I use the EMBIG+ index spread from J.P. Morgan for 34 countries on a quarterly basis. The time periods of the data are from 1998 to 2007. Since the risk premium used here is unbalanced panel data set, Perron type unit root test for unbalanced panel data is used to check the possibility of unit root process. The null hypothesis that all the panel data follow unit root is rejected with 95 percent

[8]For instance, CDS for Samsung electronics and POSCO in Korea are available from November 2004, and LG electronics from May 2007 while CDS for Korea government bonds is available from April 2002. This data was obtained from Bloomberg terminal.

of confidence interval. However, this test is not perfect since it does not provide the evidence that the time series for each country does not follow unit root process. Therefore, I use both the level and the lag difference as a dependent variables. Since our interest in on the relation of impact on risk premium, lag difference is a better proxy than the level itself.

Other than risk premia, the classification of the exchange rate regime is the most important variables. To define each country's exchange rate regime, I use the coarse classification from Reinhart and Rogoff (2004)[9]. This classification is based on actual behavior of exchange rates rather than the declaration of the governments. The choice of regime classification is important because the actual behavior of the exchange rate can be different from what the governments announce. Even though a country label its exchange regime as "flexible", it can use its power to intervene in the exchange rate market so that the exchange rate does not move flexibly as expected. Furthermore, Reinhart distinguishes crises periods by adding a class called "free falling", so that the analysis based on their classification can be clear without any potential distortion from crisis.

In order to clarify the relations of risk premia and exchange rate regimes, it is essential to study the extent to which economic and financial variables explain the

[9]In the case of developing countries, there are relatively small number of countries that do not intervene in the foreign exchange market. Those countries are in general classified as "managed floating" by Reinhart and Rogoff (2004). Since there are a relatively small number of countries classified as "floating", I combined these two classification as "flexible" regimes. This changes little in the regression results.

variation of risk premia. Explanatory variables used for the purpose of controlling risk premia can be divided into two groups, domestic and global. In the domestic group, local stock index, government efficiency index, GDP per capita, real GDP growth, external debt, short term debt, and reserves are included. On the other hand, U.S. bond price, regional risk premia, PER of U.S. market, spreads for investment grade bond, high yield bonds' spread, term premium of U.S. bond, and volatility of U.S. stock market are included as global economic variables. Details about these variables are presented in the Appendix.

For domestic economic environments, debt related variables are considered indispensable for potential event of defaults, which is clearly described in various previous works such as Kaminsky and Reinhart (1997). In this regard, the ratio of external debt to GNI and short term debt to reserves are included in the explanatory variables. Also, reserves holding should be considered to check the capacity of repayment of foreign debt. Since the capacity of repayment is related to the level of debt, the ratio of reserves to external debt is included as an explanatory variable. From the perspective of capital flows to clear debts, the ratio of trade balance to GDP is adopted. In addition to these debt related variables, there are a lot of financial and economic forces that may impact the risk premia. To capture the state of economy, I include the local stock index denominated on local currency, GDP per capita, and real GDP growth. Finally there may be some factors which are independent of economic situation and risk premia, but can effect both. To control this endogeneity issue, government efficiency index is used as explanatory variable.

It is equally important to review global economic environments as a factor that can cause developing countries to have trouble repaying the debt. International investors may be reluctant to lend money to developing countries because their commitments are questionable, but it should also be considered that investors will not invest since there may be more profitable (or risk reducing) options in the markets. This logic is denoted as "flight to quality" in the financial markets, which can be easily seen when the world economic situation is pessimistic.

As a stock market variable, the price-earning ratio of S&P 100 index is included. It should be noted that multiple stock related indices can cause multicollinear problem when included at the same time. When excess return of S&P 500 index is adopted to reflect the behavior of the equity market with PER of S&P 100 index, the correlation of those indices are higher than 0.9, and coefficients change drastically as diverse subsamples are applied. Therefore, only the PER of S&P index is chosen solely for the equity market behavior. For the bond market variation, I include the change in the five year constant maturity Treasury (CMT) bond yield. This index is included because it is one of the best proxies for the U.S. economic growth, and it is highly affected by the flight to quality issue.

To consider different behaviors of bond according to the bond grades, the spreads of U.S. investment-grade and high-yield corporate bonds are included as explanatory variables. The core concept of flight to quality is that the portfolio will be concentrated on safe assets when the economic environment is getting worse. In this situation, the spread of investment grade level bonds will be lower compared with high yield bonds. To include these indices is important especially since the

bond grade of developing countries are lower.

The contagion effect is another issue to be seriously considered in the empirical work. It is considered one of main factors in emerging market crises, especially in the Asian Crises of the late 1990s and a series of defaults in Latin American countries in early 2000s. To control this issue, I construct spreads of regional EMBIG+ based on geographical locations of Asia, Latin America, Europe, and others. For each country, the regional spreads are calculated as the average of the spreads of other countries in the same region. Following the logic of Longstaff et al. (2007), the changes of these regional spreads are regressed on the other explanatory variables and the residual is used as an explanatory variable. It should be noted that empirical work suggested here is different from Longstaff et al. (2007) since they make a regression based on country by country basis while I explore the regression for the panel that covers all the countries at the same time. Furthermore they included regional and global variables to check the contagion factor by constructing global spreads as the same way. However, when the two variables are included in the panel model, serious collinearity problem arise. When both indices are included in the regression model, the coefficients for regional spreads show opposite signs. So I chose regional spread as the only explanatory variables for representing contagion impact on risk premia.

Considering suggested controlling issues, the regression model is as follows:

$$\begin{aligned} RP_{i,t} =& \beta_1 + \beta_2 1(\text{FX = Fixed}) + \beta_3 1(\text{FX = Crawl}) + \beta_4 1(\text{FX = Free Falling}) \\ &+ \beta_5 1(\text{FX = Dual Rate}) + \beta' X + \mu_{i,t} \end{aligned}$$

In the equation, the dependent variable denoted by $RP_{i,t}$ is risk premium of country i at time t, and there are four dummy variables for exchange rate regime. X in the righted haned side of mean equation means the set of control variables, and $\mu_{i,t}$ is an error term. The reader may find out from Table 1.1 that the coefficient of risk premium is negative under the fixed regime after considering control variables which is explained in detail below. [10] From Table 1.1, it should be noted that the coefficient of risk premium under the fixed regime is significant on both level and difference regressions. Second, the coefficient for crawling regime do not show significance under the log difference regression model. Finally, under the unstable regimes such as free falling and dual rates, the regression results do not show consistency on the sign of the coefficients.

The reader can find the regression results in Table **??** for this equation. The most notable point that should be mentioned is that the risk premium is lower under fixed regime than flexible regime. This also applies to Crawling regimes. However, for other regimes such as free falling and dual rates risk premia are bigger than flexible regime. It is also worth mentioning that volatility also impact the risk premium. This result is interesting considering I already include regional risk spread to control the contagion effect. This can be treated as a market influence that is well known for the financial market data. Local variables related to external debts show significance and correct signs. Finally, there may exist some factors that affect on both risk premium and exchange regimes. To control this, the efficiency of government index from the World Bank is included in the model and shows that as

[10] The full results of the regressions can be found in the appendix.

a government is more efficient, risk premium is lower.

There are some observances that during the crisis periods the behaviors of economic variables are different from tranquil times. For instance, one might expect that risk premium is much volatile during the crisis periods so that this "irregular" movements of risk premium may affect to the result of this kind of regression. In order to explore this possibility, I run the regression by dropping out some crisis episodes. The result is presented in Table **??**. To be short, the coefficients for exchange rate regime dummies, especially for fixed regime, does not show big difference. Moreover, the magnitude of coefficient is generally bigger when the crisis episodes are dropped, and the biggest when the banking crisis episodes are excluded.

To check the consistency of this result, I change the risk premium from the EMBIG+ index to credit default swap for smaller size of countries and time periods. This data is obtained from the Bloomberg terminal, which provides the CDS data for 22 countries from the years 2000 to 2007. After the change of dependent variables, the regression results for the fixed and flexible regimes do not change much. From the independent variables, exchange rates are most important in this regression. Therefore, I change the real exchange rate into real effective exchange rate to verify the consistency, and the results do not show significant difference. In addition, there may be side effects from crises periods since the risk premia and exchange rate changes drastically. I included a dummy variable for the crisis periods as an explanatory variable, and conclude that there are little changes in the regression results.

1.6 Conclusion

It is widely accepted that the flexible exchange regime is preferred to the fixed regime against real shocks because the former insulate shock from real economy by quickly adjusting relative price level. Previous work concentrates on the issue of trade sector, such as slower import price transfer or heavily consuming foreign goods. I analyze this problem with the friction in the wage structure where there are two types of wages; a conventional wage available to the current period of consumption and a deferred wage that is paid at the end of the period. When a deferred wage shock occurs such that share of conventional wage decreases and that of deferred wage increases, the real exchange rate and capital used for the next period production is higher under the flexible exchange regime. Since the production in the current period can be defined as a negative function of real exchange rate, higher increase of real exchange rate leads into lower production in the period when a positive deferred wage shock occurs under the flexible exchange regime. Even though the production at the next period is higher under the flexible exchange regime, that does not cover initial loss of welfare at the current period. As a result, the fixed regime is preferred to the flexible regime thanks to lower volatility in consumption. In addition to facing sharp drop of production at the current period under the flexible regime as well as higher level of capital for the next period's production, the remaining wealth that will be used for the next period of capital production is further reduced. The reduce of remaining wealth, increase of real exchange rate, and a surge of capital for the next period lead into the increase of leverage ratio, which is

defined by value of money for capital production to own capital. Therefore, the risk premium under the flexible regime is higher. When I replace a deferred wage shock with other real shocks, such as technology shock and world interest rate shock, still the risk premium under the flexible regime is higher than under the fixed regime. The addition of the asset holders do not change these results with the assumption of exogenous segmented asset market.

There are some points that should be investigated further. Even though it was possible to distinguish among the exchange rate regimes in terms of the response ratio, the ratio itself is relatively small, compared with empirical data suggested. In addition, the difference between fixed regime and flexible regime with inflation target policy is small. Other factors such as openness of market can be a potential candidate for widening this response, which will be the issue of future research.

Chapter 2

The Impact of Macroeconomic Announcements on Real Time Foreign Exchange Rate in Emerging Markets

2.1 Introduction

Information transmission across foreign exchange markets has become a widely studied topic in the academic literature.[1] One strand of this literature focuses on the impact of macroeconomic data announcements on foreign exchange markets. Andersen et al. (2003) (ABDV (2003) hereafter) finds that news about macroeconomic fundamentals affect both conditional mean returns and volatilities of exchange rates for major currencies. Some other recent papers in this vein include Andersen et al. (2007), Dominguez and Panthaki (2006), Ehrmann and Fratzscher (2005), Fair (2003), Chaboud et al. (2004), Laakkonen (2004), and Faust et al.(2007). Evans and Lyons (2008) connects the impact of news in the FX market to order flows. Most existing studies have however been limited to major currencies exchange rates. The price discovery process and the information transmission mechanism in emerging economy foreign exchange markets have not yet been well understood.

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This paper is the first to focus on how U.S. and domestic macroeconomic announcements affect exchange rates in nine emerging markets: Czech Republic, Hungary, Indonesia, Korea, Mexico, Poland, South Africa, Thailand, and Turkey.[2] We construct a unique database that covers high frequency exchange rates for the nine emerging market economies from January 2, 2000 to December 31, 2006. The database is complemented by information from Consensus Forecast on market expectations for these exchange rates, and data from Bloomberg on market expectations for macroeconomic news and the actual announcement. Although similar databases have been studied for major currencies, this is the first time such data for emerging markets are utilized for economic research.

We try to address the following questions in this paper: (i) what macro news announcements move emerging market exchange rates? (ii) did emerging market currencies become more sensitive to news as government controls of foreign exchange (FX) markets have reportedly weakened in some of these countries? (iii) how does market sentiment affect the way emerging market currencies respond to news? and (iv) does uncertainty in the FX market affect how these currencies react to news?

We find that the answer to the first question depends on whether the news is about the U.S. or the emerging economies and varies across countries. Domestic macro news in emerging markets generally do not have significant effect on exchange rates, with the notable exception for Czech Republic. The set of U.S. macro news that moves major currencies significantly turns out to affect 6 out of 9 emerging

[2]Galati (2000) examines the relationship between trading volumes, volatility and bid-ask spreads in foreign exchange markets in 7 emerging economies, but does not measure the impact of news.

market currencies in the same direction in the sample. For the other three currencies, Mexican Peso also reacts to U.S. news significantly but almost always in the opposite direction, while the Thai baht and the Turkish lira rarely respond to U.S. news significantly.

We find evidence that exchange rates in emerging markets have become more sensitive to U.S. news in recent years, probably due to loosened government controls of the FX markets in some of these countries. This pattern is clear for most exchange rates in the sample except for Thailand, where the Thai bahts lack of reaction to news is persistent through out the sample. The other two Asian currencies, the Korean won and the Indonesian rupiah, used to be irresponsive foreign and domestic macro news in the early part of the sample, but became more influenced by U.S. news in recent years.

Do macro news have more effect on emerging market currencies when market sentiment is strong, i.e., investors expect the currencies to move substantially in one direction? The answer is yes. We find strong evidence across country and macro news that market reaction is reinforced by investors conviction on the direction of the emerging market currencies. The magnitude of this reinforcement effect is large. For instance, when investors expect the Indonesian rupiah to appreciate by 5 percent, the effect of news on non-farm payroll in the U.S. on the Indonesian rupiah became twice as much as when investors expect the Korean won to stay unchanged.

Does market uncertainty amplify or dampen the impact of news on exchange rates? The answer is ambiguous. While regressions show that market uncertainty dampens more news than it amplifies, the evidence is not overwhelmingly one-sided.

In some special cases, the effect of uncertainty on the same news differs across countries. Further analysis on this issue is necessary.

Our paper complements other studies on the impact of news on asset prices in emerging markets. Wongswan (2006) provides evidence of transmission of information from the U.S. and Japan to Korean and Thai equity markets. Using high-frequency intraday data, he finds a large and significant association between emerging-economy equity volatility and trading volume and developed-economy macroeconomic announcements at short time horizons. Andritzky, Bannister, and Tamirisa (2007) examine how emerging market bonds react to macroeconomic announcements and find that global bond spreads respond to rating actions and changes in U.S. interest rates rather than domestic data and policy announcements. Consistent with their studies, we find a significant impact of major U.S. macroeconomic news on emerging market currencies using high-frequency data. Compared with their papers, the innovations of our work are: (a) the longer sample of our data makes it possible to track the evolution of reactions to news in the emerging currency markets, and (b) the reaction of exchange rates to news is linked to market sentiment and uncertainty.

The rest of the paper proceeds as follows. Section 2 provides the description of the data. Section 3 presents the econometric specifications and the estimates of how news surprises affect exchange rate returns and volatility in the nine emerging markets. Section 4 shows how market forecasts and uncertainty interact with macro news and affect exchange rates in emerging markets. Section 5 concludes.

2.2 Data

2.2.1 Exchange Rate Data

The paper uses high-frequency exchange rate data for nine emerging markets, drawn from Olsen Financial Technologies. The data report exchange rates of the nine EM currencies versus U.S. dollar at 5-minute intervals. The full sample period is from January 2, 2000 to December 31, 2006, covering 2,557 days of bid-ask prices for each currency with two exceptions.[3] It should be noted that the dataset has quite many missing values, in particular for the earlier years. The number of non-missing values for bid and ask price of each countrys exchange rate is presented in Table A.10.[4]

Using bid-ask price quotes from the raw exchange rate data, we take the simple arithmetic average to get the middle price quote. Then we calculate 5-minute currency returns by taking log differences. We multiply the log differences of currency returns by 100 to obtain log currency returns. Following ABDV (2003), we exclude data on weekends and national holidays, since the quoted prices may have some bias based on low transaction volumes. First, we drop the period from

[3]For KRW/USD, January 2004 (31 days) data are not included. For TRY/USD, the sample period is from January 2, 2001 to December 31, 2006. The number of observations of high frequency FX data is 2,557 * 288 = 736,416 for Czech Republic, Hungary, Indonesia, Mexico, Poland, South Africa, and Thailand, 727,488 for Korea, and 631,008 for Turkey.

[4]We also estimate the same model with fully filled data using interpolation for missing values. The estimates with interpolated data show similar but a little bit weaker results compared with the results presented in this paper.

Friday 21:05 to Sunday 21:00 (local time) for weekends. Second, we drop national holidays in the U.S. and the nine emerging markets.

In order to check how the series of currency returns vary over time, we plot autocorrelations of the currency returns and its absolute value in Figures A.17 and A.18, respectively. The general pattern of the two figures is similar with what previous studies show for major currencies: the autocorrelations of currency returns are statistically significant in the short term, and decay fast; the autocorrelations of absolute returns are statistically significant in the short term and stay high persistently.

In addition, it should be taken into account that the exchange rate regimes in some emerging markets (such as Hungary, Poland, and Turkey), might have changed within the sample period (Table A.11). The Hungarian foreign exchange regime changed from a crawling peg to a pegged exchange rate within horizontal band in October 2001, and devalued on June 2003. For the Polish zloty, a crawling peg based on 55% of Euro and 45% of dollar changed into independent floating on April 2000. For the Turkish lira, many changes happened during the sample period due to the financial crisis in 2001. The regime changed from a crawling peg to independent floating on February 2001, and the New Turkish lira was introduced on 2005 and became a sole legal tender from January 1, 2006 with a conversion rate of YTL 1 = TL 1 million. We convert all previous TL quotes into YTL based on the conversion rate when calculating log returns of its exchange rate.

2.2.2 Actual and Predicted Economic Variables

We use economic forecast data from Bloomberg on various actual and predicted economic indices in the U.S. and nine emerging market countries.[5] Many economists and analysts in the financial markets who use Bloomberg submit their own forecasts to Bloomberg. However since such forecast data submission is voluntary, the number of the observations varies for each observation of economic index. For instance, 39 people submitted forecasts of the initial jobless claims in the U.S. that is published by the Department of Labor on January 5, 2008. Based on those forecasts, Bloomberg provides mean, median, maximum, and minimum values for each economic index. In some cases (mostly in emerging markets) the forecasts are based on the views from a small number of economists. We drop all forecasts that are based on views from fewer than 5 economists.

In Table A.3, we present the number of the observations for each variable used in the empirical analysis. There are 26 indices for the U.S. news, 12 for Hungary, 11 for Mexico and Poland, 9 for Turkey, 6 for South Africa, 5 for Korea and Thailand, and 4 for Indonesia. Since the unit of each economic index is different, we standardize the time series of each economic index by calculating the surprise as (actual number - forecasts) divided by its sample standard deviation

$$S_{kt} = \frac{A_{kt} - F_{kt}}{\hat{\sigma}_k} \tag{2.1}$$

[5]These forecasts of economic indices are easily obtained from ECO menu in the Bloomberg terminal by the country.

where A_{kt} is the actual announced value for economic index k at time t, F_{kt} is the mean of forecasts, and $\hat{\sigma}_k$ is sample standard deviation of $A_{kt} - F_{kt}$.

2.2.3 Foreign Exchange Forecasts

To measure market expectations on exchange rates, we use forecast data from Consensus Forecasts, which provides a simple arithmetic average of the forecasts for foreign exchange rates over 90 countries as well as major economic indices on a monthly or bimonthly basis.[6] The exact date when the survey is conducted is shown in the published data. We collect information on the survey date, spot rate on the survey date, sample average, maximum, minimum, and standard deviation of each exchange rate for the following 1, 3, 12 and 24 months. A variable is constructed to measure which direction the market anticipates the exchange rates move,

$$FXD_{i,d,t} = \frac{CFX_{i,d,t} - SFX_{i,t}}{SFX_{i,t}} \tag{2.2}$$

where $CFX_{i,d,t}$ is consensus forecast for country is exchange rate at day t for the next d months, and $SFX_{i,t}$ is the spot exchange rate on day t. If $FXD_{i,d,t}$ is positive, then market participants expect that local currency i will depreciate for next d months, and vice versa. In Appendix 3a, we provide summary statistics for *FXD*.

[6]Monthly forecasts for Asian economies are available for the full sample. For Latin American economies, monthly forecasts are available after May 2001, and bimonthly forecasts are available before. For other economies, only bimonthly forecasts are available.

2.3 Announcements and FX responses

2.3.1 Contemporaneous Effect from OLS Regression

We start by running an OLS regression

$$R_{i,t} = \beta_{i,k} S_{i,k,t} + \epsilon_{i,t} \tag{2.3}$$

where $R_{i,t}$ denotes 5-minute exchange rate returns from time t to time t+1 in country i, $S_{i,k,t}$ is the surprise of macroeconomic news k at time t in country i. The estimates are based on only those observations $(R_{i,t}, S_{i,k,t})$ such that an announcement was made at time t. This specification has the advantage of simplicity. The drawback is that it does not control for the potential dynamic feature of exchange rates and news, and does not correct for heteroskedastic disturbances in the error terms. We will move to a more sophisticated model in the next subsection that addresses these issues.

Table A.6 shows the estimates from these regressions. For comparison, we also examine the impact of U.S. news on the euro/dollar exchange rate. Three features stand out. First, exchange rates for South Africa and emerging markets in Europe react to many U.S. news in a similar way as major currencies do (as documented in previous literature), but many of the same news have little effect on currencies in Asia and Turkey. Second, most domestic macroeconomic news have no impact on EM exchange rates. Finally, the euro exchange rate responds to major U.S. news in a similar way to European emerging market currencies. We elaborate more on

these findings before moving to the more sophisticated specification.

In the case of U.S. news, positive surprises on consumer confidence, durable goods order, GDP, non-farm payroll, retail sales and trade balance lead to appreciation of the U.S. dollar and depreciation of EM currencies in Czech Republic, Hungary, Poland, and South Africa, with a few exceptions. This set of news is also found to be significant in ABDV (2003). New home sales turns out to be highly significant for emerging markets in Europe, reflecting the importance of the U.S. housing sector for the sample we study. On the other hand, very few U.S. news have significant impact on the Mexican, Turkish and Asian currencies. Of the 26 U.S. news we studied, only 3 show up significantly for Korea, 6 for Indonesia, 1 for Thailand, 3 for Mexico, and 2 for Turkey.

In contrast with the large number of significant U.S. news, few domestic news in emerging markets have a significant impact on their exchange rates. For Indonesia, Thailand, and Turkey, no domestic news are significant in the regressions. Even for Hungary and Poland where many U.S. news move exchange rates significantly, only one domestic news is significant in each country. Of the 14 cases where domestic news announcements move the exchange rates, 9 cases are related to domestic growth or external balance: the current account in Czech Republic and Poland, GDP in Czech Republic and Mexico, industrial production in Hungary, and the trade balance in Czech Republic, Mexico, and South Africa.

Given the long sample of the dataset, we can examine if exchange rates in emerging markets have become more sensitive to news in recent years. We estimate equation (2.3) using a two-year rolling window, and plot the point estimates of

$\beta_{i,k}$ over time. Charts in Figure 3 plot the significant estimates from such rolling regressions. Two patterns stand out. First, most EM currencies have become more sensitive to news in recent years than before. For instance, in Korea, few U.S. news had significant impact on the won before late 2002, while 4 out of 9 news are persistently significant in recent years. Thailand is an exception, where Thai baht barely reacts to any U.S. news throughout the whole sample.

Second, the fact that some news do not affect certain currencies cannot be explained by the lack of observations. In the later part of the sample, the numbers of observations for given U.S. news are fairly equal across countries. Yet, some currencies persistently react to news, while others seem to be irresponsive.

2.3.2 Contemporaneous Effect from Dynamic Regressions with Heteroskedasticity

We follow ABDV (2003) in their econometric specifications to include lag terms of currency returns and news, and control for heteroskedestic errors. First, we estimate a linear regression model based on I lags of 5-minute returns, and J lags for all the news surprises. We choose the lags I = 5 and J = 2 according to the Akaike Information Criteria and Schwartz Criteria.[7] The number of news surprises in the model is different for each country since that of the domestic news surprises is different.

[7]The exact AIC and BIC show different optimal number of lags across the countries. However, 6 of the sample countries showed that 5 lags of FX returns are good enough, whereas the other countries showed relatively small lags for FX returns.

$$R_t = \beta_0 + \sum_{i=1}^{I} \beta_i R_{t-i} + \sum_{k=1}^{K} \sum_{j=0}^{J} \beta_{kj} S_{k,t-j} + \epsilon_t \quad t = 1, \ldots, T. \tag{2.4}$$

$$|\hat{\epsilon}_t| = c + \psi \frac{\hat{\sigma}_{d(t)}}{\sqrt{288}} + \sum_{k=1}^{K} \sum_{j'=0}^{J'} \beta_{kj'} |S_{k,t-j'}| + \left(\sum_{q=1}^{Q} \left(\delta_q \cos\left(\frac{2q\pi t}{288} \right) + \phi_q \sin\left(\frac{2q\pi t}{288} \right) \right) \right) + \mu_t \tag{2.5}$$

As in ABDV (2003), the absolute value of the residual from equation (2.4) is modeled as the sum of three terms: daily volatility forecast to measure average volatility level during the day; the absolute value of news surprise including lags to assess the impact from the news; and the Fourier flexible form with trigonometric terms for the calendar effect. Equations (2.4) and (2.5) are estimated by 2-stage WLS. First, we run an OLS regression with equation (2.4). Then we estimate equation (2.5) to get a linear prediction of the absolute value of the residuals in equation (2.4). Finally, using the linear prediction from equation (2.5) as a weight, we perform a weighted least-squares estimation of equation (2.4).

It is necessary to be more specific on the independent variables used in equation (2.5). The daily level of volatility in the second term is based on the residual from the regression of GARCH (1,1) model using daily spot exchange rate returns from January 1, 1993 as described above in the data description. GARCH (1,1) models are generally used to extract predictions in high-frequency financial data in a wide variety of papers.

The third term represents the impact of news surprise on the volatility. In order to enhance tractability, we impose a polynomial specification on the response

patterns associated with $\beta_{kj'}$, as in ABDV (2003). This ensures that the response patterns related to the news surprise are determined by the restriction we provide on the specifications. Consider the general form of polynomials, $p(\tau) = c_0 + c_1\tau + \cdots + c_p\tau^p$, for $\tau = 0, 1, \ldots, J$. The restrictions we apply to this equation are J = 12, p = 3, and $p(J) = 0$. As a result, we have $p(\tau) = c_0\left[1 - (\tau/12)^3\right] + c_1\tau\left[1 - (\tau/12)^2\right] + c_2\tau^2\left[1 - (\tau/12)\right]$. Using this equation, we estimate three coefficients for each FX returns and each news surprise, and plug the fixed value from the estimation into the disturbance equation (2.5).

$$|\hat{\epsilon}_t| = c + \psi\frac{\hat{\sigma}_{d(t)}}{\sqrt{288}} + \sum_{k=1}^{K}\sum_{j'=0}^{J'}\eta_k\left[\hat{c}_0\left(1 - \left(\frac{j'}{12}\right)^3\right) + \hat{c}_1 j'\left(1 - \left(\frac{j'}{12}\right)^2\right) + \hat{c}_2(j')^2\left(1 - \left(\frac{j'}{12}\right)\right)\right]|S_k \tag{2.6}$$
$$+ \left(\sum_{q=1}^{Q}\left(\delta_q\cos\left(\frac{2q\pi t}{288}\right) + \phi_q\sin\left(\frac{2q\pi t}{288}\right)\right)\right) + \mu_t$$

The fourth term of Fourier series covers calendar effects in the model. AIC and Schwartz criteria suggest that Q = 4 is appropriate for the model, and it means that the seasonal pattern of intra-day trading quote is relatively smooth.

Table A.5 presents the estimates for a selected group of U.S. news. Compared with Table A.4, emerging market exchange rates react to U.S. news more consistently across countries. Currencies in Thailand and Turkey remain rather insensitive to most U.S. news. For the other 7 countries, all of the 9 major U.S. news have significant signs in the expected direction, with few exceptions. As in the OLS regressions, the Mexican pesos reaction to U.S. news remain mostly the opposite of those of other currencies.

The dynamic structure of this model allows us to estimate the persistence of news effects on exchange rates. The lagged variables of U.S. news surprises mostly show the same sign as the contemporaneous variables. There are some exceptions for news such as Nonfarm Payroll and Producer Prices, which show mean reversion effects across the time. However, the size of impact seems to decay as time goes by.

