Surprise Effect of European Macroeconomic Announcements on CIVETS Stock Markets

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Abstract
This paper investigates the surprise effect of eight commonly used scheduled macroeconomic news announcements (eight indicators) from the European Union on CIVETS (Colombia, Indonesia, Vietnam, Egypt, Turkey, and South Africa) stock markets. The data refers to the period 2007 – 2012 and the method used is EGARCH. The surprise effect can be applied to measure market integration; integrated stock markets exhibit reaction on international news surprises, while partially integrated or segmented markets do not show significant interdependence on international macroeconomic news surprises. In this study we investigate, if and how CIVETS stock markets are integrated with the EU, with regards to the impact of news surprises. The results show a linkage between EU macroeconomic news and CIVETS stock markets: announcements affect stock market volatility and in some instances the stock returns.

1. Introduction

CIVETS (Colombia, Indonesia, Vietnam, Egypt, Turkey, and South Africa) is a fairly new acronym coined in 2009 by the Economist Intelligence Unit of the Economist Group to refer to six dynamic frontier markets that are considered new rising economies. The CIVETS, as well as, other frontier economies have become of interest to the international investment community as a source for possible higher returns that may escape the well-known negative spillovers from one developed market to another one.

CIVETS countries have, however, in the recent years opened their markets to foreign investments and international trade, becoming more susceptible to external shocks. Thus, CIVETS countries are interesting for study of spillover effects and degree of countries' integration. It can be expected that their exposure to external shocks from global markets has increased in the wake of their internationalization. The purpose of this research is to investigate, whether CIVETS stock markets are integrated with the European economy, as measured by the *surprise* of scheduled European Union (EU) macroeconomic news announcements. To the best of the authors' knowledge this is the first study on the surprise effect of the EU macroeconomic news announcements on CIVETS stock markets.

Macroeconomic announcements provide information on national, or regional economic developments for economists and market participants, thus affecting their decision making and reflected by the financial markets. The empirical literature distinguishes two sources of news effects (e.g., Rangel, 2011): scheduled macroeconomic announcements that defy observer expectations (the announcement effect) and unexpected macroeconomic announcements (the surprise effect). The method used for measurement of surprises is defined in section 3 of this paper. This research is focused on studying the surprise effect of eight commonly used scheduled macroeconomic news

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announcements (eight indicators) from EU. Daily stock market data from CIVETS is analyzed for the period from 2007 to 2012. Exponential Generalized Autoregressive Conditional Heteroscedasticity (EGARCH) model is a one of preferable and widely used methods to study impact of macroeconomic announcements on asset pricing and volatility at the market; it is applied also in this study. The starting hypothesis is that stock returns and/or volatilities react, at least to some extent, to the incoming information from EU because EU is among the main trading partners and sources of foreign direct investment into CIVETS. However, it is likely that there are differences in the impacts among countries due to the heterogeneity of CIVETS markets.

The remainder of this paper is organized as follows: The following section presents the theoretical background of studying the effects of macroeconomic announcements on local stock markets. Section 3 provides descriptive statistics for the CIVETS stock markets and description of the EU macroeconomic announcements that are examined in this study. Model specification applied to test the surprise effect of the EU macroeconomic announcements is introduced in Section 4. Section 5 presents the results from this study, and Section 6 concludes the paper and provides suggestions for future research.

2. Background

Previous research regarding the effects of macroeconomic news announcements on financial markets is widely studied, but the focus of researchers has mainly concentrated on the relationships among developed economies.

Surprise announcements are typically more informative and significant for the market than scheduled announcements (e.g., Kim et al., 2004). Some particular financial markets show interdependence on announcements surprises, while the news themselves are not as informative for market participants as their surprises (Jiang at al., 2010, study on European markets).

Andersen et al. (2007) examined the interactions among U.S., German, and British stock, bond, and foreign exchange markets, with respect to the U.S. macroeconomic news surprises. They found that stock, bond, and exchange rate dynamics are linked to macroeconomic fundamentals. Harju and Hussain (2011) investigated the intraday dynamics of four major European equity markets (France, Germany, Switzerland, and the United Kingdom) with respect to the U.S. macroeconomic news surprises. They found many of the U.S. indicators to have statistically significant influence across these markets. However, mostly macroeconomic surprises seem to have a significant impact only on the conditional volatility, and not on the asset returns.

Nikkinen et al. (2006) studied global stock market integration with respect to surprises of the U.S. macroeconomic news announcements. The results of the research supported the earlier findings (see Bekaert and Harvey, 1995, and Rockinger and Urga, 2001) in that market integration seems to be higher among the major stock markets of Europe and Asia, with respect to the U.S. macroeconomic news announcements and their surprises, whereas some emerging markets would seem to be more segmented.

