Construction of Stock Market-Based Daily Index of Fiscal News for Japan

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Overview

• Topic = Estimation of macroeconomic impact of fiscal policy (FP).

• Motivation behind this study = “Fiscal foresight” problem

• Objective = develop a new empirical approach to overcome the problem.

• Result = Construction of a daily indicator of news about FP (more precisely, public investment (IG)) for Japan.
1. Introduction
1.1 What is the “Fiscal foresight” problem?

• Traditional identification: FP shock = unexpected changes in actual spending.

• BUT! In reality, much of FP is expected by the time the spending is made.

• If agents are rational, they would start adjusting their behaviors as soon as the news arrives! (Ramey (2011) “It’s all in the timing”.)
Two existing approaches to deal with the problem:

“Fiscal foresight” Problem

“News” approach

Stock market based approach
This paper stands at the crossroads between the two approaches.
1.2. News-based approach

• Identify dates when the FP news first arrived.
• Set up dummies for those dates.

• Ramey & Shapiro (Carnegie 1997), Ramey (QJE 2011):
  – news about future US military spending.
For Japan:

- **Fukuda & Yamada (JJIE 2011):**
  - News on Emergency Fiscal Stimulus Packages.

- **Miyazaki (JWE 2010):**
  - VAR with dummies for those dates.
• Drawbacks
  – Dummies lack a measure of the magnitude of the policy.
  – More importantly, we do not know how big a surprise the news was!
1.3. Stock price based approach

• Idea: People’s expectations should be reflected in stock prices.
  – Look at firms that are deeply dependent on FP!

• Fisher & Peters (EJ 2010)
  – excess return (=individual return – market return) on four large military contractors in the US.
• **Drawbacks**
  
  – Stock returns could reflect many things, not just FP...
    • even for those firms that are heavily FP dependent.
  
  – Excess returns might even be correlated with market returns, unless the “beta” is equal to 1.
For Japan:

Morita (2014)

– “Purified” measure: extract a part of the changes in the returns that are correlated with future G.
  • Based on the VAR with sign restrictions.
1.4. This paper

- Combine **Fukuda & Yamada** (2011) and **Morita (2014)**... and takes one step further!

- Study **excess returns** of **individual** companies in the construction industry on the news dates.

- Take their weighted averages.
• Advantages:
  – This approach allows us to obtain a single time series of news indicator.
  – It reflects the magnitudes of the surprises generated by the news.
  – As we focus on the FP news dates, it is likely to be less contaminated by other types shocks.
• We also expand the Fukuda-Yamada list of news dates considerably.
1.5 We have gone even further recently... (not in the paper)

- NEW news indicator: Take advantage of **within-industry heterogeneity** across firms.

- Idea: Even within the construction industry, some are very IG-dependent, while others are more into building houses, etc.

- Utilize this variation to control for industry specific shocks.
Structure of presentation

1. Introduction
2. Extended list of FP news dates
3. On the stock price data
4. Construction of the FP news indicator
5. VAR analysis
6. Conclusions
2. Extended list of FP news dates
List of FP events


2. Reconstruction Budget after the Great East Japan Earthquake.


4. Natural Disasters (three earthquakes and a tunnel collapse).

5. Future Sports Events (Nagano, World-cup, Tokyo)

All together...

- Identified **38** FP events; **159** dates.
- Generate 159 dummies corresponding to each of those dates.
- “Small” compared to the total sample size = 5930.
3. On the stock price data
Daily stock returns data

- Construction industry’s 177 firms, listed on Tokyo Stock Exchange (1st or 2nd), at some point between 1974 and 2014.

- Returns = log difference of the close price.

- In the 1 factor model case, we regress them on the Market (TOPIX) return to obtain excess returns.

- **Are they really useful?** Let’s take a look at them on dates when people’s perceptions about future FP changed!
Excess returns by firm

(a) Great East Japan Earthquake  (March 14-15, 2011)

Ranking based on the total market value as of 2012 (if present).
(b) Sasako Tunnel Failure  (December 3-5, 2012)
(c) IOC gives the Olympics 2020 to Tokyo (Sept 9-11, 2013)
(d) FIFA gives World Cup 2002 to Korea/Japan (June 3, 1996)
(e) “Shiwake” (Nov 10-27, 2009)
4. Construction of the FP news indicator
Three stage estimation

• Stage 1: Estimate excess returns for each construction company.

• Stage 2: Regress excess returns on the 159 dummies; compute fitted values.

• Stage 3: Take weighted average of those fitted values across companies.
Two indicators, OLD and NEW

- **OLD** (in the paper)
  - Stage 1: Use a **1 factor** model (TOPIX returns).
  - Stage 3: Take weighted avg across **all the construction companies** (weights = R^2 in stage 2).
• **NEW** (not in the paper)
  – Stage 1: Use a 3 factor model
    • Market (TOPIX) returns
    • Banking Sector returns
    • Construction Sector returns
  – Stage 3: Take weighted avg across “IG intensive” construction companies only (weights = that intensity).
FP news indicator (based on the 3 factor model), daily
FP news indicator, monthly
FP news indicator, quarterly
5. VAR analysis
VAR with 4 variables

- FP news
- Construction orders from the public sector (top 50 companies)
- Nominal Public Investment (SNA)
- Public Investment Deflator (SNA)

- Details
  - All in log differences except for FP news.
  - # of lags = 4
  - Cholesky with the above ordering.
  - Dummies for the 3 major earthquakes
FP news -> Nominal Public Investment
FP news -> Public Investment Deflator

The graph shows the relationship between FP news and the public investment deflator over time. The deflator increases as FP news values increase, indicating a positive correlation. The blue line represents the trend of the deflator over time, while the red dashed line shows a more pronounced increase, suggesting a stronger impact of FP news on the deflator.
Then we add one macro variable at a time; we find...

- **Significant**
  - Residential Investment
  - *TANKAN, Overall Business Condition (actual)*
  - Tankan, Business Condition, Construction (actual & forecast)
  - Tankan, Financial Position, Construction (overall & small)

- **Insignificant**
  - GDP
  - Private Consumption (significant with OLD indicator)
  - Business Fixed Investment
  - Government Consumption
  - Consumer Confidence
  - Tankan, Overall Business Condition (forecast)
  - Tankan, Financial Position, Construction (large and medium)
6. Summary and work ahead
• Summary: Constructed a new daily indicator of FP news for Japan = positively related to future IG; positive effects on some macro variables.

• What needs to be done:
  – Make the date selection more objective (mechanical).
  – Take into account possibilities of structural changes or breaks (non-Keynesian effect? ZLB? Liquidity constraints?)
THANKS!