A complete table with all U.S. and domestic news is provided in Table A.14. Among domestic news surprises, the consumer price index and current account balance show significance for the contemporary FX impact across the countries. The trade balance and producer price also seem to be significant when lagged variables are considered. Major domestic macroeconomic news surprises in Eastern European countries also have a significant impact on their exchange rate returns. For the Czech Republic, the budget deficit, current account, consumer price index, exports, imports, industrial production index, producer price index, retail sales index, and trade balance are all significant in the model. The current account, consumer price index, and industrial production show significance in Hungary. And in Poland, the significant news surprises include current account, GDP, money supply, unemployment, and wholesale sales index. Along with European countries, exchange rate returns in South Africa are strongly responsive to domestic news surprises. Among the 6 domestic macroeconomic announcements we collect, the consumer price index, interest rate, money supply, and trade balance are all statistically significant. In Asian countries, nevertheless, the impact of domestic news surprises on exchange rate returns are somewhat smaller compared with that of the U.S. news surprises. Only one of the domestic news surprises in Thailand is significant in the estimation

model. None of the domestic news is significant in Indonesia and Korea.

2.3.3 Announcements and FX Volatility

In order to assess how the news surprises affect FX volatility, we compare contemporaneous coefficients with the sum of those across 12 lags (i.e., 60 minutes of time) used in the regression model suggested in equation (2.5). In this case, we concentrate on the 9 news surprises that are statistically significant for at least 6 countries in the current terms or more than 13 including additional 2 lags in equation (2.4).

It should be noted that we use equation (2.5) for the estimation, so the impact of the news surprise on the volatility should last until the next 60 minutes.[8] Results presented in the middle section of Table 3 suggest that several of the coefficients for news surprises in the volatility equation have statistical significance, although they tend to be smaller compared with the contemporaneous return response coefficients in the top panel. Only 7 of the coefficients for 7 countries excluding Thailand and Turkey are insignificant. Comparing the significance of coefficients in the conditional mean equation (2.4) with those of volatility equation (2.5), it can be seen that the news surprises provide more impact on volatility than on conditional mean of exchange rate. To summarize, 87.5% of 9 major economic news surprises in 9 countries which are statistically significant have a more prolonged impact on volatility for 60 minutes. The whole set of coefficients including contemporaneous and cumulated

[8]We can extend the time period for this estimation by assigning a bigger number for the time lag J than 12, however this may introduce other sources of volatility within the period.

coefficients are presented in Table A.14.

As shown in the bottom panel of Table A.5, the cumulative response of volatility is much larger than the contemporaneous volatility response, which is consistent with ABDV (2003)s finding that volatility adjusts to news surprises gradually. An alternative possibility is that the announcement itself can influence on FX market rather than the size of the news surprise. To check for this possibility, we include dummy variables that represent the announcement in both equation (2.4) and (2.5) such that the lags should be the same as news surprise. Then the equation model changes as follows:

$$R_t = \beta_0 + \sum_{i=1}^{I} \beta_i R_{t-i} + \sum_{k=1}^{K} \sum_{j=0}^{J} \beta_{kj} S_{k,t-j} + \sum_{k=1}^{K} \sum_{j=0}^{J} \theta_{kj} D_{k,t-j} + \epsilon_t \quad t = 1, \ldots, T. \tag{2.7}$$

$$|\hat{\epsilon}_t| = c + \psi \frac{\hat{\sigma}_{d(t)}}{\sqrt{288}} + \sum_{k=1}^{K} \sum_{j'=0}^{J'} \beta_{kj'} |S_{k,t-j'}| + \sum_{k=1}^{K} \sum_{j=0}^{J} \theta_{kj} D_{k,t-j} + \left(\sum_{q=1}^{Q} \left(\delta_q \cos\left(\frac{2q\pi t}{288} \right) + \phi_q \sin\left(\frac{2q\pi t}{288} \right) \right) \right) \tag{2.8}$$

As before, we present major 9 economic indices that show significant impact on FX markets across the countries in Table A.6. The set of all coefficients can also be found in Table A.6. In Table A.6, many major economic indicators seem to have an announcement effect on FX changes even after taking into account the news surprise impact. Furthermore, the announcement effects exist not only for FX returns but also for the volatility.

2.3.4 Testing for Asymmetry

We test if there is any asymmetry in the impact of the news surprises according to the sign. ABDV (2003) reports asymmetric response of US news in the case of major currencies. The long sample and the large number of currencies in our sample provide a good opportunity to check if such patterns also exist in emerging markets. First, we divide news surprises into two groups based on their signs, and estimating two equations below:

$$R_t = \begin{cases} \beta_{0k} S_{kt} + \beta_{1k} S_{kt}^2 + \epsilon_t & \text{if } S_t \leq 0 \\ \beta_{2k} S_{kt} + \beta_{3k} S_{kt}^2 + \epsilon_t & \text{if } S_t > 0 \end{cases} \tag{2.9}$$

With this estimation, we reconstruct the set of graphs that contain the fitted value on the vertical axis and the standard deviation of the news surprise in horizontal axis in Figure A.21 (using the average impact over all news surprises). There appear to be some differences between the two subgroups in our sample. To investigate this more formally, we try a modified equation to test if there is any asymmetry across the sign of the news surprise.

$$R_t = \beta_{0k} S_{kt} + \beta_{1k} S_{kt}^2 + D_{kt} \left(\beta_{2k} S_{kt} + \beta_{3k} S_{kt}^2 \right) + \epsilon_t \tag{2.10}$$

where D_{kt} denotes a dummy variable which takes the value 1 if the news surprise is positive, and the value of 0 if negative. To test for asymmetry, we define the null hypothesis such that FX returns have symmetry ($\beta_{2k} = 0$, and $\beta_{3k} = 0$) for major 9 economic indicators. The results of the test are presented below in Table A.7. Only 9 cases suggest that the symmetry hypothesis is rejected at 5%

significance, while 72 other cases cannot reject the symmetric null hypothesis.

This symmetric impact of news surprises on FX returns is in contrast with the findings in ABDV (2003). To look into the source of this difference, we repeat the regression above for euro. As it turns out, the euro responds to most U.S. news in a symmetric way as well in our sample, suggesting that the different findings between ours and ABDV (2003) come from the different sample periods rather than differences between emerging market currencies and major currencies.

2.4 Market Sentiment, Uncertainty, and Macroeconomic News

In this section, we examine the interaction between market sentiment on emerging market currencies and the exchange rate response to news surprises. For instance, if market participants expect that Korean won will depreciate in a near future as a consensus, then the news surprise that suggests the U.S. economy be stronger than expected may have a greater impact on returns of Korean won by making this currency depreciating more rapidly, and vice versa. Therefore, this case consists of two different expectational errors from market participants: a first error from news expectations, and a second error consisting of an FX forecast error. On the other hand, if we can think that the expectation of future appreciation or depreciation is related to the economic cycle in a country, then this approach may become the alternative way to assess symmetry in the impact described in the above section. We use the median value of 1-month-ahead FX forecasts from Consensus Forecasts as a proxy of market expectation of each currency.

We use an ordinary least square regression with some modification in equation (2.4), by adding an FX consensus variable multiplied by news surprises. If the hypothesis described above is true, then the coefficients on the interaction variable will be positive. The modified equation is as follows:

$$R_t = \beta_0 + \sum_{i=1}^{I} \beta_i R_{t-i} + \sum_{k=1}^{K} \sum_{j=0}^{J} \beta_{kj} S_{k,t-j} + \sum_{k=1}^{K} \sum_{j=0}^{J} \gamma_{kj} FXD_{d,t-j} S_{k,t-j} + \epsilon_t \quad t = 1, \ldots, T. \tag{2.11}$$

In Table A.8, we focus on 9 U.S. major economic indices discussed earlier. All the coefficients for variables used in this regression are presented in Appendix 6. The first part of the table presents coefficients for news surprises only, and the second part for FX forecasts (FXD) multiplied by the news surprises. Notably, many of the FX forecast-related coefficients show statistically significant and positive values, suggesting that market sentiment plays an important role in how news surprises move EM currencies. It acts as an amplifier when the market is pessimistic (optimistic) about the EM currencies and news surprises suggest stronger (weaker) U.S. economy. For instance, if market analysts think that the Czech Republic koruna will depreciate (appreciate) by 10% for next d months and the durable good orders data is 1 standard deviation higher (lower) than expected, then exchange rate returns will depreciate (appreciate) 2.2 basis points more than when no exchange rate change is expected for next d months.[9] On the other hand, when the EM currencies are under pressure to appreciate, positive sentiment for these currencies works as

[9]Since we multiply log difference of FX by 100 to increase the scale of coefficients, we need to divide by 100 again, so that the magnitude of the shock can be measured correctly.

a shock absorber against strong U.S. news. This evidence is consistent with the findings of Mian and Sankaraguruswamy (2008) that the stock market response to good (bad) news is greater during a high (low) sentiment period. One explanation for these results is investor overconfidence as documented in Barberis and Thaler (2003) and Hirshleifer (2001), i.e., investor are more likely to accept news that is in line with their prior beliefs and ignore information that is contradictory to their prior beliefs.

The accelerator effect of market sentiment provides a potential explanation why we find no evidence for asymmetry in EM currencies reaction to news as in ABDV (2003). EM currencies experience more ups-and-downs than major currency pairs. The long sample of our dataset contains both periods of market optimism and pessimism for each EM currency. Over the market sentiment cycle, this asymmetry might be averaged out. In contrast, ABDV (2003)s sample period covers one side of the business cycle, when market sentiment might be persistently one-sided as well.

We further test the effect of uncertainty on exchange rate response to news. The specification is

$$R_t = \beta_0 + \sum_{i=1}^{I} \beta_i R_{t-i} + \sum_{k=1}^{K} \sum_{j=0}^{J} \beta_{kj} S_{k,t-j} + \sum_{k=1}^{K} \gamma_k DISP_{d,t} S_{k,t} + \epsilon_t \quad t = 1, \ldots, T. \quad (2.12)$$

where *DISP* is a measure of market uncertainty defined by the dispersion of market forecasts for each EM currency. It is constructed as $DISP_{d,t} = |\frac{CFX^{high}_{d,t} - CFX^{low}_{d,t}}{SFX_t}|$, where $CFX^{high}_{d,t}$ denotes the maximum of FX forecasts at time t, and $CFX^{low}_{d,t}$ denotes the minimum of FX forecasts at time t (the summary statistics for DISP is presented

in Table A.13).

The role of market uncertainty in these regressions is not conclusive. The estimates are shown in Table A.9. Despite many significant estimates, the signs of the parameters for market uncertainty vary across country and across news. The diverse set of parameters leaves the regressions inconclusive. Nonetheless, the fact that market uncertainty shows significance in many regressions indicates it does have influence on how exchange rates react to news, but the channel of such influence is not yet well understood.

2.5 Conclusion

This paper documents some interesting features in the FX market for emerging market currencies. Except for Thailand and Turkey, whose currencies are not sensitive to news, the other 7 currencies show consistent reactions to news. First, U.S. news matters much more than domestic news. Second, currencies have become more sensitive in recent years than before. Third, market sentiment on these currencies plays an important role by swaying the impact of news surprises, i.e., good (bad) news matters more when optimism (pessimism) prevails. These finding are robust across countries and news we studied.

The role of uncertainty in FX market is also studied but is not fully explored. The significant yet inconclusive estimates indicate that its role could be state-dependent, and we are not yet able to capture what is the missing state variable. On the role of market sentiment, although we found significant and consistent

results for emerging markets, it is not clear if this is a unique phenomenon for emerging market currencies, or it also exists for major currencies and other financial assets. These are potential topics for future research.

Appendix A

Appendix

A.1 Data Description and Source

The list of 34 countries that are included in the regression (for EMBIG+) is as follows: Algeria, Argentina, Brazil, Bulgaria, Chile, China, Colombia, Cot'e di Voire, Croatia, Dominican Republic, Egypt, El Salvador, Greece, Hungary, Jamaica, Korea, Malaysia, Mexico, Morocco, Pakistan, Panama, Peru, Phillippines, Poland, Russia, Serbia, South Africa, Thailand, Tunisia, Turkey, Uruguay, Urkraine, Venezuela, Vietnam.

Foreign Exchange Rate: Monthly, End of period. From IFS. For consistence check, Real Effective Exchange Rate (REER) from OECD and BIS are used.

Rating : Moody's ratings, Long term dollar denominated bond (Government issued). From Bloomberg.

Stock index: Local index for each country. From Bloomberg. For some countries (Algeria, Cote di Voire, and El salvador) where local stock market index is not available, the regional MSCI Index is used.

Reserves: From IFS

US Treasury Bond 5 year maturity: From BEA

Regional/Global EMBIG (CDS): In the case of the region, I divide into 4 (Asia, Latin America, Europe, and Others). To construct regional EMBIG, the

simple average of countries' EMBIG (CDS) in the region is used except the applied country itself. For Global EMBIG (CDS), all the EMBIG (CDS) available excluding the applied region are used to make a simple mean. CDS from Bloomberg and EMBIG from J.P. Morgan.

S&P 100 Index PER: Price to Earning ratio of S&P 100 index. From Bloomberg.

Corporate Yield Spread in the U.S.: basis point spread between AAA and BBB- industrial bonds yields for investment grade, between BBB- and BB- for high yield bonds. Data from Bloomberg.

Term Premium: Based on Cochrane and Piazessi (2005), expected excess return on US treasury bonds can be estimated from linear function of forward rates with 1 to 5 year maturities. I reconstruct predicted excess return on 5 year maturity US Treasury bond.

External Debt, Short Term Debt: From World Bank Economic Policy and External Debt. For Hungary and Korea, Deutsche Bank estimates are used due to data availability.

A.2 Contract between capitalist and investors

Contracting Problem between Capitalist j and foreign lender

- j's net worth: $P_t N_t^j$
- dollar interest rate: $1 + r$
- prices in period t are known

- the period t+1 rental rate on capital in dollars R_{t+1}/S_{t+1} is known

Choice variable

- investment K_{t+1}^j
- dollar loan D_{t+1}^j
- repayment B_{t+1}

K_{t+1}^j yields $\omega_{t+1}^j K_{t+1}^j \frac{R_{t+1}}{S_{t+1}}$ next period. ω_{t+1}^j : random shock, iid across j and t with $E_t\{\omega_{t+1}^j\} = 1$, cannot be observed by lenders.

Monitoring cost $\zeta\omega_{t+1}^j K_{t+1}^j \left(\frac{R_{t+1}}{S_{t+1}}\right)$.

$\bar{\omega}$ is such that $B_{t+1} = \bar{\omega} K_{t+1}^j \left(\frac{R_{t+1}}{S_{t+1}}\right)$.

Payoffs for lenders and borrower.

$$\text{if } \omega^j \geq \bar{\omega}^j, \begin{cases} \text{lender:} & \bar{\omega}^j K_{t+1}^j \left(\frac{R_{t+1}}{S_{t+1}}\right) \\ \text{borrower:} & \omega_{t+1}^j K_{t+1}^j \left(\frac{R_{t+1}}{S_{t+1}}\right) - \bar{\omega}^j K_{t+1}^j \left(\frac{R_{t+1}}{S_{t+1}}\right) \end{cases}$$

$$\text{if } \omega^j < \bar{\omega}^j, \begin{cases} \text{lender:} & (1-\zeta)\,\omega_{t+1}^j K_{t+1}^j \left(\frac{R_{t+1}}{S_{t+1}}\right) \\ \text{borrower:} & 0 \text{ default} \end{cases}$$

Risk neutral lender: expected return should be $1 + r$.

$$K_{t+1}^j \left(\frac{R_{t+1}}{S_{t+1}}\right) \left[\bar{\omega}\left(1 - H(\bar{\omega})\right) + (1-\zeta)\int_0^{\bar{\omega}} \omega_{t+1}^j dH(\omega_{t+1}^j)\right] = (1+r)\, D_{t+1}^j = (1+r)\,\frac{Q_t K_{t+1}^j - P_t N_t^j}{S_t} \tag{A.1}$$

Capitalist's Budget constraint

$$P_t N_t + S_t D_{t+1} = Q_t K_{t+1} \tag{A.2}$$

Capitalist's Utility

$$\left[\int_{\bar{\omega}}^{\infty} \omega_{t+1}^{j} dH(\omega_{t+1}^{j}) - \bar{\omega}\left(1 - H(\bar{\omega})\right)\right]\left(\frac{R_{t+1}}{S_{t+1}}\right) K_{t+1}^{j} Q_t \tag{A.3}$$

Define ratio of the value of investment to net wealth.

$$\kappa_{j,t} = \frac{Q_t K_{t+1}}{P_t N_t^j} \tag{A.4}$$

Also, define risk premium.

$$1 + \eta_{t+1} = \frac{R_{t+1} S_t}{Q_t S_t \left(1 + r\right)} \tag{A.5}$$

Then, from (A.1),

$$\kappa_{j,t} - 1 = \left(1 + \eta_{t+1}\right)\kappa_{j,t}\left[\bar{\omega}\left(1 - H(\bar{\omega})\right) + \left(1 - \zeta\right)\int_{0}^{\bar{\omega}} \omega_{t+1}^{j} dH(\omega_{t+1}^{j})\right] \tag{A.6}$$

Utility function (A.3) using known variables at period t is

$$\left[\int_{\bar{\omega}}^{\infty} \omega_{t+1}^{j} dH(\omega_{t+1}^{j}) - \bar{\omega}\left(1 - H(\bar{\omega})\right)\right]\kappa_{j,t}\left(1 + \eta_{t+1}\right) \tag{A.7}$$

Now, construct maximization problem using (A.7) and (A.6).

$$\max_{\kappa_{j,t},\bar{\omega}} \left[\int_{\bar{\omega}}^{\infty} \omega_{t+1}^{j} dH(\omega_{t+1}^{j}) - \bar{\omega}\left(1 - H(\bar{\omega})\right)\right]\kappa_{j,t}\left(1 + \eta_{t+1}\right)$$

$$\text{s.t. } \kappa_{j,t} - 1 = \left(1 + \eta_{t+1}\right)\kappa_{j,t}\left[\bar{\omega}\left(1 - H(\bar{\omega})\right) + \left(1 - \zeta\right)\int_{0}^{\bar{\omega}} \omega_{t+1}^{j} dH(\omega_{t+1}^{j})\right]$$

Define the followings for the convenience of calculation.

$\Gamma(\bar{\omega})$: expected gross share of profits going to the lender

$$\Gamma(\bar{\omega}) = \int_{0}^{\bar{\omega}} \omega_{t+1}^{j} dH(\omega_{t+1}^{j}) + \bar{\omega}\int_{\bar{\omega}}^{\infty} dH(\omega_{t+1}^{j})$$

$$1 - \Gamma(\bar{\omega}) = \int_{\bar{\omega}}^{\infty} \omega_{t+1}^{j} dH(\omega_{t+1}^{j}) - \bar{\omega}\left(1 - H(\bar{\omega})\right)$$

$$\Gamma'(\bar{\omega}) = 1 - H(\bar{\omega})$$

$$\Gamma''(\bar{\omega}) = -h(\bar{\omega})$$

$\zeta G(\bar{\omega})$: expected monitoring cost

$$\zeta G(\bar{\omega}) = \zeta \int_0^{\infty} \omega_{t+1}^j dH(\omega_{t+1}^j)$$

$$\zeta G'(\bar{\omega}) = \zeta \bar{\omega} h(\bar{\omega})$$

Then, maximization problem can be rewritten.

$$\max_{\kappa_{j,t}, \bar{\omega}} (1 - \Gamma(\bar{\omega})) \kappa_{j,t} (1 + \eta_{t+1})$$

$$\text{s.t. } \kappa_{j,t} - 1 = (1 + \eta_{t+1}) \kappa_{j,t} [\Gamma(\bar{\omega}) - \zeta G(\bar{\omega})]$$

First order conditions

$$(\bar{\omega}): \quad \Gamma'(\bar{\omega}) - \lambda [\Gamma'(\bar{\omega}) - \zeta G'(\bar{\omega})] = 0$$

$$(\kappa): \quad (1 - \Gamma(\bar{\omega})) (1 + \eta) + \lambda \{ [\Gamma(\bar{\omega}) - \zeta G(\bar{\omega})] (1 + \eta) - 1 \} = 0$$

$$(\lambda): \quad [\Gamma(\bar{\omega}) - \zeta G(\bar{\omega})] (1 + \eta) \kappa - \kappa + 1 = 0$$

Then, from Bernanke et al.(1999), it is shown that the ratio of the value of investment to net wealth, κ, and risk premium is is an increasing function of $\bar{\omega}$.

$$\kappa_{j,t} = \Psi(\bar{\omega})$$

$$1 + \eta_{t+1} = \rho(\bar{\omega})$$

Therefore, we can construct the relation between κ and risk premium.

$$1 + \eta_{t+1} = \rho \left(\Psi^{-1} (\kappa_{j,t}) \right) = \rho \left(\Psi^{-1} \left(\frac{Q_t K_{t+1}}{P_t N_t} \right) \right) \equiv F \left(\frac{Q_t K_{t+1}}{P_t N_t} \right) \tag{A.8}$$

where $F(\cdot)$ is an increasing function.

A.3 The signs of Major Variables in Linearization

For $\mathbf{A}_{fix}$:

$$\begin{aligned}\mathbf{A}_{fix} &= \gamma + (1-v)(-1+\Phi) \\ &= \gamma + (1-v)\frac{\chi-(1-\alpha)\gamma}{1-\alpha-\chi} \\ &= \frac{1}{1-\alpha-\chi}\left[v\gamma(1-\alpha)+(1-v-\gamma)\chi\right]\end{aligned}$$

Therefore, $\mathbf{A}_{fix} < 0$ is and only if $(1-v-\gamma) > -\frac{v\gamma(1-\alpha)}{\chi}$. Stronger assumption in this case is $1-v-\gamma > 0$, but the parameters suggested in the simulation satisfy this stronger assumption without any problem.

For $\mathbf{C}_{IS}$:

$$\begin{aligned}\mathbf{C}_{IS} &= \frac{v}{(1-v)}\frac{1}{(1-\alpha-\chi)}\left((1-v)\,\lambda_2\chi-(1-\alpha)\right) \\ &= \frac{v}{(1-v)}\frac{(1-\alpha)}{(1-\alpha-\chi)}\left((1-v)\,\gamma\chi-1\right)\end{aligned}$$

$\mathbf{C}_{IS} < 0$ if and only if $\left((1-v)\,\gamma\chi-1\right) > 0$. Also, the parameters used in the simulation satisfy this inequality.

For Γ_{fix}:

$$\begin{aligned}
\Gamma_{fix} &= \Phi - (\lambda_1 + \lambda_2)(1-\gamma) - (1 - \lambda_1 - \lambda_2) - \lambda_2 \mathbf{A}_{fix} \\
&= \Phi - \mathbf{A}_{fix} + \mathbf{A}_{fix} - (\lambda_1 + \lambda_2)(1-\gamma) - (1 - \lambda_1 - \lambda_2) - \lambda_2 \mathbf{A}_{fix} \\
&= v\Phi + (1 - v - \gamma) - (\lambda_1 + \lambda_2)(1-\gamma) - (1 - \lambda_1 - \lambda_2) + (1 - \lambda_2)\mathbf{A}_{fix} \\
&= v\Phi - \gamma(1 - \lambda_1 - \lambda_2) - v + (1 - \lambda_2)\mathbf{A}_{fix} \\
&< 0
\end{aligned}$$

For Γ_{flex}:

$$\begin{aligned}
\Gamma_{flex} &= \Phi - (\lambda_1 + \lambda_2)(1-\gamma) - (1 - \lambda_1 - \lambda_2) - \lambda_2 \mathbf{A}_{flex} \\
&= \Phi - \mathbf{A}_{flex} + \mathbf{A}_{flex} - (\lambda_1 + \lambda_2)(1-\gamma) - (1 - \lambda_1 - \lambda_2) - \lambda_2 \mathbf{A}_{flex} \\
&= v\Phi + (1 - \gamma) - (\lambda_1 + \lambda_2)(1-\gamma) - (1 - \lambda_1 - \lambda_2) + (1 - \lambda_2)\mathbf{A}_{flex} \\
&= v\Phi - (1 - \lambda_1 - \lambda_2)\gamma + (1 - \lambda_2)\mathbf{A}_{flex} \\
&< 0
\end{aligned}$$

For $\mathbf{C}_{BP}$:

$$\begin{aligned}
\mathbf{C}_{BP} &= \left[1 - \lambda_1 - \lambda_2 (1-v)\right] \frac{v}{1-v} \frac{(1-\alpha)}{(1-\alpha-\chi)} + \lambda_2 v \\
&= \left[1 - \lambda_1 - \lambda_2 (1-v) + (1-v)\gamma(1-\alpha-\chi)\right] \frac{\lambda_2 v}{(1-v)\gamma(1-\alpha-\chi)} \\
&= \left[1 - \gamma\chi(1-v) - \alpha\delta\gamma\right] \frac{\lambda_2 v}{(1-v)\gamma(1-\alpha-\chi)} \\
&> 0
\end{aligned}$$

The first two terms in the large bracket is negative according to the assumption used in $\mathbf{C}_{IS}$. Since the denumerator of the second term in the righted handed side is also negative, $\mathbf{C}_{BP}$ should be positive.

A.4 Convergence under Perfect Foresight

To examine convergence to the steady state, assume that there are no stochastic shocks affecting the system and that the situation is under the perfect foresight such that the expectation of the variable is the same as the variable itself. Based on equations (1.16), (1.17), and (1.81), the summarized linear equations are as follows:

$$q_t + k_{t+1} - p_t = y_{t+1} - \eta'_{t+1} - e_{t+1} + e_t \tag{A.9}$$

$$(1 - \lambda_2(1 - v))\, y_t = \lambda_1(q_t + k_{t+1} - p_t) - \lambda_2 v p_t + (1 - \lambda_1 - \lambda_2)e_t \tag{A.10}$$

$$\eta'_{t+1} - \eta'_t = \mu\,[q_t + k_{t+1} - p_t - y_t] \tag{A.11}$$

Now, plugging equation (A.9) into (A.10) and (A.11) leads into

$$\lambda_1 \eta'_{t+1} = \lambda_1(y_{t+1} - e_{t+1}) - (1 - \lambda_2(1 - v))(y_t - e_t) \tag{A.12}$$

$$\eta'_{t+1} - \eta'_t = \mu \left[\frac{1 - \lambda_1 - \lambda_2(1 - v)}{\lambda_1}\right](y_t - e_t). \tag{A.13}$$

By defining $z_t = y_t - e_t$, the dynamic system of three variables are turned into 2-variable dynamic equations, which is quite convenient to check the convergence. These two equations can be rearranged into

$$\lambda_1 \eta'_{t+1} = \lambda_1 z_{t+1} - (1 - \lambda_2(1 - v))z_t \tag{A.14}$$

$$\eta'_{t+1} = \mu \left[\frac{1 - \lambda_1 - \lambda_2(1 - v)}{\lambda_1} \right] z_t + \eta'_t. \tag{A.15}$$

Rewriting equations (A.14) and (A.15) into a matrix form leads us into

$$\begin{bmatrix} z_{t+1} \\ \eta'_{t+1} \end{bmatrix} = \Theta \begin{bmatrix} z_t \\ \eta'_t \end{bmatrix} \tag{A.16}$$

where

$$\Theta = \begin{bmatrix} \frac{1}{\lambda_1}\{(1 - \lambda_2(1 - v))(1 + \mu) - \mu\lambda_1\} & 1 \\ \mu\frac{1 - \lambda_1 - \lambda_2(1-v)}{\lambda_1} & 1 \end{bmatrix} \tag{A.17}$$

From this matrix, saddle path stability requires that one of the eigenvalues of Θ should be located inside the unit circle and the other should be outside the unit circle. Using trace and determinant of the matrix Θ, it is possible to check the sign of eigenvalues.

$$\mathrm{Tr}(\Theta) = \frac{1}{\lambda_1}\{(1 - \lambda_2(1 - v))(1 + \mu) - \mu\lambda_1\} + 1 > 1 \tag{A.18}$$

$$\mathrm{Det}(\Theta) = \frac{1}{\lambda_1}(1 - \lambda_2(1 - v)) > 0 \tag{A.19}$$

Since the trace and determinant of the matrix Θ is positive, all the eigenvalues should be real and positive. In order to check if there is any eigenvalue lesser than a unit, we should have to derive the analytic solution of eigenvalue, which is denoted by ζ.

$$\begin{aligned}\zeta =& \frac{1}{2}\Bigg[\frac{1}{\lambda_1}\{(1-\lambda_2(1-v))(1+\mu)-\mu\lambda_1\}+1 \\ & -\sqrt{\left(\frac{1}{\lambda_1}\{(1-\lambda_2(1-v))(1+\mu)-\mu\lambda_1\}+1\right)^2-4\left(\frac{1}{\lambda_1}(1-\lambda_2(1-v))\right)}\Bigg]\end{aligned}$$

Since the eigenvalue suggested above is lesser one, it should be less than one in order to satisfy the saddle path condition. That means the following condition must be satisfied:

$$\begin{aligned}&\frac{1}{\lambda_1}\{(1-\lambda_2(1-v))(1+\mu)-\mu\lambda_1\}+1 \\ &< 2+\sqrt{\left(\frac{1}{\lambda_1}\{(1-\lambda_2(1-v))(1+\mu)-\mu\lambda_1\}+1\right)^2-4\left(\frac{1}{\lambda_1}(1-\lambda_2(1-v))\right)}\end{aligned}$$

The reader may find out with ease that it is equivalent to the following inequality:

$$\mu\left(1-\lambda_1-\lambda_2(1-v)\right)>0 \tag{A.20}$$

, which is clear since $1-\lambda_1-\lambda_2>0$. In addition, it can be shown that $\frac{1}{\lambda_1}\left[(1-\lambda_2(1-v))(1+\mu)-\mu\lambda_1\right]-1>0$.

