ASERS

Theoretical and Practical Research in Economic Fields

Biannually

Volume I

Issue 2(2)

Winter 2010

ISSN 2068 – 7710

Winter 2010
Volume I, Issue 2(2)

ASERS Publishing
http://www.asers.eu/asers-publishing
ISSN 2068 – 7710

Contents:

Call for Papers
Summer_Issue 2011

Theoretical and Practical Research in Economic Fields

Many economists today are concerned by the proliferation of journals and the concomitant labyrinth of research to be conquered in order to reach the specific information they require. To combat this tendency, **Theoretical and Practical Research in Economic Fields** has been conceived and designed outside the realm of the traditional economics journal. It consists of concise communications that provide a means of rapid and efficient dissemination of new results, models and methods in all fields of economic research.

Theoretical and Practical Research in Economic Fields publishes original articles in all branches of economics – theoretical and empirical, abstract and applied, providing wide-ranging coverage across the subject area.

Journal promotes research that aim at the unification of the theoretical-quantitative and the empirical-quantitative approach to economic problems and that are penetrated by constructive and rigorous thinking. It explores a unique range of topics from the frontier of theoretical developments in many new and important areas, to research on current and applied economic problems, to methodologically innovative, theoretical and applied studies in economics. The interaction between empirical work and economic policy is an important feature of the journal.

Theoretical and Practical Research in Economic Fields, starting with its first issue, it was indexed in **CEEOL**, **IndexCopernicus**, **EBSCO** and **RePEc** databases.

The primary aim of the Journal has been and remains the provision of a forum for the dissemination of a variety of international issues, empirical research and other matters of interest to researchers and practitioners in a diversity of subject areas linked to the broad theme of economic sciences.

All the papers will be first considered by the Editors for general relevance, originality and significance. If accepted for review, papers will then be subject to double blind peer review.

Invited manuscripts will be due till April 25st, 2011, and shall go through the usual, albeit somewhat expedited, refereeing process.

Deadline for submission of proposals:	25st April 2011
Expected Publication Date:	15th June 2011
Web:	www.asers.eu/journals/tpref/
E-mail:	tpref@asers.eu

To prepare your paper for submission, please see full author guidelines in the following file: TPREF_Full_Paper_Template.doc, then send it via email at tpref@asers.eu.

MACROECONOMIC FUNDAMENTALS AND STOCK RETURN DYNAMICS: INTERNATIONAL EVIDENCE FROM THE GLOBAL FINANCE AREA

Ezzeddine ABAOUB
University of 7 November at Carthage, **Tunisia**
Faculty of Economics and Management Sciences of Nabeul
abaoub.ezzeddine@planet.tn
Mongi ARFAOUI
University *El Manar*, **Tunisia**
Faculty of Economics and Management Sciences of Tunis
Arfaoui.mongi@gmail.com
Hammadi SLITI
University *El Manar*, **Tunisia**
Faculty of Economics and Management Sciences of Tunis
sliti_h.fsegt@yahoo.fr

Abstract

Through this paper, we seek to shed light on the divergence between expected and observed returns. Empirical theory attributes this divergence to macroeconomic fundamental shocks. We try, via an ECM model, to study the existence of cointegration relations between macroeconomic volatility and stock returns dynamics using monthly data over the period 1986 to 2008, for a sample of developed and emerging markets. Furthermore, we aim at quantifying the marginal explanation power of global risk-factors in the current sustained financial globalisation. Our findings show that local factors have an instantaneous effect on emerging markets but not very significantly on developed markets. However, global factors effect persists over the future periods on emerging markets but it is instantaneous and persistent on developed markets. Furthermore, local risk factors contribute increasingly to the explanation of the forecast error variance decomposition. Nevertheless, global factors contribute instantaneously but persist on future periods for the developed markets. Our findings may provide an additional contribution to the question of stock return dynamics as well as to the prediction of the 'Out-of-sample' stock return.

Keywords: stock return, macroeconomic volatility, local risk factors, global risk factors, ECM, impulse response functions, forecast error variance decomposition

JEL Classification: G12, G14, G15

1. Introduction

Capital market theory supposes that investors require an *ex ante* premium to hold risky assets. Since the *ex-ante* risk premium was not been easily observable; average past returns substitutes expected returns without considering uncertainties attributed to fluctuations of stock prices (Campello *et al.* 2008, 1297). Moreover, recent empirical investigations were interested in ex post mean-variance analysis without considering the statistical properties of stock returns and the problem of estimation risk.

For instance, Jorion (1985, 259) raised the question of ex post return versus ex ante return. Although estimation risk is a rational explanation (e.g. Elton 1999, 1199; Kumar *et al.* 2008, 1037), recent empirical investigation (e.g. Lettau *et al.* 2008, 1653; Boucher 2007, 1), shows that instability of stock returns through time is closely associated to macroeconomic volatility effects. Considering these questions, we aim at several purposes; (i) to clarify the relative influence of local and common macroeconomic factors on equity returns. (ii) To study stock market reactions to macroeconomic volatility and (iii) to study the relative contributions of the local and common factors. Our intentions seem to provide a basic tool to decision-making for international investors as well as for domestic governors.

The remainder of this paper is organized as follows: the second Section presents a review of empirical literature; the third Section presents the methodology and the empirical specification. The fourth Section, presents data and preliminary tests. In the fifth Section, we interpret and discuss our results to conclude some in the sixth Section.

2. Literature review

Theoretical motivations of the article start from a general consensus of a bilateral link between macroeconomic volatility and stock returns dynamics. Indeed, since Fama (1981, 545), Chen *et al.* (1986, 383), the close relation between macroeconomic volatility, real activity and stock prices behaviour has been well documented. For example, Chen *et al.* (1986, 383), noticed that interest rate, anticipated and unanticipated inflation, spread of bond returns and industrial production affects significantly stock returns.

Otherwise, recent empirical literature suggests that stock return dynamics is far from being independent of macroeconomic volatility (e.g. Bekaert and Harvey (1997, 29), Patro *et al.* 2002a, 421; Basher and Sadorsky 2006, 424; Henriques and Sadorsky 2008, 998; Kubo 2008, 83; Abugri 2008, 396). For instance, Patro *et al.* (2002, 421), show that macroeconomic and financial variables leads equity returns via systematic risk and non-systematic risk. Abugri (2008, 396) shows that key macroeconomic variables such as exchange rate, interest rate, industrial production, money supply, MSCI world and world interest rate affect stock returns on Latin American emerging markets.

In the current framework of sustained international financial integration, global factors are likely to carry additional implications to international asset pricing. In this direction, portfolio theory (ICAPM) contends that world market risk is a significant pricing factor. Empirical literature approximates world market risk by changes in world industrial production, and alternatively by MSCI world or S&P 500. (e.g. Ferson and Harvey 1998, 1625; Bekaert *et al.* 2002, 203). However, the world interest rate is a central variable that determines international parities and capital flows. Interest rate determines the mechanisms of international asset allocation and stimulates reflections to make wealth from arbitrage opportunities. (e.g. Bekaert *et al.* (2002, 203), Abugri 2008, 396).

Beyond these usual factors, empirical literature contends that since oil transactions have been started to be denominated in American dollars, oil prices has been taken a global feature (e.g. Lanza *et al.* 2005, 1423; Basher and Sadorsky 2006, 224; Henriques and Sadorsky 2008, 998). Recent empirical literature, such as Henriques and Sadorsky (2008, 998); Aloui and Jammazi, (2009, 31), contends that crude oil prices have been acquired a global feature that shifts equity market behaviour. Furthermore, Jones and Kaul (1996, 463), contends that this close relation can be explained by the impact of oil shocks on firms' cash flows. Sadorsky (1999, 449) noticed that oil price movement explains a large part of forecast error variance decomposition of real stock returns well than interest rates. Moreover, the relevant inference to rise in the empirical literature is that oil prices prove an asymmetric effect on real economy. Indeed, positive shocks on oil prices affect stock returns and economic activity more significantly than negative shocks.

Papapetrou (2001, 511), employed a VAR methodology to examine the dynamic interaction between real stock returns and interest rate, real economic activity and oil prices on Greek market. Their empirical results show that macroeconomic chocks affects significantly market behave and employment. Sadorsky (2003, 191) supports the close relation between conditional volatility of industrial production, oil price, interest rate, default premium, consumer price index and exchange rate and conditional volatility of stock returns. Basher and Sadorsky (2006, 224), show that shocks on oil prices influence well stock prices. Henriques and Sadorsky (2006, 998), affirm that even if the investigation (via causality tests) is implemented over a shorter period, changes in oil prices and interest rates provide a marginal explanatory power to stock returns.

Otherwise, the remark which deserves to be noted is that empirical literature does not provide enough of implications on horizons feature of this relation. Similarly, previous works are not very interested in the identification of marginal contribution of macroeconomic and financial variables to forecast stock returns. In the same way, empirical investigations are only interested in developed markets or in emerging markets. We test the advantage of admitting both developed markets and emerging markets as well as over one large period. Our study is aimed at considering several intentions; (i) assess the relative effect of local and global macroeconomic shocks on stock returns in the current framework of financial globalisation. The question which arises here is that response to the global factors depends on international financial integration of a given domestic equity market as well as it depends on international transmissions mechanisms. (ii) Clarify the nature of reactions between equity markets and macroeconomic volatility and (iii) be interested in the marginal contribution of local and global variables via the forecast error variance decomposition, since few works were been interested in this question.

3. Model and methodology

3.1. Model and empirical specification

Seeing the success of autoregression models in the modelling of endogenous dynamic relations, VAR model become a frequently used approach by analysts and financial economists. In this direction and to be exact to our objectives, we employ a VAR approach. This specification allows modelling the potential interconnections between the two sides.

We consider $\{y_t\}$ denote an n-dimensional vector time series. Let us assume that $\{y_t\}$ is generated by an unrestricted VAR model of the form:

$$A(L)y_t = \delta + \varepsilon_t \quad (1)$$

Where, L is the lag operator, i.e. $L^j y_t = y_{t-j}$ for any integer j. the n-dimensional vector sequence of the reduced form $\{\varepsilon_t\}$ is assumed to be Gaussian white noise, that is, ε_t and ε_s are independent for $s \neq t$, and ε_t ~ $N(0,\Sigma)$ for all t. Σ is a positive definite matrix. Furthermore, the n x n matrix polynomial $A(\lambda) = I_n - \sum_{j=1}^{p} A_j \lambda^j$ satisfies $\det[A(\lambda)] = 0$, for all λ on and outside the complex unit circle so that explosive $\{y_t\}$ processes are ruled out. In other words, the only form of non-stationarity is due to unit roots. Moreover, if $\{y_t\}$ is generated by (1), then the process is integrated of order d, where d is a non-negative integer (for a definition of integration, see Johansen 1991, 1551).

If $\{y_t\}$ in (1) is cointegrated of order (1,1) with r cointegration vectors, we will know from Granger's Representation Theorem (GRT) that (i) rank [A(1)] = r, and (ii) $A(1) = \alpha\beta'$. The matrix α and β are then of dimension $n \times r$, which have both rank r, and the columns of β are called the cointegration vectors (see Engle and Granger 1987, 251; Johansen 1991, 1551). Moreover, β is a matrix representing the r cointegration relations such that $\beta' y_t$, is stationary. Commonly, $\beta' y_t$ is interpreted as the long run equilibrium relation between the y variables. Since this relation was been often of interest, it follows by Granger's representation theorem that an alternative form of (1) is:

$$A^*(L)\Delta y_t = \delta - \alpha z_{t-1} + \varepsilon_t \quad (2)$$

Here $\Delta = 1 - L$, is the first difference operator and polynomial matrix $A^*(L) = I_n - \sum_{i=1}^{p-1} A_i^* \cdot L^i$ is related to A(L) through $A_i^* = I_n - \sum_{j=i+1}^{p} A_j$ for i = 1, …, p-1. In this representation, widely known as the VEC model, it becomes quite obvious that deviations from the equilibrium relations $z_{t-1} = \beta' y_{t-1}$ form a stationary process. The term αz_{t-1} represents correction of the change in y_t due to last period's long run equilibrium error. Note that the major difference between Eq. (1) and Eq. (2) is that the latter representation is conditioned on cointegration while the former is merely consistent with unit roots.

Engle and Granger's (1987, 251) version of GRT is based on the Wold representation of the vector moving average (VMA) of the form:

$$\Delta y_t = \rho + C(L)\varepsilon_t \quad (3)$$

The polynomial matrix $C(L) = I_n + \sum_{j=1}^{\infty} C_j \cdot L^j$, is assumed to be 1-summable in the sense of Brillinger (1981), i.e. $\sum_{j=1}^{\infty} j|C_j|$ is finite. In other words, time series $\{\Delta y_t\}$ is jointly stationary.

Quantities of interest in the following are the impulse responses or dynamic multipliers that represent the effects of shocks in variables of the system. To obtain their estimates, we must know how to invert the VECM. Note that $c_{ik,n}$ is the ik[th] element of C_n and represents the response of Δy_i to a unit shock in variable k, n periods ago. Seeing that we are based on reduced form, this shock may be a linear combination of other variables. To exert a shock that is purely attributed to only one variable and to clean effects of other variables of the system, in many econometric studies responses to orthogonalized impulses are preferred. They are defined as $R_n = C_n \Gamma^{-1}$, where, Γ, $n \times n$ non-singular matrix, is the lower triangular cholesky decomposition of Σ, such that $\Gamma\Sigma\Gamma'$ is diagonal. We then have:

$$\Delta y_t = \delta + C(L)\varepsilon_t = \delta + R(L)\upsilon_t \quad (4)$$

Where, $R(L)=C(L)\Gamma^{-1}$, $\nu_t=\Gamma\varepsilon_t$, and $E(\nu_t\nu_t')=I_n$.

Here, the component $R(L)\nu_t$ denotes the orthogonalized impulse response function of Δy_t. Thus, a unit impulse has size one standard deviation in this case. Moreover, suppose that we shock Δy_t at $t=t^*$, by a one standard deviation change in ν_{t^*}. The dynamic responses in Δy_{t^*+s} are given by:

$$resp(\Delta y_{t^*+s})=R_s \tag{5}$$

Where, $resp(\Delta y_{inf})=\lim_{s\to\infty} resp(\Delta y_{t^*+s})=0$. Similarly, the responses in the levels y_{t^*+s} are given by:

$$resp\,(y_{t^*+s})=\sum_{j=0}^{s}R_j \tag{6}$$

Where, $resp(y_{inf})=\lim_{s\to\infty} resp\,(y_{t^*+s})=R(1)$.