Studies that have examined the surprise effect of macroeconomic news announcements on emerging economies have only recently arisen. Hanousek et al. (2009) investigated the impact of the U.S., EU and neighboring markets macroeconomic news announcements on stock returns in three largest emerging EU financial markets (Hungary, Czech Republic, and Poland). They found that the impact of foreign news is more significant in markets with a larger proportion of foreign investors.

Nowak et al. (2011) investigated how emerging bond markets of Brazil, Mexico, Russia, and Turkey reacted to U.S., German, and local macroeconomic news announcements. The results show that similarly to mature bond markets, both conditional returns and volatility were found to be affected by surprises at the global, regional, and the local macroeconomic levels. This suggests that global and regional news tend to be at least as important, as the local news for emerging bond markets in these countries. However, the absorption of new information was found to be slower in emerging markets, than in the developed markets.

Only few researchers have focused on studying CIVETS. The rare examples are Korkmaz et al. (2012), studying return and volatility spillovers among (between) CIVETS stock markets, and Yi et al. (2013), comparing CIVETS to BRICs (Brazil, Russia, India, and China) by a scientometric

approach. Their findings show interdependence between stock returns and volatilities, and report similarity between these two groups of countries.

The results regarding the impact of macroeconomic news surprises on stock markets vary across regions. Commonly developed markets have been found to respond more to macroeconomic news surprises coming from other markets, and to exhibit a higher level of market integration (see e.g., Harju and Hussain, 2011; Andersen et al., 2007; and Bollerslev et al., 2000). Some emerging markets demonstrate increasing integration with the world, with respect to macroeconomic surprises in developed markets (see e.g., Hussainey and Ngoc, 2009, or Nguyen, 2011). However, some segmented regions in the world economy will exist (e.g., Turkey and some smaller Asian economies) that exhibit more dependence on the local and the regional news and their surprises, than on global news (see Nikkinen et al., 2006; Hanousek et al., 2009; Önder and Simga-Mugan, 2006; and Nowak et al., 2011).

3. Description of the data used

The stock market data analyzed in the study is provided by Reuters. Daily MSCI total return indices from 2007 to 2012 for Colombia, Indonesia, Vietnam, Egypt, Turkey, South Africa, and the emerging markets as an aggregate are used to compute logarithmic return differences. The data period is dictated by availability of stock market data for all CIVETS countries. Historical development of each country stock market from CIVETS group is presented in Figure 1.

Figure 1. Development of CIVETS stock market indices
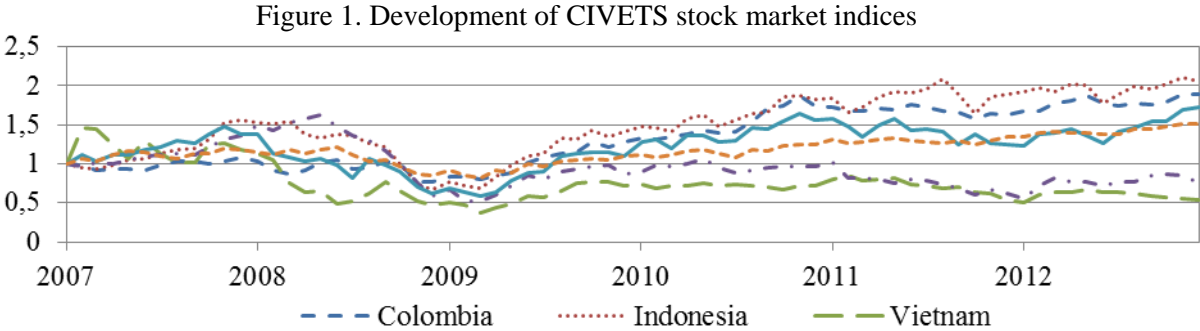
Source: Datastream database. All indices are scaled to 1 in the beginning of 2007.

Figure 2 introduces historical stock market development of S&P500 and groups of countries such as CIVETS, BRIC, Emerging Markets, and Europe (MSCI).

Figure 2. Performance of CIVETS, BRIC, Emerging Markets, Europe, and S&P500 indices
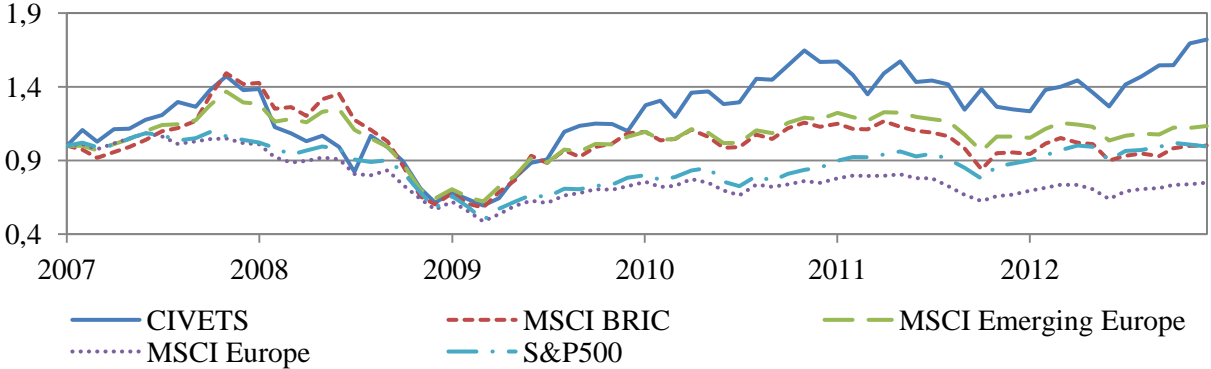
Source: Datastream database. All indices are scaled to 1 in the beginning of 2007.