A.5 Analytical Solution for Real Exchange Rate

From IS and BP curve, it is possible to derive analytical solution of real exchange rate and capital as a function of a shock. In this section, I show the that the real exchange rate under the fixed regime at the shock is less than under the flexible regime. And using this result, it is verified that the risk premium under the fixed regime is also less than under the flexible regime.

Using IS and BP curve presented in the main body, the real exchange rate can be presented as follows:

$$e_{t,j} = \frac{-\lambda_1(1-\zeta)\frac{\mu}{\lambda_1}\mathbf{C}_{BP} + \mathbf{C}_{IS}}{\Gamma_j - \lambda_1\left[\gamma - (1-\zeta)\frac{\mu}{\lambda_1}\mathbf{B}_j\right]} v_t \equiv -\frac{\Omega}{\Lambda_j} \tag{A.21}$$

where $j = fix, flex$ denotes exchange regimes. Furthermore, Ω is positive considering the fact that $\mathbf{C}_{BP} > 0$ and $\mathbf{C}_{IS} < 0$. In addition, Λ_j is negative since $\Gamma_j < 0$ and $\mathbf{B}_j < 0$.

Now, remind that $\Gamma_{fix} - \Gamma_{flex} = -\lambda_2 v < 0$ and $\mathbf{B}_{fix} - \mathbf{B}_{flex} = -\lambda_2 v < 0$. Then it is possible to derive the relationship between Λ's.

$$\begin{aligned}
\Lambda_{fix} &= \Gamma_{fix} - \lambda_1\left[\gamma - (1-\zeta)\frac{\mu}{\lambda_1}\mathbf{B}_{fix}\right] \\
&= \Gamma_{flex} - \lambda_2 v - \lambda_1\left[\gamma - (1-\zeta)\frac{\mu}{\lambda_1}(\mathbf{B}_{flex} - \lambda_2 v)\right] \\
&= \Lambda_{flex} - \lambda_2 v\left(1 + \lambda_1(1-\zeta)\frac{\mu}{\lambda_1}\right)
\end{aligned}$$

Then, it is easy to find out that $\Lambda_{fix} < \Lambda_{flex} < 0$. Therefore, the following inequality is satisfied:

$$0 < e_{t,fix} = -\frac{\Omega}{\Lambda_{fix}} < -\frac{\Omega}{\Lambda_{flex}} = e_{t,flex}$$

This inequality proves that real exchange rate under the fixed regime is less than under the flexible regime. The next step is to prove the inequlity of risk premia. Following equation (1.63), what needs to be verified is $\mathbf{B}_{fix}e_{t,fix} - \mathbf{B}_{flex}e_{t,flex} < 0$.

$$\begin{aligned}
&\mathbf{B}_{fix}e_{t,fix} - \mathbf{B}_{flex}e_{t,flex} \\
&\qquad = \frac{\Omega}{\Lambda_{fix}\Lambda_{flex}}\left(-\mathbf{B}_{fix}\Lambda_{flex} + \mathbf{B}_{flex}\Lambda_{fix}\right) \\
&\qquad = \frac{\Omega}{\Lambda_{fix}\Lambda_{flex}}\left[-\mathbf{B}_{fix}\Lambda_{flex} + \mathbf{B}_{flex}\left(\Lambda_{flex} - \lambda_2 v\left(1 + \lambda_1(1-\zeta)\frac{\mu}{\lambda_1}\right)\right)\right] \\
&\qquad = \frac{\Omega}{\Lambda_{fix}\Lambda_{flex}}\left[\Lambda_{flex}\lambda_2 v - \lambda_2 v\left(1 + \lambda_1(1-\zeta)\frac{\mu}{\lambda_1}\right)\mathbf{B}_{flex}\right] \\
&\qquad = \frac{\Omega}{\Lambda_{fix}\Lambda_{flex}}\lambda_2 v\left[\Gamma_{flex} - \mathbf{B}_{flex} - \lambda_1\gamma\right]
\end{aligned}$$

The last term in big bracket in the right handed side is as follows:

$$\begin{aligned}
&\Gamma_{flex} - \mathbf{B}_{flex} - \lambda_1\gamma \\
&\qquad = \Phi - (\lambda_1+\lambda_2)(1-\gamma) - (1-\lambda_1-\lambda_2) - \lambda_2\mathbf{A}_{flex} - [(-1+\Phi)(1-\lambda_1-\lambda_2(1-v)) + \lambda_2 v] - \\
&\qquad = -(\lambda_1+\lambda_2)(1-\gamma) - \lambda_2\mathbf{A}_{flex} + \Phi\left(\lambda_1 + \lambda_2(1-v)\right) - \lambda_1\gamma \\
&\qquad = \lambda_1(-1+\Phi) + \lambda_2\left((1-v)\Phi - (1-\gamma) - \mathbf{A}_{flex}\right) \\
&\qquad = \lambda_1(-1+\Phi) < 0
\end{aligned}$$

Now, it is easier to see the verification by summariization using two equations above.

$$
\begin{aligned}
&\eta'_{t+1,fix} - \eta'_{t+1,flex} \\
&\qquad = \frac{\mu}{\lambda_1}\left[\mathbf{B}_{fix}e_{t,fix} - \mathbf{B}_{flex}e_{t,flex}\right] \\
&\qquad = \frac{\mu}{\lambda_1}\frac{\Omega}{\Lambda_{fix}\Lambda_{flex}}\lambda_2 v\left[\Gamma_{flex} - \mathbf{B}_{flex} - \lambda_1\gamma\right] \\
&\qquad = \frac{\mu}{\lambda_1}\frac{\Omega}{\Lambda_{fix}\Lambda_{flex}}\lambda_2 v\lambda_1(-1+\Phi) < 0
\end{aligned}
$$

Therefore, $\eta'_{t+1,fix} < \eta'_{t+1,flex}$.

A.6 Tables

Table A.1: Regression During Tranquil Times

VARIABLES	Excluded Periods Based on[a] Currency Crisis	Sovereign Debt Crisis-Domestic	Sovereign Debt Crisis-External	Banking Crisis
PEG	-0.22***	-0.22***	-0.20***	-0.45***
	(0.00)	(0.00)	(0.00)	(0.00)
Crawling	-0.08	0.01	0.03	-0.07
	(0.15)	(0.85)	(0.52)	(0.25)
Free Falling		0.56***	0.35	
		(0.00)	(0.13)	
Dual Rates	0.52	0.29*	0.00	0.03
	(0.14)	(0.08)	(.)	(0.85)
US Tr 5 year	0.57***	0.30***	0.43***	0.40***
	(0.00)	(0.00)	(0.00)	(0.00)
Regional EMBIG	0.23***	0.25***	0.20***	0.26***
	(0.00)	(0.00)	(0.00)	(0.00)
S&P 100 PER	-0.07	-0.39***	-0.44***	-0.43**
	(0.67)	(0.00)	(0.00)	(0.01)
IG Spread	-0.07	0.09	0.14	0.04
	(0.58)	(0.46)	(0.23)	(0.74)
High Yield Spread	0.44***	0.30***	0.29***	0.32***
	(0.00)	(0.00)	(0.00)	(0.00)
Govt. efficiency	-0.84***	-0.69***	-0.68***	-0.85***
	(0.00)	(0.00)	(0.00)	(0.00)
TB/GDP	0.01	0.00	0.01	0.00
	(0.26)	(0.47)	(0.10)	(0.40)
Real GDP growth	1.18**	-1.18**	-1.93***	-0.63
	(0.02)	(0.01)	(0.00)	(0.26)
External Debt/GNI	0.35***	0.02	-0.05	-0.06
	(0.00)	(0.73)	(0.36)	(0.39)
StDebt/Res	0.02	-0.01	-0.02*	-0.01
	(0.13)	(0.59)	(0.05)	(0.24)
Res/External Debt	-0.17***	-0.28***	-0.26***	-0.32***
	(0.00)	(0.00)	(0.00)	(0.00)
Time trend	-0.02***	-0.02***	-0.02***	-0.02***
	(0.00)	(0.00)	(0.00)	(0.00)
Constant	5.17***	7.85***	8.32***	8.42***
	(0.00)	(0.00)	(0.00)	(0.00)
Observations	590	750	684	578
R-squared	0.720	0.702	0.697	0.735

*** p<0.01, ** p<0.05, * p<0.1

[a]The excluded periods based on classifications of crises are the periods of crisis ± 2 years.

Table A.2: Short History of Crises from 1997 to 2010

Crisis	Country	Year
Currency Crisis[a]	Turkey	1997,1998,1999,2000,2001,2008
	South Africa	1998,2000,2001,2008
	Argentina	2002
	Brazil	1999,2001,2002,2008
	Chile	2008
	Colombia	1997,1998,1999,2000,2002
	Dominican Republic	2002,2003
	Mexico	1998,2008
	Peru	1998
	Uruguay	1997,2001,2002
	Venezuela, Rep. Bol.	2002,2004,2010
	Egypt	2001,2003
	Korea	1997,2008
	Malaysia	1997
	Philippines	1997,2000
	Thailand	1997,2000
	Russia	1998,1999,2008
	Hungary	1997,1999
	Poland	1997,1999,2008
	Turkey	2001
	Argentina	2001,2002,2003,2004,2005
	Brazil	2002
Sovereign Debt Crisis-External[b]	Dominican Republic	2005
	Peru	1997
	Uruguay	2003
	Venezuela, Rep. Bol.	1997,2004,2005
	Russia	1997,1998,1999,2000

[a] An annual depreciation versus the US dollar (or the relevant anchor currency - historically the UK pound, the French franc, or the German DM and presently the euro) of 15 percent or more.

[b] A sovereign default is defined as the failure to meet a principal or interest payment on the due date (or within the specified grace period). The episodes also include instances where rescheduled debt is ultimately extinguished in terms less favorable than the original obligation.

Crisis	Country	Year
Sovereign Debt Crisis-Domestic[a]	Turkey	2001
	Argentina	2001,2002,2003,2004,2005,2007,2008,2009,2010
	Brazil	2002
	Dominican Republic	1997,1998,1999,2000,2001
	Venezuela, Rep. Bol.	1997,1998
	Russia	1998,1999
Banking Crisis[b]	Turkey	2000
	Argentina	2001,2002,2003
	Brazil	1997
	Colombia	1998,1999
	Dominican Republic	2003
	Mexico	1997,1998,1999,2000
	Peru	1999
	Uruguay	2002
	Korea	1997,1998,1999,2000,2001,2002
	Malaysia	1997,1998,1999,2000,2001
	Philippines	1997,1998,1999,2000,2001
	Thailand	1997,1998,1999,2000,2001
	Russia	1998,2008,2009
	China	1997,1998,1999
	Hungary	2008,2009,2010

[a]The definition given above for external debt applies. In addition, domestic debt crises have involved the freezing of bank deposits and or forcible conversion of such deposits from dollars to local currency.

[b]A banking crisis is marked by two types of events: (1) bank runs that lead to the closure, merging or takeover by the public sector of one or more financial institutions; and (2) if there are no runs, the closure, merging, takeover, or large-scale government assistance of an important financial institution (or group of institutions), that marks the start of a string of similar outcomes for other financial institutions.

Table A.3: U.S. and National News Announcements

	News Announcements	Source	No of Obs	Start Date	Final Date	Time[a]
	United States					
1	Business Inventories[b]	US treasury	83	14-Jan-00	13-Dec-06	15:00
2	Budget Deficit[c]	BEA	83	21-Jan-00	12-Dec-06	19:00
3	Current Account[d]	Federal reserve	27	15-Mar-00	18-Dec-06	13:30
4	Capacity Utilization[e]	Conference board	70	14-Jan-00	15-Dec-06	14:15
5	Consumer Confidence	Federal reserve	84	25-Jan-00	28-Dec-06	15:00
6	Consumer Credit	Census	84	7-Jan-00	7-Dec-06	20:00
7	Construction Spending	BLS	84	4-Jan-00	1-Dec-06	15:00
8	Consumer Price Index[f]	Census	82	18-Feb-00	15-Dec-06	13:30
9	Durable Goods Orders	Census	84	27-Jan-00	22-Dec-06	13:30
10	Factory Orders	BEA	84	5-Jan-00	5-Dec-06	15:00
11	Gross Domestic Product	dept of commerce	84	28-Jan-00	21-Dec-06	13:30
12	Housing Starts[g]	BLS	83	19-Jan-00	19-Dec-06	13:30
13	Imports[h]	Federal reserve	80	12-Jan-00	14-Dec-06	13:30
14	Interest rate (FOMC)	Federal reserve	56	2-Feb-00	12-Dec-06	19:15
15	Industrial production[i]	ISM	84	14-Jan-00	15-Dec-06	14:15
16	NAPM	Conference board	84	3-Jan-00	1-Dec-06	15:00
17	Leading Indicators[j]	Census	83	2-Feb-00	21-Dec-06	15:00
18	New Home Sales[k]	BLS	84	6-Jan-00	27-Dec-06	15:00
19	Nonfarm Payroll Employment	BEA	84	7-Jan-00	8-Dec-06	13:30
20	Personal Spending	dept of commerce	60	31-Jan-02	22-Dec-06	13:30
21	Personal Income	BLS	84	31-Jan-00	22-Dec-06	13:30
22	Producer Price	Census	84	13-Jan-00	19-Dec-06	13:30
23	Retail Sales[l]	Census	83	13-Jan-00	13-Dec-06	13:30
24	Trade Balance	dept. of Labor	84	20-Jan-00	12-Dec-06	13:30
25	Initial Unemployment[m]	Census	363	6-Jan-00	28-Dec-06	13:30
26	Wholesales	Census	84	11-Jan-00	11-Dec-06	15:00

[a] The time presented in this table is based on GMT time.

[b] 3/04 is a missing observation.

[c] 3/04 is a missing observation.

[d] 1^{st} Quarter of 04 is a missing observation.

[e] 1/01~11/01, 8/02,3/04, 8/04 are missing observations.

[f] 1/00, 8/04 are missing observations.

[g] 8/04 are missing observation.

[h] 3/00, 4/01, 10/01, and 3/04 are missing observations.

[i] 3/04 and 8/04 are missing observations. 9/06 and 12/06 have revisited observations.

[j] 8/04 is a missing observation.

[k] 1/01 has a revised observation. 1/04 is a missing observation.

[l] 3/04 is a missing observation.

[m] 8/21/2004 and 3/13/2004 are missing observations.

	News Announcements	Source	No. of Obs	Start Date	Final Date	Time
	Czech Republic					
27	Budget Deficit[a]	MoF	15	2-May-00	1-Apr-05	13:00
28	Current Account[b]	CNB	42	16-Jun-03	13-Dec-06	9:00
29	Current Account(US Dollar)[c]	CNB	13	5-Jun-01	6-Sep-05	8:00
30	Consumer Price Index	CSO	84	10-Jan-00	8-Dec-06	8:00
31	Exports[d]	CSO	15	23-Jun-03	3-Jun-05	7:00
32	Gross Domestic Product	CSO	29	22-Mar-00	8-Dec-06	8:00
33	Imports[e]	CSO	31	21-Jan-00	3-Jun-05	7:00
34	Industrial production[f]	CSO	82	11-Jan-00	12-Dec-06	8:00
35	Money Supply	CNB	14	31-Mar-00	30-Apr-01	8:00
36	Producer Price[g]	CSO	81	13-Jan-00	14-Dec-06	8:00
37	Retail Sales[h]	CSO	83	14-Jan-00	18-Dec-06	8:00
38	Trade Balance[i]	CSO	82	21-Jan-00	6-Dec-06	8:00
39	Initial Unemployment[j]	MoL	73	10-Jan-00	12-Jul-06	7:00
	Hungary					
40	Budget Deficit[k]	HFM	25	4-Aug-03	8-Aug-06	15:00
41	Current Account[l]	MNB	53	3-Apr-00	29-Sep-06	6:30
42	Consumer Price Index[m]	HSO	79	14-Jan-00	12-Dec-06	8:00
43	Gross Domestic Product[n]	HSO	28	31-Mar-00	14-Nov-06	8:00
44	Industrial production[o]	HSO	50	4-Feb-00	13-Oct-06	7:00
45	Producer Price[p]	HSO	45	1-Mar-00	30-Nov-06	8:00
46	Trade Balance[q]	HSO	34	10-Oct-02	9-Nov-06	8:00

[a] 6/01˜12/01, 1/04˜11/04, 1/05˜3/05, and 5/05˜12/05 are missing observations.

[b] 3/04 is a missing observation.

[c] 3Q/01, 2Q/03˜4Q/03, and 3Q/04 are missing observations.

[d] 7/03, 12/03, 1/04, 6/04, 7/04, 9/04, 10/04, and 1/05˜3/05 are missing observations.

[e] 5/01˜12/01, 1/02˜12/02, 1/03˜5/03, 7/03, 12/03, 1/04, 6/04, 7/04, 9/04, 10/04, and 1/05˜3/05 are missing observations.

[f] 9/02 and 3/04 are missing observations.

[g] 11/02, 3/04, and 9/04 are missing observations.

[h] 8/04 is a missing observation.

[i] 6/04 and 11/04 are missing observations.

[j] 1/06˜6/06 are missing observations.

[k] 9/03˜1/04, 3/04˜5/04, 1/05, 2/06, 3/06, and 5/06 are missing observations.

[l] Current Account is announced quarterly since 2005. 12/01, 3/02,4/02,8/02,12/02, 3/04, 7/04, 8/04, 10/04, 11/04 and 1Q/06 are missing observations.

[m] 7/00, 11/00, 4/01, 3/03, 3/03 are missing observations.

[n] 4Q/01, 1Q/03, 2Q/03, and 4Q/06 are missing observations.

[o] 1/00, 8/00˜11/00, 3/01, 12/01˜4/02, 6/02˜8/02, 11/02˜3/03, 6/03˜6/04, 2/05, 2/06 are missing observations.

[p] 1/00, 7/00, 9/00, 10/00, 12/00, 2/01, 9/01, 12 /01, 2/02, 3/02, 11/02, 1/03˜3/03, 5/03˜3˜04, 5/04˜7/04, 9/04, 12/04, 3/05, 7/05, 9/05˜12/05, 2/06, 5/06, 7/06, 10/06 are missing observations.

[q] 11/02, 12/02, 1/03˜3/03, 6/03, 8/03˜1/04, 4/04, 5/04, 7/04, 6/06 are missing observations.

	News Announcements	Source	No of Obs	Start Date	Final Date	Time
	Indonesia					
47	Exports[a]	BPS	75	1-Sep-00	1-Dec-06	7:00
48	Gross Domestic Product	BPS	24	15-Nov-00	16-Nov-06	7:00
49	Imports[b]	BPS	72	1-Sep-00	1-Dec-06	7:00
50	Trade Balance[c]	BPS	75	1-Sep-00	1-Dec-06	7:00
	Korea					
51	Consumer Price Index[d]	NSO	62	31-Aug-00	29-Dec-06	4:30
52	Exports[e]	MoC	53	2-Feb-01	1-Dec-06	1:00
53	Gross Domestic Product[f]	BOK	22	22-Aug-00	24-Oct-06	23:00
54	Imports[g]	MoC	53	2-Feb-01	1-Dec-06	1:00
55	Industrial production[h]	NSO	56	31-Jan-01	29-Dec-06	4:30
56	Initial Unemployment	NSO	3	18-Apr-05	13-Sep-06	4:30
	Mexico					
57	Current Account	Banco de Mexico	14	27-Aug-03	24-Nov-06	20:30
58	Consumer Confidence[i]	INEGI	38	4-Aug-03	5-Dec-06	20:30
59	Consumer Price Index[j]	Banco de Mexico	47	7-Jan-00	7-Dec-06	20:30
60	Fixed Invest	INEGI	33	7-Apr-04	7-Dec-06	20:30
61	Gross Domestic Product[k]	INEGI	27	16-Feb-00	22-Nov-06	20:30
62	Industrial production[l]	INEGI	81	11-Jan-00	13-Dec-06	20:30
63	Producer Price[m]	Banco de Mexico	29	7-Jan-00	7-May-04	19:30
64	Retail Sales[n]	INEGI	78	20-Jan-00	19-Dec-06	20:30
65	Trade Balance[o]	INEGI	117	24-Jan-00	26-Dec-06	20:30
66	Unemployment[p]	INEGI	80	19-Jan-00	20-Dec-06	20:30
67	Wholesales	INEGI	31	20-Jan-00	22-Jul-02	19:30

[a] 1/02 is a missing observation.

[b] 12/01, 6/03, 2/06, 3/06 are missing observations.

[c] 12/01 is a missing observation.

[d] 10/00, 12/00, 1/01, 3/01, 4/01, 6/01, 8/01, 3/02, 4/02, 9/03, 12/03, 12/04, 2/05, 5/05 are missing observations.

[e] 4/01, 1/02, 3/02, 4/02, 6/02, 11/02, 12/02, 1/03, 2/03, 5/03, 6/03, 8/03, 9/03, 12/03, 2/04, 12/04, 1/05, 2/06 are missing observations.

[f] 2Q/01, 3Q/02, 2Q/04 are missing observations.

[g] 4/01, 1/02, 3/02, 4/02, 6/02, 11/02~2/03, 5/03, 6/03, 8/03, 9/03, 12/03, 2/04, 12/04, 2/05, 2/06 are missing observations.

[h] 2/01, 4/01~8/01, 1/02, 3/02, 7/02~10/02, 2/03, 12/03, 12/04, 12/05 are missing observations.

[i] 1/04, 8/04, 11/04 are missing observations.

[j] 12/01 is a missing observation.

[k] 3Q/02, 4Q/02, and 2Q/05 are missing observations.

[l] 11/02, 12/02 and 3/04 are missing observations.

[m] 12/01, 6/02~4/04 are missing observations.

[n] 8/02, 11/02, 12/02, 2/03, 6/03, and 8/04 are missing observations.

[o] 12/01, 9/02, 11/02, 12/02, 1/03, 2/03, 4/03, and 5/03 are missing observations.

[p] 8/02, 11/02, 12/02, and 2/03 are missing observations.

	News Announcements	Source	No of Obs	Start Date	Final Date	Time
	Poland					
68	Budget Deficit[a]	MoF	33	15-Nov-01	15-Dec-06	13:30
69	Current Account[b]	NBP	77	3-Apr-00	13-Dec-06	13:00
70	Consumer Price Index[c]	PSO	79	15-Feb-00	14-Dec-06	13:00
71	Exports[d]	NBP	75	3-Apr-00	13-Dec-06	13:00
72	Gross Domestic Product[e]	Eurostat	25	21-Jun-00	30-Nov-06	9:00
73	Imports[f]	NBP	76	3-Apr-00	13-Dec-06	13:00
74	Money Supply[g]	NBP	72	14-Apr-00	14-Dec-06	13:00
75	Producer Price[h]	PSO	77	18-Apr-00	19-Dec-06	13:00
76	Retail Sales[i]	PSO	48	20-Dec-02	21-Dec-06	9:00
77	Unemployment[j]	PSO	80	26-Apr-00	21-Dec-06	9:00
78	Wholesales[k]	PSO	77	18-Apr-00	19-Dec-06	13:00
	South Africa					
79	Current Account	SARB	2	21-Sep-06	8-Dec-06	9:00
80	Consumer Price Index[l]	SSA	83	18-Jan-00	20-Dec-06	9:30
81	Gross Domestic Product[m]	SSA	26	28-Feb-00	28-Nov-06	9:30
82	Interest rate[n]	SARB	24	15-Nov-01	7-Dec-06	13:20
83	Money Supply[o]	SARB	79	1-Feb-00	29-Dec-06	6:00
84	Producer Price[p]	SSA	82	26-Jan-00	21-Dec-06	9:30
85	Retail Sales	SSA	4	4-Nov-04	6-Dec-06	9:00
86	Trade Balance[q]	SARB	81	31-Jan-00	28-Dec-06	12:00

[a] 12/01, 1/04, 3/04, 2/06, and 9/06 are missing observations.
[b] 8/03, 10/03, 11/03, 2/04, and 3/04 are missing observations.
[c] 2/01~4/01, and 3/04 are missing observations.
[d] 8/03, 10/03, 11/03, 2/04, 3/04, 11/05, and 12/05 are missing observations.
[e] 2Q/00, 3Q/00, and 4Q03 are missing observations.
[f] 8/03, 10/03, 11/03, 2/04, 3/04, and 12/05 are missing observations.
[g] 10/01, 5/02, 8/02, 3/04, 4/05, 8/05~10/05, 12/05 are missing observations.
[h] 2/01~4/01, and 8/04 are missing observations.
[i] 2/03 is a missing observation.
[j] 10/04 is a missing observation.
[k] 2/01~4/01, and 8/04 are missing observations.
[l] 9/04 is a missing observation.
[m] 4Q/00, and 3Q/02 are missing observations.
[n] Bimonthly announcements. 2/01~2/03 are missing observations.
[o] 7/02, 12/02, 2/03, 3/03, and 2/05 are missing observations.
[p] 5/03 and 8/03 are missing observations.
[q] 12/00, 2/05 and 2/06 are missing observations.

	News Announcements	Source	No of Obs	Start Date	Final Date	Time
	Thailand					
87	Current Account[a]	BOT	27	30-Sep-04	29-Dec-06	7:30
88	Consumer Price Index[b]	Commerce Ministry	31	3-Nov-03	1-Dec-06	3:30
89	Exports[c]	BOT	7	30-Sep-04	31-May-05	8:00
90	Gross Domestic Product[d]	BOT	22	19-Jun-00	4-Dec-06	2:30
91	Interest rate	BOT	9	19-Oct-05	13-Dec-06	7:30
	Turkey					
92	Current Account[e]	CBT	27	24-Jun-04	11-Dec-06	14:35
93	Consumer Price Index[f]	SIS	48	3-Jan-00	4-Dec-06	14:30
94	Exports[g]	SIS	8	31-Mar-05	29-Jul-06	13:30
95	Gross Domestic Product[h]	SIS	24	31-Aug-00	11-Dec-06	8:00
96	Imports[i]	SIS	8	31-Mar-05	29-Jul-06	13:30
97	Industrial production[j]	SIS	71	8-Aug-00	8-Dec-06	8:00
98	Producer Price	SIS	23	3-Feb-05	4-Dec-06	14:30
99	Trade Balance[k]	SIS	32	24-Jun-02	29-Dec-06	14:30
100	Unemployment[l]	SIS	10	9-Dec-04	20-Nov-06	8:00

[a] 4/05 is a missing observation.
[b] 12/03~6/04 are missing observations.
[c] 2/05, and 4/05 are missing observations.
[d] 3Q/02~2Q/03, 4Q/04 are missing observations.
[e] 8/04, 9/04, 11/04, and 1/06 are missing observations.
[f] 2/01~6/03, and 8/03~2/04 are missing observations.
[g] 10/05~6/06 are missing observations.
[h] 4Q/01, and 3Q02 are missing observations.
[i] 10/05~6/06 are missing observations.
[j] 12/00, 3/01, 4/01, 6/01, 8/01, and 12/02 are missing observations.
[k] 1/04, 2/04, 4/04, 5/04, 8/04 are missing observations.
[l] 1/05~4/05, 7/05, 9/05, 12/05, 2/06~5/06, and 7/06~9/06 are missing observations.