Here, $R(1)=C(1)\Gamma^{-1}$ is called the total impact matrix. Let Φ_s denote the VMA parameters s of responses in the level, such that $\Phi_s=\sum_{j=0}^{s}R_j$. Note that for both types of impulse responses, difference to the stationary case that the shocks effect in one of the variables will, in general, not die out in the long run. Moreover, the variables may not return to their initial values even if no further shocks occur. In other words, a onetime impulse may have a permanent effect in the sense that it shifts the system to a new equilibrium (e.g. Lütkepohl 1990, 116). Other quantities of potential interest are forecast error variance decompositions. They are also available for cointegrated systems and are computed using the same formulae as in the stationary case but with the VMA parameters of integrated process of order (1) (Lütkepohl and Poskitt (1991, 487).

Mean squared error matrix of the optimal h-step ahead forecast of the y_t process is determined as follow:

$$MSE(h)=\sum_{s=0}^{h-1}\Phi_s E(\nu_t\nu_t')\Phi_s' \tag{7}$$

One recalls that the innovations ν_{it} have, by construction, a unit variance and are sullied neither with serial correlations nor of instantaneous correlations. Similarly, we can compute the mean squared error of the optimal h-step ahead forecast of the variable y_i as follows:

$$\sigma_i^2(h)=\sum_{s=0}^{h-1}(\varphi_{i1,s}^2+\cdots+\varphi_{in,s}^2)=\sum_{j=1}^{n}(\varphi_{ij,0}^2+\cdots+\varphi_{ij,h-1}^2) \tag{8}$$

Where, $\varphi_{ij,s}$ is the ij[th] element of Φ_s. $(\varphi_{ij,0}^2+\cdots+\varphi_{ij,h-1}^2)$, is the measure of the contribution of variable y_j in the variance of y_i in horizon h. In other words, this quantity represents a measure of the contribution of the variable y_j in the explanation of the volatility of y_i in the horizon h. In terms of percentage, we define $w_{ij}(h)$, as the proportion of y_i volatility at the horizon h, attributed to the specific shock of y_j, such as:

$$w_{ij}(h)=\frac{(\varphi_{ij,0}^2+\cdots+\varphi_{ij,h-1})}{\sigma_i^2(h)} \tag{9}$$

The result in Eq.(9) involves that $\sum_{j=1}^{n}w_{ij}(h)=1$. Moreover, $w_{ii}(h)$ is the measurement of the proportion of the volatility of y_i inherent to its own shocks? Furthermore, if $w_{ii}(h)=1,\forall h$, then we will conclude that the volatility of y_i is independent of other variables fluctuation.

Finally, we can deduce that the forecast error variance decomposition (FEVD) is an indicator of causality between variables. Note that the major difference between the FEVD and Granger-causality is that the latter recalls interrelations of variables of the systems within the period of studies, while the former informs us about the dynamic behaviour of the different variables in the out-of-sample.

3.2. Selection of variables

We employ as candidate variables a vector of macroeconomic and financial variables. For stock return, we use stock indices with reinvested dividends (return index) denominated in American dollars. The use of data expressed in US dollars, is justified by an intention of conformity of the data for the perspective of an international investor rather than a domestic investor. To justify choice of the variables, we make use of, in first time, existing literature and, in second time, the role of each variable in firms' performance control, value of stock market and stock market equilibrium, as well as these variables are external to stock markets. The macroeconomic variables consist of two groups; local variables and global variables. The first group represents changes of exchange rate against the US dollar (Exchg), the consumer price index (CPI) and the foreign trade (Wtrade). Whereas, the second gathers MSCI world index (MSCI), world interest rate (TBill), and crude oil prices (Oil).

First, the exchange rate is measured by the number of units of domestic currencies against one American dollar. Thus, an increase (decrease) in the exchange rate represents depreciation (appreciation) of the local currency. The link between exchange rate and stock return is based on the simple intuition of the financial theory. The appreciation of domestic currency should decrease the cost of imports and that of the production and therefore increase firms' profitability and in turn their stock returns. Appreciation of a currency is generally accompanied by an increase in money supply and a decline in interest rates. This decline –associated with a reduction in cost of capital– involves an increase in stock returns. Second, the consumer price index is employed as a proxy to domestic inflation (Inf). Stochastic inflation informs about the economic stability of a given country in so far as the stability of the price general level improves consumers and investors' confidence and the national production. Inflation is an explicative factor of interest rates, exchange rates and external financial dependence.

Pioneers work by Adler and Dumas (1983, 925), Cooper and Kaplanis (1994, 46), affirms that international investors prefer domestic assets to hedge local inflation risk. In this case, the more local inflation is rising, the more preference is for domestic assets. The argument is that inflationary economies will have a currency which depreciates likely to create adverse conditions for local stock market and financial activity. Adler and Dumas (1983, 925), consider that the effect of stochastic inflation on stock market in the absence of purchasing power parity forms a central vector that affects stock return dynamics. Third, the trade activity (wtrade) is defined by exports over imports over GDP. Trading development is a determinant factor of economic growth and a stimulus of financial development. Indeed, a good economic performance and an eminent external trading position are likely to attract international investors. Generally speaking, local risk factors characterize the economic and financial situation and allow integrating the role of domestic economic cycles, in so far as the risk of domestic market and deviations from international parities are leading domestic market returns.

As for global variables, MSCI world index is used a proxy for the effect of the overall economic situation and the international business cycle. Economic intuition shows that probability distributions of firms' cash-flows are affected by changes in aggregate estimation risk which is driven by innovations in macroeconomic variables.

For instance, innovations in oil price, interest rates, exchange rate volatility determine cash-flow prospects of firms. World interest rate is employed as an explanatory variable of stock return dynamics in the sense that it contributes to the definition of firms' cost of capital. Accordingly, it increases uncertainty on expected returns. Since, oil transactions were been expressed in US dollars, they becomes a strategic commodity as well as acquires a global feature. Thus, oil price is used as global macroeconomic factor. Indeed, it is often mentioned like a significant economic variable in the absence of theoretical or empirical contending that innovations in oil prices should have the same degree of influence as interest rate, money supply, industrial production, etc... We admit the price for the crude oil to assess its marginal contribution in the explanation of stock returns.

4. Data and preliminary tests

We consider a sample of 15 developed and developing markets. The sample consists of two groups; the eight major emerging markets (Argentina, Brazil, Chile, India, Korea, Malaysia, Mexico and Thailand), and the group of G7 (Canada, France, Germany, Italy, Japan, UK and USA). We employ monthly series of national stock returns expressed in American dollars with dividends reinvested (return indexes) for the period February 1986 to June 2008. Beginning dates differ for each stock market according to the availability of the data.

Data on bilateral exchange rates are extracted from the database Datastream (mnemonic: I..AE.). For European markets which belong to the euro zone and to neutralize effects of breaking data since the introduction of the Euro in January 1999, we use a synthetic exchange index of the major currencies more circulating outside the country of issue[1]. This index is calculated by Federal Reserve Board. Data on the consumer price index are extracted from Datastream (code: I64... F). External trade activity is measured by the ratio 'X/M' expressed in US dollar and extracted from Datastream (code: I70..DA and I71..DA). Employing series denominated in US dollars, allows preserving conformity of the data as well as neutralizing the effect of international exchange parities on external trade positions. The MSCI world index is extracted from the 'mscibarra'. The world interest rate (Tbill) is the three months Eurodollar deposit-rate obtained from the Federal Reserve Board. Crude oil prices series are extracted, in monthly frequency, from EIA and denominated in dollars by Barrel. The studied data were expressed in logarithmic form in order to log-linearize the series. On the other hand, estimated coefficients in the system are interpreted as elasticities between variables (Lanza *et al.* 2005, 1423).

Table 1. Descriptive Statistics of excess returns

Panel A. Eight major Emerging Markets

Country	Argent.	Brazil	Chile	India	Korea	Malays.	Mexico	Thail.
Mean	14.58	10.52	1.301	0.947	-1.491	5.188	5.650	2.891
Min.	6.067	10.45	0.418	0.490	-2.813	3.465	3.713	1.919
Max.	16.24	10.58	2.445	1.516	-0.174	6.246	7.215	3.824
Std. Dev.	1.842	0.039	0.484	0.226	0.517	0.624	0.727	0.497
Skewness	-2.976	-0.048	0.706	0.689	0.4801	-0.572	-0.027	0.147
Kurtosis	12.456	1.803	2.891	2.828	3.4797	2.819	3.379	1.875
JB.	1227.6a	10.09a	16.49a	17.87a	12.05a	15.06a	1.41	7.49a

Panel B. Developed Markets

Country	Canada	France	Germ.	Italy	Japan	UK	USA
Mean	6.874	8.117	7.102	8.195	1.600	7.774	7.266
Min.	5.609	6.387	6.273	7.217	0.636	6.748	5.767
Max.	8.526	9.573	8.130	9.346	2.029	8.477	8.356
Std. Dev.	0.761	0.785	0.480	0.527	0.249	0.479	0.796
Skewness	0.403	-0.012	0.160	0.584	-0.800	-0.335	-0.319
Kurtosis	2.1114	2.029	2.329	2.172	3.417	1.804	1.613
J.B.	16.149a	10.554a	4.811c	22.991a	30.674a	20.911a	26.156a

Analyzed series are expressed in logarithmic form and denominated in US dollars, extracted from the Datastream and EMDB of IFC. a, b, c: significant at the 1%, 5%, and 10%, level respectively.

Table 1 presents descriptive statistics of stock returns. We note that average stock returns vary between -1.49 (Korea) and 14.58 (Argentina). The most volatile market is Argentina with a standard deviation equal to 1.84, but the less volatile market is Brazil, with a standard deviation equal to 0.039. The largest difference between a minimal return and a maximal return is observed on the Argentinean market. These differences in the characteristics of returns and volatility inform about the dispersion of risk classes and risk premium on international stock markets in the absence of the contribution of fundamental macroeconomic effects. The normality of statistical distributions is checked via the Jarque-Bera test. We note that the normality hypothesis is not rejected for the whole of considered stock markets except for Mexico. For the case of the German market, the hypothesis is rejected at the 10% level.

4.1. Unit root test

Results of ADF test, presented in Table 2, indicate that the null hypothesis of existence of unit root is not rejected for all countries. They are maintained for the three models of ADF test. Optimal lag length was given for each series using the usual information criteria, in particular, the AIC criterion, Final Prediction Error, Hannan-

[1]The major currencies index is a weighted average of the foreign exchange values of the US dollar against a subset of currencies in the broad index that circulate widely outside the country of issue, The weights are derived from those in the broad index.

Quinn Criterion, Schwarz Criterion. These results involve that the current series are nonstationary and are integrated of order one, I(1). Our findings corroborate the statistical properties of economic and financial series. Consequently, shocks on stock returns tend to be persistent on the whole markets.

Table 2. Unit root Test (Emerging markets & Developed markets)

Series/variables	Lag lenght	ADF	Series	Lag lenght	ADF
Argentina	1	1.8984	**Canada**	0	3.6020
Exchg	7	-2.2649	Exchg	2	0.7743
CPI	7	-0.0892	CPI	1	7.6687
Wtrade	1	-1.9502	Wtrade	5	-1.2440
Brasil	1	2.7995	**France**	0	3.2022
Exchg	2	-0.3068	Exchg	2	-0.7743
CPI	2	3.1859	CPI	6	4.4239
Wtrade	2	-1.9946	Wtrade	5	-0.9199
Chile	1	1,3447	**Germany**	0	2.2634
Exchg	1	0,9525	Exchg	2	-0.2433
CPI	5	3,0670	CPI	4	5.1689
Wtrade	5	0,4759	Wtrade	7	-0.7802
India	1	0.7471	**Italy**	0	1.7862
Exchg	1	2.2059	Exchg	2	-0.7743
CPI	1	5.2816	CPI	8	2.2387
Wtrade	3	-1.8509	Wtrade	7	-1.9535
Korea	1	-1.1735	**Japan**	0	0.5010
Exchg	2	0.3481	Exchg	0	-1.2302
CPI	3	4.6373	CPI	3	2.7057
Wtrade	6	-2.5033	Wtrade	2	-1.3275
Malaysia	2	-1,0865	**UK**	0	1.7974
Exchg	8	0,2309	Exchg	1	0.1618
CPI	0	11,8660	CPI	6	3.2879
Wtrade	2	-1,6951	Wtrade	8	0.1089
Mexico	0	2.0305	**USA**	0	3.2493
Exchg	4	1.6612	Exchg	2	-0.7828
CPI	1	2.5294	CPI	2	8.4473
Wtrade	1	-1.8547	Wtrade	8	-0.4637
Thailand	0	0.1257	**Global var.**		
Exchg	9	-0.5368	MSCI	0	2.1278
CPI	1	0.4904	TBill	0	-1.0321
Wtrade	2	-2.1304	Oil	1	1.6900

Column ADF indicates computed values. Critical values of ADF statistics are equal to -1.94 (-2.56) at the 5% (1%) level. If observations number exceeds 250, critical value will be equal to -2.87 (-3.44) at the 5% (1%) level. If the computed value is higher than the critical value, then we will reject the null hypothesis of unit root.

4.2. Cointegration Test

ADF results confirm properties of non-stationary macroeconomic variables. In such a situation, Engle and Granger (1987, 251) show that the use of a VAR model of first difference, risks leading to a miss-specified data and that a VECM modelling will be more relevant. In that direction, we have to verify the number of cointegration relations between variables of the system. An approach based on the trace test of Johansen (1991, 1551), generates the results presented in Table 3. The letter p, in the second column of the Table, indicates the number of common lag of the variables in level for each market in line, which was determined by the information criteria (AIC, FPE, HQ and SC). Other columns of the Table indicate computed values of the statistic λ_{trace} according to different null hypothesis of r cointegration relation ($r = 0, \cdots, 6$) for each market. Critical values are presented in the last two lines at the 5% and 1%, level for a model with a constant term. Results show that the null hypothesis of absence of cointegration relations is rejected for all markets, seeing that the computed value $\lambda_{trace}(0)$ exceeds critical values at the 5% and 1% level. Consequently, the vector of macroeconomic variables forms a cointegrated system for each market. The statistics λ_{trace} allows detecting three cointegration relations, at the 5% level, for the majority of countries, such as Canada, Germany, Italy, Argentina, Brazil, Korea, Thailand, Mexico and Malaysia. The number of cointegration relations is equal to 2 for the other markets, at the 5% level.