Table 1 shows the descriptive statistics for the asset returns for CIVETS countries. Panel A in Table introduces the first four moments. The average returns and standard deviations are annualized. The highest annual mean return for the period examined is in Indonesia (13.2 %), whereas Vietnam and Egypt experienced negative returns, -8.2 % and -2.7 %, respectively. The highest standard deviation of asset returns is in Vietnam (31.2 %), while the lowest volatility is found for Colombia (19.5 %). The null hypothesis of normal distribution is rejected in all cases.

Table 1: Descriptive statistics for the asset returns

Panel A reports descriptive statistics for the continuously compounded returns of CIVETS and emerging European stock markets (as an aggregate). Panel B reports pairwise correlations for the return series. The sample includes 1,510 daily observations for each stock for the period from 2007 to 2012. The means and standard deviations in the table have been annualized. The p-values for the Jarque-Bera test statistic of the null hypothesis of normal distribution.

Asset return series	Mean (%)	Std. dev. (%)	Skewness	Excess Kurtosis	Normality (p-value)		
Panel A: Summary statistics							
Colombia	11.705	19.509	-0.399	10.061	<0.001		
Indonesia	13.206	29.653	-0.540	9.900	<0.001		
Vietnam	-8.193	31.217	0.008	4.138	<0.001		
Egypt	-2.686	29.668	-1.068	12.130	<0.001		
Turkey	10.315	30.002	-0.011	9.394	<0.001		
South Africa	7.831	21.423	-0.097	5.726	<0.001		
Emerging Markets	2.813	20.217	-0.395	10.199	<0.001		
Panel B: Pairwise correlations	**Colombia**	**Indonesia**	**Vietnam**	**Egypt**	**Turkey**	**S. Africa**	**EM**
Colombia	1	0.329	0.093	0.174	0.387	0.406	0.531
Indonesia		1	0.127	0.295	0.353	0.422	0.652
Vietnam			1	0.140	0.108	0.091	0.161
Egypt				1	0.191	0.210	0.312
Turkey					1	0.527	0.593
South Africa						1	0.703
Emerging Markets							1

Panel B in Table 1 reports the pairwise correlations among the examined asset returns. CIVETS stock returns during the observed period have a fairly low cross correlation across the board. The highest correlation among CIVETS is between Turkey and South Africa (0.527). Vietnam has the lowest correlation with the other CIVETS and with the emerging markets aggregate.

Macroeconomic announcements are identified as scheduled news announcements of macroeconomic indicators for the European Union. Scheduled announcements of eight different macroeconomic indicators are applied in this study, they are: consumer price index (CPI), industrial production (IP), gross domestic product (GDP), retail sales (RS), unemployment (UE), liquidity by M3 (M3), purchasing managers index (PMI), and consumer confidence (CC).

To test macroeconomic surprise effect on the market, news surprises are calculated and standardized (the macroeconomic indicators are measured in different units; see, e.g., Balduzzi et al., 2001) by using the following formula:

$$S_{i,t} = \frac{R_{i,t} - C_{i,t}}{\sigma_{S_i}}, \tag{1}$$

where $R_{i,t}$ and $C_{i,t}$ are the realization and the consensus[2] of data release i at time t and σ_{S_i} is the standard deviation for the forecast error of data release i. The data has been fitted so that if MSCI

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[2] Median expectation of the monthly FactSet Consensus Economics survey.

index return was not published on a day of scheduled macroeconomic news announcement, the impact is studied on the following day. All the data regarding macroeconomic indicators has been retrieved from FactSet.

Table 2 provides information on macroeconomic indicators applied in this study. Such set of macroeconomic news are applied in similar type of analysis (see, e.x., Graham et al., 2003).

Table 1: Scheduled macroeconomic news reports

Macroeconomic indicators are collected for the period from 2007 to 2012. Release day is an average release day of the month.

Report	Abrv.	Issued	Issuing office	# of releases	Ex. of release day	Release time (GMT)
Consumer price index	CPI	Monthly	Eurostat	72	16.5	5.00 AM
Industrial production	IP	Monthly	Eurostat	72	13.2	5.00 AM
Gross domestic product,	GDP	Quarterly	Eurostat	24	14.1	5.00 AM
Retail sales	RS	Monthly	Eurostat	72	4.8	5.00 AM
Unemployment	UE	Monthly	Eurostat	71	16.4	5.00 AM
M3	M3	Monthly	European Central Bank	71	27.2	4.00 AM
Purchas. manag. index	PMI	Monthly	Reuters	71	1.7	4.00 AM
Consumer confidence	CC	Monthly	Economic and Financial Affairs	71	27.5	5.00 AM

Source: European Central Bank and FactSet.