Table A.4: U.S. and Domestic News Response and R squares

	Euro		Czech Republic		Hungary		Indonesia		Korea		Mexico		Poland		South Africa		Thailand		Turkey	
	β	R^2	β	R^2	β	R^2	β	R^2	β	R^2	β	R^2	β	R^2	β	R^2	β	R^2	β	R^2
U.S. Announcement																				
Business Inventories	0.00	0.00	0.01	0.00	-0.01	0.00	0.01	0.03	0.00	0.00	-0.01	0.00	-0.01	0.00	-0.03	0.03	0.00	0.00	-0.03	0.02
Budget Deficit	0.00	0.01	-0.01	0.02	0.01	0.00	0.01	0.00	0.17*	0.15	0.00	0.01	0.00	0.00	-0.01	0.01	-0.03	0.02	0.08	0.66
Current Account	0.01	0.06	0.04*	0.15	0.05	0.13	-0.07*	0.21	0.01	0.02	0.00	0.00	0.02	0.10	0.04	0.09	0.03	0.15	0.04	0.04
Capital Utilization	0.01*	0.10	0.01	0.02	0.00	0.00	-0.01	0.01	-0.03	0.04	0.00	0.01	0.00	0.00	0.06**	0.13	0.01	0.02	0.02	0.03
Consumer Confidence	0.06**	0.38	0.11**	0.48	0.10**	0.40	0.01	0.02	0.03	0.07	-0.03**	0.13	0.05**	0.17	0.05**	0.18	0.00	0.00	0.04*	0.09
Consumer Credit	0.00	0.01	0.00	0.00	-0.02*	0.06	-0.01	0.04	-0.01	0.07	-0.01	0.02	0.00	0.00	-0.02	0.02	0.01	0.01	-0.05	0.59
Construction Spending	0.00	0.00	0.04*	0.08	0.04	0.05	0.00	0.00	0.01	0.01	0.00	0.00	0.02	0.05	-0.01	0.00	-0.02	0.05	-0.02	0.01
Consumer Price Index	0.01	0.04	0.01	0.00	0.02	0.02	-0.05**	0.13	0.00	0.00	0.03*	0.05	0.02	0.01	0.05	0.04	0.01	0.00	0.06	0.04
Durable Goods Orders	0.02**	0.09	0.06**	0.21	0.07**	0.22	0.05*	0.13	0.02	0.06	-0.01	0.02	0.04**	0.14	0.05**	0.11	-0.01	0.00	-0.02	0.01
Factory Orders	0.00	0.00	0.03	0.05	0.02	0.03	0.00	0.00	-0.01	0.01	0.00	0.00	0.00	0.00	0.03*	0.06	0.01	0.03	0.05**	0.17
Gross Domestic Product	0.05**	0.27	0.11**	0.42	0.11**	0.39	0.06**	0.29	0.02	0.06	0.00	0.00	0.07**	0.37	0.07**	0.16	0.00	0.00	0.01	0.00
Housing Starts	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.02	0.02	0.00	0.00	0.01	0.00	0.01	0.01	-0.01	0.01	0.01	0.00
Imports	-0.01	0.01	0.03*	0.07	0.02	0.04	0.01	0.01	0.03	0.07	0.02	0.01	0.03	0.04	0.00	0.00	-0.01	0.01	-0.02	0.01
Interest rate	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
Industrial production	0.01	0.01	0.02*	0.06	0.02	0.04	0.00	0.00	0.00	0.00	-0.01	0.01	0.01	0.02	0.02	0.01	0.00	0.00	0.01	0.00
NAPM	0.17	0.02	1.39**	0.21	1.35**	0.16	0.20	0.01	0.29	0.02	0.04	0.00	0.82**	0.19	0.44	0.03	-0.44*	0.09	-0.28	0.01
Leading Indicators	0.00	0.00	0.00	0.00	0.02	0.04	-0.01	0.02	-0.01	0.01	0.00	0.00	0.00	0.00	-0.01	0.00	0.01	0.01	0.01	0.00
New Home Sales	0.01*	0.05	0.04*	0.07	0.05**	0.13	0.03*	0.14	0.03	0.06	0.01	0.01	0.03**	0.14	0.01	0.00	-0.01	0.02	-0.01	0.00
Nonfarm Payroll	0.09**	0.18	0.22**	0.34	0.24**	0.36	0.06*	0.12	0.09*	0.16	0.03	0.03	0.18**	0.31	0.19**	0.24	0.01	0.01	0.02	0.00
Personal Spending	0.00	0.00	0.01	0.00	0.02	0.02	0.01	0.03	-0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01	-0.01	0.02	-0.01	0.00
Personal Income	0.01	0.04	0.00	0.00	0.01	0.00	-0.01	0.02	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.02	0.01
Producer Price	0.01	0.03	0.02	0.01	0.02	0.01	0.03	0.05	0.01	0.03	0.01	0.01	0.03	0.05	0.03	0.02	0.00	0.00	0.00	0.00
Retail Sales	0.03**	0.20	0.08**	0.22	0.08**	0.24	0.03	0.06	0.03*	0.09	-0.05*	0.08	0.07**	0.23	0.03	0.01	0.01	0.03	0.00	0.00
Trade Balance	0.04**	0.20	0.12**	0.38	0.11**	0.36	0.00	0.00	0.02	0.05	-0.01	0.01	0.10**	0.35	0.08**	0.19	0.01	0.00	0.02	0.01
Initial Unemployment	-0.01**	0.04	-0.03**	0.07	-0.03**	0.06	0.00	0.00	-0.01	0.01	0.00	0.00	-0.01*	0.02	-0.01	0.00	0.00	0.00	-0.01	0.00
Wholesales	0.01	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	-0.01	0.01

	Euro		Czech Republic		Hungary		Indonesia		Korea		Mexico		Poland		South Africa		Thailand		Turkey	
	β	$\mathbf{R^2}$	β	$\mathbf{R^2}$	β	$\mathbf{R^2}$	β	$\mathbf{R^2}$	β	$\mathbf{R^2}$	β	$\mathbf{R^2}$	β	$\mathbf{R^2}$	β	$\mathbf{R^2}$	β	$\mathbf{R^2}$	β	$\mathbf{R^2}$
Domestic Announcement																				
Budget Deficit			0.00	0.00	0.04	0.16							0.00	0.00						
Current Account			-0.03**	0.24	-0.02	0.04					0.00	0.02	-0.078**	0.24	0.13	0.11	0.37	0.11	0.03	0.05
Current Acc. (US)			-0.01	0.02																
Consumer Confidence											0.00	0.00								
Consumer Price Index			-0.02	0.03	0.02	0.03			0.01*	0.16	0.01	0.06	0.01	0.02	-0.07**	0.28	0.00	0.00	-0.01	0.00
Exports			-0.03	0.03			0.00	0.00	0.01	0.04			0.01	0.00			0.00	0.02	0.04	0.04
Fixed Invest											0.00	0.00								
GDP			-0.03*	0.14	0.01	0.01	0.00	0.00	0.01	0.00	-0.03*	0.25	-0.04	0.18	-0.03	0.10	-0.07	0.06	-0.02	0.01
Imports			-0.01	0.01			-0.01	0.03	0.00	0.00			0.04	0.06					-0.14	0.30
Interest rate															-0.26*	0.20	-0.01	0.03		
Industrial production			-0.01	0.04	-0.028*	0.10			0.00	0.00	0.01	0.01							-0.01	0.00
Money Supply			0.00	0.00									-0.01	0.03	0.04	0.07				
Producer Price			-0.02**	0.10	-0.02	0.08					0.01	0.14	0.00	0.00	0.01	0.01			0.15	0.15
Retail Sales			-0.03**	0.10							-0.01	0.05	-0.01	0.01	-0.02	0.05				
Trade Balance			-0.07**	0.33	-0.01	0.00	0.36	0.00			-0.01**	0.10			-0.13**	0.30			0.04	0.03
Initial Unemployment			-0.01	0.02					0.00	0.29	-0.02	0.02	0.02	0.03					-0.01	0.01
Wholesales											-0.03*	0.25	-0.02	0.04						

Notes: We estimate the exchange rate conditional mean model (1.3) , where R_t is the 5-minute return from period t to period t+1, and S_{kt} is the standardized news surprise as described in the text. We estimate the regression only using non-missing data for each news surprise. β_k and R^2 are reported for each regression result. Asterisks denote statistical significance (*** at 1-percent level, ** at 5-percent level, and * at 10-percent level).

Table A.5: The Impact of Major News Surprises on FX Returns and FX Volatility

Announcements	Czech Republic	Hungary	Indonesia	Korea	Mexico	Poland	South Africa	Thailand	Turkey
Response of Contemporaneous News Surprises on FX Returns									
Durable Goods Orders	0.05**	0.06**	0.04**	0.03*	-0.01*	0.04**	0.05**	-0.03**	-0.01
Nonfarm Payroll	0.19**	0.21**	0.04**	0.09**	0.02**	0.18**	0.18**	0.00	0.02*
Trade Balance	0.12**	0.12**	0.00	0.02**	-0.02**	0.12**	0.09**	0.00	0.02
Producer Price	0.02**	0.02**	0.04**	0.01	0.01*	0.02**	0.05**	0.00	-0.01
New Home Sales	0.02**	0.03**	0.03**	0.03**	0.01*	0.03**	0.00	-0.01	-0.02
GDP	0.10**	0.11**	0.07**	0.02**	0.00	0.07**	0.07**	-0.01	0.03
Consumer confidence	0.11**	0.10**	0.01	0.02**	-0.03**	0.04**	0.05**	0.00	0.05
Retail Sales	0.07**	0.07**	0.03**	0.03**	-0.07**	0.07**	0.02	0.01	-0.01
Initial Unemployment	-0.03**	-0.03**	-0.01	-0.01**	0.00	-0.02**	-0.02**	0.01	0.01
Impact of Contemporaneous News Surprises on Volatility									
Durable Goods Orders	0.02**	0.05**	0.01*	-0.01**	0.00	0.01**	0.01**	0.02**	0.01
Nonfarm Payroll	0.17**	0.17**	-0.01**	0.09**	0.05**	0.16**	0.18**	0.01**	0.10**
Trade Balance	0.04**	0.04**	0.04**	0.04**	0.00**	0.06**	0.03**	0.00	0.01
Producer Price	0.03**	0.03**	0.02**	-0.01*	0.01**	0.01	0.01**	0.00	0.07**
New Home Sales	0.03**	0.03**	0.02**	0.02**	0.00	0.03**	0.00	0.00	-0.01
GDP	0.05**	0.04**	0.04**	0.04**	0.00	0.04**	0.04**	0.01	0.03**
Consumer confidence	0.03**	0.04**	0.03**	0.03**	0.02**	0.03**	0.00	0.01**	0.00
Retail Sales	0.03**	0.03**	0.03**	0.05**	0.03**	0.04**	0.00*	0.00	0.00
Initial Unemployment	0.01**	0.00	0.01**	0.01**	0.01**	0.02**	0.02**	0.00	0.01**
Cumulated Impact of News Surprises on Volatility									
Durable Goods Orders	0.17**	0.20**	0.05*	0.05**	0.00	0.07**	0.13**	0.02**	0.03
Nonfarm Payroll	0.26**	0.32**	0.16**	0.39**	0.19**	0.37**	0.38**	0.05**	0.16**
Trade Balance	0.05**	0.06**	0.01**	0.25**	0.02**	0.11**	0.11**	-0.03	0.02
Producer Price	0.03**	0.06**	0.04**	0.04*	0.01**	0.01	0.10**	-0.01	0.08**
New Home Sales	0.10**	0.06**	0.05**	0.03**	-0.01	0.08**	0.01	0.00	-0.01
GDP	0.06**	0.02**	0.05**	0.04**	0.00	0.11**	0.08**	0.03	-0.02**
Consumer confidence	0.03**	0.10**	0.13**	0.07**	0.05**	0.12**	0.01	0.02**	-0.04
Retail Sales	0.09**	0.05**	0.06**	0.13**	0.03**	0.16**	0.06*	0.00	0.01
Initial Unemployment	0.03**	0.00	-0.01**	0.01**	0.04**	0.12**	0.07**	0.00	0.01**

Notes: We estimate the exchange rate conditional mean model (1.4) $R_t = \beta_0 + \sum_{i=1}^{I} \beta_i R_{t-i} + \sum_{k=1}^{K} \sum_{j=0}^{J} \beta_{kj} S_{k,t-j} + \epsilon_t$, and we report estimates of the contemporaneous response of exchange-rate returns to news surprises, β_{k0}. We also estimate the disturbance volatility model (1.5), and we report estimates of the contemporaneous response of exchange-rate volatility to news surprise, β_{k0}=η_kp$_k(0)$. In addition, we report estimates of the cumulative volatility response, $\sum_{j'=0}^{12} \eta_k p_k(j')$, as described in the text. Asterisks denote statistical significance (*** at 1-percent level, ** at 5-percent level, and * at 10-percent level).

Table A.6: Response of Major News Surprises and Announcement Effects

Announcements		Czech Republic	Hungary	Indonesia	Korea	Mexico	Poland	South Africa	Thailand	Turkey
Impact of Major News Surprises on FX Returns										
Durable Goods Orders	β_{k0}	0.06***	0.07***	0.05***	0.02***	-0.02***	0.05***	0.05***	-0.03***	-0.01
	θ_{k0}	-0.01	-0.02***	0.00	0.01	0.01**	-0.02***	-0.02	0.03***	0.04*
Nonfarm Payroll	β_{k0}	0.22***	0.25***	0.06***	0.09***	0.01***	0.20***	0.18***	0.01	0.05***
	θ_{k0}	0.05***	0.06***	0.02***	0.04***	-0.05***	0.02***	-0.01	0.01	0.10***
Trade Balance	β_{k0}	0.12***	0.11***	0.00	0.02***	-0.02***	0.11***	0.10***	0.00	0.03*
	θ_{k0}	0.01	0.00	-0.02***	0.02***	0.00	0.01**	0.01	0.01	0.05**
Producer Price	β_{k0}	0.00	0.01	0.03***	0.02***	0.01**	0.01**	0.04***	0.01	0.00
	θ_{k0}	-0.02***	-0.03***	-0.02**	-0.01	-0.03***	-0.02***	0.00	0.01	0.09***
New Home Sales	β_{k0}	0.02***	0.03***	0.02***	0.03***	0.01**	0.03***	0.00	-0.01	-0.03
	θ_{k0}	-0.01**	0.03***	0.01	-0.02***	-0.01**	0.01	0.01	-0.01	0.03
GDP	β_{k0}	0.10***	0.11***	0.06***	0.02***	0.00	0.07***	0.07***	0.00	0.03*
	θ_{k0}	-0.03***	-0.04***	-0.04***	-0.03***	-0.01**	-0.01	-0.02*	0.01	0.07***
Consumer Confidence	β_{k0}	0.11***	0.10***	0.01	0.01	-0.03***	0.05***	0.05***	0.00	0.05
	θ_{k0}	0.00	-0.01	-0.01	0.04***	0.01**	-0.02***	0.00	0.00	-0.02
Real Sales	β_{k0}	0.09***	0.08***	0.03***	0.03***	-0.07***	0.08***	0.03**	0.01	-0.01
	θ_{k0}	0.00	0.00	0.00	0.00	0.02***	0.00	-0.06***	0.01	-0.04**
Initial Unemployment	β_{k0}	-0.04***	-0.03***	-0.01**	-0.02***	0.00	-0.02***	-0.02***	0.01	0.01
	θ_{k0}	-0.01***	-0.01**	0.00	0.00	0.00	-0.01***	-0.01	-0.01*	0.01
Impact of Major News Surprises on Volatility										
Durable Goods Orders	β_{k0}	-0.01	0.00	0.00	-0.01	0.00	0.00	0.00	0.03***	0.01
	θ_{k0}	0.05***	0.05***	0.04***	0.03***	0.02***	0.04***	0.01	0.00	-0.01
Nonfarm Payroll	β_{k0}	0.07***	0.06***	0.00	0.02*	0.02***	0.08***	0.12***	0.01	0.04**
	θ_{k0}	0.17***	0.16***	0.08***	0.08***	0.06***	0.12***	0.08***	0.00	0.07***
Trade Balance	β_{k0}	0.02***	0.02***	0.01	0.03***	0.00	0.03***	0.03***	-0.01**	-0.03
	θ_{k0}	0.04***	0.04***	0.05***	0.00	0.02**	0.04***	0.02	0.03***	0.04*
Producer Price	β_{k0}	-0.02***	-0.02***	0.00	0.00	-0.01*	0.00	0.00	0.00	-0.01
	θ_{k0}	0.06***	0.06***	0.04***	0.02	0.03***	0.03**	0.04***	-0.01	0.08***
New Home Sales	β_{k0}	-0.02***	-0.02**	0.00	-0.01	0.01	0.01	0.00	0.00	0.01
	θ_{k0}	0.07***	0.05***	0.03**	0.06***	0.01	0.02***	0.03***	0.00	-0.03
GDP	β_{k0}	0.02***	0.03***	0.03***	0.02**	0.00	0.01*	0.03**	0.02***	-0.01
	θ_{k0}	0.04***	0.03***	0.01	0.01	0.02***	0.03***	0.01	-0.02*	0.06***
Consumer Confidence	β_{k0}	0.02***	0.03***	0.00	0.00	0.01**	0.01	0.00	0.01***	0.00
	θ_{k0}	0.03***	0.02***	0.03**	0.04**	0.00	0.04***	0.01	-0.01	0.00
Retail Sales	β_{k0}	0.01*	0.01	0.01	0.02	0.03***	0.02***	0.00	0.00	-0.04*
	θ_{k0}	0.04***	0.04***	0.01	0.02**	0.03***	0.02**	0.06***	0.00	0.04
Initial Unemployment	β_{k0}	0.00	0.00	0.01	0.00	0.00	-0.01	0.00	0.00	0.00
	θ_{k0}	0.02***	0.02***	0.01	0.02***	0.01***	0.03***	0.01**	0.00	0.01

Notes: We estimate the exchange rate conditional mean model (1.7), where $D_{k,t-j}$ is dummy variable for the announcement.

We report estimates of the contemporaneous response of exchange-rate returns to news surprises, β_{k0}. We also estimate the disturbance volatility model (1.8). Asterisks denote statistical significance (*** at 1-percent level, ** at 5-percent level, and * at 10-percent level).

Table A.7: F-Test Results with Symmetric Response between Positive and Negative News Surprises

News		Euro	Czech Republic	Hungary	Indonesia	Korea	Mexico	Poland	South Africa	Thailand	Turkey
Consumer Confidence	Fvalue	1.40	0.83	0.64	1.22	1.67	4.03	2.47	0.56	1.79	2.02
	Pvalue	0.25	0.44	0.53	0.31	0.20	0.02	0.09	0.57	0.18	0.15
Durable Goods Orders	Fvalue	1.26	1.67	2.53	2.43	0.77	1.25	1.33	2.63	6.86	0.35
	Pvalue	0.29	0.20	0.09	0.10	0.47	0.29	0.27	0.08	0.00	0.70
Gross Domestic Product	Fvalue	0.65	3.09	4.48	0.03	0.77	0.01	0.62	0.82	0.15	2.65
	Pvalue	0.52	0.05	0.01	0.97	0.47	0.99	0.54	0.45	0.86	0.08
New Home Sales	Fvalue	2.31	0.23	0.02	0.22	0.43	0.55	1.02	0.20	1.78	0.88
	Pvalue	0.11	0.80	0.98	0.81	0.65	0.58	0.37	0.82	0.18	0.42
Nonfarm Payroll	Fvalue	1.25	1.47	1.05	2.63	1.64	1.62	0.85	1.80	0.18	2.11
	Pvalue	0.29	0.24	0.36	0.08	0.21	0.21	0.43	0.17	0.83	0.13
Producer Price	Fvalue	1.30	1.27	1.51	1.37	0.89	0.31	1.14	0.58	0.38	1.67
	Pvalue	0.28	0.29	0.23	0.26	0.42	0.74	0.33	0.56	0.69	0.20
Retail Sales	Fvalue	0.03	0.93	0.66	0.34	0.29	2.14	2.81	0.34	1.56	0.70
	Pvalue	0.97	0.40	0.52	0.71	0.75	0.13	0.07	0.71	0.22	0.50
Trade Balance	Fvalue	0.21	1.10	0.76	1.14	0.29	3.59	3.25	0.55	0.18	2.60
	Pvalue	0.81	0.34	0.47	0.33	0.75	0.03	0.05	0.58	0.84	0.08
Initial Unemployment	Fvalue	1.60	4.10	3.70	0.06	3.32	0.54	2.41	1.10	1.00	1.83
	Pvalue	0.20	0.02	0.03	0.94	0.04	0.58	0.09	0.33	0.37	0.16

Notes: We estimate the exchange rate conditional mean model (1.9), where $D_{k,t}$ is dummy variable for that has value 1 if the new surprise is positive, and value of 0 if negative. The null hypothesis used in the test is $\beta_2 = \beta_3 = 0$.

Table A.8: Impact of Major News Surprises with FX Forecasts

Announcements	Czech Republic	Hungary	Indonesia	Korea	Mexico	Poland	South Africa	Thailand	Turkey
Impact of News Surprises Only									
Durable Goods Orders	0.05**	0.07**	0.06**	0.02*	0.01	0.06**	0.06**	-0.02	0.04
Nonfarm Payroll	0.19**	0.21**	0.07**	0.08**	0.11**	0.23**	0.26**	0.01	0.14**
Trade Balance	0.04**	0.06**	-0.01	0.01	-0.01	0.11**	0.09**	0.01	0.03
Producer Price	-0.01	-0.01	0.02*	0.01	0.01	0.01	0.03	0.00	0.02
New Home Sales	-0.02	0.03*	0.04**	0.03**	0.01	0.03**	-0.01	-0.01	-0.04
Gross Domestic Product	0.09**	0.09**	0.06**	0.02	0.01	0.07**	0.09**	0.00	0.00
Consumer confidence	0.12**	0.10**	0.02	0.02	0.02	0.07**	0.05**	0.00	0.10
Retail Sales	0.09**	0.07**	0.04**	0.04**	0.02	0.08**	0.03*	0.01	-0.01
Initial Unemployment	-0.04**	-0.03**	-0.01	-0.02**	-0.02**	-0.02**	-0.02**	0.01	0.01
Impact of News Surprises with FX Forecasts									
Durable Goods Orders	0.22**	0.19**	1.08*	0.39	0.04**	0.10	0.29	-1.04	0.00*
Nonfarm Payroll	0.73**	0.65**	1.36**	1.07*	0.10**	-0.52*	-0.13	-1.80**	0.00**
Trade Balance	0.38**	0.31**	-0.74	1.12*	-0.01	-0.84*	-1.00**	0.06	0.00
Producer Price	0.13**	0.18**	0.50	0.16	0.01	0.24	0.11	0.43	0.00*
New Home Sales	0.18**	-0.01	0.89*	-0.75	0.01	0.00	0.34	0.28	0.00
Gross Domestic Product	0.20**	0.24**	0.87*	0.81*	0.03	0.17	-0.51	-0.18	0.00
Consumer confidence	-0.11*	-0.03	0.52	2.35**	0.05**	-1.02**	0.15	0.65	0.00
Retail Sales	0.06	0.13*	1.85**	-0.29	0.12**	0.30	0.39	-0.49	0.00
Initial Unemployment	-0.01	-0.04	-0.09	-0.16	-0.03**	0.44**	0.14	0.32	0.00

Notes: We estimate the exchange rate conditional mean model (1.10) , where $FXD_{j,t}$ is the index that measures the change between consensus and spot price. Asterisks denote statistical significance (*** at 1-percent level, ** at 5-percent level, and * at 10-percent level).

Table A.9: Impact of Major News Surprises with FX Forecasts Dispersion

Announcements	Czech Republic	Hungary	Indonesia	Korea	Mexico	Poland	South Africa	Thailand	Turkey
Impact of News Surprises Only									
Consumer Confidence	0.08**	0.09**	-0.01	0.03	-0.03	0.07**	0.04	-0.01	0.12
Durable Goods Order	0.12**	0.11**	0.13**	0.02	0.01	0.06**	0.03	-0.05	0.12*
Gross Domestic Product	0.19**	0.09**	0.11**	0.01	0.01	0.04	0.03	0.04	0.01
New Home Sales	0.00	0.07**	-0.02	0.01	-0.02	0.01	-0.05	-0.05	-0.05
Nonfarm Payroll	0.25**	0.17**	0.08**	0.19**	0.10**	0.47**	0.16**	0.00	0.17**
Producer Price	0.02	-0.01	0.04*	0.05*	-0.01	0.02	-0.01	0.00	0.12**
Retail Sales	0.16**	0.06**	0.07**	0.02	0.14**	0.14**	0.03	0.02	-0.03
Trade Balance	0.07**	0.17**	-0.03	0.02	-0.04	0.10**	0.02	-0.02	0.03
Initial Jobless Claim	-0.05**	-0.03**	-0.01	0.01	-0.02	-0.02*	-0.01	0.01	0.01
Impact of News Surprises with Dispersions									
Consumer Confidence	0.61*	0.32	0.10	-0.09	0.04	-0.20	0.08	0.16	-0.31
Durable Goods Order	-0.76**	-0.54	-0.60**	0.16	-0.47	-0.02	0.15	0.34	-0.82**
Gross Domestic Product	-1.96**	0.58	-0.51	0.15	-0.31	0.33	0.26	-0.72	0.06
New Home Sales	0.11	-0.75*	0.43	0.28	0.38	0.18	0.28	0.55	0.20
Nonfarm Payroll	0.87**	2.23**	-0.21	-1.59**	-1.36**	-2.02**	0.50*	0.05	-0.76**
Producer Price	-0.16	0.50*	-0.23	-0.57	0.35	-0.02	0.22	0.12	-0.68**
Retail Sales	-0.98**	0.45	-0.28	0.25	-3.42**	-0.45*	0.03	-0.17	0.06
Trade Balance	0.83**	-1.10**	0.31	0.03	0.49	0.05	0.34	0.37	-0.10
Initial Jobless Claim	0.17	-0.03	0.03	-0.47*	0.33	0.00	-0.07	-0.04	0.00

Notes: We estimate the exchange rate conditional mean model (1.12) , where *DISP* is the index that measures the magnitude of dispersions between consensus and spot price, defined by , means the maximum of FX forecasts at time t, and means the minimum of FX forecasts at time t. Asterisks denote statistical significance (*** at 1-percent level, ** at 5-percent level, and * at 10-percent level).

Table A.10: Summary Table for FX Time Series

Country	**Number of Observations**	**Number of Nonmissing Observation**	**Period**
Czech Republic	736,416	479,119	January 2, 2000 ˜ December 31, 2006
Hungary	736,416	517,950	January 2, 2000 ˜ December 31, 2006
Indonesia	736,416	365,843	January 2, 2000 ˜ December 31, 2006
Korea*	727,488	341,508	January 2, 2000 ˜ December 31, 2006
Mexico	736,416	302,674	January 2, 2000 ˜ December 31, 2006
Poland	736,416	409,279	January 2, 2000 ˜ December 31, 2006
South Africa	736,416	366,973	January 2, 2000 ˜ December 31, 2006
Thailand	736,416	446,514	January 2, 2000 ˜ December 31, 2006
Turkey	631,008	175,967	January 2, 2001 ˜ December 31, 2006

Source: Olsen Financial Technology (www.olsendata.com)

* For Korea, January 2004 data is not included.