Table 3. Trace test

Country	p	0	1	2	3	4	5	6
Argentina	3	234.45	150.17	96.80	46.18	25.28	13.39	3.30
Brazil	1	467.46	259.22	127.27	42.13	24.17	11.18	2.65
Chile	2	196.24	131.73	63.97	36.44	21.03	10.89	3.18
India	2	171.11	115.58	76.47	42.87	22.01	10.49	3.53
Korea	3	220.08	125.55	82.67	51.20	28.47	14.37	4.04
Malaysia	1	312.10	168.97	93.91	37.38	10.85	4.71	1.56
Mexico	2	173.54	123.71	78.00	47.37	25.71	9.72	3.53
Thailand	2	166.21	109.35	76.82	50.43	29.43	29.43	3.18
Canada	2	236.28	148.74	89.46	52.92	19.57	10.00	4.02
France	2	293.35	171.09	71.93	30.70	17.51	7.88	2.69
Germany	2	246.52	157.80	86.16	38.10	23.14	10.77	4.54
Italy	2	305.11	135.91	80.79	40.60	20.00	10.06	2.63
Japan	3	152.73	105.48	70.79	42.36	22.67	10.92	4.49
UK	2	227.72	135.43	60.02	32.37	16.14	6.98	3.21
USA	2	219.54	122.39	71.25	39.30	21.72	10.55	4.07
	95%	134.54	103.68	76.81	53.94	35.07	20.16	9.14
	99%	144.91	112.88	84.84	60.81	40.78	24.69	12.53

The absence of cointegration relations, third column, is represented by the test of $H_0: r = 0, vs. H_a: r \rangle 0$. Null hypothesis of this test is rejected for all markets. The presence of at maximum three cointegration relations, sixth column, is represented by the following test $H_0: r \leq 3, vs. H_a: r \rangle 3$. H_0, is not rejected for the majority of countries, because computed value $\lambda_{trace}(3)$ is less than critical value at the 5% level. (e.g., for Germany $\lambda_{trace}(3) = 38.10 \langle 53.94(5\%)$). Accordingly, the number of cointegration relations varies between two and three, at the 5% level. Critical values are tabulated by Osterwald-Lenum (1992, 461).

Results of cointegration test show that all markets belong to cointegrated systems. Within this framework, a VECM representation would be interesting to study interactions of each market with the selected variables. Such a task requires determination of the optimal number of common lag of the variables of first difference. Results of the application of information criteria are summarized in Table 4. The last column presents the final choice of the lag length for each market selected via the common number indicated by the maximum of criteria.

Table 4. Optimal endogenous lags from information criteria

Countries	Akaike Info Criterion	Final Prediction Error	Hannan-Quinn Criterion	Schwarz Criterion	Selected Lag length
Argentina	2	3	3	2	2
Brazil	1	1	1	1	1
Chile	1	1	1	0	1
India	1	1	1	0	1
Korea	2	2	1	0	2
Malaysia	1	1	0	0	1
Mexico	1	3	1	1	1
Thailand	1	0	0	0	0
Canada	1	1	1	1	1
France	1	1	1	0	1
Germany	1	1	0	0	1
Italy	1	1	1	0	1
Japan	3	3	3	1	3
UK	1	3	0	1	1
USA	1	1	1	0	1

5. Interpretation and discussion of results

5.1. The impulse response functions

The impulse response functions allow characterizing the impact of a shock or an innovation of a variable on the current and future values of other variables.

Plots 1, in appendix, provides a description of these response functions of each series of stock return to an innovation on each macroeconomic variable in the system. The confidence intervals allow measuring the significance of each impulse response function. The first inference to cite is that stock returns react positively and significantly to their own shocks. This reaction persists sufficiently in time for the majority of markets.

Generally, the results show that shocks on exchange rate involves dynamism on stock markets. For instance, depreciation of the exchange rate leads to a decline of stock returns at least for the perspective of an international investor who considers the exchange gain in his asset portfolio (e.g. Bilson *et al.* 2001, 401; Abugri 2008, 396). In the majority of cases, the response of stock returns to exchange rates shock reaches a maximal value in short term (example, Argentina 0.926, Korea 0,0356, UK 0,0341). These reactions exhibit a sure stability during the future periods (example, Chile, India, Korea, Thailand, France, Germany ...). Innovation on the consumer price index affects negatively stock return (example, Argentina, Brazil, Chile, India, Italy, and USA). On the other hand, reaction is positive for Mexico, Malaysia, Thailand, Canada, France, and UK. However, the reaction of stock return is stabilized, also, over the future periods (example, Argentina, Chile, Mexico, Canada, Germany, Italy, Japan, and UK). This stabilization of reactions can be explained by the effect of regulating actions considered by investors conditionally to the vector of information acquired during the following periods. Reactions to impulses on the trade openness are often positive but they stabilize and/or amortize through time. Negative sign of the response, for some of stock markets, can be explained by the presence of rational anticipations inherent to joined effects of nominal interest rates and inflation. The significant response to local factors confirms the sensitivity of equity markets to domestic economic and financial circumstances.

As for global risk factors, response to innovations on MSCI world is positive. The positive sign involves that stock markets has become sufficiently integrated in the world market. Moreover, lessons of portfolio theory contend that in a context of international financial integration, international asset pricing is defined by world market risk prices. World interest rate seems to produce a positive response by developed markets and emerging markets (example, Brazil, Chile, Korea, Canada, Germany, Italy ...). However, a negative reaction is observed on American, British, Thai and Indian markets. The positive response can be explained by investor's anticipations over the future periods. The functions of negative reaction to interest rate shocks observed on certain markets are explained by the fact that the increase in the US interest rates, lead capital flows towards the United-States and bring to a reduction in stock returns on domestic markets (e.g. Bekaert *et al.* 2002, 203). Reaction functions to shocks on oil prices take a negative sign (example, Argentina, Brazil, Chile, Korea, Thailand, Canada, France, Germany, Japan, U.K., and USA). We contend that the current result is far from being surprising considering oil is a strategic commodity which leads, world production, firms performance and the behaviour of investors on international stock markets. On Indian and Mexican markets, the functions of reaction are associated to positive sign. Generally, oil price affects positively the dynamics of equity returns. Jones and Kaul (1996, 463), employed quarterly data and noticed that the nature of the reaction of stock returns to oil prices can be explained by the impact of shocks on firms cash-flows. However, economic theory suggests that the long-run sensitivity of stock return to chocks on oil prices should be positive. The observation of a negative relation can be explained by the presence of intrinsic feature of assets (Lanza *et al.* 2005, 1423).

The examination of results allows surveying a number of inferences which can be distinguished on several shutters: First, the behaviour of stock markets returns cannot be predetermined in a final way in relation to macroeconomic fundamentals. Thus, stock prices vary according to economic and financial industry of each country as well as according to the logic of business cycles and the nature of listed firms. We can affirm, in this framework, that the heterogeneity of reactions to shocks on local factors can be attributed to effects of economic policies developed by governments to ensure the development and the stability of their national financial markets. Second, global factors seem to be more determining of stock return dynamics. Indeed, they imply a significant but such a common reaction for overall stock markets. In other words, impulse response functions to global variables do not show significant differences in terms of size and sign. Our findings corroborate the financial theory and are in conformity with those obtained by recent literature, such as Abugri (2008, 396), Henriques and Sadorsky (2008, 998), Aloui and Jammazi (2009, 31).

We specify that the significance of a response impulse function is of capital importance in so far as it mirrors relevant effects on stock prices and leads investor's anticipations and their investment strategies through time. Similarly, modification of the sign of reaction makes difficult the establishment of prediction process for equity returns on a long horizon. Being the prediction of returns for a given forecast horizon, the forecast error variance decomposition allows assessing the relative contributions of each variable.

5.2. The forecast error variance decomposition

Table 3, (Panel A and panel B) provides results of the forecast error variance decomposition. Five horizons of forecast are selected (3 months, 6 months, 12 months, 18 months and 20 months).

Table 3. The Forecast Error variance Decomposition (FEVD)

Panel A. Eight major Emerging Markets

Country explained	Horizon (months)	Return index	Local Factors			Global Factors		
			Exchg	CPI	Wtrade	MSCI	TBill	Oil
Argentina	3	0.78	0.14	0.04	0.03	0.01	0.00	0.00
	6	0.73	0.15	0.06	0.05	0.00	0.00	0.01
	12	0.73	0.14	0.05	0.05	0.00	0.00	0.02
	18	0.70	0.12	0.05	0.05	0.00	0.00	0.07
	20	0.69	0.11	0.05	0.05	0.00	0.00	0.09
Brazil	3	0.89	0.04	0.02	0.01	0.00	0.03	0.01
	6	0.79	0.11	0.03	0.01	0.01	0.05	0.02
	12	0.59	0.20	0.07	0.00	0.04	0.03	0.06
	18	0.43	0.25	0.11	0.00	0.06	0.02	0.13
	20	0.39	0.26	0.12	0.00	0.07	0.01	0.15
Chile	3	0.98	0.00	0.00	0.00	0.00	0.01	0.00
	6	0.95	0.00	0.00	0.00	0.00	0.03	0.00
	12	0.90	0.02	0.01	0.00	0.01	0.06	0.00
	18	0.87	0.03	0.01	0.00	0.02	0.08	0.00

Country explained	Horizon (months)	Return index	Exchg	Local Factors CPI	Wtrade	MSCI	TBill	Global Factors Oil
	20	0.86	0.03	0.01	0.00	0.02	0.08	0.00
India	3	0.99	0.00	0.00	0.00	0.01	0.00	0.00
	6	0.96	0.00	0.00	0.00	0.03	0.00	0.00
	12	0.91	0.00	0.01	0.00	0.07	0.00	0.01
	18	0.86	0.00	0.01	0.00	0.11	0.00	0.01
	20	0.85	0.00	0.01	0.00	0.12	0.00	0.01
Korea	3	0.88	0.05	0.00	0.02	0.01	0.02	0.01
	6	0.76	0.08	0.00	0.05	0.04	0.07	0.01
	12	0.64	0.07	0.00	0.09	0.06	0.11	0.01
	18	0.58	0.07	0.00	0.12	0.08	0.14	0.01
	20	0.56	0.07	0.00	0.12	0.09	0.14	0.12
Malaysia	3	0.99	0.00	0.00	0.00	0.00	0.00	0.00
	6	0.97	0.01	0.01	0.00	0.00	0.00	0.00
	12	0.92	0.05	0.01	0.00	0.01	0.01	0.00
	18	0.87	0.08	0.01	0.00	0.03	0.01	0.00
	20	0.86	0.08	0.02	0.00	0.04	0.01	0.00
Mexico	3	0.78	0.17	0.00	0.01	0.04	0.00	0.00
	6	0.77	0.19	0.01	0.01	0.03	0.00	0.00
	12	0.77	0.18	0.01	0.00	0.02	0.00	0.00
	18	0.79	0.17	0.01	0.00	0.02	0.01	0.01
	20	0.79	0.16	0.01	0.00	0.01	0.01	0.01
Thailand	3	0.99	0.00	0.00	0.00	0.00	0.00	0.00
	6	0.96	0.01	0.00	0.00	0.01	0.00	0.02
	12	0.90	0.02	0.01	0.00	0.02	0.00	0.05
	18	0.84	0.02	0.02	0.00	0.04	0.01	0.08
	20	0.82	0.01	0.02	0.00	0.04	0.01	0.09

The first inference to rise is that the forecast error variance of stock returns is explained mainly by the effect of their proper last shocks. The effect of this proper shock persists on a longer horizon. It is a direct link between the return and his history. As for the selected macroeconomic factors, they exhibit a considerable contribution to explain the forecast error variance. The effect of these factors is present at the overall forecast horizons considered. However, by distinguishing relative contributions from these macroeconomic variables, we can note that, on emerging markets, local risk factors tend to have an instantaneous effect but global risk factors produce an effect on a longer horizon. We must note that the variable 'Exchg' persists on the whole forecast periods.

This evidence can be explained by the fact that exchange rate checks at the same time a local feature and a global feature. To move forward the analysis, influences of exchange rate risk increases while advancing in the forecast horizon. We note this influence in the case of Brazil, Argentina, Chile, Korea and Malaysia. By transition from a forecast horizon of 3 months to 24 months, contribution of the exchange rate risk goes from 4% to 26% for Brazil, from 0% to 3% for Chile, from 5% to 7% for Korea and from 0% to 8% for Malaysia. The effect of 'wtrade' persists through time only for Argentina and Korea. We explain this evidence by the importance of bilateral trade. However, global variables display a contribution on a longer horizon. Indeed, MSCI world and Oil prices provide a marginal contribution to the explanation of the forecast error variance. For example, on a 24 months horizon, the effect of MSCI world is 7% for Brazil, 12% for India, 9% for Korea and 4% for Thailand. For oil prices, it is equal to 9% for Argentina, 15% for Brazil, 12% for Korea and 9% for Thailand. As for the world interest rate, it seems to be very relevant for the Korean stock market. The Korean market seems, either, to be very sensitive to global risk factors. Accordingly, the Korean market seems to be more integrated in the world market, as well as, the presence of the international investors on this market increases its sensitivity to the common factors.

For the developed markets, the contribution effects is similar for the global factors but with the presence of an instantaneous effect. MSCI world verify the hypothesis of perfect integration. As for oil prices, it exerts an instantaneous effect but which persists over the following horizons. From our findings, we can contend that oil prices constitute a determining factor on stock market. This evidence corroborate Chen *et al.* (1986, 383), and recently, Aloui and Jammazi (2009, 31).

Panel B. Developed markets

Country explained	Horizon (months)	Return index	Exchg.	Local Factors CPI	Wtrade	MSCI	Global Factors Tbill	Oil
Canada	3	0.99	0.00	0.00	0.00	0.00	0.00	0.00
	6	0.97	0.00	0.00	0.01	0.00	0.01	0.00
	12	0.94	0.00	0.00	0.01	0.00	0.03	0.01
	18	0.92	0.01	0.00	0.00	0.00	0.04	0.03
	20	0.92	0.01	0.00	0.00	0.00	0.04	0.03
France	3	0.98	0.00	0.00	0.01	0.00	0.00	0.01
	6	0.97	0.01	0.00	0.01	0.00	0.00	0.01
	12	0.96	0.02	0.01	0.01	0.00	0.00	0.00
	18	0.95	0.02	0.01	0.00	0.01	0.00	0.00
	20	0.95	0.03	0.01	0.00	0.01	0.00	0.00
Germany	3	0.98	0.00	0.00	0.00	0.00	0.00	0.01
	6	0.97	0.01	0.00	0.00	0.00	0.00	0.02
	12	0.94	0.02	0.00	0.00	0.01	0.00	0.03
	18	0.92	0.02	0.00	0.00	0.01	0.00	0.04
	20	0.92	0.03	0.00	0.00	0.01	0.00	0.04
Italy	3	0.93	0.00	0.00	0.01	0.02	0.01	0.03
	6	0.89	0.01	0.00	0.01	0.04	0.01	0.04
	12	0.84	0.02	0.00	0.01	0.06	0.01	0.06
	18	0.80	0.03	0.00	0.01	0.07	0.01	0.08
	20	0.79	0.04	0.00	0.01	0.07	0.01	0.08
Japan	3	0.98	0.00	0.00	0.01	0.00	0.00	0.00
	6	0.94	0.00	0.00	0.03	0.00	0.02	0.01
	12	0.83	0.00	0.00	0.08	0.00	0.06	0.03
	18	0.71	0.01	0.00	0.13	0.00	0.10	0.05
	20	0.68	0.02	0.00	0.14	0.00	0.10	0.06
UK	3	0.97	0.00	0.00	0.00	0.01	0.00	0.02
	6	0.93	0.00	0.00	0.02	0.02	0.00	0.03
	12	0.87	0.00	0.01	0.03	0.04	0.00	0.04
	18	0.83	0.01	0.01	0.03	0.06	0.00	0.06
	20	0.82	0.01	0.01	0.03	0.07	0.00	0.06
USA	3	0.99	0.00	0.00	0.00	0.00	0.00	0.01
	6	0.97	0.00	0.00	0.00	0.01	0.00	0.02
	12	0.94	0.00	0.00	0.01	0.02	0.01	0.02
	18	0.92	0.00	0.00	0.02	0.02	0.01	0.02
	20	0.91	0.00	0.00	0.03	0.02	0.01	0.02

What remains interesting in our results is that stock markets exhibit a considerable sensitivity to macroeconomic volatility. This sensitivity changes according to whether it is a local variable or a global variable. Likewise, response to the global factors is related to the financial integration level. Being of a developing market or a developed market, the response to local shocks is instantaneous on emerging markets but it is not very significant on developed markets. However, the response to global factors persists over future periods on emerging markets but it is immediate and persistent on developed markets.

