

Preliminary draft

May 1, 2014

Construction of stock-market based daily index of fiscal news for Japan

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Abstract: This paper aims to construct daily data on fiscal policy surprises, based on a cross section of stock returns. It is essentially a weighted average of the responses of individual company's stock returns to important fiscal news, on the days that the news arrives. The weights reflect importance of fiscal matters to each firm: they are computed from the estimated importance of the fiscal policy shocks to each firm's stock returns. Based on this idea and utilizing the stock market data for the Japanese construction companies, we construct a daily series on surprises about public investment policies in Japan. It is confirmed that, when aggregated up to the quarterly frequency, our indicator predicts future changes in public investment in the National Accounts. The effect on future private consumption is also positive.

¹Department of Economics, Hitotsubashi University, 2-1 Naka, Kunitachi, Tokyo, 186-8601, Japan. E-mail: shioji(at) econ.hit-u.ac.jp.. I thank Tran Lam Anh Duong for valuable insights. Key words: fiscal foresight, public investment, daily data, stock returns, narrative approach. JEL codes: E62, H54, E44.

1. Introduction

This paper aims to create daily data on fiscal policies: it proposes a novel way to measure day-to-day fiscal policy surprises based on a cross section of stock returns. One of the most noteworthy developments in the field of empirical studies on fiscal policy has been the recognition of the importance of “fiscal foresight”. As Ramey (2011) argues, government spending increases, especially major ones, are typically announced long before the actual spending is made. Forward looking agents would adjust their behaviors based on those expectations as soon as the news comes in. In such a circumstance, using the actual amount of spending as a sole indicator of fiscal policy would lead to a misspecification. This is the reason why we need to know *when* the news about policy changes was perceived by the private sector as well as *how large* the surprise was.

This paper stands at the crossroads between two strands of the empirical literature on fiscal policies. On the one hand, Fisher and Peters (2010) propose using information from the stock market to extract the public’s expectations about future fiscal policy. Specifically, they identify innovations in excess stock returns of large military contractors in the US as anticipated fiscal policy shocks. As Morita (2014) argues, a potential drawback of this approach is that those excess returns might be influenced by factors other than expectations about future military spending². To overcome this shortcoming, he proposes a new VAR approach based on sign restrictions. That is, only those parts of excess returns innovations that are associated with subsequent increases in actual government spending are identified as anticipated fiscal policy shocks. He utilizes this approach, which produces a series of “purified” anticipated fiscal policy shocks, to study the Japanese data: he uses the average stock returns of the construction industry to measure perceptions about future policies related to public investment.

On the other hand, the “narrative” approach to fiscal policy identifies periods in which major increases in fiscal expenditure were anticipated. Ramey and Shapiro (1997) identify “military build-up dates”, namely three quarters in which large increases in military spending were first expected. Ramey (2011) extends this approach. An interesting recent

²Suppose, for example, that stock returns of those contractors are uncorrelated with market returns, i.e., their beta’s are zero. Then, by subtracting the overall market returns, the resulting excess returns would be perfectly negatively correlated with the market portfolio.

development along this line of research is represented by Fukuda and Kei (2002), Fukuda (2002) and Fukuda and Yamada (2011). They construct a *daily* series of fiscal news dates for Japan. Based on extensive reading of newspaper articles, around the times when the government enacted major “emergency” fiscal stimulus packages, they determine the dates on which policy makers first announced their intentions, as well as the dates when the amount of spending was adjusted. Using the methodology of event analyses, they study how each of the identified policy surprises has affected both the stock price and the exchange rate in Japan. A drawback is that it is difficult to know the economic significance of each piece of news, i.e., the magnitude of a surprise that each announcement created. Miyazaki (2010) incorporates their fiscal news date dummies (aggregated up to the quarterly frequency) into his VAR model to evaluate effects of a fiscal expansion in Japan. This paper proposes a way to combine those two approaches. Construction of our daily fiscal news variable starts with identification of candidate dates on which important fiscal news might have arrived. In this regard, our approach can be viewed as an extension of that of Fukuda and Kei (2002), Fukuda (2002) and Fukuda and Yamada (2011), though we incorporate much wider varieties of fiscal events compared to theirs. Our approach, however, deviates significantly from theirs in the second step of the construction process. It is based on the idea that, on a day when there truly was an important news about an upcoming fiscal stimulus, stocks of those firms that are more dependent on such a measure should react more strongly. By regressing individual company’s excess stock returns on dummies that correspond to those fiscal dates, we can measure changes in the private sector’s expectations reflected in those returns. In the third step, we compute a weighted average of those market responses (fitted values from the previous regressions), where the weights attached to individual firms represent importance of fiscal matters to each of those firms, to estimate the magnitude (if any) of the market surprise on each fiscal news date. The question is how to find appropriate weights. Here again, this paper’s approach is data-driven. We take the position that those companies whose stocks are reacting more strongly to policy news, on the average, must be the ones of the companies that are more policy dependent.