Table A.11: Exchange Regime Changes from 2000 to 2006

Country	Currency	Period	Classification	Notes
Czech Republic	Czech koruna	full sample	Managed floating with no predetermined path for the exchange rate	The external value of the koruna is determined by supply and demand in the foreign exchange market. The Czech National Bank (CNB) may intervene in the foreign exchange market in order to smooth large intraday volatility swings of the Euro-koruna rate. The CNB publishes daily rates of 29 selected currencies against the koruna for customs and accounting purposes. Commercial banks set their own exchange rate with no limitation.
Hungary	Hungarian forint	6/4/2003 – current	Pegged exchange rate within horizontal bands	The Hungarian forint trades against the Euro within a band of ±15% around the central parity, which is fixed to the Euro at Ft 282.36 per EUR 1.
		10/1/2001 – 6/4/2004	Pegged exchange rate within horizontal bands	The crawling peg was abolished and the central parity of the forint was fixed to the Euro at Ft 276.1 per EUR 1. Thus, the exchange arrangement of the forint was reclassified to the category pegged exchange rate within horizontal bands from the category crawling band. (10/1/2001)
		5/4/2001 – 10/1/2001	Crawling Band	The width of the band within which the forint trades against the Euro was widened to ±15% from ±2.25% around the parity. (5/4/2001)
		4/1/2001– 5/4/2001	Crawling Band	The monthly depreciation of the forint was adjusted to 0.2% from 0.3% (4/1/2001)
		4/1/2000 – 4/1/2001	Crawling Band	The monthly depreciation of the forint was adjusted to 0.3% from 0.4% (4/1/2000)
		1/1/2000 – 4/1/2000	Crawling Band	The preannounced rate of crawl against the Euro was affected. (1/1/2000)
Indonesia	Indonesian rupiah	full sample	Managed floating with no predetermined path for the exchange rate	The exchange rate is determined by supply and demand conditions in the foreign exchange market. However, the Bank Indonesia (BI) may intervene in the foreign exchange market to maintain stability of the exchange rate.
Korea	Korean won	full sample	Independently floating	The exchange rate of the won is determined on the basis of supply and demand in the foreign exchange market. However, the authorities intervene when necessary to counter disorderly conditions in the market.

Mexico	Mexican peso	full sample	Independently floating	The exchange rate of the peso is determined freely in the foreign exchange market. The Exchange Commission established a rules-based mechanism to reduce the rate of international reserves accumulation. The Bank of Mexico (BOM) sells dollars directly in the foreign exchange market every day according to the following procedure: the BOM announces every quarter the total amount of dollars it will offer to the currency market each day during the following four quarters. The total amount of dollars to be sold will equal 50% of the net international reserves accumulated during the previous quarter, with one-fourth of the established amount being auctioned each quarter, not including the cumulative amount of dollars sold through the auction mechanism during the same period. Based on the total amount of dollars, the BOM auctions on a daily basis a fixed amount of dollars following a preestablished schedule (the daily amount to be sold is determined according to the number of working days in the current quarter).
Poland	Polish zloty	4/12/2000 – current	Independently floating	The exchange rate of the zloty is determined on the basis of supply and demand in the foreign exchange market, and the zloty is traded freely against all currencies.
		3/24/1999 – 4/12/2000	Crawling peg	Effective 1/1/1999, the currency basket was changed to 55% Euro and 45% dollar. Effective 3/24/1999, the width of the band was increased to ±15% around the central parity.
South Africa	South African rand	full sample	Independently floating	The exchange rate of the rand is determined by demand and supply in the foreign exchange market.
Thailand	Thai baht	full sample	Managed floating with no predetermined path for the exchange rate	The exchange rate of the baht is determined in the foreign exchange market. The baht-dollar reference exchange rate is announced daily, based on the average exchange rate of the previous day. The authorities intervene in the foreign exchange market as conditions require.

Turkey	New Turkish lira (YTL 1 = TL 1 million, 1/1/2006)	2/21/2001 – current	Independently floating	The lira was allowed to float. As a consequence, the exchange rate arrangement was reclassified to the category independently floating from the category crawling peg (2/22/2001). The exchange rate of the lira is determined on the basis of supply and demand in the foreign exchange market. The Central Bank of the Republic of Turkey (CBRT) conducts daily auctions to build up reserves hereby it buys a fixed amount of dollars and provides the successful bidders with the option to purchase up to 200% of their successful bid amount at the average auction price. The daily fixed purchase amount was raised to $20 million in 2006. The daily foreign exchange purchase auctions were suspended on May 16, 2006, in response to financial market volatility. On June 26 and June 27, 2006, the CBRT held foreign exchange auctions under which it sold $500 million on each day through multiple price auctions. On November 10, 2006, the CRBT resumed its daily foreign exchange auction program, with a daily fixed purchase amount of $15 million. The CBRT reserves the right to intervene in the foreign exchange market in case of excessive volatility in the foreign exchange rates.
	Turkish Lira	Dec 1999 – 2/21/2001	Crawling Band	In December 1999, the Central Bank of Turkey (CBT) modified its exchange arrangement by moving to a preannouncement of the exchange rate path of the lira against the current basket comprising the dollar and the Euro (in amounts equivalent to $1 and EUR 0.77).

Table A.12: Summary Statistics for Market Forecast

Country	# month ahead	Mean	Median	Max	Min	Std. Dev.
Czech Republic	1	0.004	0.006	0.024	-0.015	0.008
	3	0.004	0.005	0.035	-0.021	0.010
	12	-0.002	-0.005	0.092	-0.040	0.022
	24	-0.004	-0.007	0.053	-0.052	0.026
Hungary	1	0.005	0.006	0.034	-0.037	0.013
	3	0.008	0.010	0.045	-0.034	0.017
	12	0.016	0.013	0.077	-0.040	0.030
	24	0.013	0.016	0.081	-0.070	0.034
Indonesia	1	0.002	-0.001	0.140	-0.043	0.023
	3	0.000	-0.001	0.172	-0.048	0.029
	12	-0.005	-0.002	0.169	-0.071	0.038
	24	-0.008	-0.007	0.133	-0.111	0.040
Korea	1	0.000	0.000	0.032	-0.034	0.013
	3	-0.004	-0.004	0.034	-0.047	0.016
	12	-0.024	-0.023	0.016	-0.067	0.018
	24	-0.030	-0.028	0.019	-0.084	0.023
Mexico	1	0.006	0.006	0.032	-0.028	0.014
	3	0.015	0.017	0.054	-0.023	0.019
	12	0.046	0.045	0.108	-0.011	0.029
	24	0.076	0.073	0.176	0.020	0.035
Poland	1	-0.001	-0.003	0.056	-0.046	0.022
	3	-0.005	-0.007	0.048	-0.058	0.026
	12	-0.015	-0.017	0.071	-0.097	0.042
	24	0.005	0.001	0.115	-0.104	0.052
South Africa	1	0.009	0.009	0.082	-0.051	0.030
	3	0.020	0.016	0.119	-0.056	0.041
	12	0.060	0.063	0.216	-0.061	0.069
	24	0.110	0.111	0.319	-0.043	0.096
Thailand	1	0.000	0.003	0.024	-0.035	0.012
	3	-0.003	-0.001	0.022	-0.045	0.016
	12	-0.014	-0.013	0.030	-0.056	0.020
	24	-0.022	-0.023	0.024	-0.066	0.022
Turkey	1	0.024	0.023	0.097	-0.066	0.033
	3	0.057	0.049	0.165	-0.057	0.048
	12	0.164	0.146	0.378	-0.040	0.107
	24	0.298	0.305	0.652	-0.013	0.186

Table A.13: Summary Statistics for Market Forecaset Dispersion

Country	# month ahead	Mean	Median	Max	Min	Std. Dev.
Czech Republic	1	0.049	0.042	0.140	0.008	0.029
	3	0.061	0.055	0.210	0.026	0.027
	12	0.122	0.104	0.385	0.043	0.057
	24	0.179	0.157	0.395	0.053	0.071
Hungary	1	0.058	0.055	0.132	0.007	0.031
	3	0.067	0.061	0.145	0.009	0.030
	12	0.120	0.107	0.230	0.047	0.043
	24	0.144	0.150	0.224	0.054	0.039
Indonesia	1	0.121	0.096	0.468	0.045	0.085
	3	0.158	0.142	0.518	0.053	0.083
	12	0.269	0.259	0.540	0.119	0.108
	24	0.346	0.344	0.667	0.154	0.121
Mexico	1	0.063	0.063	0.116	0.022	0.020
	3	0.080	0.079	0.174	0.038	0.025
	12	0.103	0.101	0.168	0.052	0.024
	24	0.110	0.111	0.200	0.030	0.041
Poland	1	0.110	0.098	0.342	0.033	0.053
	3	0.132	0.136	0.242	0.053	0.036
	12	0.202	0.200	0.337	0.101	0.052
	24	0.228	0.216	0.416	0.124	0.071
South Africa	1	0.177	0.171	0.506	0.058	0.074
	3	0.226	0.210	0.575	0.081	0.089
	12	0.315	0.303	0.807	0.135	0.111
	24	0.347	0.323	0.664	0.165	0.120
Korea	1	0.071	0.065	0.183	0.032	0.029
	3	0.103	0.100	0.220	0.047	0.026
	12	0.175	0.178	0.252	0.104	0.035
	24	0.209	0.199	0.324	0.133	0.047
Thailand	1	0.063	0.060	0.206	0.023	0.025
	3	0.089	0.085	0.205	0.046	0.031
	12	0.130	0.127	0.226	0.073	0.031
	24	0.150	0.145	0.369	0.072	0.050
Turkey	1	0.178	0.146	0.449	0.071	0.093
	3	0.227	0.194	0.512	0.095	0.111
	12	0.382	0.334	0.817	0.161	0.170
	24	0.605	0.588	1.320	0.187	0.283

Table A.14: Return and Volatility News Response Coefficients

Announcements	Czech Republic	Hungary	Indonesia	Korea	Mexico	Poland	South Africa	Thailand	Turkey
Impact of News Surprises on FX Returns									
Business Inventories	0.00	-0.01	0.00	-0.01	0.01*	-0.02**	-0.03*	0.00	-0.04**
Budget Deficit	0.00	0.01	0.01	0.14**	0.00	0.00	0.05	0.01	0.00
Current Account	0.07**	0.05**	-0.08**	0.01	-0.01	0.01	0.05	0.03*	0.06
Capital Utilization	0.00	0.00	-0.02	-0.02**	-0.01	0.01	0.13**	0.01	0.04
Consumer Confidence	0.11**	0.10**	0.01	0.02**	-0.03**	0.04**	0.05**	0.00	0.05
Consumer Credit	-0.01	-0.01	-0.01	-0.01	0.00	0.00	-0.02	0.00	0.00
Construction Spending	0.03**	0.02**	0.02	0.00	0.00	0.01	-0.02	-0.04**	0.00
Consumer Price Index	0.00	0.02**	-0.04**	0.00	0.02**	0.00	0.04**	0.00	0.08**
Durable Goods Orders	0.05**	0.06**	0.04**	0.03*	-0.01*	0.04**	0.05**	-0.03**	-0.01
Factory Orders	0.02**	0.02**	0.00	-0.01	0.00	0.00	0.03*	0.00	0.08**
Gross Domestic Product	0.10**	0.11**	0.07**	0.02**	0.00	0.07**	0.07**	-0.01	0.03
Housing Starts	0.01*	0.01	-0.01	0.01*	-0.01	0.01	0.02	-0.01	0.03
Imports	0.00	-0.01	0.02*	0.03**	0.05**	-0.01*	-0.02	-0.01	-0.05**
Interest rate	0.01	-0.01	0.00	0.00	0.01	0.00	0.00	0.01	0.00
Industrial production	0.02**	0.02*	0.03**	0.01	0.00	0.00	-0.01	-0.01	-0.02
NAPM	1.36**	1.27**	0.07	0.34*	0.00	0.65**	0.31	-0.27	0.00
Leading Indicators	0.00	0.02*	-0.01	-0.01	-0.01	0.00	-0.01	0.01	0.00
New Home Sales	0.02**	0.03**	0.03**	0.03**	0.01*	0.03**	0.00	-0.01	-0.02
Nonfarm Payroll	0.19**	0.21**	0.04**	0.09**	0.02**	0.18**	0.18**	0.00	0.02*
Personal Spending	0.00	0.01	0.01	0.00	0.00	-0.01	0.01	-0.01	0.00
Personal Income	0.00	0.00	-0.01	0.00	0.01	0.00	-0.01	0.00	0.02
Producer Price	0.02**	0.02**	0.04**	0.01	0.01*	0.02**	0.05**	0.00	-0.01
Retail Sales	0.07**	0.07**	0.03**	0.03**	-0.07**	0.07**	0.02	0.01	-0.01
Trade Balance	0.12**	0.12**	0.00	0.02**	-0.02**	0.12**	0.09**	0.00	0.02
Initial Unemployment	-0.03**	-0.03**	-0.01	-0.01**	0.00	-0.02**	-0.02**	0.01	0.01
Wholesales	0.00	0.00	0.00	0.01	-0.01	0.00	0.00	0.00	0.00
Budget Deficit	0.05**	0.03				0.01			
Current Account	-0.03**	-0.02*			-0.01	-0.08**	0.09	0.22**	0.03
Current Account(US)	-0.01								
Consumer Confidence					-0.01				0.00
Consumer Price Index	-0.04**	0.01*		0.01	0.01	0.00	-0.10**	-0.01	0.01
Exports	-0.03**		0.00	0.01		0.02		0.02	0.09
Fixed Invest					0.00				
Gross Domestic Product	-0.02	0.01	-0.02	-0.04	-0.02*	-0.03**	-0.02	-0.04	-0.03
Imports	-0.03**		0.00	0.00		-0.01			-0.19**
Interest rate							-0.30**	-0.01	
Industrial production	-0.01*	-0.03**		0.00	0.01				-0.03
Money Supply	0.00					-0.01*	0.15**		
Producer Price	-0.02**	-0.02			0.01	0.00	0.01		0.14**
Retail Sales	-0.03**				-0.01	-0.01	0.06		
Trade Balance	-0.07**	0.00	0.52		-0.01		-0.16**		0.00
Initial Unemployment	0.07			-0.01	-0.02**	0.02*			-0.01
Wholesales					-0.03	-0.03**			

Announcements	Czech Republic	Hungary	Indonesia	Korea	Mexico	Poland	South Africa	Thailand	Turkey
Impact of Contemporaneous News Surprises on Volatility									
Business Inventories	0.00	0.02**	0.00	0.00	0.01	0.00	-0.01**	0.00	0.05**
Budget Deficit	-0.01	0.01	0.01	0.11**	0.00	0.00	0.01	-0.01	0.13
Current Account	-0.02**	0.00	0.02**	0.01	0.00	-0.01**	0.01	0.01	0.00
Capital Utilization	0.03**	0.02**	-0.01	0.00	0.00	0.00	-0.02**	-0.01*	-0.02
Consumer Confidence	0.03**	0.04**	0.03**	0.03**	0.02**	0.03**	0.00	0.01**	0.00
Consumer Credit	0.00	0.00	0.01*	0.00	0.00	0.01	0.00	0.00	-0.08
Construction Spending	0.01**	0.01**	-0.02**	0.02*	0.01	0.00	0.01	0.00	0.00
Consumer Price Index	0.05**	0.04**	0.00*	0.00	0.03**	0.04**	0.05**	0.00	0.01
Durable Goods Orders	0.02**	0.05**	0.01*	-0.01**	0.00	0.01**	0.01**	0.02**	0.01
Factory Orders	0.04**	0.02**	0.01	0.00*	0.00	0.00	0.00**	0.01	-0.01
Gross Domestic Product	0.05**	0.04**	0.04**	0.04**	0.00	0.04**	0.04**	0.01	0.03**
Housing Starts	0.01**	0.02**	0.02**	0.01	0.00	0.00	0.00	0.00	0.00
Imports	0.02**	0.01**	0.00	0.02*	0.01*	0.01	0.00	0.00	0.02*
Interest rate	0.00	0.01**	0.00	0.00	0.00	0.00	0.03**	0.00	0.00
Industrial production	0.00	0.00**	0.00	0.00	0.00	0.02**	0.00	-0.01	0.00
NAPM	0.05*	0.05	0.42**	0.10	0.05	0.82**	0.06	0.24	0.02
Leading Indicators	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
New Home Sales	0.03**	0.03**	0.02**	0.02**	0.00	0.03**	0.00	0.00	-0.01
Nonfarm Payroll	0.17**	0.17**	-0.01**	0.09**	0.05**	0.16**	0.18**	0.01**	0.10**
Personal Spending	0.02**	0.01	0.01	0.01	0.00	-0.01	0.00**	-0.01	0.03**
Personal Income	0.01**	0.00	0.00	0.00	0.01**	0.05**	0.01	0.00	0.01
Producer Price	0.03**	0.03**	0.02**	-0.01*	0.01**	0.01	0.01**	0.00	0.07**
Retail Sales	0.03**	0.03**	0.03**	0.05**	0.03**	0.04**	0.00*	0.00	0.00
Trade Balance	0.04**	0.04**	0.04**	0.04**	0.00**	0.06**	0.03**	0.00	0.01
Initial Unemployment	0.01**	0.00	0.01**	0.01**	0.01**	0.02**	0.02**	0.00	0.01**
Wholesales	0.01**	0.01	0.00	0.02**	0.00	-0.01**	0.00	0.00	0.00
Budget Deficit	0.00	-0.01				0.00			
Current Account	0.00	0.01			-0.02*	0.02**	0.06	0.24**	0.00
Current Account(US)	0.03**								
Consumer Confidence					0.00				0.00
Consumer Price Index	0.04**	0.04**		0.00	0.01*	0.00	0.01	0.00	0.00
Exports	0.02		0.00	0.00		0.00		0.00	0.00
Fixed Invest					0.00				
Gross Domestic Product	0.01	-0.01	-0.02	-0.02	0.00	0.02**	0.03*	-0.01	0.00
Imports	0.02**		0.00	0.01		0.02**			0.09*
Interest rate							0.26**	0.00	
Industrial production	0.01**	0.01**		0.00	0.00				0.00
Money Supply	0.00**					0.01*	0.03**		
Producer Price	0.00	-0.01			0.00*	0.01	0.02*		0.19**
Retail Sales	0.00				-0.01**	-0.01	-0.04*		
Trade Balance	0.03**	0.01	0.17		-0.01		0.07**		-0.02
Initial Unemployment	-0.04**			0.00**	0.02**	0.00			0.00
Wholesales					0.00	0.03**			

Announcements	Czech Republic	Hungary	Indonesia	Korea	Mexico	Poland	South Africa	Thailand	Turkey
Impact of Cumulated news Surprises on volatility									
Business Inventories	0.01	0.04**	-0.01	-0.01	0.01	0.00	0.04**	0.00	0.10**
Budget Deficit	-0.02	0.06	-0.04	0.11**	-0.01	-0.01	0.05	-0.01	-0.12
Current Account	0.03**	0.00	-0.05**	0.03	0.00	0.05**	0.00	0.01	-0.02
Capital Utilization	0.11**	0.05**	0.02	0.01	0.01	0.01	0.08**	-0.07*	-0.02
Consumer Confidence	0.03**	0.10**	0.13**	0.07**	0.05**	0.12**	0.01	0.02**	-0.04
Consumer Credit	0.00	0.00	-0.04*	0.00	-0.01	-0.04	0.01	0.00	0.75
Construction Spending	0.00**	0.00**	0.09**	0.01*	0.02	0.00	0.03	0.00	0.00
Consumer Price Index	0.13**	0.08**	0.06*	0.01	0.09**	0.05**	0.12**	0.00	0.08
Durable Goods Orders	0.17**	0.20**	0.05*	0.05**	0.00	0.07**	0.13**	0.02**	0.03
Factory Orders	0.13**	0.06**	0.02	0.02*	0.01	0.02	0.07**	-0.02	-0.05
Gross Domestic Product	0.06**	0.02**	0.05**	0.04**	0.00	0.11**	0.08**	0.03	-0.02**
Housing Starts	0.02**	0.03**	0.04**	0.00	0.00	0.00	0.01	0.00	0.01
Imports	0.14**	0.06**	-0.01	0.04*	0.02*	0.00	-0.01	-0.01	0.01*
Interest rate	-0.01	0.01**	0.00	0.00	0.01	0.01	-0.09**	-0.01	0.00
Industrial production	0.00	0.04**	0.01	-0.01	0.00	0.06**	0.01	-0.03	-0.03
NAPM	-0.11*	0.08	2.57**	0.10	-0.11	2.43**	0.46	0.03	0.00
Leading Indicators	0.01	0.00	0.00	0.00	0.00	0.02	0.01	0.01	0.00
New Home Sales	0.10**	0.06**	0.05**	0.03**	-0.01	0.08**	0.01	0.00	-0.01
Nonfarm Payroll	0.26**	0.32**	0.16**	0.39**	0.19**	0.37**	0.38**	0.05**	0.16**
Personal Spending	0.08**	0.00	0.01	0.02	0.00	-0.01	0.09**	-0.02	0.03**
Personal Income	0.03**	0.00	0.00	0.00	0.03**	0.14**	-0.01	0.00	0.02
Producer Price	0.03**	0.06**	0.04**	0.04*	0.01**	0.01	0.10**	-0.01	0.08**
Retail Sales	0.09**	0.05**	0.06**	0.13**	0.03**	0.16**	0.06*	0.00	0.01
Trade Balance	0.05**	0.06**	0.01**	0.25**	0.02**	0.11**	0.11**	-0.03	0.02
Initial Unemployment	0.03**	0.00	-0.01**	0.01**	0.04**	0.12**	0.07**	0.00	0.01**
Wholesales	0.02**	0.00	0.00	0.00**	-0.02	0.04**	0.01	-0.01	-0.02
Budget Deficit	0.00	-0.01				0.03			
Current Account	0.00	-0.01			-0.06*	0.06**	0.09	0.40**	0.01
Current Account(US)	0.11**								
Consumer Confidence					-0.01				0.00
Consumer Price Index	0.14**	0.12**		0.01	-0.01*	0.00	0.00	0.00	0.00
Exports	0.03		0.02	0.00		-0.03		-0.01	0.01
Fixed Invest					0.00				
Gross Domestic Product	-0.01	0.01	-0.03	-0.04	0.00	0.09**	0.07*	0.01	-0.16
Imports	0.12**		0.04	0.01		0.13**			0.23*
Interest rate							0.31**	-0.03	
Industrial production	0.05**	0.07**		0.00	0.01				0.00
Money Supply	0.00**					0.04*	0.07**		
Producer Price	0.00	-0.01			0.07*	0.01	0.02*		0.49**
Retail Sales	0.00				-0.07**	0.01	0.04*		
Trade Balance	0.10**	0.01	1.96		-0.02		0.02**		-0.02
Initial Unemployment	-0.07**			0.19**	0.01**	-0.01			0.01
Wholesales					0.04	0.18**			

Table A.15: Return and Volatility Response with Announcement Dummy

Announcements	xvar_id	Czech Republic	Hungary	Indonesia	Korea	Mexico	Poland	South Africa	Thailand	Turkey
U.S. Contemporaneous Announcements in equation (1.7)										
Business Inventories	β_{k0}	-0.01	-0.01	0.00	-0.01	0.02***	-0.03***	-0.04***	0.00	-0.07***
	θ_{k0}	0.00	0.00	0.01	0.01	-0.02***	0.00	-0.03**	0.01	0.03
Budget Deficit	β_{k0}	0.00	0.02	0.01	0.13***	0.00	0.00	0.05	0.02	0.00
	θ_{k0}	0.01*	0.00	0.00	0.03***	0.00	0.00	0.01	0.00	0.00
Current Account	β_{k0}	0.04***	0.05***	-0.08***	0.01	-0.01	0.03**	0.11***	0.03**	0.07**
	θ_{k0}	0.00	-0.02	-0.03***	0.00	0.01	0.02**	0.09***	0.00	0.02
Capital Utilization	β_{k0}	0.00	-0.01	-0.02**	-0.03***	0.00	0.01	0.12***	0.00	0.05
	θ_{k0}	0.01	-0.02	-0.02	0.03*	0.01	0.02	0.02	-0.01	-0.02
Consumer Confidence	β_{k0}	0.11***	0.10***	0.01	0.01	-0.03***	0.05***	0.05***	0.00	0.05
	θ_{k0}	0.00	-0.01	-0.01	0.04***	0.01**	-0.02***	0.00	0.00	-0.02
Consumer Credit	β_{k0}	-0.01	-0.01	-0.01	-0.01	0.00	0.00	-0.02	0.00	0.01
	θ_{k0}	0.00	0.01	0.00	0.00	0.01	0.00	0.00	-0.01	0.00
Construction Spending	β_{k0}	0.03***	0.02***	0.01	0.00	0.00	0.02**	-0.01	-0.04***	0.01
	θ_{k0}	-0.03**	-0.01	-0.05**	-0.09***	-0.03**	-0.01	-0.10***	-0.02	0.00
Consumer Price Index	β_{k0}	0.00	0.02***	-0.05***	-0.01	0.02***	0.01**	0.04***	0.00	0.08***
	θ_{k0}	-0.03***	-0.02***	-0.01	0.01	0.01	-0.01	-0.03**	0.01	0.06***
Durable Goods Orders	β_{k0}	0.06***	0.07***	0.05***	0.02***	-0.02***	0.05***	0.05***	-0.03***	-0.01
	θ_{k0}	-0.01	-0.02***	0.00	0.01	0.01**	-0.02***	-0.02	0.03***	0.04*
Factory Orders	β_{k0}	0.03***	0.02***	0.00	-0.01**	0.00	0.00	0.03***	0.00	0.07***
	θ_{k0}	0.00	0.00	-0.02**	0.02***	-0.01**	0.00	0.00	0.01	0.03
Gross Domestic Product	β_{k0}	0.10***	0.11***	0.06***	0.02***	0.00	0.07***	0.07***	0.00	0.03*
	θ_{k0}	-0.03***	-0.04***	-0.04***	-0.03***	-0.01**	-0.01	-0.02*	0.01	0.07***
Housing Starts	β_{k0}	0.02***	0.02***	-0.01	0.02**	0.00	0.01**	0.04***	-0.01	0.03*
	θ_{k0}	0.00	-0.02**	-0.03***	-0.02***	-0.02***	-0.01*	-0.02*	0.00	-0.01
Imports	β_{k0}	0.01	0.00	0.01	0.02***	0.06***	0.00	-0.03***	-0.01	-0.04***
	θ_{k0}	0.03***	0.02***	-0.02***	0.02**	0.03***	0.04***	-0.03***	-0.01	0.10***
Interest rate	β_{k0}	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	θ_{k0}	0.00	0.05*	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial production	β_{k0}	0.02***	0.02**	0.03**	0.01**	0.00	0.01	-0.01	0.00	-0.02
	θ_{k0}	-0.02**	-0.01	0.00	-0.03	-0.01	-0.02	0.04	0.00	0.02
NAPM	β_{k0}	1.39***	1.42***	0.12	0.56***	-0.07	0.87***	0.17	-0.31**	0.04
	θ_{k0}	0.04***	0.04***	0.06**	0.09***	0.02	0.01	0.12***	0.05**	0.03
Leading Indicators	β_{k0}	0.01	0.02***	-0.01	-0.01	-0.01	0.00	0.00	0.01	0.00
	θ_{k0}	0.01	0.00	0.01	0.01	0.01	0.01	-0.01	0.00	-0.03
New Home Sales	β_{k0}	0.02***	0.03***	0.02***	0.03***	0.01**	0.03***	0.00	-0.01	-0.03
	θ_{k0}	-0.01**	0.03***	0.01	-0.02***	-0.01**	0.01	0.01	-0.01	0.03
Nonfarm Payroll	β_{k0}	0.22***	0.25***	0.06***	0.09***	0.01***	0.20***	0.18***	0.01	0.05***
	θ_{k0}	0.05***	0.06***	0.02***	0.04***	-0.05***	0.02***	-0.01	0.01	0.10***
Personal Spending	β_{k0}	0.00	0.02*	0.01	0.00	0.00	0.00	0.00	-0.01	0.03
	θ_{k0}	0.00	0.00	0.01	0.03**	0.03***	0.09***	-0.03	0.01	0.15***
Personal Income	β_{k0}	0.00	0.01	-0.02	0.00	0.01	0.01	-0.01	0.00	0.02
	θ_{k0}	-0.03***	-0.03***	0.00	-0.02**	-0.05***	-0.09***	0.04**	0.01	-0.07**
Producer Price	β_{k0}	0.00	0.01	0.03***	0.02***	0.01**	0.01**	0.04***	0.01	0.00
	θ_{k0}	-0.02***	-0.03***	-0.02**	-0.01	-0.03***	-0.02***	0.00	0.01	0.09***