Trading hours in CIVETS stock markets vary as measured in GMT. The scheduled macroeconomic announcements have been released prior the opening of the exchange or during the trading hours for all CIVETS. Thus, the impact of the announcement is examined on the release day. The sample period consist of 1510 trading days, where 1065 (70.5 %) trading days were absent of a news release and 71 (4.7 %) trading days had multiple news releases.

4. Model specification

The EGARCH approach, proposed by Nelson (1991), is widely used to study volatility in financial markets (see, e.g., Koutmos and Booth, 1995). EGARCH (1,1) model with a Gaussian normal distribution of errors is applied in order to examine the effects of EU macroeconomic news surprises on CIVETS stock markets. Thus, the mean (Equation 2) and the conditional variance (Equation 5) of baseline EGARCH (1,1) are extended as follows:

Model 1: $r_{i,t}=\mu_i+\omega_{EM}r_{t-1}^{EM}+\lambda_i S_{i,t}+\varepsilon_{i,t},$ (2)

Model 2: $r_{i,t}=\mu_i+\omega_{EM}r_{t-1}^{EM}+\lambda_i \boldsymbol{S}_{i,t}+\varepsilon_{i,t},$

$$\varepsilon_{i,t} = \sigma_{i,t}z_{i,t},$$ (3)

$$z_{i,t}|\Omega_{t-1} \sim \psi(0,1,\upsilon),$$ (4)

Model 1: $ln(\sigma_{i,t}^2)=c_i+\alpha_i \frac{|\varepsilon_{i,t-1}|}{\sigma_{i,\,t-1}}+\gamma_i \frac{\varepsilon_{i,t-1}}{\sigma_{i,\,t-1}}+\beta_i \, ln\left(\sigma_{i,t-1}^2\right)+\eta_i \boldsymbol{S}_{i,t},$ (5)

Model 2: $ln(\sigma_{i,t}^2)=c_i+\alpha_i \frac{|\varepsilon_{i,t-1}|}{\sigma_{i,\,t-1}}+\gamma_i \frac{\varepsilon_{i,t-1}}{\sigma_{i,\,t-1}}+\beta_i \, ln\left(\sigma_{i,t-1}^2\right)+\eta_i \boldsymbol{S}_{i,t},$

where $r_{i,t}$ is the daily return for CIVETS market i at time t. μ_i is a constant and $\sigma_{i,t}^2$ is a conditional variance. The standardized residuals, $z_{i,t}$, are obtained from the set of information available in the previous period. $\psi(.)$ is a conditional density function and v is a vector of parameters that specifies the

517

probability distribution. r_{t-1}^{EM} represents stock market returns for Emerging Markets (EM) at time $t\text{-}1$. ω_{EM} is a parameter representing the autoregressive effects in returns of EM. In the mean equation of Model 1, $S_{i,t}$ represents the news surprise for macroeconomic announcements. In the mean equation of Model 2, $S_{i,t}$ is a $cx1$ vector of the news surprises for macroeconomic announcements taking place in category c at time t.

The variance equation in this test is a function of five parameters. The first parameter, c_i, is a constant term, the second estimated parameter, α_i, represents the symmetric effects of the model. The third parameter, γ_i, indicates asymmetric effects in the model. Forth paramet, β_i, measures the persistence of conditional volatility, and fifth parameter, η_i, is a parameter that defines the impact of macroeconomic news surprises. In the variance equation of Model 1, $S_{i,t}$ is a $cx1$ vector of surprises for macroeconomic announcements taking place in category c at time t. In the variance equation of Model 2, $S_{i,t}$ is the representation of the news surprise of macroeconomic announcements.

The computation of news surprises $S_{i,t}$ takes into account categories, which share the same announcement day. Positive surprise for news from such categories as GDP, RS, M3, IP, PMI, and CC has a positive effect on the market, while positive surprises for UE and CPI are expected to have a negative effect on the financial markets. Thus, this information was taken into account on days of multiple announcements (whether news has a positive or a negative impact on the market). Furthermore, the estimated coefficients of λ_i (in Model 2) and η_i (in Model 1) capture the contemporaneous effects of macroeconomic news surprises from different categories on stock markets and on the volatilities of these markets respectively.

The presence of asymmetric (leverage) effects in the model can be tested by the hypothesis that parameter γ_i is less than 0. Positive shocks in the market generate less volatility, than negative shocks, if γ_i is negative. Market volatility is increased more by positive news, than by negative news, if the value of γ_i is positive.

