

**EC 613:**  
**Dynamic Aspects of Turkish and International Financial Markets**

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**Term projects**

*(abstracts are preliminary; last updated: June 4, 2014)*

1. The origin of stock market volatility — the case of Indonesia and Turkey

One of the advantages to analyze the economic links between two countries on the basis of stock market data, rather than aggregate economic data published by national statistical offices, is that stock market data are readily available, allowing analysis in almost real time. We consider a directed network with equity markets as nodes and return-to-volatility spillovers, obtained via forecast error variance decomposition (fevd), indicating the weights of the edges.

In the course of globalization, it can be generally observed that the share of volatility originating from outside a local stock market has been gradually decreasing. This is also the case for Indonesia and Turkey. We show that the link of Indonesia to Turkey has recently become more important, that is, spillovers from the Indonesian to the Turkish stock market have increased, but not in the opposite direction. Using notions related to network centrality and information entropy, we also identify political and economic events having a big impact on the distribution of stock market volatility in Indonesia and Turkey.

2. Investing in energy: can the crude oil market stabilize equity markets?

Equity markets on the one hand and the crude oil market on the other do not operate in isolation. One way to assess the degree of interaction between markets is to measure return-to-volatility spillovers from one market to another. This approach leads to a network with markets as nodes and edge weights defined by spillovers. An interpretation of the network in terms of information flow provides a basis for the introduction of entropy concepts with the aim of assessing network stability, that is, the ability of the network to digest shocks. Considering a network of equity markets, the following question arises: Will the stability of a network of equity markets increase when the crude oil market is included as a further node? This question is obviously important for investors as well as for oil market regulators. We consider the example of Dow-Jones (New York), FTSE (London), s5e (euro area), SSE (Shanghai), N225 (Tokyo), and WTI (West Texas Intermediate) crude oil, from 1997 through 2014.

Vector autoregressive models are fitted to series of daily price changes of stock indices and the crude oil price. Return-to-volatility spillovers are analyzed via forecast error variance decomposition (fevd). The resulting network structure is then characterized on the basis of entropy measures, which provide an assessment of network stability. Different network architectures — with and without crude oil — are investigated.

It is found that crude oil has been able to increase equity market stability from about 2009 onwards. Investigating the role of the crude oil market as a news channel, we find that it can either mitigate news from other markets or act as a news source in itself, where the latter phenomenon predominates. In certain circumstances, encouraging investors to consider investing in the crude oil market can have a stabilizing effect on markets. This may result in energy as well as equity markets being less vulnerable to shocks, and also in more stable investor portfolios.

### 3. Stability of a financial network: the case of BRIC, the USA, and the euro area

Have recent political events on the world stage, in particular: the 2014 Crimean crisis and its aftermath, changed the way international equity markets interact in terms of risk spillovers? This question is important for international investors and policy makers likewise.

A suitable basic model for assessing the amount of connectedness of equity markets is to fit vector autoregressive models to moving windows of daily returns on stock indices representing these markets, and to decompose the forecast error variance by origin within the network. This methodology provides a tool for assessing return-to-volatility spillovers. A largely isolated market will not reveal a high share of spillovers from others. This well-known methodological framework can be augmented building on notions from network theory and information theory to provide more insight into the propagation of shocks (or news) in the network.

We consider a network consisting of equity markets in the USA (represented by the Dow-Jones Industrial Average stock index, dji), the euro area (represented by EURO STOXX 50, sx5e), and the BRIC countries, namely Brazil (represented by Bovespa, bvsp), Russia (Russian Trading System index, rts), India (S&P BSE SENSEX, bsen), and China (Shanghai Stock Index Composite, ssec). Our empirical investigations are based on daily return data from 1997 through 2014.

Our hypotheses are that (i) BRIC markets are still less connected than developed markets, (ii) the recent sanctions against Russia have reduced Russia's international connectedness, (iii) Russia's equity market as a news spreader has changed in the wake of recent events. We find hypothesis (i) confirmed, but find that Russia's role in the international market network has not recently changed its character. Indeed, Russia today (end of April 2014) is very similar to the US and euro area markets when considering the propagation of shocks. It is also shown that Russia still has a stabilizing effect in this network in an information-theoretic sense.