Announcements	xvar_id	Czech Republic	Hungary	Indonesia	Korea	Mexico	Poland	South Africa	Thailand	Turkey
U.S. Contemporaneous Announcements in equation (1.7)										
Retail Sales	β_{k0}	0.09***	0.08***	0.03***	0.03***	-0.07***	0.08***	0.03**	0.01	-0.01
	θ_{k0}	0.00	0.00	0.00	0.00	0.02***	0.00	-0.06***	0.01	-0.04**
Trade Balance	β_{k0}	0.12***	0.11***	0.00	0.02***	-0.02***	0.11***	0.10***	0.00	0.03*
	θ_{k0}	0.01	0.00	-0.02**	0.02***	0.00	0.01**	0.01	0.01	0.05**
Initial Unemployment	β_{k0}	-0.04***	-0.03***	-0.01**	-0.02***	0.00	-0.02***	-0.02***	0.01	0.01
	θ_{k0}	-0.01***	-0.01**	0.00	0.00	0.00	-0.01***	-0.01	-0.01*	0.01
Wholesales	β_{k0}	0.00	0.00	0.00	0.01	-0.01	0.00	0.01	0.00	0.01
	θ_{k0}	-0.01***	-0.01*	-0.01	-0.04***	0.00	-0.02**	-0.01	0.00	-0.02
Domestic Contemporaneous Announcements in equation (1.7)										
Budget Deficit	β_{k0}	0.01	0.02				0.00			
	θ_{k0}	0.11***	0.00				-0.02**			
Current Account	β_{k0}	-0.02**	-0.01**			0.00	-0.08***	0.00	0.18***	0.02
	θ_{k0}	0.01	0.02**			0.00	-0.01	-0.38**	-0.07***	-0.02
Current Account(US)	β_{k0}	-0.01								
	θ_{k0}	0.04***								
Consumer Confidence	β_{k0}					0.00				0.00
	θ_{k0}					0.01				0.00
Consumer Price Index	β_{k0}	-0.01	0.02***		0.01	0.01	-0.01	-0.09***	-0.01	0.03
	θ_{k0}	-0.01	-0.04***		-0.01	0.00	-0.02*	-0.01	0.00	-0.13*
Exports	β_{k0}	-0.01		-0.05***	0.00		0.02**		0.09	-0.01
	θ_{k0}	-0.15		0.00	0.00		0.00		0.01	-0.18***
Fixed Invest	β_{k0}					0.00				
	θ_{k0}					0.00				
Gross Domestic Product	β_{k0}	-0.01	0.01	-0.03	-0.05	-0.02**	-0.03**	-0.03	-0.08***	-0.03
	θ_{k0}	-0.03***	0.00	0.01	-0.01	-0.01	0.00	-0.08**	-0.06***	0.01
Imports	β_{k0}	-0.07		0.04**	0.00		-0.01			-0.10*
	θ_{k0}	0.12		0.22***	0.00		0.00			0.00
Interest rate	β_{k0}							-0.14***	-0.01	
	θ_{k0}							0.58***	0.00	
Industrial production	β_{k0}	-0.01	-0.03***		0.00	0.01				-0.03
	θ_{k0}	-0.01	0.00		0.00	0.01				-0.02
Money Supply	β_{k0}	0.02					-0.01	0.09***		
	θ_{k0}	-0.15					0.00	0.10***		
Producer Price	β_{k0}	-0.02***	0.01			0.01	0.00	0.01		0.17***
	θ_{k0}	-0.01**	-0.02**			-0.01	-0.09***	0.03*		0.24***
Retail Sales	β_{k0}	-0.03***				-0.01	-0.01	0.12		
	θ_{k0}	-0.01				0.01	-0.03***	0.00		
Trade Balance	β_{k0}	-0.07***	-0.01	4.97***		-0.01**		-0.17***		0.03
	θ_{k0}	-0.03***	0.01	-0.21***		0.00		0.04***		0.04
Initial Unemployment	β_{k0}	0.01			-0.01	-0.01***	0.02**			-0.01
	θ_{k0}	0.02***			0.00	-0.01	0.03**			-0.01
Wholesales	β_{k0}					-0.03*	-0.03***			
	θ_{k0}					0.00	0.06***			

Announcements	xvar_id	Czech Republic	Hungary	Indonesia	Korea	Mexico	Poland	South Africa	Thailand	Turkey
U.S. Contemporaneous Announcements in equation (1.8)										
Business Inventories	β_{k0}	0.00	-0.01	0.01	0.01	0.01	0.01	-0.01**	0.00	0.06***
	θ_{k0}	0.03***	0.04***	0.02	0.02	-0.01	0.02	0.02*	-0.01	-0.04
Budget Deficit	β_{k0}	0.00	0.01	0.01	0.15***	0.00	0.00	0.01	0.03	0.11
	θ_{k0}	0.00	0.00	-0.01	-0.01	0.00	-0.01	-0.02	-0.01	0.00
Current Account	β_{k0}	0.01	-0.02	0.03**	-0.02	0.00	-0.02**	0.01	0.02	-0.02
	θ_{k0}	-0.01	0.03*	0.04**	0.03*	0.01	0.03*	0.00	0.00	0.01
Capital Utilization	β_{k0}	-0.01	-0.02	0.01	0.01	-0.01	0.00	-0.02	0.00	-0.01
	θ_{k0}	0.01	0.00	0.01	0.02	0.02	0.01	0.03	0.01	-0.03
Consumer Confidence	β_{k0}	0.02***	0.03***	0.00	0.00	0.01**	0.01	0.00	0.01***	0.00
	θ_{k0}	0.03***	0.02***	0.03**	0.04**	0.00	0.04***	0.01	-0.01	0.00
Consumer Credit	β_{k0}	-0.01	-0.01	0.00	-0.01	0.00	0.00	0.00	-0.01	-0.01
	θ_{k0}	0.01	0.00	-0.01	0.00	0.00	0.00	0.01	0.00	-0.07
Construction Spending	β_{k0}	-0.01*	0.00	0.00	0.01	0.00	0.00	-0.01	0.00	0.00
	θ_{k0}	0.03***	0.03**	0.00	0.01	0.02*	0.01	0.00	0.00	0.02
Consumer Price Index	β_{k0}	0.01	0.00	0.00**	-0.02**	0.00	-0.03*	-0.03	0.00	-0.01*
	θ_{k0}	0.04***	0.05***	0.03***	0.03*	0.05***	0.09***	0.09***	0.01	0.10***
Durable Goods Orders	β_{k0}	-0.01	0.00	0.00	-0.01	0.00	0.00	0.00	0.03***	0.01
	θ_{k0}	0.05***	0.05***	0.04***	0.03***	0.02***	0.04***	0.01	0.00	-0.01
Factory Orders	β_{k0}	-0.01	-0.01**	-0.03**	0.00	0.00	0.00	0.00	0.00	0.01
	θ_{k0}	0.06***	0.05***	0.05***	0.05***	0.01	0.03***	0.02*	0.00	-0.03*
Gross Domestic Product	β_{k0}	0.02***	0.03***	0.03***	0.02**	0.00	0.01*	0.03**	0.02***	-0.01
	θ_{k0}	0.04***	0.03***	0.01	0.01	0.02***	0.03***	0.01	-0.02*	0.06***
Housing Starts	β_{k0}	-0.01***	-0.01	0.00	-0.03***	0.00	0.00	-0.01	0.00	0.00
	θ_{k0}	0.04***	0.03***	0.02	0.06***	0.01	0.02**	0.01	0.00	0.02
Imports	β_{k0}	-0.01	0.00	0.00	0.01	-0.01*	0.02**	0.00	0.00	0.01
	θ_{k0}	0.01	0.00	0.03**	0.00	0.02**	0.00	0.04***	0.00	0.03
Interest rate	β_{k0}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	θ_{k0}	-0.03	0.06**	0.00	0.00	-0.03	-0.03	-0.05	-0.04	0.00
Industrial production	β_{k0}	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
	θ_{k0}	0.03***	0.03***	-0.01	0.02	0.00	-0.01	0.01	-0.02	0.03
NAPM	β_{k0}	0.08***	-0.03	0.03	-0.46**	0.01	0.06	-0.04	0.17	-0.26
	θ_{k0}	0.03***	0.04***	0.04	0.06**	-0.01	0.03	0.02	0.00	0.01
Leading Indicators	β_{k0}	-0.01*	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	0.01
	θ_{k0}	0.04***	0.02***	0.01	0.04***	0.01	0.00	0.03	-0.01	-0.04
New Home Sales	β_{k0}	-0.02***	-0.02**	0.00	-0.01	0.00	0.01	0.00	0.00	0.01
	θ_{k0}	0.07***	0.05***	0.03**	0.06***	0.01	0.02***	0.03***	0.00	-0.03
Nonfarm Payroll	β_{k0}	0.07***	0.06***	0.00	0.02*	0.02***	0.08***	0.12***	0.01	0.04**
	θ_{k0}	0.17***	0.16***	0.08***	0.08***	0.06***	0.12***	0.08***	0.00	0.07***
Personal Spending	β_{k0}	0.00	0.00	0.00	0.01	-0.01	-0.01	0.00	-0.01	0.00
	θ_{k0}	-0.01	0.01	-0.01	-0.01	-0.01	-0.01	0.00	0.00	0.00
Personal Income	β_{k0}	0.00	0.00	-0.01	0.00	-0.01	0.01	0.00	0.01	-0.01
	θ_{k0}	0.04***	0.02**	0.02	0.03**	0.03***	0.05***	0.04**	-0.01	0.05*
Producer Price	β_{k0}	-0.02***	-0.02***	0.00	0.00	-0.01*	0.00	0.00	0.00	-0.01
	θ_{k0}	0.06***	0.06***	0.04***	0.02	0.03***	0.03**	0.04***	-0.01	0.08***

Announcements	xvar_id	Czech Republic	Hungary	Indonesia	Korea	Mexico	Poland	South Africa	Thailand	Turkey
Retail Sales	β_{k0}	0.01*	0.01	0.01	0.02	0.03***	0.02***	0.00	0.00	-0.04*
	θ_{k0}	0.04***	0.04***	0.01	0.02**	0.03***	0.02**	0.06***	0.00	0.04
Trade Balance	β_{k0}	0.02***	0.02***	0.01	0.03***	0.00	0.03***	0.03***	-0.01**	-0.03
	θ_{k0}	0.04***	0.04***	0.05***	0.00	0.02**	0.04***	0.02	0.03***	0.04*
Initial Unemployment	β_{k0}	0.00	0.00	0.01	0.00	0.00	-0.01	0.00	0.00	0.00
	θ_{k0}	0.02***	0.02***	0.01	0.02***	0.01***	0.03***	0.01**	0.00	0.01
Wholesales	β_{k0}	-0.01	-0.01*	0.00	0.00	0.00	0.01	0.00	-0.01	0.00
	θ_{k0}	0.04***	0.04***	0.02	0.02	0.02***	0.02*	0.03***	0.02	-0.03
Domestic Contemporaneous Announcements in equation (1.8)										
Budget Deficit	β_{k0}	0.01	-0.02*				0.00			
	θ_{k0}	-0.01	0.03**				0.04***			
Current Account	β_{k0}	-0.01*	0.02***			-0.01	-0.01	-0.11	0.37***	0.00
	θ_{k0}	0.01	0.03***			0.00	-0.04	0.02	-0.05**	0.01
Current Account(US)	β_{k0}	0.01								
	θ_{k0}	0.01								
Consumer Confidence	β_{k0}					0.00				0.00
	θ_{k0}					-0.01				0.00
Consumer Price Index	β_{k0}	-0.02*	0.01		0.00	0.00	-0.01	0.01	0.00	-0.01
	θ_{k0}	0.04***	0.03***		-0.01	0.00	0.02*	0.02	0.00	-0.01
Exports	β_{k0}	0.01		0.00	0.00		0.00		0.00	-0.07
	θ_{k0}	-0.04		0.07***	0.02		0.10*		0.00	0.06
Fixed Invest	β_{k0}					0.00				
	θ_{k0}					-0.01				
Gross Domestic Product	β_{k0}	0.01***	0.00	-0.02	-0.01	0.01	0.02	0.01	-0.08***	0.00
	θ_{k0}	0.02**	0.01	0.00	-0.01	-0.01	0.01	-0.01	0.16***	0.01
Imports	β_{k0}	-0.01		0.00	0.01		0.00			-0.02
	θ_{k0}	0.04		-0.26***	-0.04		0.02			0.00
Interest rate	β_{k0}							0.00	0.00	
	θ_{k0}							0.42***	-0.03	
Industrial production	β_{k0}	0.01**	-0.01*		0.00	0.01***				0.00
	θ_{k0}	0.00	0.03***		-0.01	0.00				-0.01
Money Supply	β_{k0}	0.00					-0.02	0.04***		
	θ_{k0}	0.02					0.01	0.00		
Producer Price	β_{k0}	0.00	-0.01			0.00***	-0.02	0.00		0.16***
	θ_{k0}	0.01	0.02***			0.01	0.04*	0.01		0.02
Retail Sales	β_{k0}	0.01				0.00	0.01	-0.08***		
	θ_{k0}	0.02***				-0.01	0.02*	0.05		
Trade Balance	β_{k0}	0.01*	0.00	0.17		0.01		0.09***		-0.03
	θ_{k0}	0.02***	0.01	0.19***		-0.01		0.00		0.05
Initial Unemployment	β_{k0}	0.01			0.00	0.03***	-0.01			-0.01
	θ_{k0}	0.00			-0.01	-0.01	0.00			-0.02
Wholesales	β_{k0}					0.00	0.01			
	θ_{k0}					0.01	0.00			

Table A.16: Regression Results with Expected Appreciation

Announcements	Czech Republic	Hungary	Indonesia	Korea	Mexico	Poland	South Africa	Thailand	Turkey
Impact of Contemporaneous News Surprises on FX									
Return									
Business Inventories	-0.01	-0.01	0.01	-0.01	0.01	-0.01	-0.04**	0.00	-0.03
Budget Deficit	-0.01	0.05	0.01	0.02	-0.01	0.00	0.04	0.02	0.00
Current Account	0.10**	0.10**	-0.06**	0.01	-0.01	0.03*	0.03	0.03	0.03
Capital Utilization	-0.01	-0.02	-0.02	-0.03**	0.01	0.01	0.08**	0.00	0.06*
Consumer Confidence	0.12**	0.10**	0.02	0.02	0.02	0.07**	0.05**	0.00	0.10
Consumer Credit	-0.01	-0.01	-0.01	-0.01	-0.01	0.00	-0.02	-0.01	0.31
Construction Spending	0.06**	0.02	0.01	0.01	0.00	0.03**	-0.02	-0.05**	-0.01
Consumer Price Index	-0.02	0.02	-0.04**	0.01	0.02*	0.01	0.05**	0.00	0.05
Durable Goods Orders	0.05**	0.07**	0.06**	0.02*	0.01	0.06**	0.06**	-0.02	0.04
Factory Orders	0.05**	0.02	0.00	-0.03*	0.01	0.00	0.03*	0.00	0.02
Gross Domestic Product	0.09**	0.09**	0.06**	0.02	0.01	0.07**	0.09**	0.00	0.00
Housing Starts	0.02	0.03*	-0.01	0.02*	0.01	0.01	0.02	-0.01	-0.03
Imports	0.01	0.01	0.03*	0.02	0.00	0.00	-0.02	-0.01	-0.05*
Interest rate	0.01	0.02	0.00	0.00	0.01	0.00	0.00	0.01	0.00
Industrial production	0.07**	0.04	0.03*	0.02	0.00	0.01	-0.02	0.01	-0.01
NAPM	0.61*	0.83**	0.40	0.72**	0.24	0.78**	0.55	-0.23	0.52
Leading Indicators	-0.01	0.02	0.00	-0.01	0.00	0.00	-0.01	0.00	0.00
New Home Sales	-0.02	0.03*	0.04**	0.03**	0.01	0.03**	-0.01	-0.01	-0.04
Nonfarm Payroll	0.19**	0.21**	0.07**	0.08**	0.11**	0.23**	0.26**	0.01	0.14**
Personal Spending	-0.01	0.01	0.02	0.00	0.01	0.00	-0.01	-0.01	0.00
Personal Income	0.03	0.02	0.00	0.01	0.01	0.00	0.03*	0.00	0.00
Producer Price	-0.01	-0.01	0.02*	0.01	0.01	0.01	0.03	0.00	0.02
Retail Sales	0.09**	0.07**	0.04**	0.04**	0.02	0.08**	0.03*	0.01	-0.01
Trade Balance	0.04**	0.06**	-0.01	0.01	-0.01	0.11**	0.09**	0.01	0.03
Initial Unemployment	-0.04**	-0.03**	-0.01	-0.02**	-0.02**	-0.02**	-0.02**	0.01	0.01
Wholesales	0.00	0.01	0.01	0.01	-0.03	0.00	0.00	0.00	-0.01
Budget Deficit	-0.05	-0.34				0.01			
Current Account	-0.02	-0.04*			-0.07	-0.07**	0.34**	0.03	0.03
Current Account(US)	-0.01								
Consumer Confidence					-0.01				0.00
Consumer Price Index	-0.03*	0.05**		0.01	0.01	0.01	-0.04*	-0.01	1.74**
Exports	-0.41**		-0.01	0.01		0.00		0.01	-0.20
Fixed Invest					0.00				
Gross Domestic Product	0.01	-0.16	-0.01	-0.05	0.00	-0.06**	-0.08	-0.16**	-0.03
Imports	0.08		0.02	0.00		-0.01			0.00
Interest rate							-0.36**	-0.01	
Industrial production	-0.01	-0.02		0.00	-0.02				-0.02
Money Supply	0.00					-0.01	0.00		
Producer Price	-0.02	-0.02*			0.01	0.00	0.02		0.14**
Retail Sales	-0.02				-0.01	-0.01	0.01		
Trade Balance	-0.09**	-0.01	2.03		-0.01		-0.14**		0.06
Initial Unemployment	0.35**			-0.04	-0.01	0.01			0.00
Wholesales					-0.02	-0.03**			

Impact of Contemporaneous News Surprises Multiplied by Appreciation									
Expectation									
Business Inventories	-0.05	-0.05	-1.37*	-0.29	0.00	-0.77*	-0.28	1.05	0.00
Budget Deficit	-0.06	-0.31*	-0.26	7.53**	-0.01	-0.34	0.53	-0.42	0.00
Capital Utilization	0.01	0.11	0.04	-1.88*	0.04*	-0.03	-1.20**	0.22	0.00
Current Account	-0.23*	-0.26	1.41	0.09	-0.02	0.38	0.04	-1.53	0.00
Consumer Credit	-0.02	-0.08	0.23	-0.18	-0.01	-0.15	0.35	0.65	-6.12
Consumer Confidence	-0.11*	-0.03	0.52	2.35**	0.05**	-1.02**	0.15	0.65	0.00
Construction Spending	-0.18*	0.01	-0.06	-1.57*	0.00	0.96*	0.68*	2.34*	0.00
Consumer Price Index	0.18**	0.06	-2.67**	0.23	0.00	-0.46	0.28	0.96	0.00
Durable Goods Orders	0.22**	0.19**	1.08*	0.39	0.04**	0.10	0.29	-1.04	0.00*
Factory Orders	-0.12**	0.02	0.05	1.68*	0.02	-0.03	0.34	0.14	0.00
Gross Domestic Product	0.20**	0.24**	0.87*	0.81*	0.03	0.17	-0.51	-0.18	0.00
Housing Starts	0.02	-0.08	-0.21	-0.93	0.01	0.46	-0.19	-0.47	0.00*
Imports	0.02	-0.04	3.19**	0.39	-0.04**	0.05	-1.26**	-0.59	0.00
Interest rate	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial production	-0.21**	-0.09	0.29	1.62	-0.01	0.24	-0.20	-0.21	0.00
NAPM	2.55*	2.20	12.73	17.15	0.45	3.42	-7.16	12.46	0.00*
Leading Indicators	0.09	0.02	0.39	0.49	0.02	0.40	0.26	0.38	0.00
New Home Sales	0.18**	-0.01	0.89*	-0.75	0.01	0.00	0.34	0.28	0.00
Nonfarm Payroll	0.73**	0.65**	1.36**	1.07*	0.10**	-0.52*	-0.13	-1.80**	0.00**
Personal Spending	0.08	0.00	0.26	0.26	0.01	0.17	0.06	-0.19	0.00
Personal Income	-0.14*	-0.10	0.50	0.93	0.01	-0.43	1.57**	-0.14	0.00
Producer Price	0.13**	0.18**	0.50	0.16	0.01	0.24	0.11	0.43	0.00*
Retail Sales	0.06	0.13*	1.85**	-0.29	0.12**	0.30	0.39	-0.49	0.00
Trade Balance	0.38**	0.31**	-0.74	1.12*	-0.01	-0.84*	-1.00**	0.06	0.00
Initial Unemployment	-0.01	-0.04	-0.09	-0.16	-0.03**	0.44**	0.14	0.32	0.00
Wholesales	-0.01	-0.06	0.34	-1.28*	-0.03	-0.28	0.76**	0.11	0.00
Budget Deficit	0.09	1.52				0.53			
Current Account	-0.03	-0.51**			-0.07	1.32**	-8.49**	11.61**	0.00
Current Account(US)	-0.09								
Consumer Confidence					-0.01				0.00
Consumer Price Index	0.15*	-0.06		0.24	-0.01	-0.40	1.00**	-0.26	0.00**
Exports	1.42**		-0.34	-0.49		-1.07*		-1.64	8.92
Fixed Invest					-0.02				
Gross Domestic Product	-0.38**	0.48	-0.02	-1.84	0.04	2.02*	0.30	-5.16	0.00
Imports	1.29		0.77	0.29		1.99**			9.11**
Interest rate							-7.96**	0.00	
Industrial production	0.00	-0.08		0.11	-0.02				0.00
Money Supply	-0.10					0.10	-2.15**		
Producer Price	-0.06	0.20			0.00	-0.39	-0.83*		-2.74**
Retail Sales	0.05				0.02	-0.21	-0.21		
Trade Balance	0.08	0.05	51.91		0.01		-0.28		0.00
Initial Unemployment	-1.87**			-2.18	0.02	0.22			0.00
Wholesales					0.00	-0.10			

A.7 Figures

Figure A.1: IS and BP Curves under Different Exchange Regimes

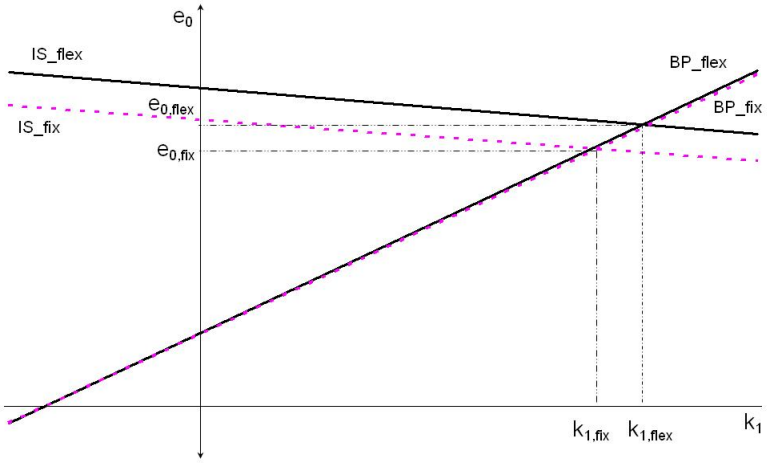


Figure A.2: Impulse Response under the Fixed Exchange Regime with a Deferred Wage Shock

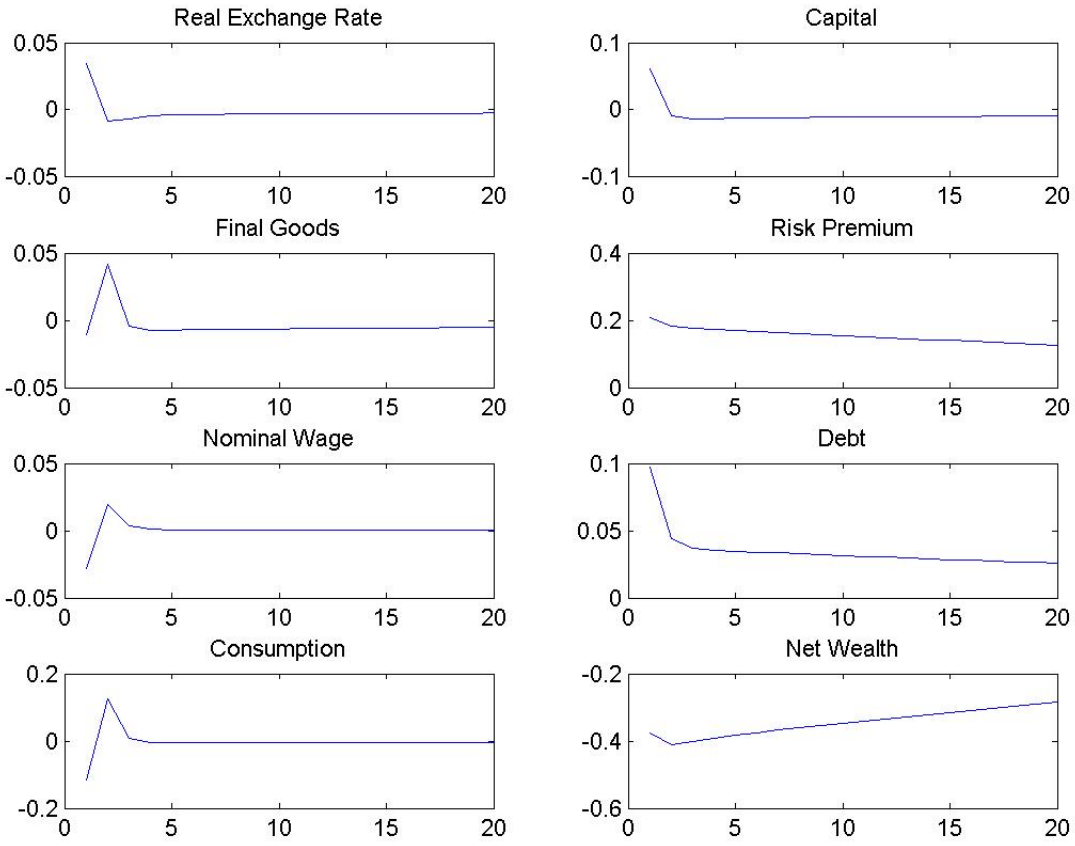


Figure A.3: Impulse Response under the Flexible Exchange Regime with a Deferred Dage Shock

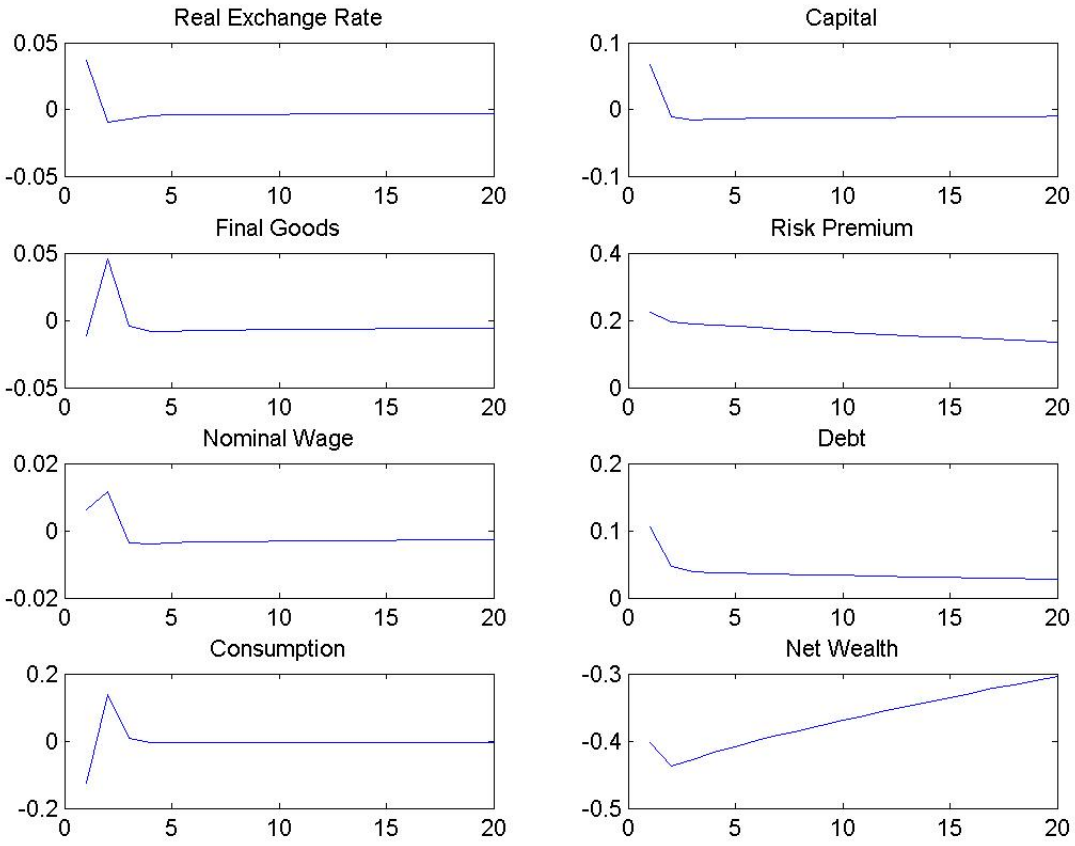


Figure A.4: Impulse Response under the Fixed Exchange Regime with a Technology Shock