The variance-covariance matrices can be optimized with the Berndt, Hall, Hall, and Hausman (BHHH, 1974) algorithm (see Engle and Kroner, 1995), which is based on the determination of the first derivatives of the log-likelihood function, with respect to the parameter values for each iteration of the model estimation. From Equation (5), we obtain the conditional log-likelihood functions $L(\theta)$ for a sample of T observations:

$$L(\boldsymbol{\theta}) = \sum_{t=1}^{T} l_t(\boldsymbol{\theta}), \tag{6}$$

$$l_t(\boldsymbol{\theta}) = -\log 2\pi - 1/2 \log |H_t(\boldsymbol{\theta})| - 1/2 \varepsilon_t'(\boldsymbol{\theta}) H_t^{-1}(\boldsymbol{\theta}) \varepsilon_t(\boldsymbol{\theta}), \tag{7}$$

where θ represents the vector of all of the unknown parameters. The numerical maximization of Equations (6) and (7) produces the maximum likelihood estimates with asymptotic standard errors.

5. Empirical results

Four preliminary tests (Jarque-Bera, Augmented Dickey-Fuller (ADF), Ljung-Box, and ARCH-LM) are conducted, in order to determine the suitable methodological approach applicable for this study. Jarque-Bera test statistics reject the null hypothesis of normal distribution in all cases. ADF exhibited no unit root in the data. Ljung-Box test showed that the null hypothesis is rejected in all markets, except for Turkey, where the first five autocorrelation coefficients are zero. ARCH-LM test showed the presence of ARCH effect in the stock returns of CIVETS markets.

Twelve models are estimated, in which the effect of news surprise is examined. Table 3 reports the main results from the EGARCH estimation. Panel A in Table 3 shows the results of the estimated mean equations of Model 1 and Model 2. The high dependency of CIVETS stock markets on the performance of the EM aggregate is evidenced by positive and statistically significant ω_{EM} coefficients. The results in Model 1 suggest that on the overall EU macroeconomic news surprises do not affect the prices of assets in CIVETS stock markets (refer to λ_{all} coefficients with no statistical significance in Model 2).

The results of the estimated mean equation of Model 2 suggest that the responses to EU news surprises vary across CIVETS based on the news category examined. News surprises from categories GDP and unemployment affect stock returns in the Vietnamese market. Turkish stock returns are affected by news surprises in PMI, whereas South African stock returns are affected by retail sales. GDP news surprises are also found to affect Egyptian stock returns. No single news surprise category affects the stock returns in Colombia and in Indonesia.

Panel B in Table 3 illustrates the results of impact of EU macroeconomic news surprises on volatility of CIVETS stock markets. Again all of the CIVETS markets exhibit homogeneity in dependence on the previous market volatility. This is exhibited by the positive and significant β_i coefficients, meaning that these volatilities are persistent. Moreover, γ_i coefficients are negative and statistically significant for Colombia, Indonesia, Egypt, and Turkey, suggesting that positive shocks generate less volatility in these markets, than negative shocks, as one would expect.

Table 3 shows results: Parameter estimates for the mean equation are reported in Panel A and the volatility equation in Panel B. The sample period runs from 2007 to 2012. The sample includes 1,510 daily observations for each stock and 524 observations of EU macroeconomic announcements. Panel C reports the results of diagnostic tests. The F-statistic and probability for the F-test of the null hypothesis that all of the slope coefficients (excluding the intercept) are equal to zero is provided in the table.

Table 3 The effects of macroeconomic news surprises (1/3)

| Parameters | Colombia | | | | Indonesia | | | |
| | Model 1 | | Model 2 | | Model 1 | | Model 2 | |
Panel A: Mean equation	Coeff.	SE	Coeff.	SE	Coeff.	SE.	Coeff.	SE.
μ_i	0.041**	0.024	0.040	0.024	0.002	0.028	0.003	0.028
ω_{EM}	0.433*	0.017	0.440*	0.016	0.925*	0.019	0.924*	0.019
λ_{all}	0.050	0.046	-	-	0.068	0.049	-	-
λ_{GDP}	-	-	0.117	0.352	-	-	-0.046	0.260
λ_{RS}	-	-	0.120	0.085	-	-	0.103	0.106
λ_{M3}	-	-	-0.164	0.100	-	-	-0.026	0.151
λ_{IP}	-	-	0.098	0.136	-	-	-0.010	0.126
λ_{CPI}	-	-	-0.043	0.122	-	-	-0.188	0.234
λ_{UE}	-	-	-0.166	0.185	-	-	0.062	0.203
λ_{PMI}	-	-	-0.069	0.117	-	-	-0.141	0.127
λ_{CC}	-	-	-0.036	0.170	-	-	0.221	0.190
Panel B: Volatility equation								
c_i	-0.244*	0.023	-0.246*	0.023	-0.204*	0.025	-0.204*	0.024
α_i	0.305*	0.028	0.312*	0.028	0.298*	0.033	0.295*	0.032
γ_i	-0.103*	0.017	-0.102*	0.017	-0.113*	0.020	-0.110*	0.019
β_i	0.854*	0.022	0.843*	0.023	0.948*	0.010	0.951*	0.009
η_{all}	-	-	-0.083*	0.046	-	-	-0.049	0.045
η_{GDP}	-0.091	0.277	-	-	-0.060	0.120	-	-
η_{RS}	-0.083	0.082	-	-	0.032	0.085	-	-
η_{M3}	-0.032	0.100	-	-	0.032	0.102	-	-
η_{IP}	-0.295*	0.114	-	-	-0.193*	0.078	-	-
η_{CPI}	0.078	0.182	-	-	0.099	0.124	-	-
η_{UE}	0.292	0.199	-	-	0.117	0.145	-	-
η_{PMI}	0.239*	0.109	-	-	-0.064	0.092	-	-
η_{CC}	0.040	0.150	-	-	0.181	0.129	-	-
Panel C: Diagnostic tests								