The observation which deserves to be evoked is that, for a given level of integration, the influence of common factors stresses the importance of external shocks. From where, analysts, decision makers and international investment managers should see beyond domestic macroeconomic volatility as well as control such factors behaviour over time.

6. Conclusion

In this paper, the relation between macroeconomic volatility and stock returns is examined under several shutters. We employed local and global macroeconomic risk factors and stock returns of both developed and emerging markets. In parallel, we used an ECM methodology and studied the impulses response functions and the forecast error variance decomposition.

We must state, that our intention is not to judge if a reaction is positive or negative but we are interested in the changes of that reaction's sign through time. Significance of the reactions is of capital importance seeing that it affects stock returns and modifies investor's anticipations and investment strategies. The forecast error variance decomposition allows us to rise that local factors contribute increasingly to the explanation of the forecast error variance. Global factors contribute instantaneously but persist through time on developed markets.

Interpretation of our findings allows noting that the behaviour of stock markets cannot be identified *a priori* in the presence of macroeconomic volatility. Thus, it varies according to the economic and financial structure of each country as well as according to the logic of the business cycles synchronisation and to the idiosyncratic specificities of stocks' value. Thus, we can affirm that the heterogeneity of response functions on local factors can be attributed to the effect of economic policies developed by governments to ensure development and stability of their national financial markets. Also, we note that global factors seem to be more determining the stock return dynamics. Consequently, we confirm the relevance of such factors.

Our results seem to be more relevant for the decision-making, in particular for analysts, portfolio managers and for domestic governors. Thus, assembling a better planning as well as a better forecast horizon makes it possible to stabilize shocks and to ensure an immunization of exposure to risk.

Reference

[1] Abugri, Benjamin A. 2008. Empirical relationship between macroeconomic volatility and stock returns: Evidence from Latin American markets. *International Review of Financial Analysis* 17: 396-410.

[2] Adler, Michael. and Dumas Bernard. 1983. International Portfolio Choice and corporate Finance: a synthesis. *Journal of Finance* 38: 925-984.

[3] Aloui, Chaker. and Jammazi, Rania. 2009. The effects of crude oil shocks on stock market shifts behaviour: a regime switching approach. *Energy Economics* 31: 789-799.

[4] Basher, Syed A., and Perry Sadorsky. 2006. Oil price risk and emerging stock markets. *Global Finance Journal* 17: 224-251.

[5] Bekaert, Geert. and Campbell Harvey. 1997. Emerging equity market volatility. *Journal of Financial Economics* 43: 29-77.

[6] Bekaert Geert, Harvey Campbell R. and Lumsdaine Robin L. 2002. Dating the Integration of World Equity Markets. *Journal of Financial Economics* 65: 203-247.

[7] Bilson, Christopher M., Brailsford Timothy J. and Hooper Vincent J. 2001. Selecting macroeconomic variables as explanatory factors of emerging stock market returns. *Pacific-Basin Finance Journal*, 9, 401−426.

[8] Boucher, Christophe. 2007. La réduction de la prime de risque : le rôle du risque macroéconomique. *Banque & Marchés* n° 87 – mars-avril.

[9] Boudoukh Jacob and Matthew Richardson. 1993. Stock returns and inflation: A long-horizon perspective. *American Economic Review* 83: 1346-1355.

[10] Breitung, Jörg. 2001. Rank tests for nonlinear cointégration. *Journal of Business and Economic Statistics* 19: 331-340.

[11] Breitung, Jörg. and Christian Gourieroux. 1997. Rank tests for unit roots. *Journal of Econometrics* 81: 7-27.

[12] Campello. Murillo, Chen, Long. and Lu. Zhang. 2008. Expected Returns, Yield Spreads, and Asset Pricing Tests. *The Review of Financial Studies* 21: 1297-1338.

[13] Chen, Nai-Fu., Roll. Richard., and Stephan. A. Ross. 1986. Economic Forces and the stock markets. *Journal of Business* 59: 383-403.

[14] Cooper Ian, and Kaplanis Evi. 1994. Home Bias in Equity Portfolio, Inflation Hedging, and International Capital Market Equilibrium. *Review of Financial Studies* 7: 46-60.

[15] Dickey, David A., and Wayne A. Fuller. 1981. Likelihood ratio statistics for autoregressive time series with a unit root. *Econometrica* 49: 1057-1072.

[16] Elton, Edwin J. 1999. Expected Return, Realized Return and Asset Pricing Tests. *Journal of Finance* 54: 1199-1220.

[17] Engle, Robert F., and C.W.J. Granger. 1987. Cointegration and error correction: Representation, estimation and testing. *Econometrica* 55: 251-276.

[18] Fama, Eugene. 1981. Stock returns, real activity, inflation, and money. *American Economic Review* 71: 545-565.

[19] Ferson Wayne. E., and Harvey Campbell. R. 1998. Fundamental determinants of national equity market returns: a perspective of conditional asset pricing. *Journal of Banking and Finance* 21: 1625-1665.

[20] Harvey Campbell, R. 1991. The world price of covariance risk. *Journal of Finance* 46: 111-157.

[21] Haugen, Robert A. and Nardin L. Baker. 1996. Commonality in the determinants of expected stock returns. *Journal of Financial Economics* 41: 401-439.

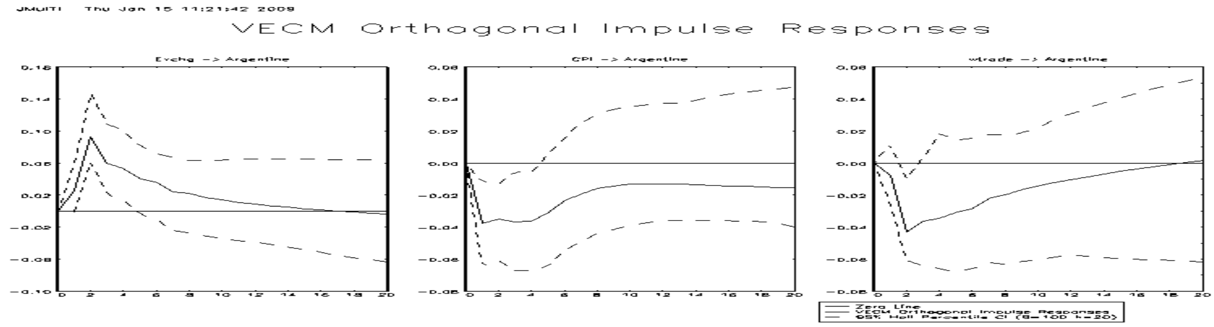
[22] Henriques, Irene, and Perry Sadorsky. 2008. Oil prices and the stock prices of alternative energy companies. *Energy Economics* 30: 998–1010.
[23] Jones Charles M., et Kaul Gautam.1996. Oil and the stock markets. *Journal of Finance* 51: 463-491.
[24] Jorion, Philippe, 1985. International Portfolio Diversification with Estimation Risk. *Journal of Business* 58: 259-278.
[25] Kubo Akihiro. 2008. Macroeconomic impact of monetary policy shocks: Evidence from recent experience in Thailand. *Journal of Asian Economics* 19: 83-91.
[26] Kumar Praveen, Sorin M. Sorescu, Boehme Rodney D., and Danielsen Bartley R. 2008. Estimation Risk, Information, and the Conditional CAPM: Theory and Evidence. *Review of Financial Studies* 21:1037-1075.
[27] Lanza Alessandro, Manera Mattero, Grasso Margherita, and Massimo Giovannini. 2005. Long-run models of oil stock prices. *Environmental Modelling and Software* 20: 1423-1430.
[28] Martin Lettau, Sydney C. Ludvigson and Jessica A. Wachter. 2008. The declining premium: What role does macroeconomic risk play? *The Review of Financial Studies* 21: 1653-1687.
[29] Lütkepohl, Helmut. 1990. Asymptotic distributions of impulse response functions and forecast error variance decompositions of vector autoregressive models. *Review of Economics and Statistics* 72: 116-125.
[30] Lütkepohl, Helmut and D.S. Poskitt. 1991. Estimating orthogonal impulse responses via vector autoregressive models. *Econometric Theory*, 7, 487-496.
[31] Lütkepohl, Helmut and D.S. Poskitt. 1996. Testing for causation using infinite order vector autoregressive processes. *Econometric Theory* 12: 61-87.
[32] Lütkepohl, Helmut. 2004. Vector autoregressive and vector error correction models. i*n H. Lütkepohl & M. Krätzig (eds), Applied Time Series Econometrics*, Cambridge University Press, Cambridge 86-158.
[33] Mandelker, Gershon and Kishore Tandon. 1985. Common stock returns, real activity, money, and inflation: Some international evidence. *Journal of International Money and Finance* 4: 267-286.
[34] Mukherjee, Tarun K. and Atsuyuki Naka. 1995. Dynamic relations between macroeconomic variables and the Japanese stock market: An application of vector error-correction model. *The Journal of Financial Research* 8: 223-237.
[35] Oyama, Tsuyoshi. 1997. Determinants of stock prices: the case of Zimbabwe. *IMF working paper* WP/97/117: 1-44.
[36] Papapetrou Evangelia. 2001. Oil price shocks, stock market, economic activity and employment in Greece. *Energy Economics* 23: 511-532.
[37] Patro Dilip K., Wald John K., and Yangru Wu. 2002a. The impact of Macroeconomic and Financial variables on market risk: Evidence from international equity returns. *European Financial Management* 8: 421-447.
[38] Phillips, Peter C.B., 1994. Some exact distribution theory for maximum likelihood estimators of cointegrating coefficients in error correction models. *Econometrica* 62: 73-93.
[39] Poskitt, D. S., 2003. On the specification of cointegrated autoregressive moving average forecasting systems. *International Journal of Forecasting* 19: 503-519.
[40] Pretorius, Elna. 2002. 'Economic determinants of emerging stock market interdependence'. *Emerging Markets Review* 3: 84-105.
[41] Sadorsky Perry. 1999. Oil price shocks and stock market activity. *Energy Economics* 21: 449-469.
[42] Sadorsky, Perry. 2003. The Macroeconomic determinants of technology stock price volatility. *Review of Financial Economics* 12: 191-205.

APPENDIX

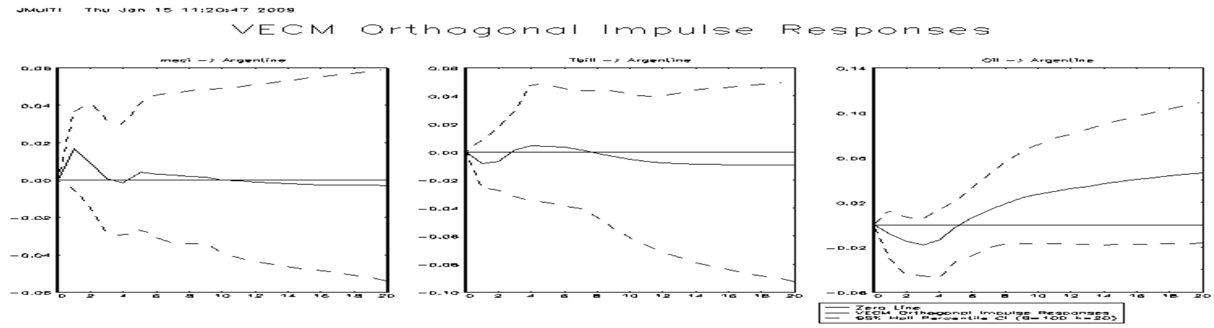
Figure 1. The impulse ofresponse functions