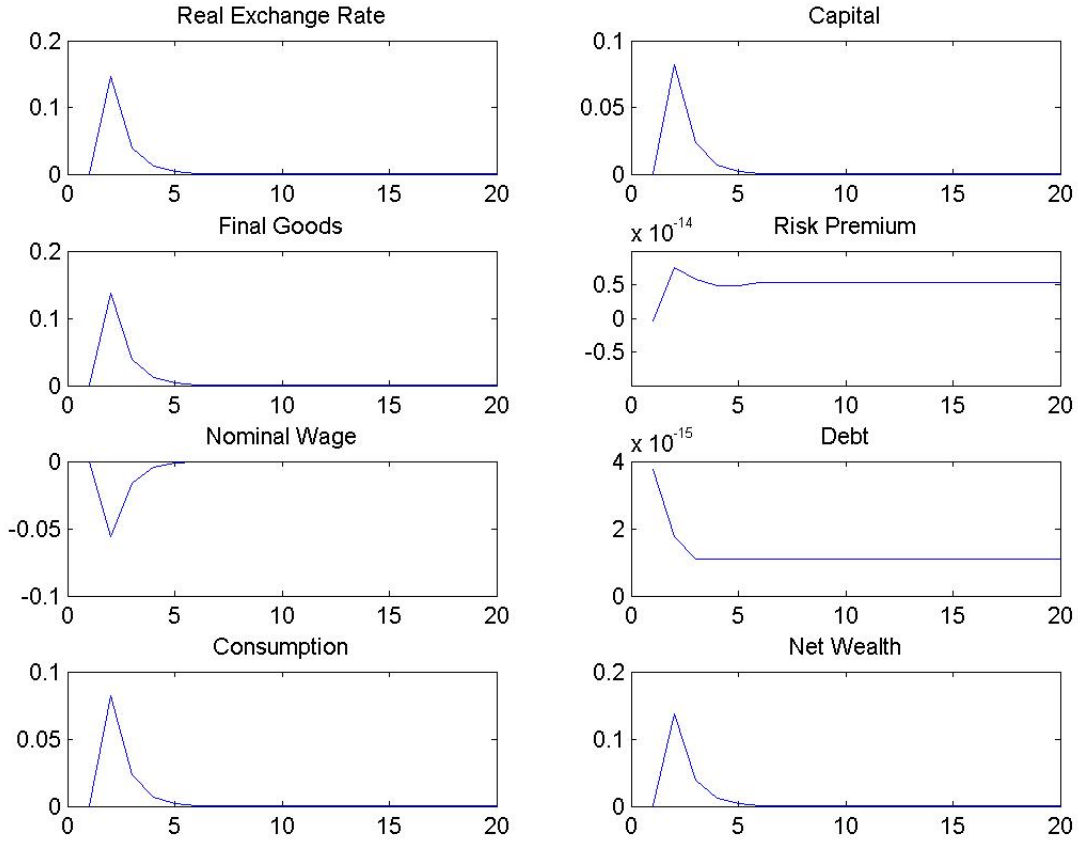


Figure A.5: Impulse Response under the Flexible Exchange Regime with a Technology Shock

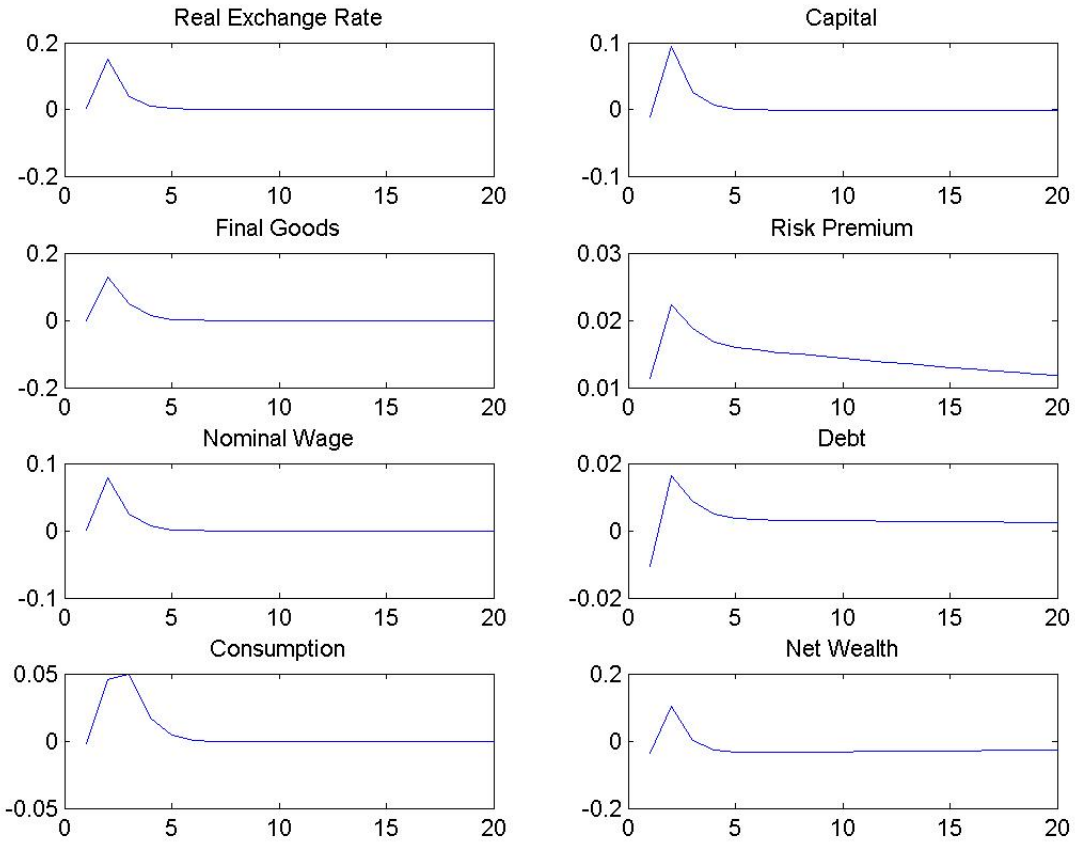


Figure A.6: Impulse Response under the Fixed Exchange Regime with a World Interest Rate Shock

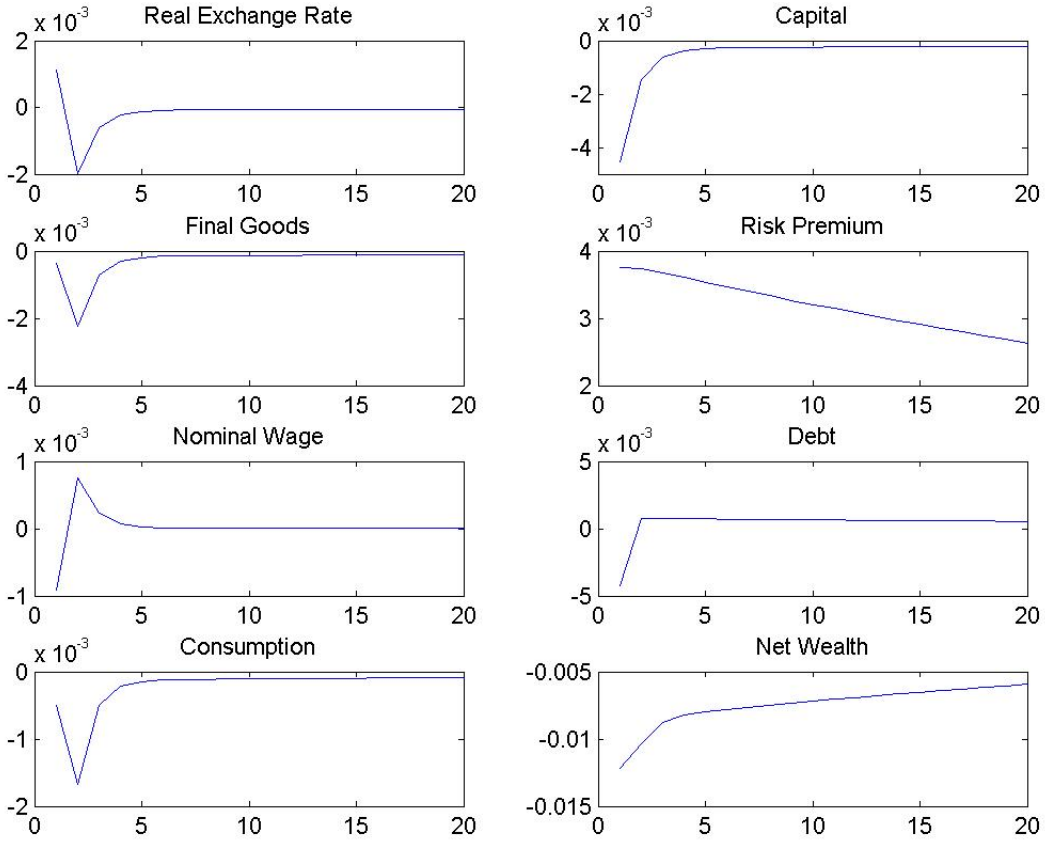


Figure A.7: Impulse Response under the Flexible Exchange Regime with a World Interest Rate Shock

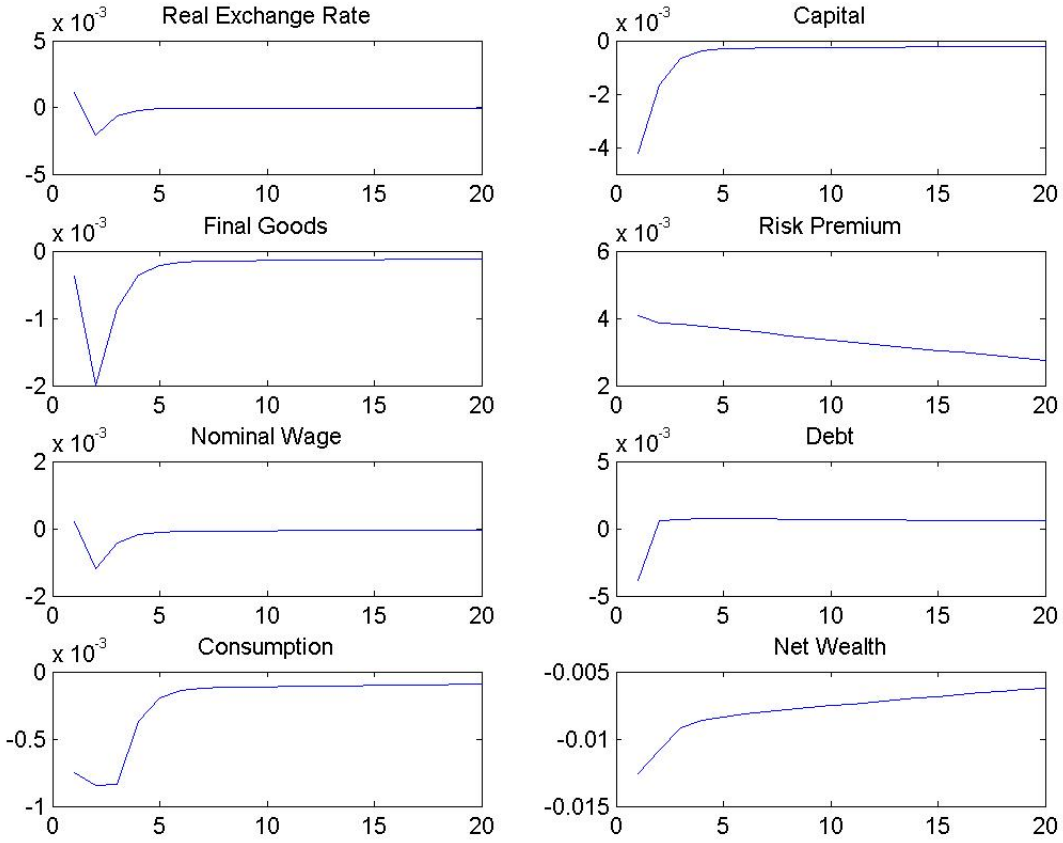


Figure A.8: Impulse Response of Consumptions with a positive deferred wage Shock

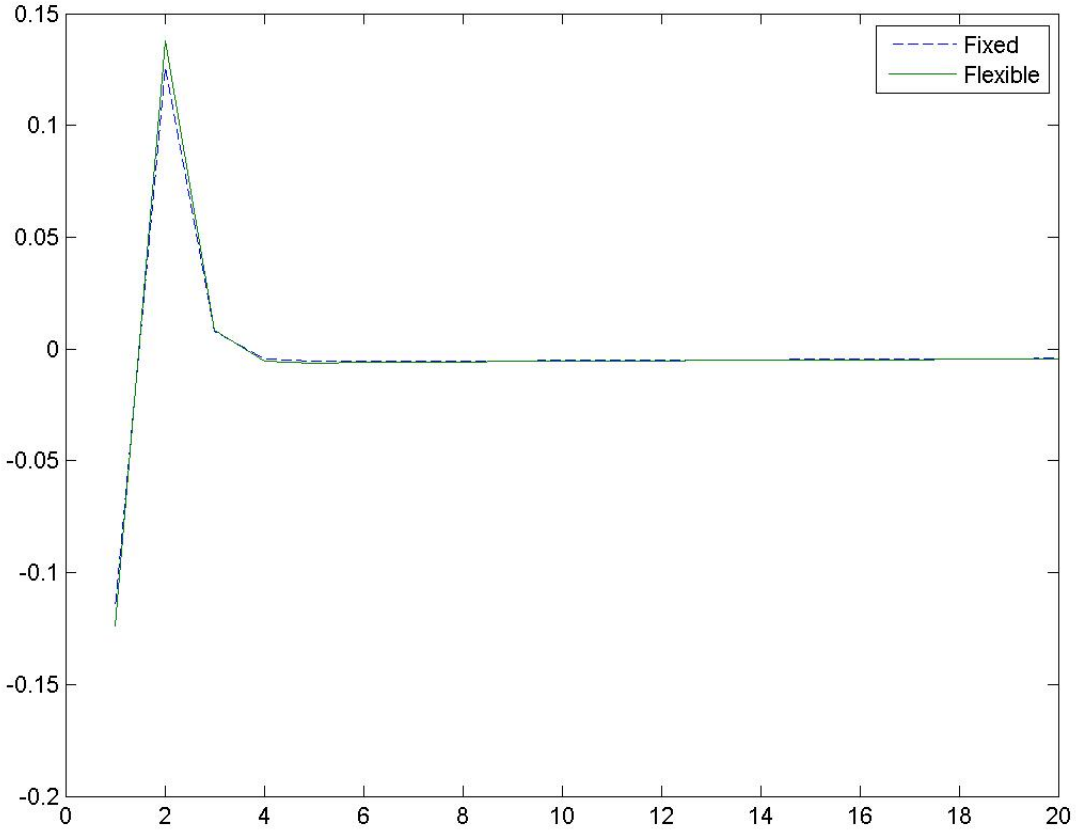


Figure A.9: Impulse Response of Composite Price with a Positive Deferred Wage Shock

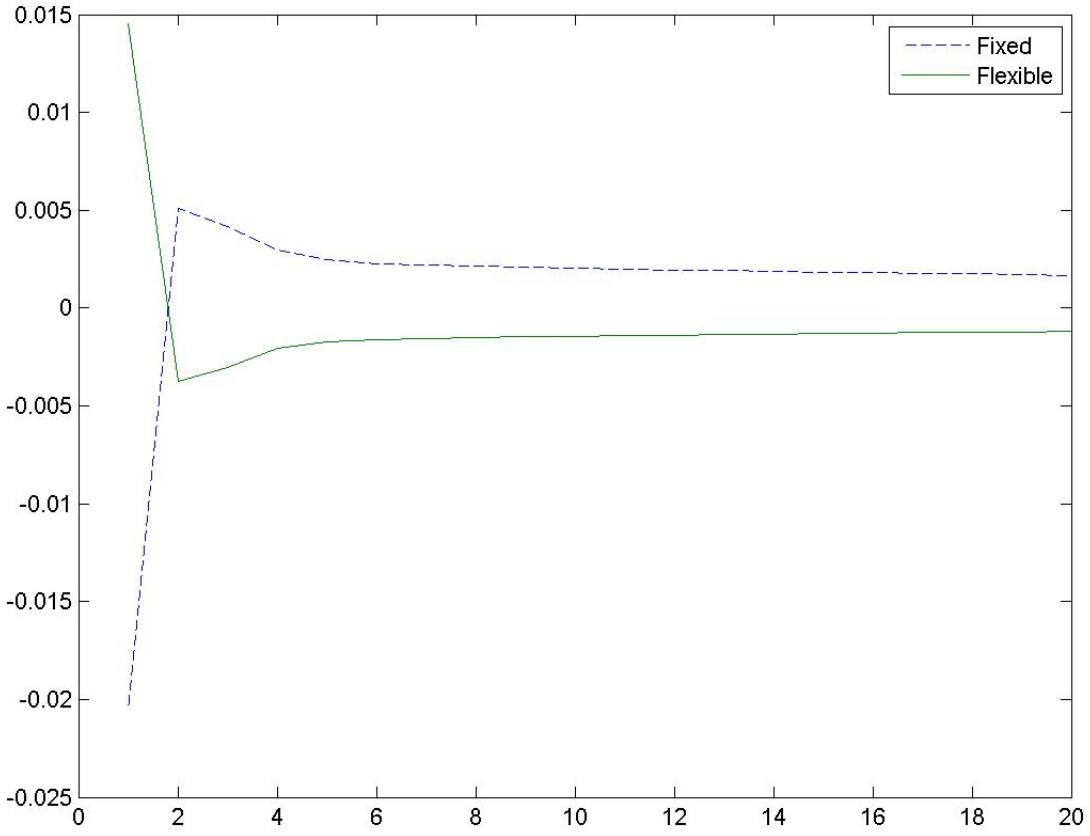


Figure A.10: Impulse Response of Risk Premium with a Positive Deferred Wage Shock

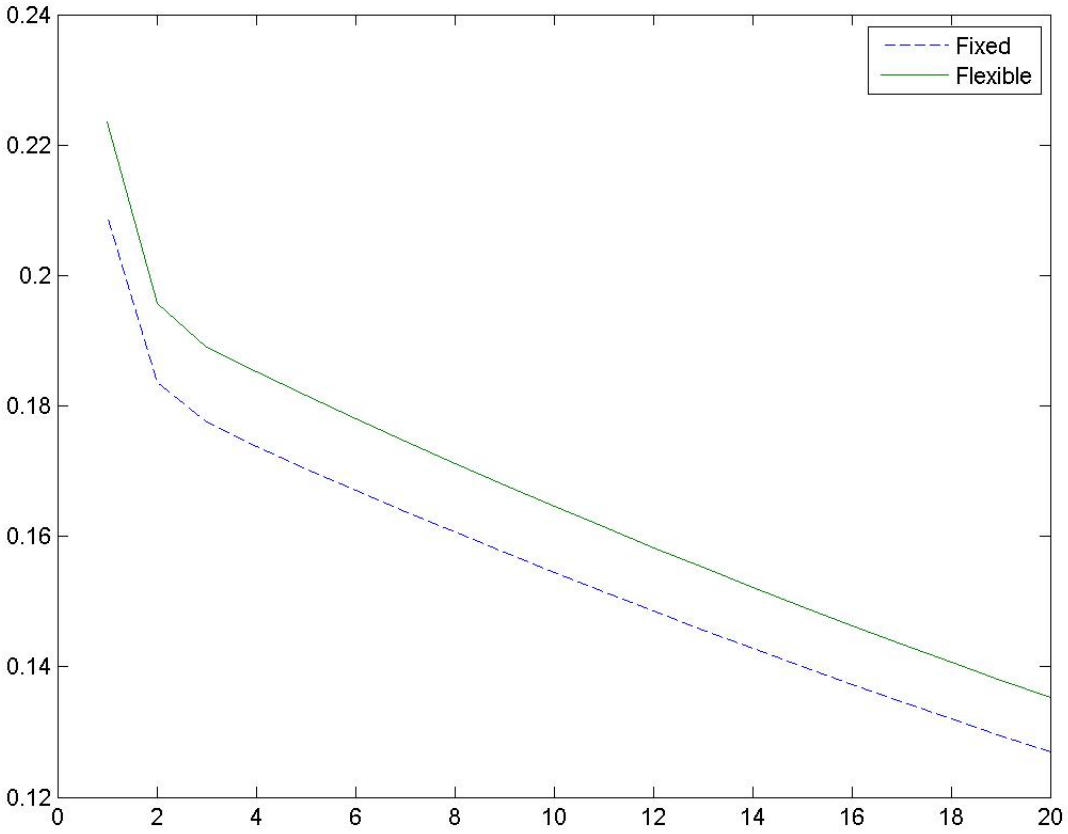


Figure A.11: Impulse Response of Risk Premium with Technology Shock

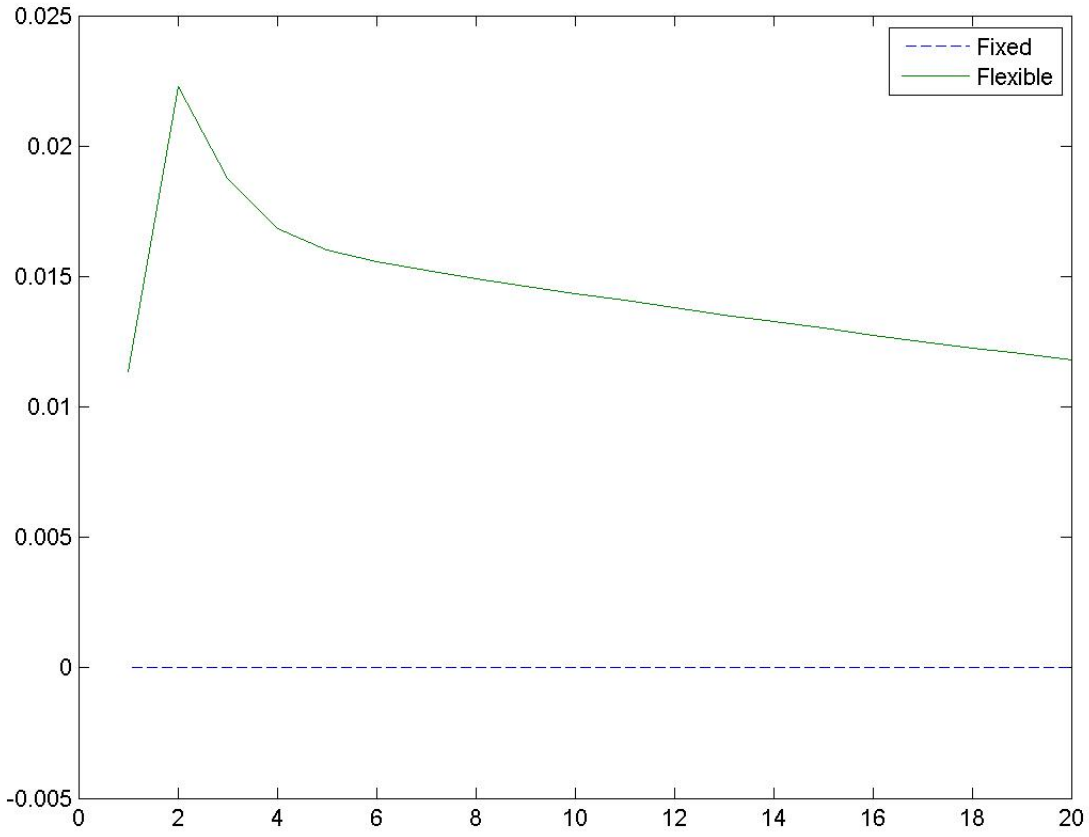


Figure A.12: Impulse Response of Risk Premium with Interest Rate Shock

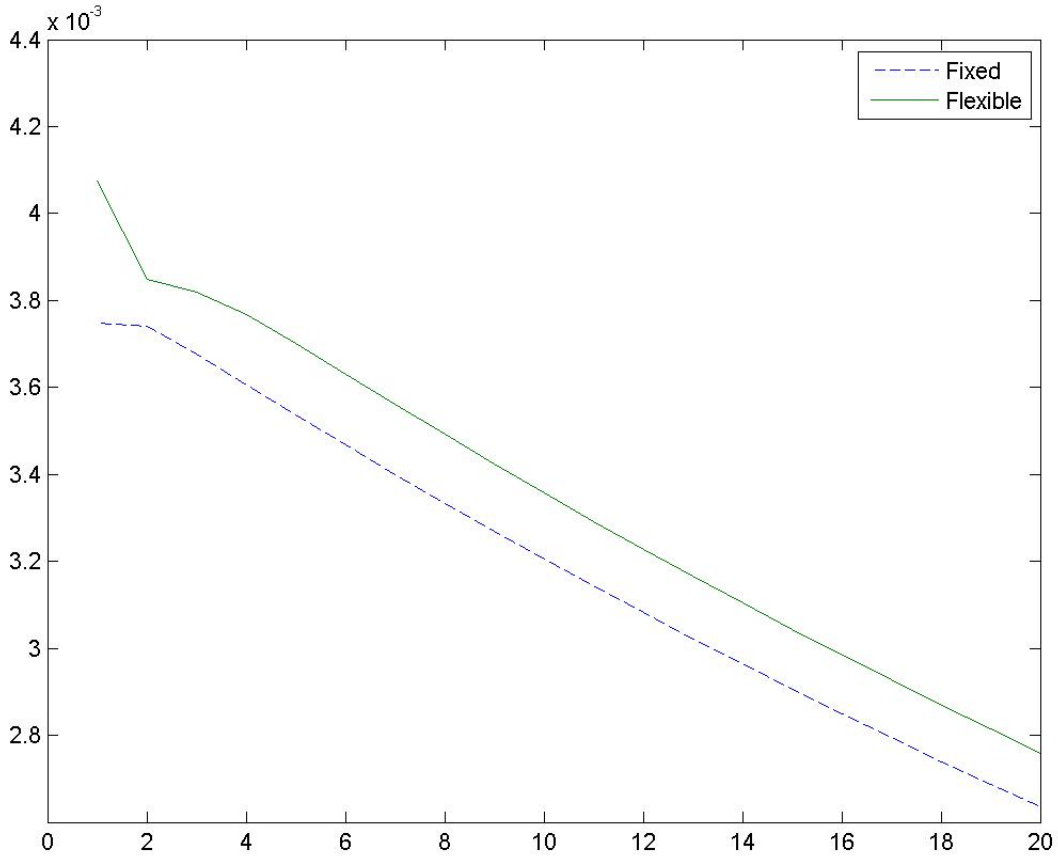


Figure A.13: Impulse Response under the Fixed Exchange Regime with Deferred Wage shock