Adj. R^2	0.269	0.273	0.419	0.420
Log-likelihood	-2093.183	-2095.164	-2453.599	-2455.073
F-statistic	40.609	41.382	78.861	78.92
Prob (F-statistic)	<0.001	<0.001	<0.001	<0.001

Considering different news categories, the news impact on stock market volatility is diverse. Stock market volatilities in Colombia and Indonesia decrease on the day of industrial production news surprises. Furthermore, stock market volatilities in Vietnam, Egypt, and Turkey on the day of monetary surprises decrease, whereas unemployment surprises increase volatility in Vietnam and in Egypt, as illustrated by positive and significant η_{UE} coefficients. GDP surprises decrease volatility in Egypt and inflation surprises increase volatility in in Egypt and Colombia. Consumer confidence news surprises contribute to Egyptian and Turkish stock market volatility, by decreasing the number of transactions on the markets. Moreover, retail sales increase volatility in South Africa. The GARCH estimates in both Model 1 and Model 2 are found to be significant for Colombia, Indonesia, Egypt, Turkey, and South Africa, as illustrated by the α_i and β_i coefficients for each of these models.

Table 3 The effects of macroeconomic news surprises (2/3)

	Vietnam				Egypt			
Parameters	**Model 1**		**Model 2**		**Model 1**		**Model 2**	
Panel A: Mean equation	Coeff.	SE	Coeff.	SE.	Coeff.	SE	Coeff.	SE
μ_i	-0.096*	0.039	-0.102*	0.040	-0.033	0.045	-0.017	0.046
ω_{EM}	0.213*	0.035	0.212*	0.034	0.398*	0.028	0.424*	0.027
λ_{all}	0.028	0.077	-	-	-0.045	0.088	-	-
λ_{GDP}	-	-	-1.052*	0.278	-	-	-0.838**	0.470
λ_{RS}	-	-	-0.017	0.187	-	-	-0.118	0.263
λ_{M3}	-	-	0.004	0.286	-	-	-0.25	0.235
λ_{IP}	-	-	0.158	0.168	-	-	0.123	0.278
λ_{CPI}	-	-	-0.065	0.235	-	-	-0.148	0.259
λ_{UE}	-	-	-0.597**	0.348	-	-	0.324	0.256
λ_{PMI}	-	-	-0.106	0.248	-	-	0.263	0.211
λ_{CC}	-	-	0.032	0.325	-	-	0.062	0.282
Panel B: Volatility equation								
c_i	-0.131*	0.017	-0.145*	0.017	0.024*	0.005	0.001	0.005
α_i	0.268*	0.028	0.276*	0.028	-0.004	0.005	0.036*	0.005
γ_i	-0.023	0.016	-0.025	0.016	-0.069*	0.005	-0.073*	0.006
β_i	0.931*	0.012	0.935*	0.011	0.978*	0.002	0.974*	0.003
η_{all}	-	-	-0.087*	0.039	-	-	-0.107*	0.016
η_{GDP}	-0.228	0.167	-	-	-0.204*	0.060	-	-
η_{RS}	0.090	0.096	-	-	0.029	0.031	-	-
η_{M3}	-0.182**	0.097	-	-	-0.164*	0.036	-	-
η_{IP}	-0.119	0.090	-	-	-0.040	0.029	-	-
η_{CPI}	0.201	0.141	-	-	0.082*	0.026	-	-
η_{UE}	0.300*	0.140	-	-	0.286*	0.042	-	-
η_{PMI}	-0.034	0.109	-	-	0.067*	0.028	-	-
η_{CC}	0.066	0.138	-	-	-0.147*	0.041	-	-
Panel C: Diagnostic tests								
Adj. R^2	0.016		0.017		0.087		0.093	
Log-likelihood	-2983.454		-2982.783		-2898.877		-2911.085	
F-statistic	2.700		2.848		11.273		12.041	

Table 3 The effects of macroeconomic news surprises (3/3)