Argentina

Local Factors

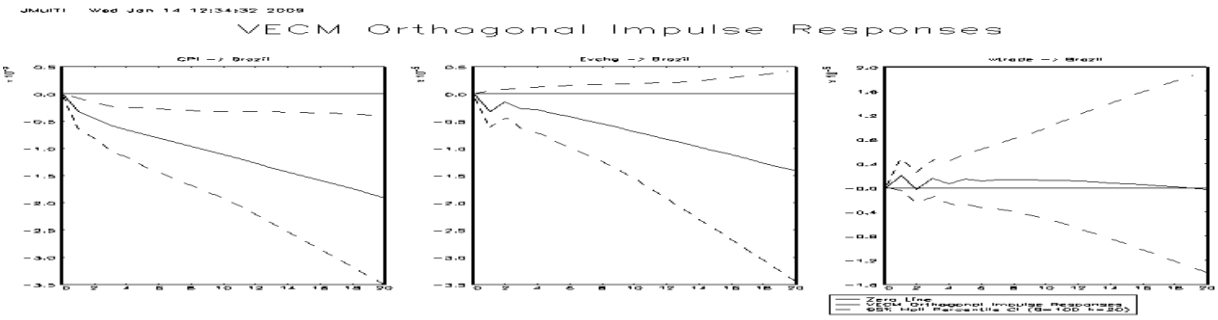


Global Factors

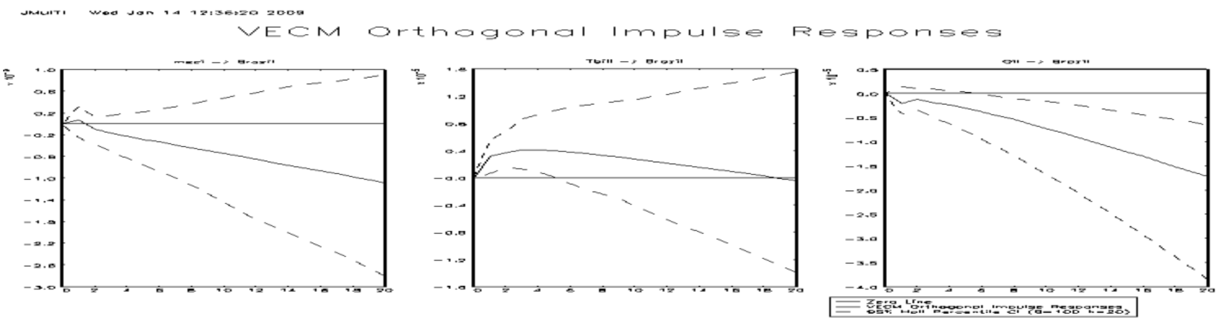


Brazil

Local Factors

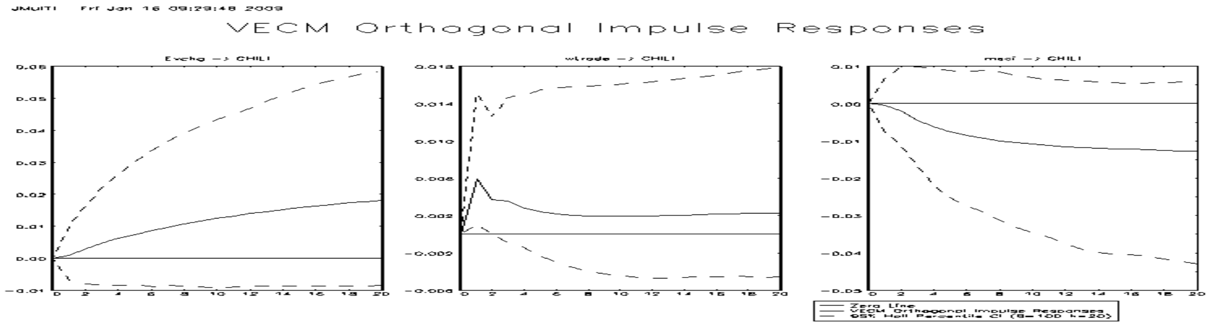


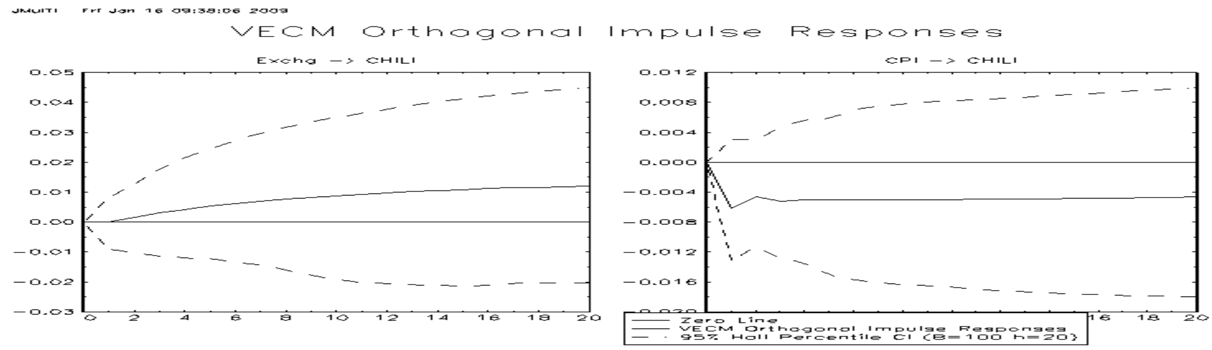
Global Factors



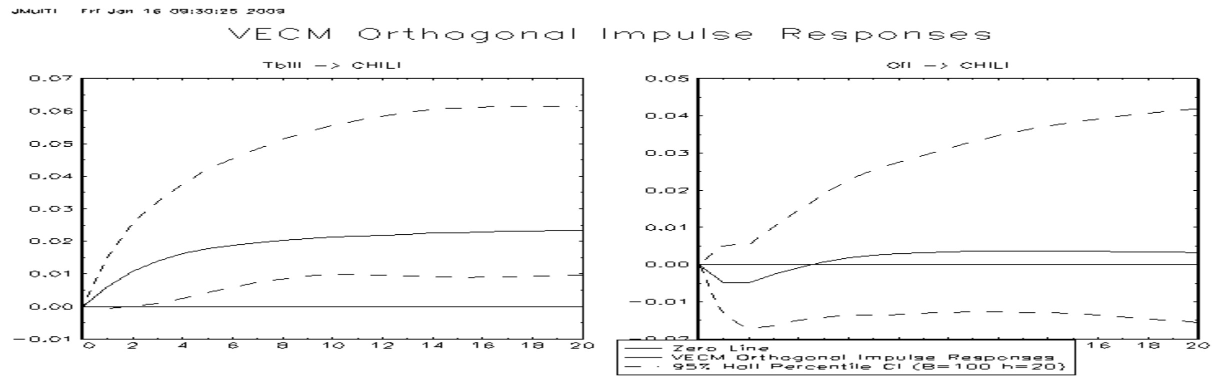
Chile

Local Factors



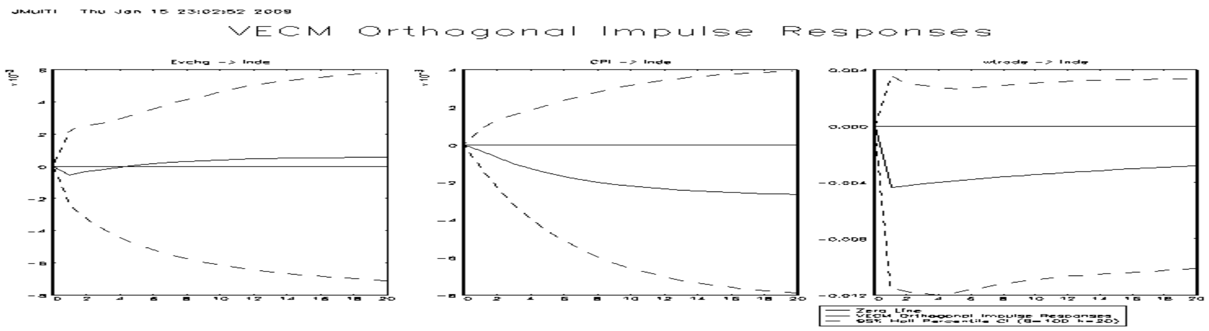


Global Factors

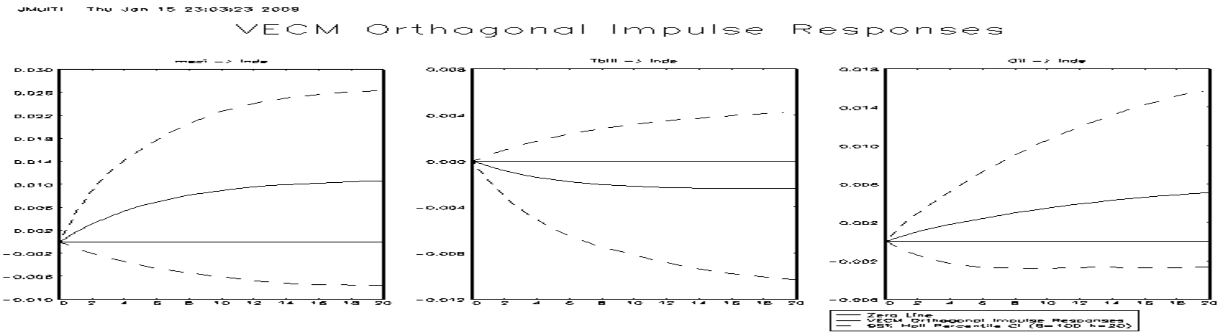


India

Local Factors

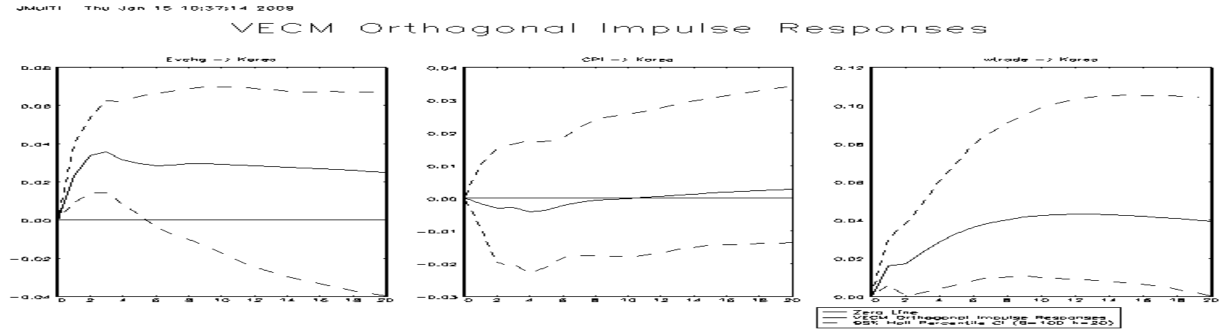


Global Factors

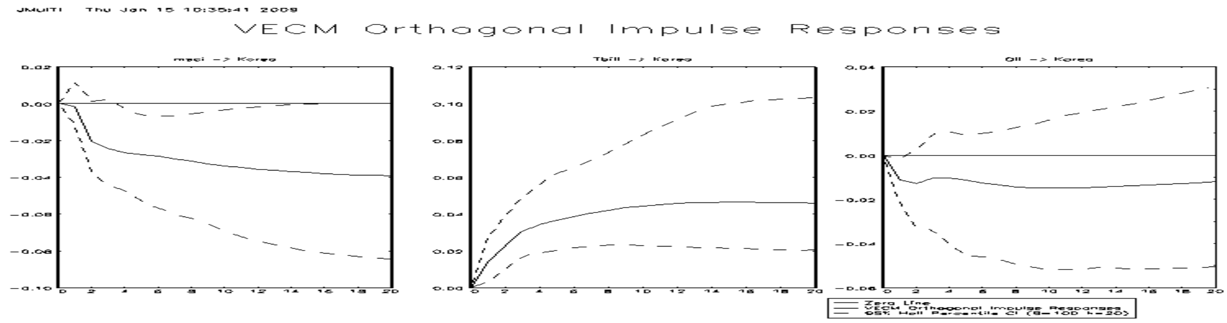


Korea

Local Factors

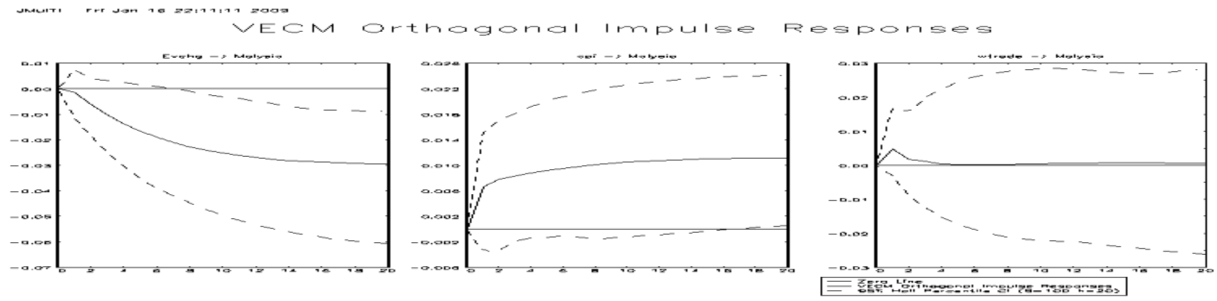


Global Factors

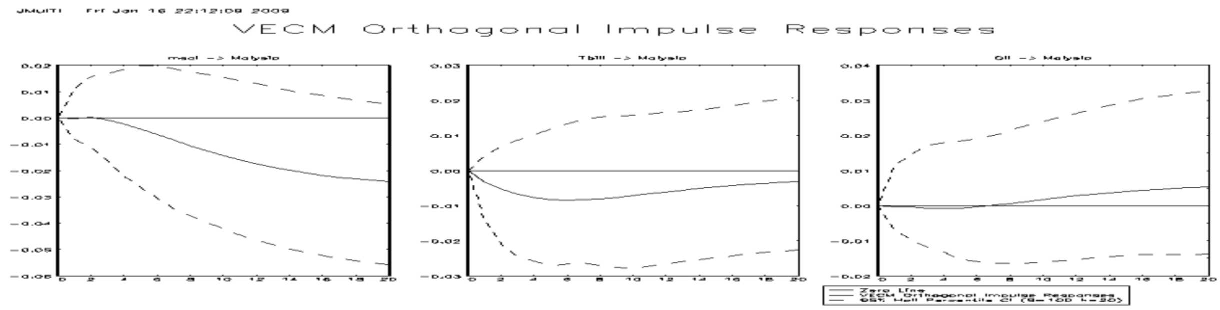


Malaysia