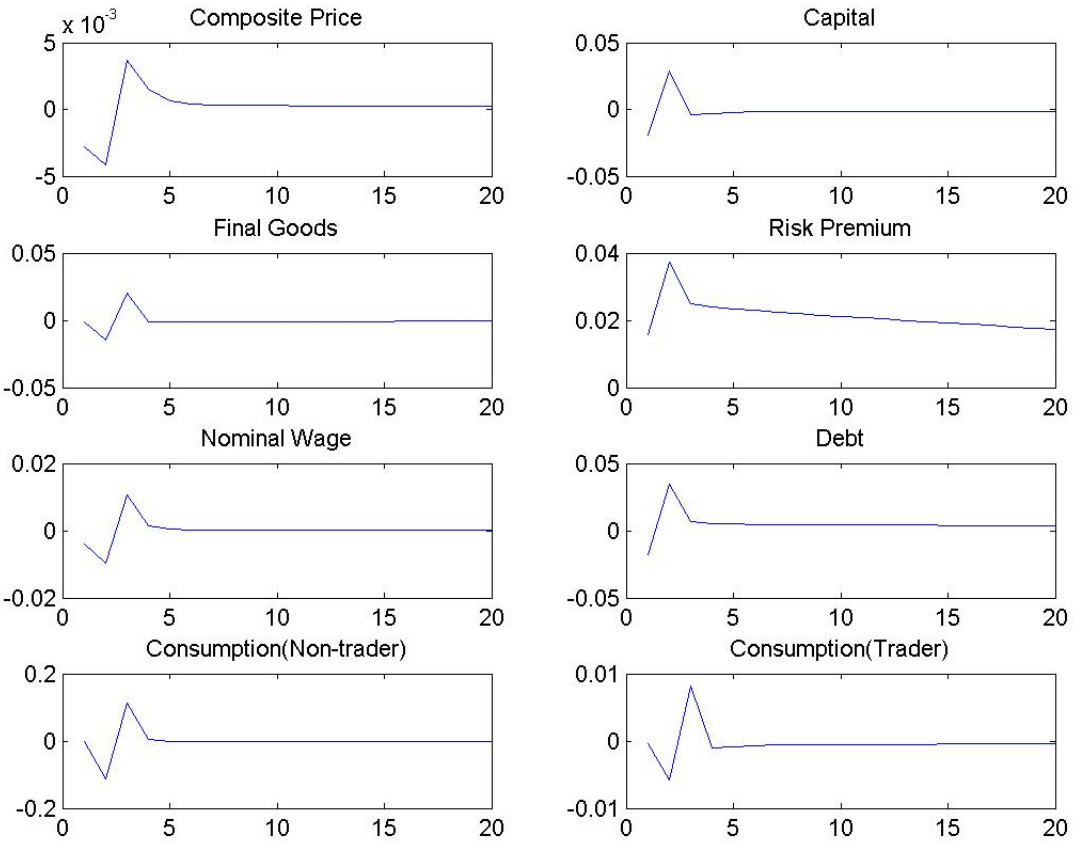


Figure A.14: Impulse Response under the Flexible Exchange Regime with Deferred Wage shock

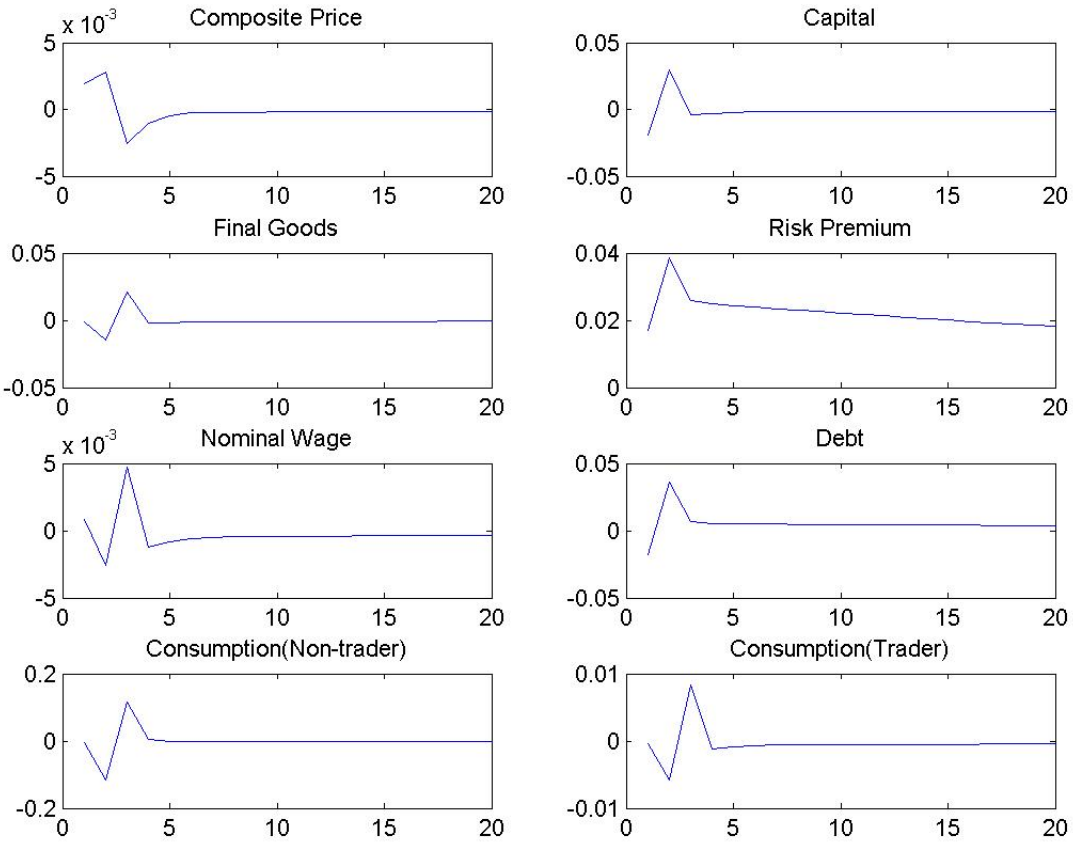


Figure A.15: Impulse Response of Composite price with Deferred Wage shock

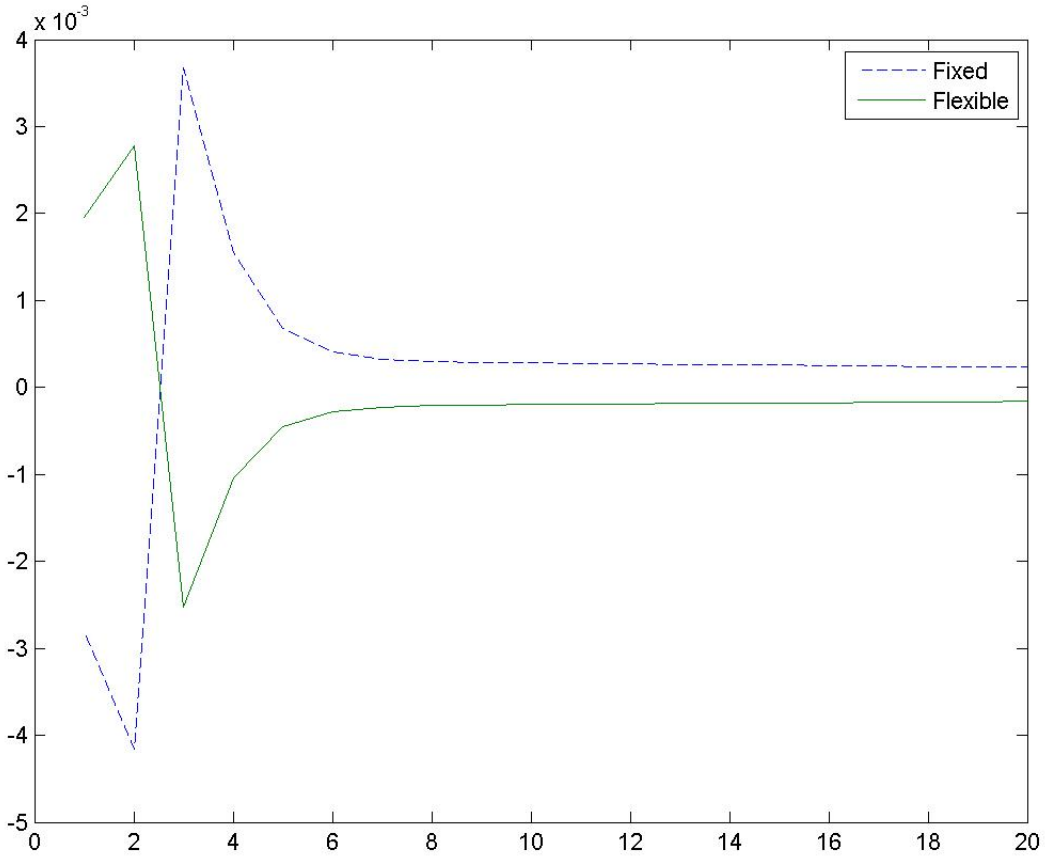


Figure A.16: Impulse Response of Risk Premium with Deferred Wage shock

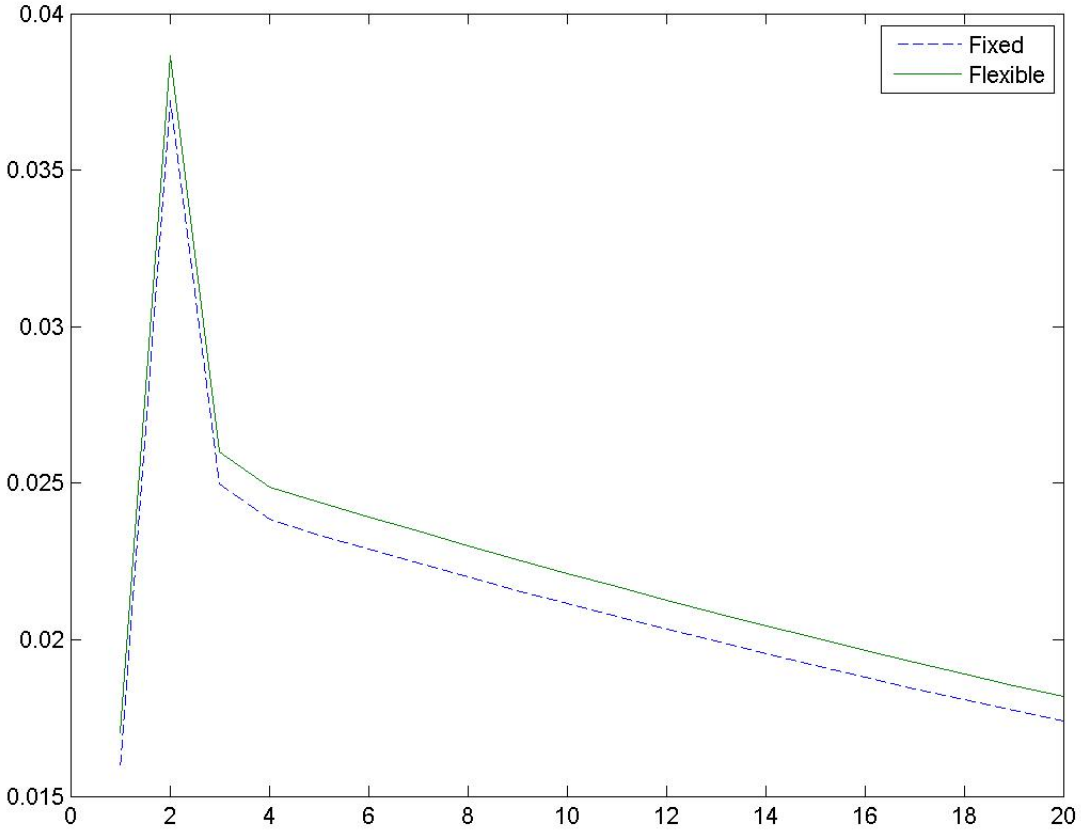


Figure A.17: Sample Autocorrelation Graphs of 5-minute Returns across Countries

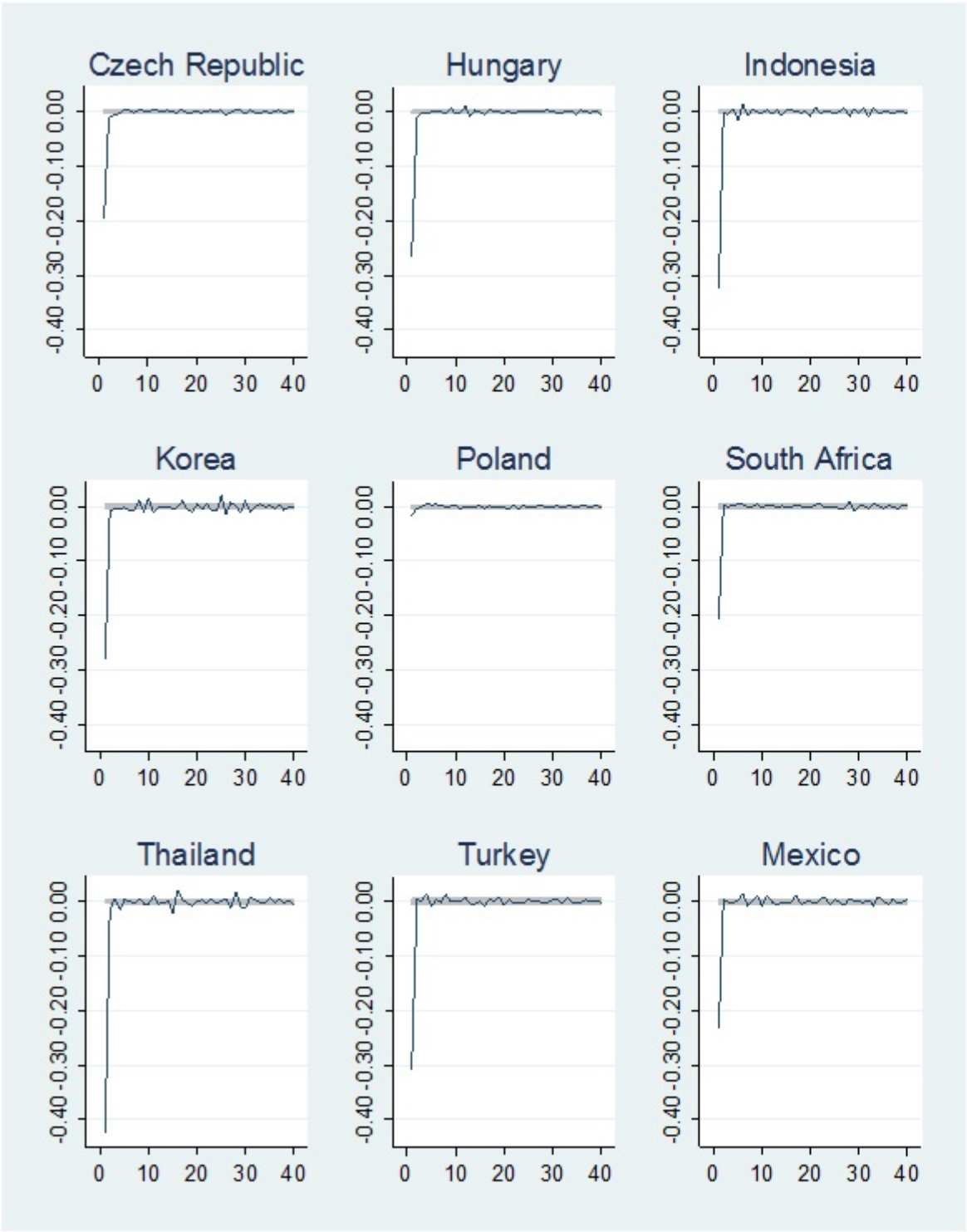


Figure A.18: Sample Autocorrelation Graphs of 5-minute Absolute Returns across Countries

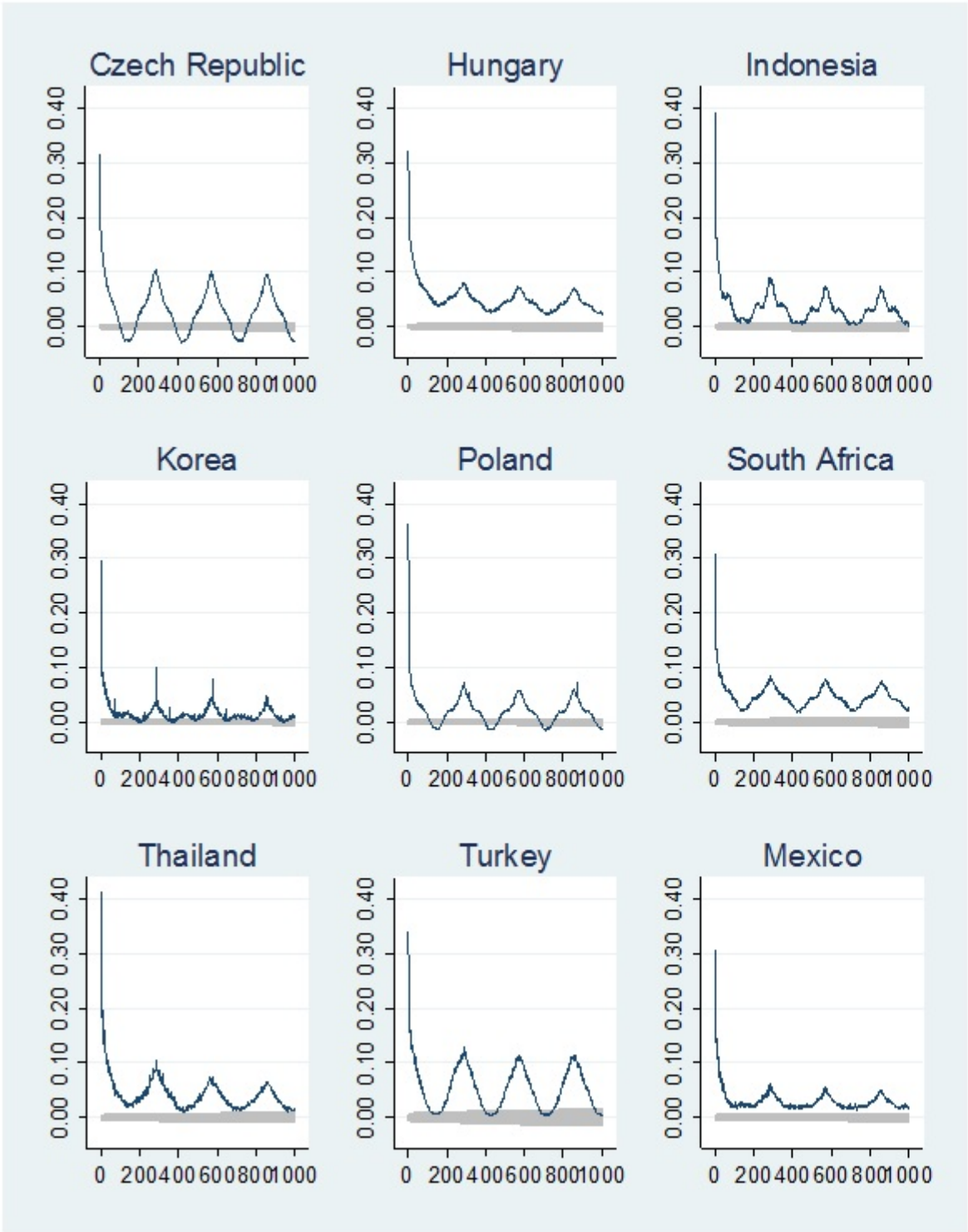
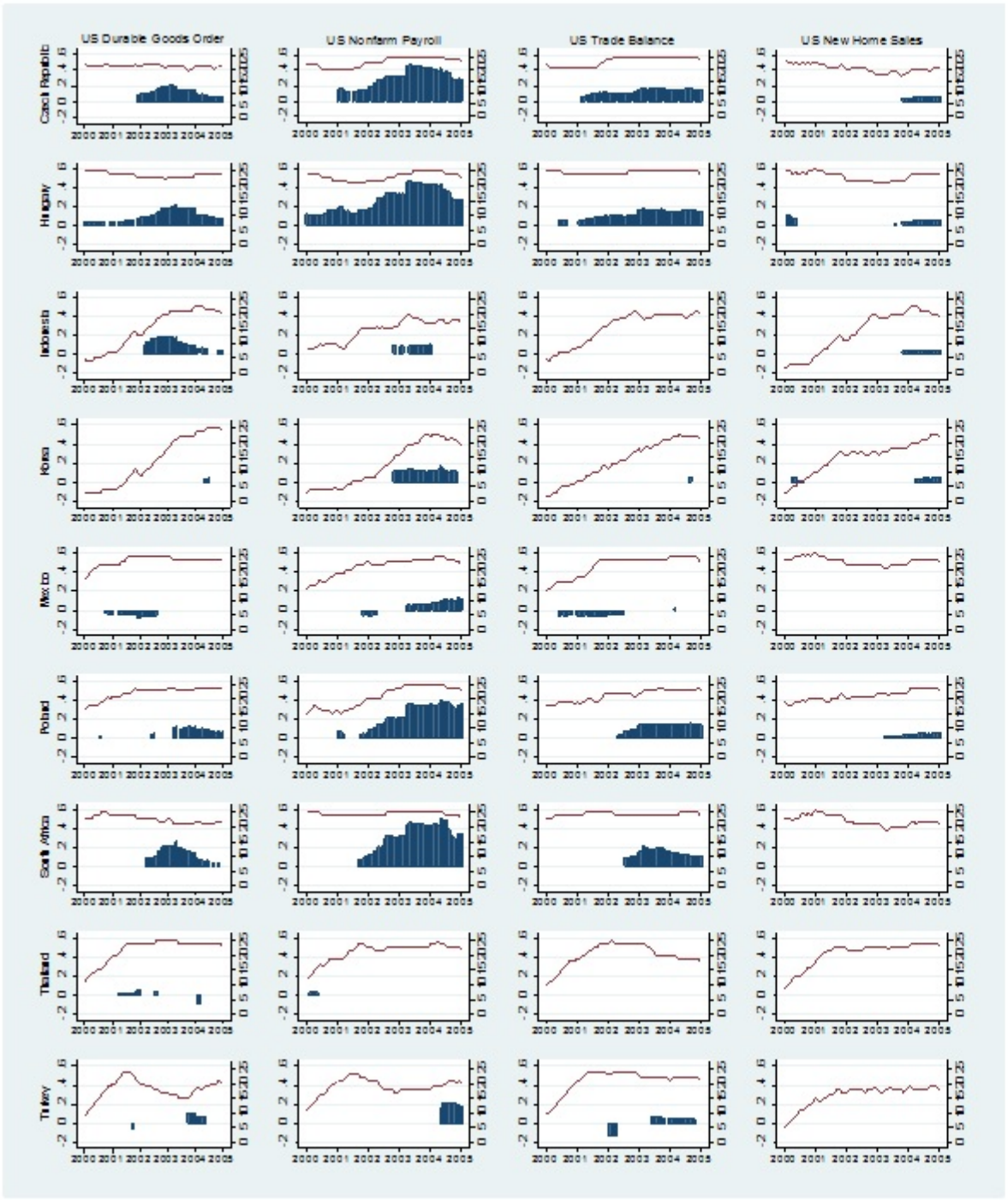


Figure A.19: Evolution of EM Exchange Rates Responses to U.S. News



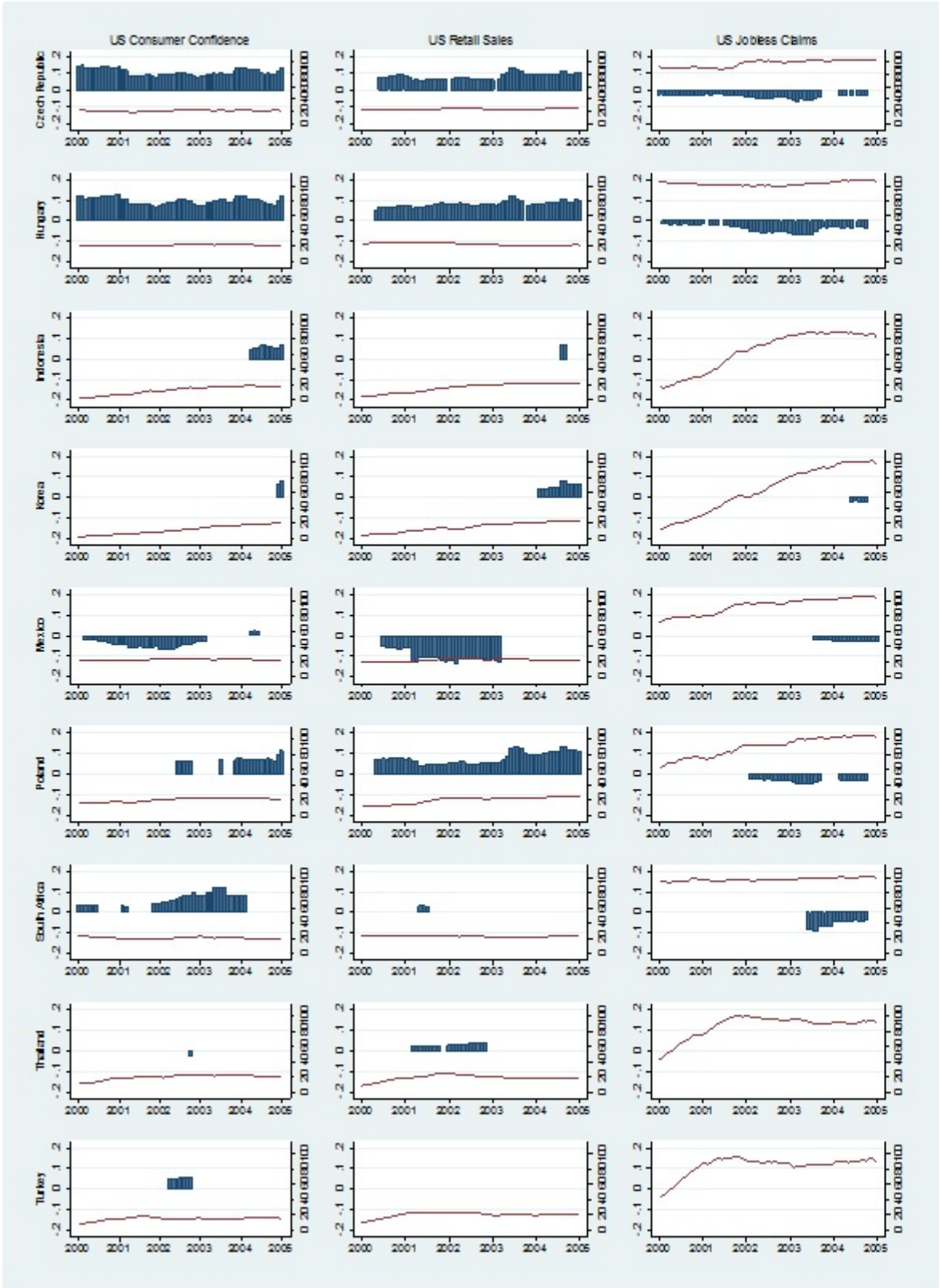
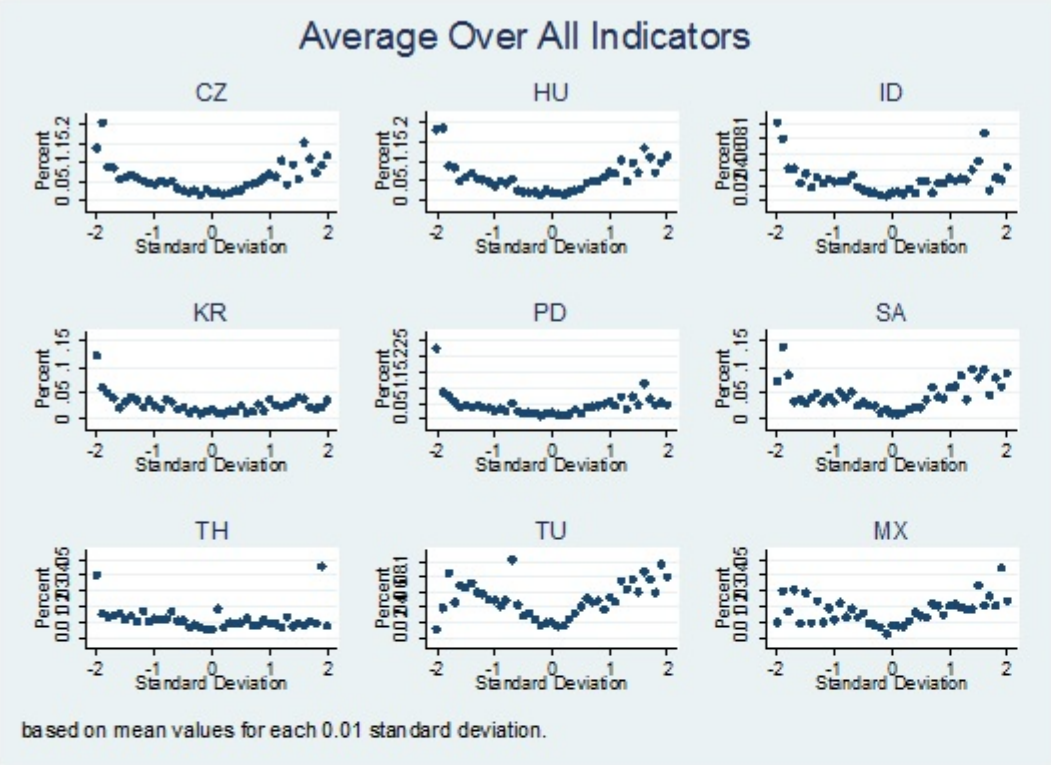

US Consumer Confidence
US Retail Sales
US Jobless Claims
Czech Republic
Hungary
Indonesia
Korea
Mexico
Poland
South Africa
Thailand
Turkey

Figure A.20: U.S. News Impact curve



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