	Turkey				South Africa			
Parameters	**Model 1**		**Model 2**		**Model 1**		**Model 2**	
Panel A: Mean equation	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
μ_i	0.031	0.036	0.035	0.036	0.008	0.021	0.019	0.021
ω_{EM}	0.837*	0.026	0.847*	0.026	0.749*	0.019	0.754*	0.018
λ_{all}	0.028	0.075	-	-	0.028	0.043	-	-
λ_{GDP}	-	-	-0.099	0.430	-	-	0.216	0.286
λ_{RS}	-	-	0.055	0.197	-	-	0.171**	0.103
λ_{M3}	-	-	-0.212	0.162	-	-	-0.054	0.123
λ_{IP}	-	-	0.027	0.261	-	-	0.146	0.102
λ_{CPI}	-	-	-0.048	0.308	-	-	0.196	0.152
λ_{UE}	-	-	0.257	0.233	-	-	0.074	0.165
λ_{PMI}	-	-	0.285*	0.114	-	-	0.038	0.124
λ_{CC}	-	-	0.371	0.234	-	-	-0.177	0.161
Panel B: Volatility equation								
c_i	-0.061*	0.016	-0.072�	0.013	-0.120*	0.019	-0.127*	0.018
α_i	0.137*	0.022	0.131ᵃ	0.019	0.149*	0.023	0.155*	0.023
γ_i	-0.071*	0.016	-0.060ᵃ	0.015	-0.019	0.019	-0.003	0.018
β_i	0.944*	0.012	0.960ᵃ	0.009	0.986*	0.005	0.987*	0.005
η_{all}	-	-	-0.062ᵃ	0.032	-	-	0.009	0.028
η_{GDP}	-0.244	0.186	-	-	0.213	0.130	-	-
η_{RS}	0.111	0.085	-	-	0.188*	0.077	-	-
η_{M3}	-0.162*	0.069	-	-	0.027	0.067	-	-
η_{IP}	0.003	0.069	-	-	0.030	0.066	-	-
η_{CPI}	0.051	0.118	-	-	-0.016	0.084	-	-
η_{UE}	0.058	0.091	-	-	0.135	0.096	-	-
η_{PMI}	-0.121	0.083	-	-	0.029	0.094	-	-
η_{CC}	-0.172**	0.103	-	-	0.148	0.095	-	-
Panel C: Diagnostic tests								
Adj. R^2		0.345		0.349		0.490		0.492
Log-likelihood		-2704.401		-2704.2		-1925.211		-1927.563
F-statistic		57.714		58.766		104.547		105.3
Prob (F-statistic)		<0.001		<0.001		<0.001		<0.001

The results of diagnostic tests are reported in Panel C of Table 3. The results indicate sufficient explanatory power for measuring the future stock market values in CIVETS countries, with the exception of Vietnam and Egypt. The F-statistic is derived as a test of the hypothesis that all slope coefficients (excluding the intercept) are equal to zero. The p-value for each F-statistic denotes the marginal significance level of each F-test. The models are correctly specified, as the null hypothesis is rejected in the estimated models.

6. Conclusions and discussion

This study aims to examine the linkage of the CIVETS stock markets with the EU, with respect to scheduled EU macroeconomic news surprises. For this purpose, the impact of scheduled EU

macroeconomic news surprises on CIVETS stock market returns and volatilities is investigated. The expectation was that stock returns and/or volatilities of CIVETS markets react, to some extent, to the EU macroeconomic news surprises, and thus indicate interconnectedness between the EU and the CIVETS markets.

The estimated results indicate that EU macroeconomic news surprises seem to affect the CIVETS stock market volatility generally and stock returns to some extent. The scope of the impact from macroeconomic surprises on CIVETS markets is heterogeneous. Moreover, information spillovers from EU to CIVETS are evidenced in all countries. Furthermore, the results reveled that Egyptian market is the most integrated market with EU, measured by effect of EU macroeconomic surprises, and that Indonesia is the most segmented market among the CIVETS markets (Indonesia has weaker responses to EU macroeconomic surprises). Homogeneity of the market volatility in CIVETS markets is significantly dependent on the previous values (of volatility). Negative shocks from macroeconomic news were found to have a leverage effect for the most of the CIVETS stock markets; thus, suggesting a negative relationship between market returns and volatility. The impact of different types of macroeconomic news surprises is diverse, with respect to each particular country.

This study supports the perception that CIVETS stock markets react to the EU macroeconomic surprises, suggesting the existence of market integration between the CIVETS markets and the euro area. EU can therefore be considered as a potential (risk) factor, which needs to be priced, when investing in CIVETS.

This research can be extended by assessing of the impact of macroeconomic news surprises from other developed economies, which could potentially have an impact on the CIVETS markets. Furthermore, the significance of the impact of local macroeconomic news and their surprises to stock markets could be tested in the future research to broaden the knowledge of these markets.