Local Factors

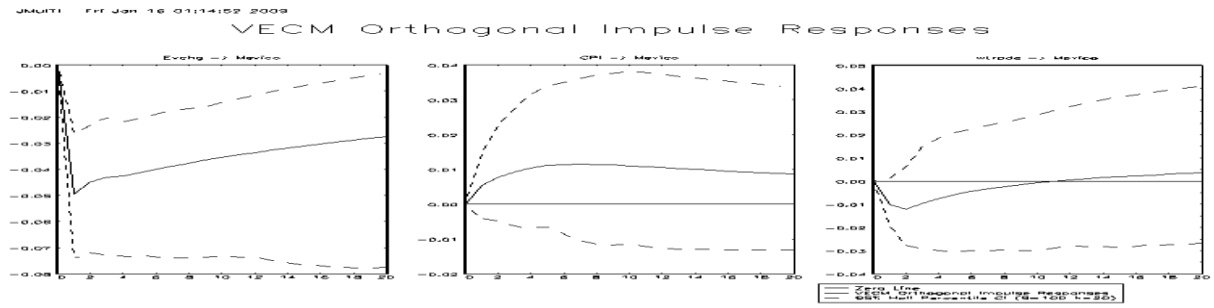


Global Factors

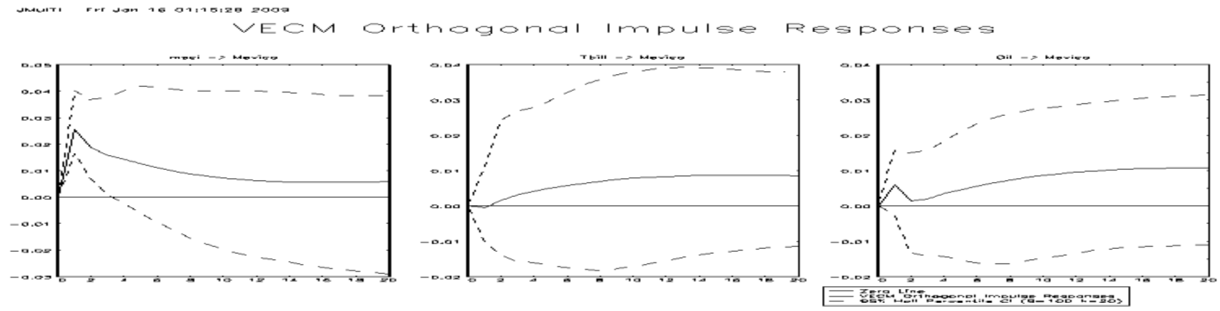


Mexico

Local Factors

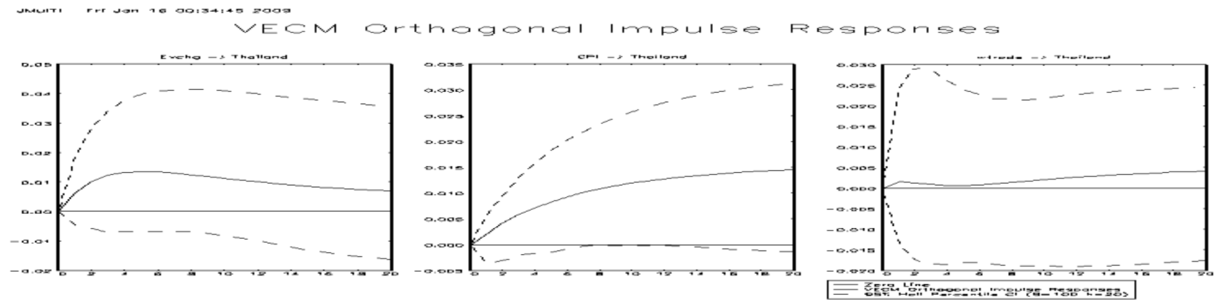


Global Factors

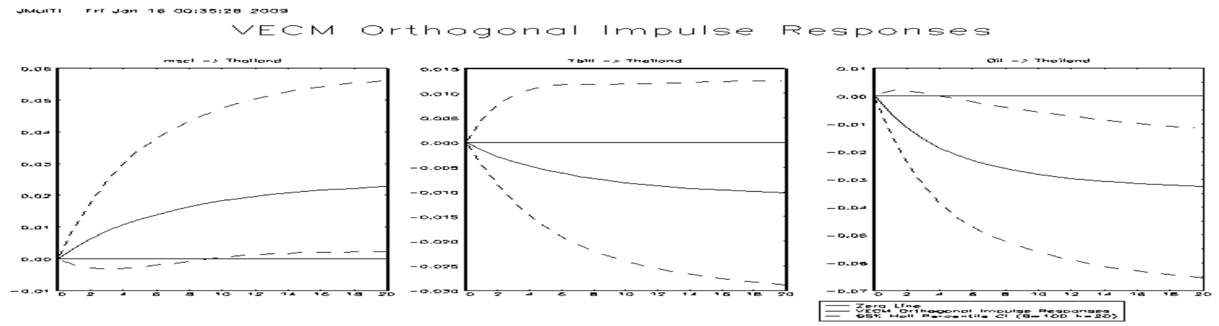


Thailand

Local Factors

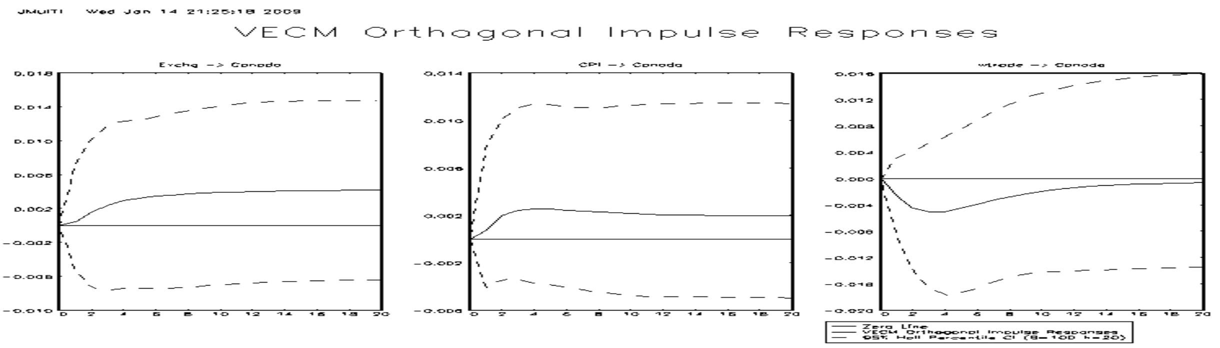


Global Factors

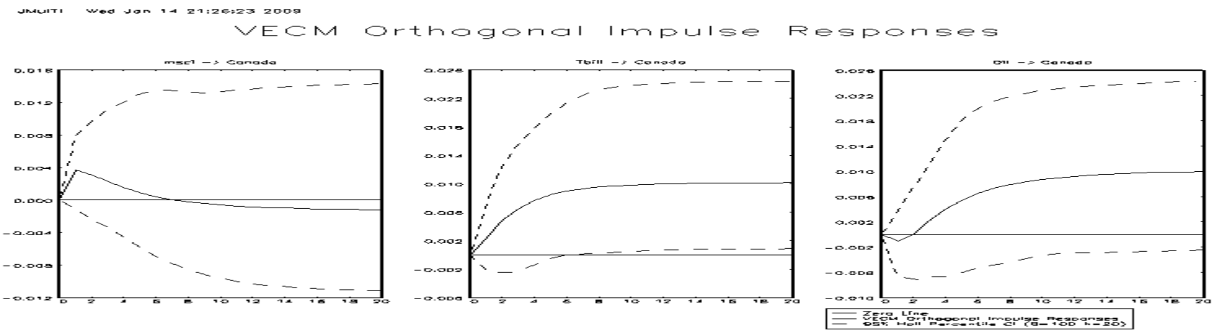


Canada

Local Factors

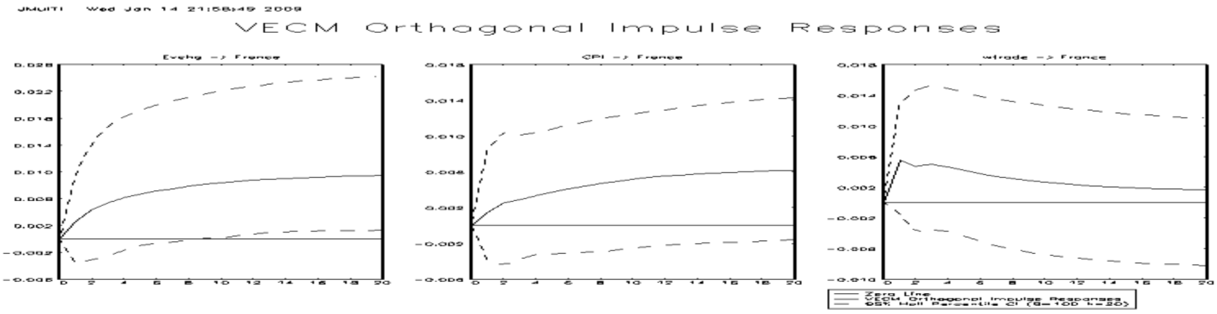


Global Factors

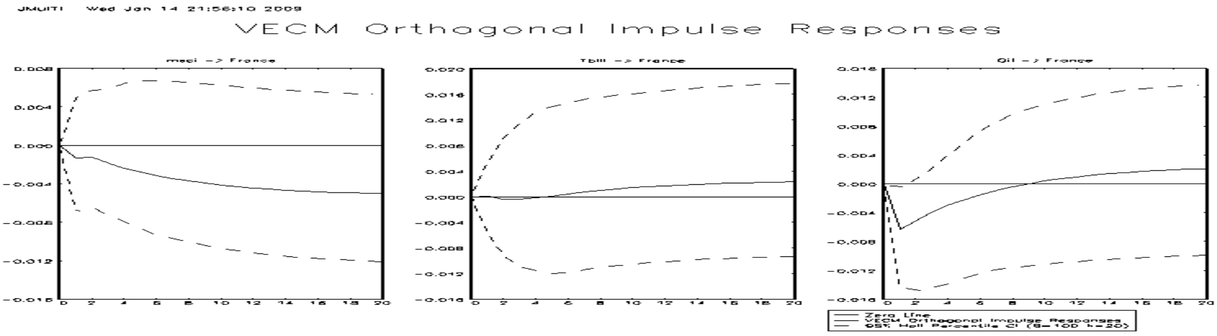


France

Local Factors

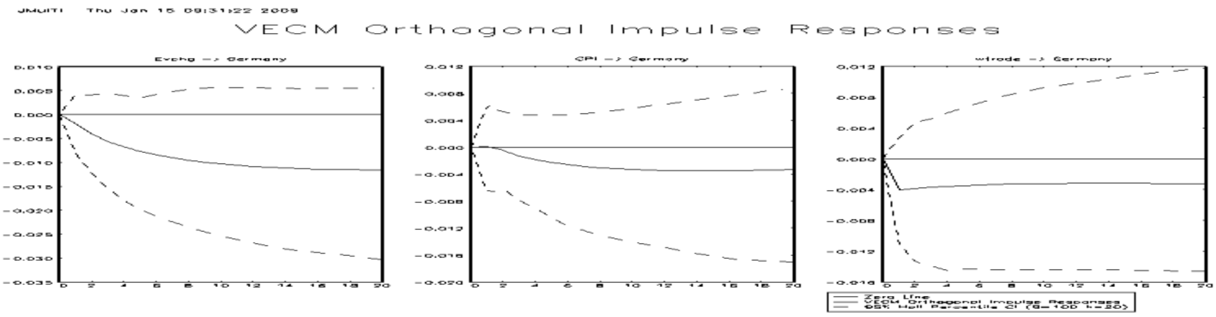


Global Factors

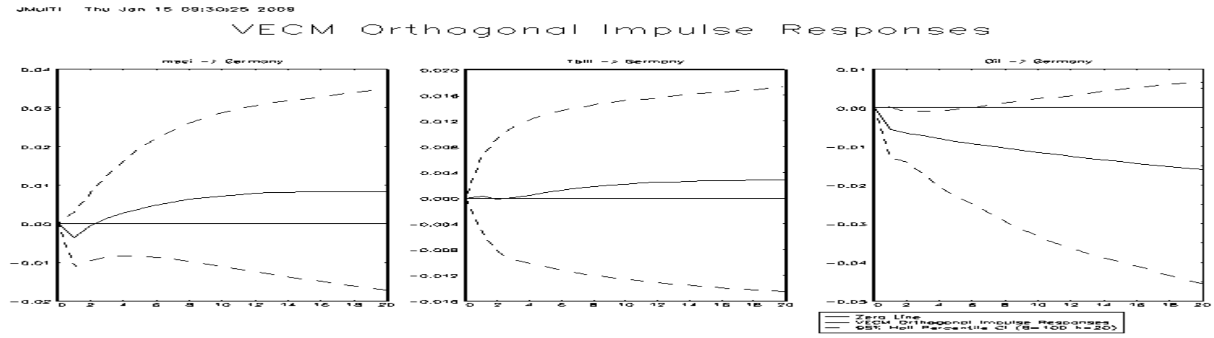


Germany

Local Factors

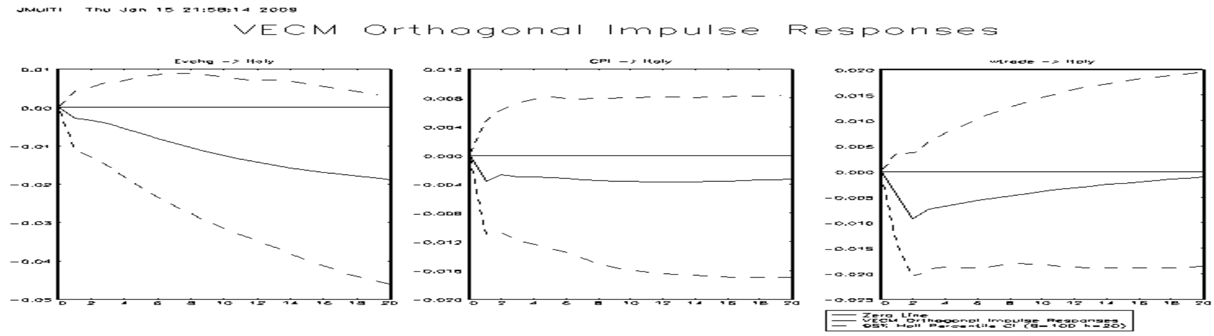