References

ANDERSEN, T.G., BOLLERSLEV, T., DIEBOLD, F.X., VEGA, C. (2007). Real-Time Price Discovery in Global Stock, Bond and Foreign Exchange Markets. *Journal of International Economics*, vol. 73, no. 2, pp. 251–277.

BALDUZZI, P., ELTON, E.J., Green, T.C. (2001). Economic News and Bond Prices: Evidence from the U.S. Treasury Market. *The Journal of Financial & Quantitative Analysis*, vol. 36, no. 4, pp. 523–543.

BEKAERT, G., HARVEY, C.R. (1995). Time-Varying World Market Integration. *The Journal of Finance*, vol. 50, no. 2, pp. 403–444.

BOLLERSLEV, T., CAI, J., SONG, F.M. (2000). Intraday Periodicity, Long Memory Volatility, and Macroconomic Announcement Effects in the US Treasury Bond Market. *Journal of Empirical Finance*, vol. 7, no. 1, pp. 37–55.

ENGLE, R., KRONER, K. (1995). Multivariate simultaneous generalized ARCH. *Econometric Theory*, vol. 11, no. 1, pp. 122–150.

GRAHAM, M., NIKKINEN, J., SAHLSTRÖM, P. (2003). Relative Importance of Scheduled Macroeconomic News for Stock Market Investors. *Journal of Economics & Finance*, vol. 27, no. 2, pp. 153–165.

HANOUSEK, J., KOĆENDA, E., KUTAN, A.M. (2009). The Reaction of Asset Prices to Macroeconomic Announcements in New EU Markets: Evidence from Intraday Data. *Journal of Financial Stability*, vol. 5, no. 2, pp. 199–219.

HARJU, K., HUSSAIN, S.M. (2011). Intraday Seasonalities and Macroeconomic Announcemements. *European Financial Management*, vol. 17, no. 2, pp. 367–390.

HUSSAINEY, K., NGOC, L.K. (2009). The Impact of Macroeconomic Indicators on Vietnamese Stock Prices. *The Journal of Risk Finance*, vol. 10, no. 4, pp. 321–332.

JIANG, G., KONSTANTINIDI, E., SKIADOPOULOS, G. (2012). Volatility spillovers and the effect of news announcements. *Journal of Banking & Finance*, vol. 36, no. 8, pp. 2260–2273.

JOHNSON, S. (2008). Emerging Markets Emerge. *Finance & Development – A quarterly magazine of the IMF*, vol. 45, no. 3, pp. 54–55.

KIM, S.-J., McKENZIE, M., FAFF, R. (2004). Macroeconomic news announcements and the role of expectations: evidence for US bond, stock and foreign exchange markets. *Journal of Multinational Financial Management*, vol. 14, no. 4, pp. 217–232.

KORKMAZ, T., CEVIK, E.I., ATUKEREN, E. (2012). Return and Volatility Spillovers among CIVETS Stock Markets. *Emerging Markets Review*, vol. 13, no. 2, pp. 230–252.

KOUTMOS, G., BOOTH, G.G. (1995). Asymmetric Volatility Transmission in International Stock Markets. *Journal of International Money & Finance*, vol. 14, no. 6, pp. 747–762.

NELSON, D. (1991). Conditional Heteroscedasticity in Asset Returns: A New Approach. *Econometrica*, vol. 59, no. 2, pp. 347–370.

NGUYEN, T. (2011). US Macroeconomic News Spillover Effects on Vietnamese Stock Market. *The Journal of Risk Finance*, vol. 12, no. 5, pp. 389–399.

NIKKINEN, J., OMRAN, M., SAHLSTRÖM, P., ÄIJÖ, J. (2006). Global Stock Market Reactions to Scheduled U.S. Macroeconomic News Announcements. *Global Finance Journal*, vol. 17, no. 1, pp. 92–104.

NOFSINGER, J.R., PRUCYK, B. (2003). Option Volume and Volatility Response to Scheduled Economic News Releases. *Journal of Futures Markets*, vol. 23, no. 4, pp. 315–345.

NOWAK, S., ANDRITZKY, J., JOBST, A., TAMIRISA, N. (2011). Macroeconomic Fundamentals, Price Discovery, and Volatility Dynamics in Emerging Bond Markets. *Journal of Banking & Finance*, vol. 35, no. 10, pp. 2584–2597.

ÖNDER, Z., SIMGA-MUGAN, C. (2006). How Do Political and Economic News Affect Emerging Markets? - Evidence from Argentina and Turkey. *Emerging Markets Finance & Trade*, vol. 42, no. 4, pp. 50–77.

RANGEL, J. (2011). Macroeconomic news, announcements, and stock market jump intensity dynamics. *Journal of Banking and Finance*, vol.35, no. 5, pp. 1263–1276.

Yi, Y., QI, W., WU, D. (2013). Are CIVETS the Next BRICs? A Comparative Analysis from Scientometrics Perspective. *Scientometrics*, vol. 94, no. 2, pp. 615–628.