Global Factors

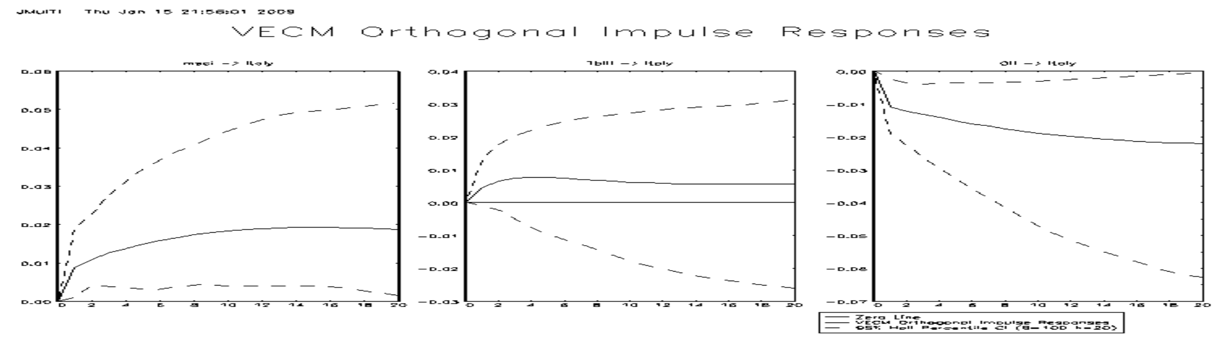


Italy

Local Factors

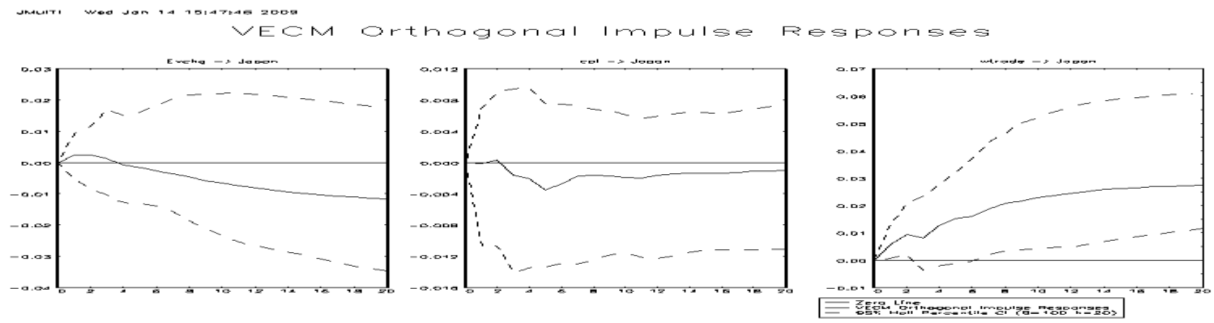


Global Factors

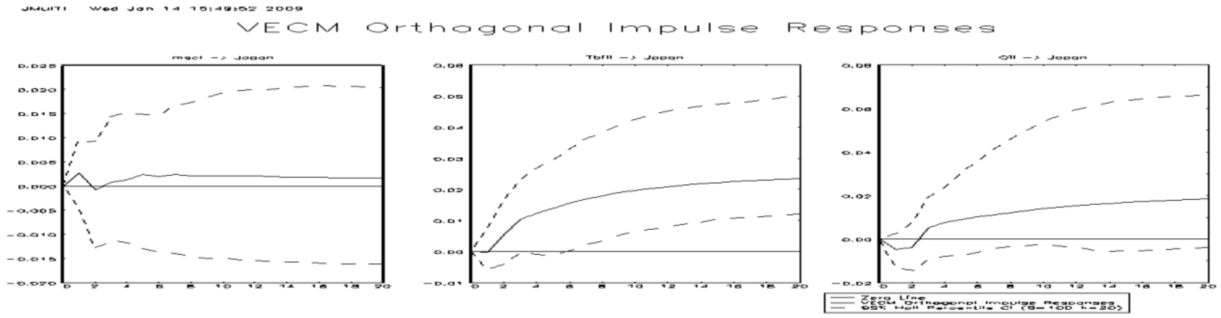


Japan

Local Factors

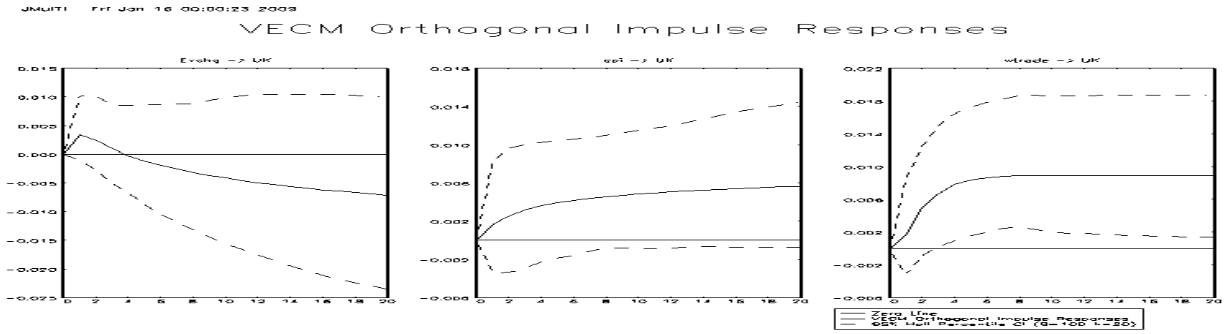


Global Factors

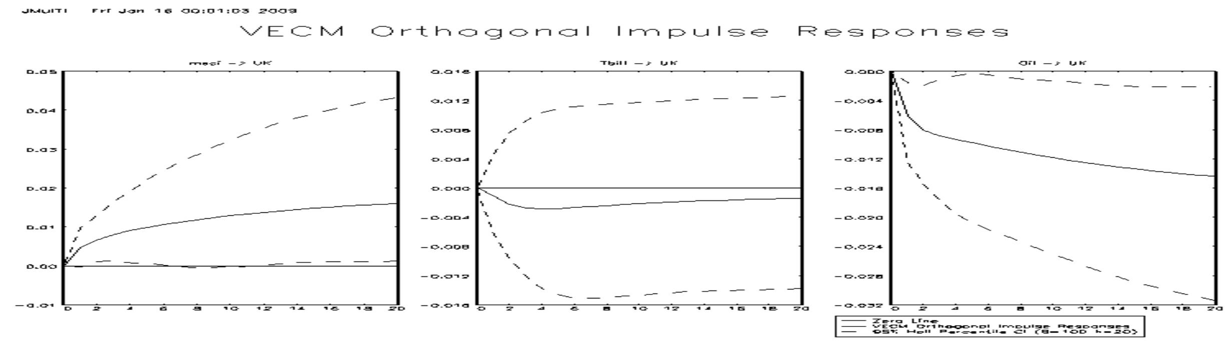


UK

Local Factors

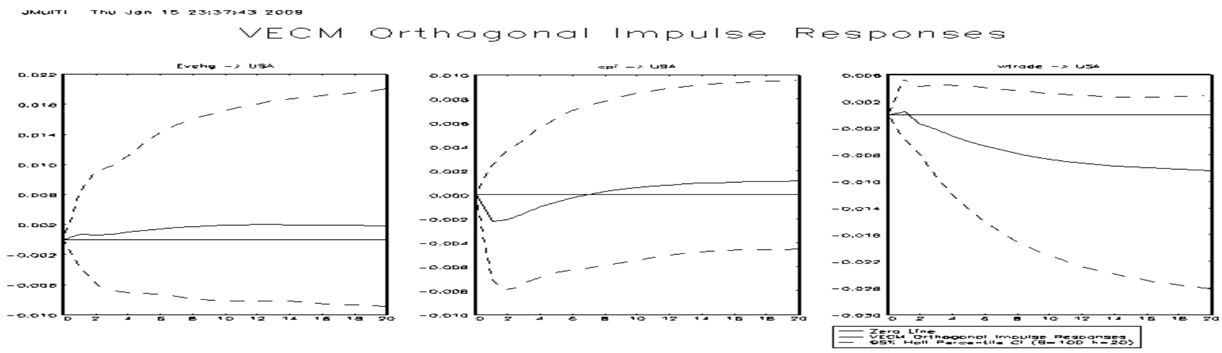


Global Factors

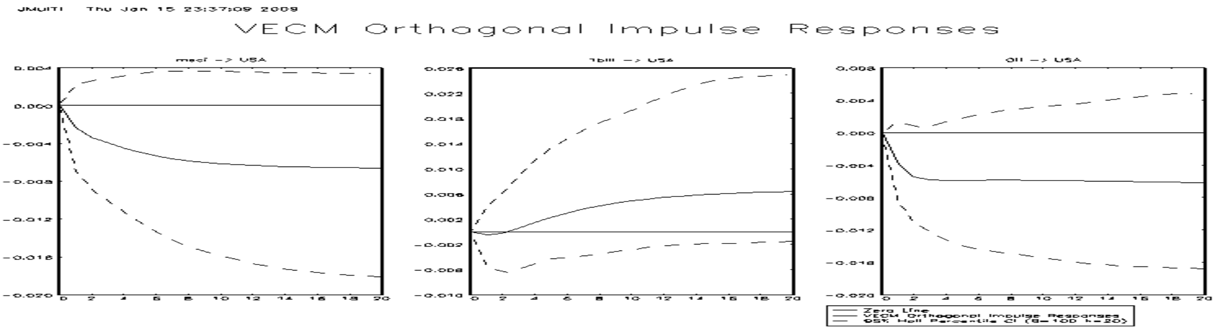


USA

Local Factors



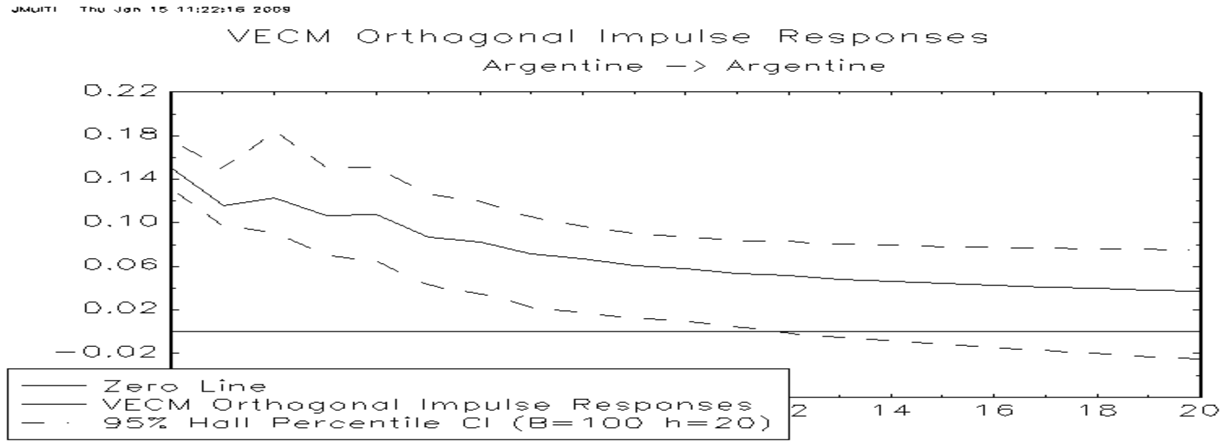
Global Factors



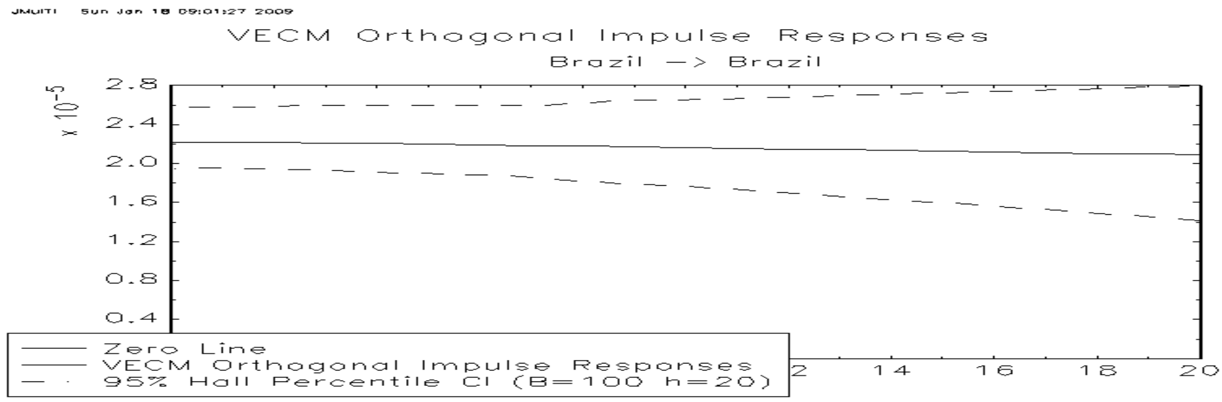
Appendix

Plots 2. IRF

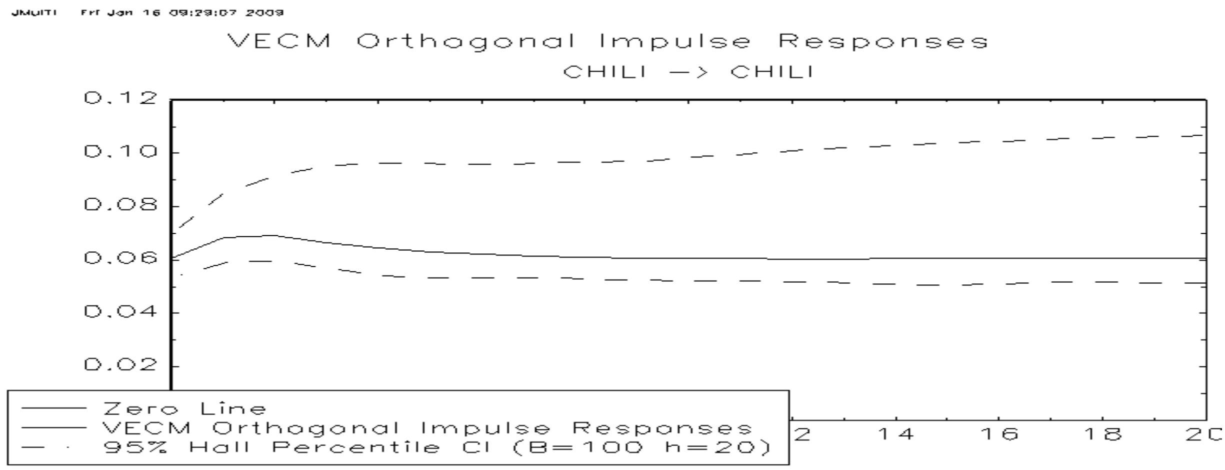
Argentina



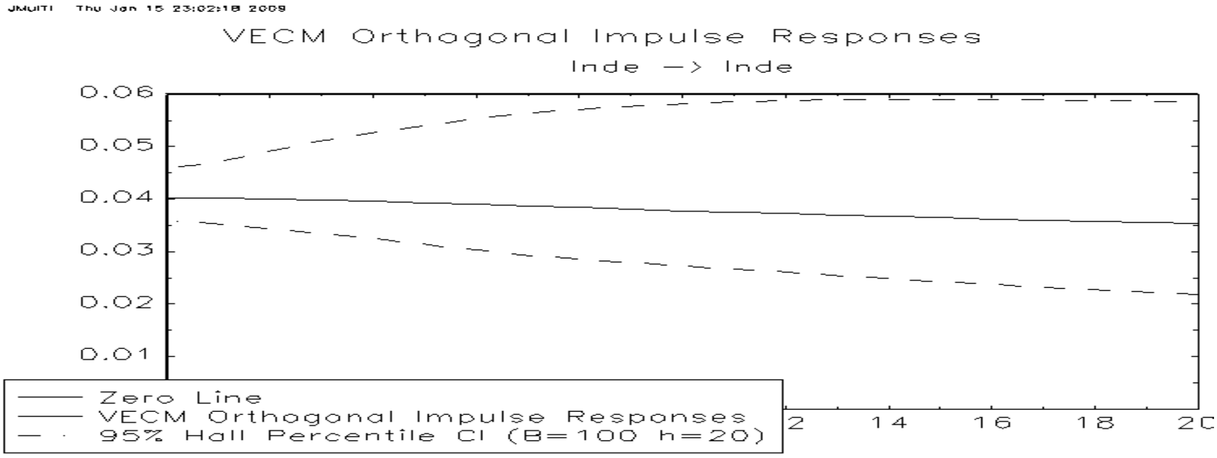
Brazil



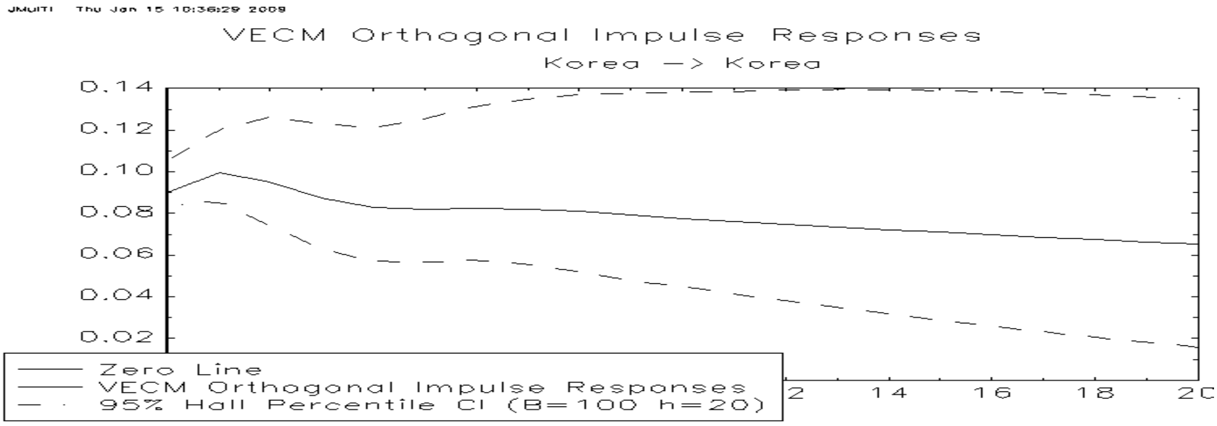
Chile



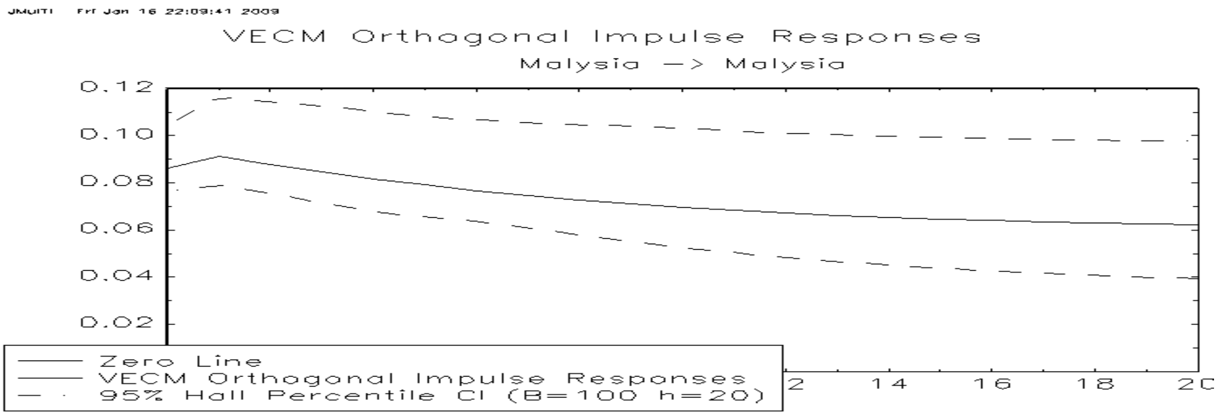
India



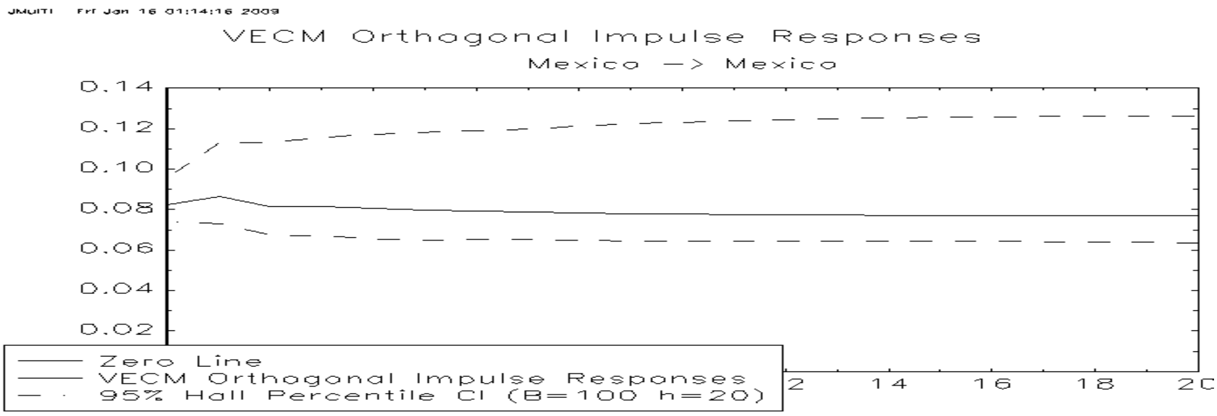
Korea



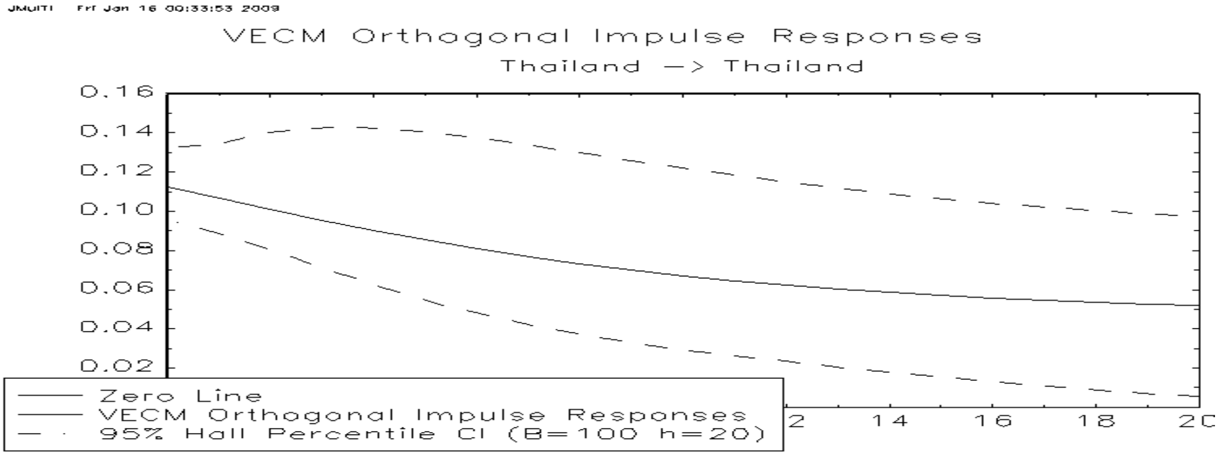
Malaysia



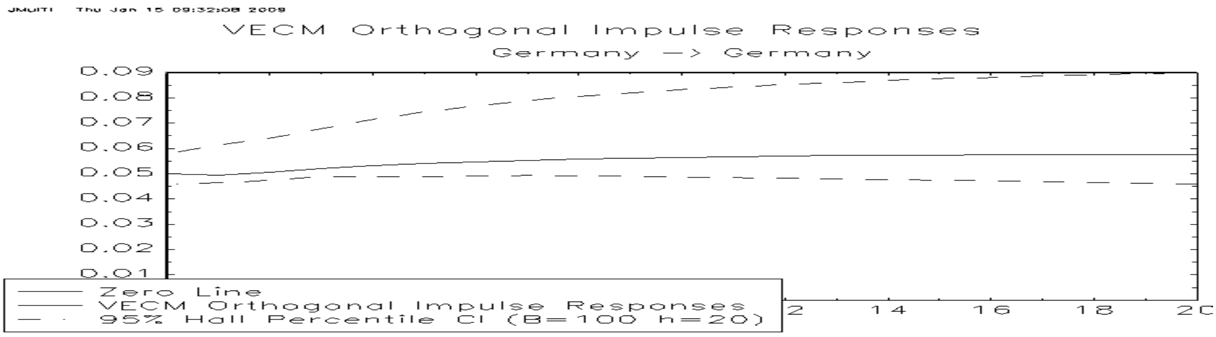
Mexico



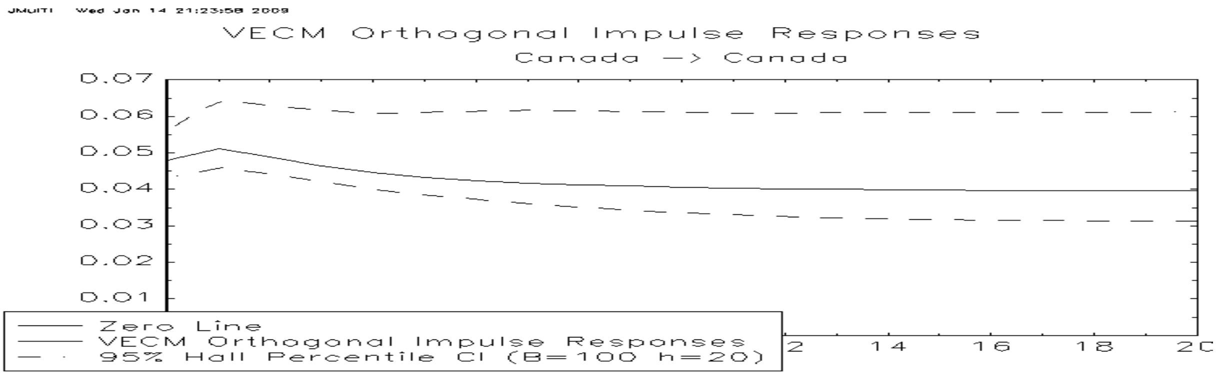
Thaïland



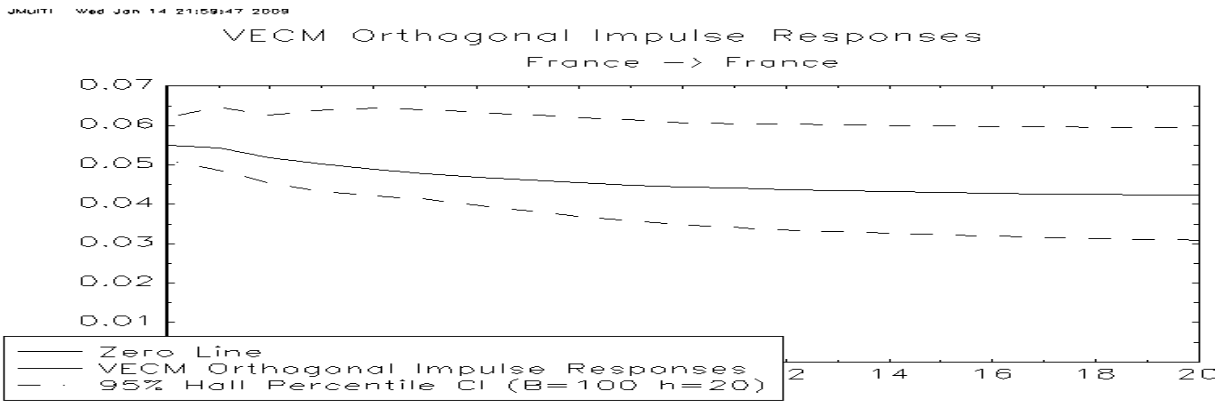
Germany



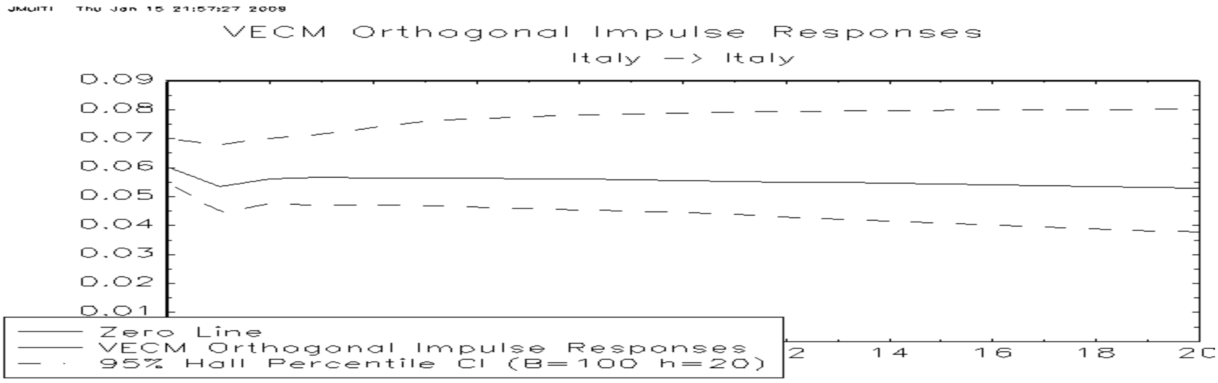
Canada



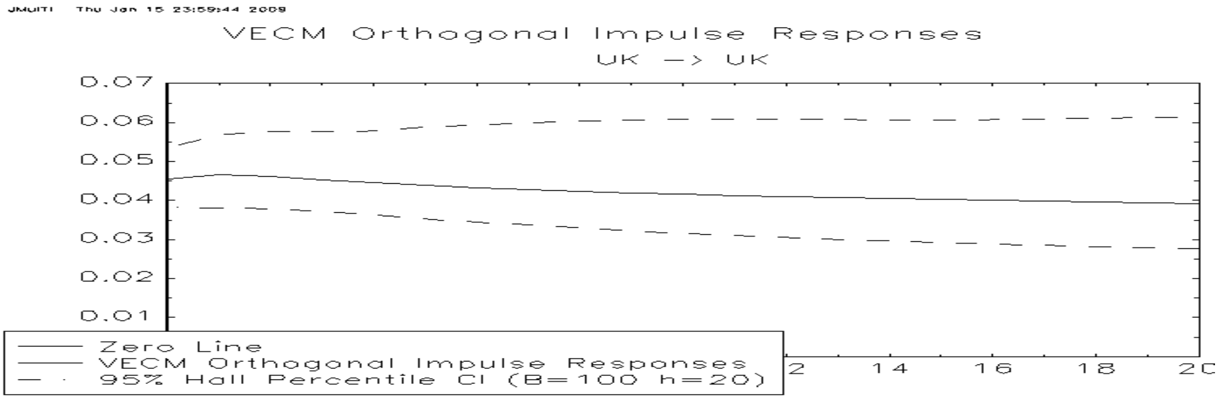
France



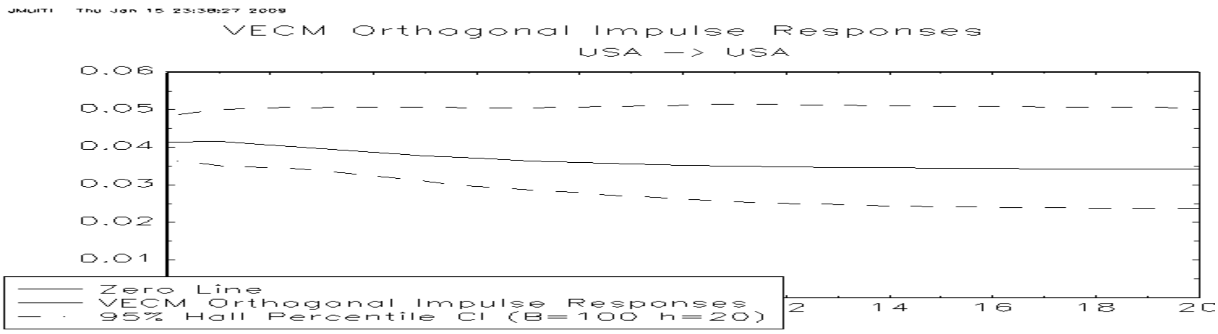
Italy



United-Kingdom



United States of America



ASERS Publishing
ASERS

ASERS Publishing
Web: www.asers.eu
URL: http://www.asers.eu/asers-publishing
ISSN 2068 – 7710