We apply this idea to the Japanese data. As Morita (2014) argues, in Japan, the most important fiscal policy tool for stimulating the economy has almost always been public investment. For that reason, we follow his study and focus on stocks of construction firms.

However, even within the construction industry, some firms (such as road construction firms) are more dependent on public works than some others (such as those specialized in residential construction or overseas plant building). For this reason, unlike Morita (2014) who uses the industry average returns (monthly), we utilize a cross section of 177 construction firms' daily stock returns. By studying the extent of the weighted average reaction of those stocks to a series of fiscal policy news, where more weights are given to companies that rely more heavily on public contracts, we should be able to measure the magnitude of surprises caused by different fiscal news.

The rest of the paper is organized as follows. Section 2 concerns the “narrative” part of our approach and explains how we determined our fiscal news dates. Section 3 explains the stock returns data. Section 4 discusses how we combine information from those two sources to construct our fiscal news variables. Sections 5 and 6 study results from some VAR exercises that involve our fiscal news variable. Section 7 concludes.

2. Identification of fiscal news dates

As stated earlier, we follow and extend the approach taken by Fukuda and Kei (2002), Fukuda (2002) and Fukuda and Yamada (2011) to identify dates on which news about future public investment arrived. The common characteristic of those studies is that they look at a specific type of fiscal events, namely emergency fiscal stimulus measures, that are often enacted as responses to sharp economic downturns. Fukuda and Kei (2002) and Fukuda (2002) identify eight such episodes during the 1990s. For example, “Emergency Economic Measures” on March 31, 1992 (proposed by the cabinet of Kiichi Miyazawa), which was first of those, was a measure to counter the asset bubble collapse of the early 1990s. Fukuda and Yamada (2011) add seven more, one in 2000 and the others in between August 2008 and October 2010.

The most notable feature of their study is that, for each of those policy events (15 in total), they pick not just one but 2 to 8 dates on which important news appeared in major newspapers in Japan. As they demonstrate, in the Japanese political system, those emergency expenditures often go through a series of negotiations (most typically between politicians and the Ministry of Finance) and the budgetary size is revised a few times, usually upwards. Their fiscal dates capture not only the news about the first proposal made

by the government but also the news about those revisions (picked up by their careful reading of the newspapers) as well as the final outcome³.

Our identification of fiscal dates extends their approach in significant ways. Most notably, as our interest is not confined to the effects of those emergency policy measures, we consider a much broader, more heterogeneous, set of fiscal-policy-related events. Those events, together with the specific dates on which we think there were important fiscal policy events, are summarized in Table 1 (along with a short description of the significance of each date). Note that, in the empirical analysis, we incorporate a dummy variable *separately* for *each* of those news dates (unless two news happen to fall onto the same day, in which case we can introduce just one dummy that corresponds to both pieces of news). Thus, all together, we create as many as 159 dummy variables. This number, however, is still much smaller than the total sample size of 5930 days. Below, we shall briefly summarize characteristics of those events, grouped into six major categories.

(1) *Emergency fiscal stimulus packages*, as utilized by Fukuda and Kei (2002), Fukuda (2002) and Fukuda and Yamada (2011). For the period 1990-2010, we simply employ the dates listed in Table 3 and Table 4 of Fukuda and Yamada (2011). We extend the sample period to the end of 2013. This adds three more stimulus packages to our sample. The first of such measures was introduced in November 2012 by the soon-to-be outgoing government of the Democratic Party of Japan, led by Prime Minister Noda. The second was enacted less than two months later by the cabinet of Prime Minister Abe, as a part of the “Second Arrow” of the so-called “Abenomics”, in January 2013. The last one was recently introduced as a measure to counter expected negative impact of the consumption tax hikes (in April 2014) whose decision came in December 2013. For each of those measures, we identify 4 to 7 news dates, based on our reading of the electronic version of *Nikkei* Newspapers⁴.

³Another novelty of their study is that they examine *intraday* responses of stock prices to those fiscal news. In that respect, the current study is more limited, as we look at stock price changes between days, using only the day’s closing prices.

⁴*Nikkei* is a popular newspaper in Japan specialized in economic issues. Fukuda and Yamada (2011)’s reading of the newspaper articles is more extensive in the sense that they read three major newspapers (including *Nikkei*), not just one. On the other hand, an advantage of using the electronic version is that we know clearly at what time the news was distributed, and thus we know, for example, if it came in before the day’s closing of Tokyo

- (2) *Reconstruction budget in response to the Great East Japan Earthquake (March 11, 2011)*: During the year of 2011, three supplementary budgets were introduced by the government under the Democratic Party (DP), and the long-term plan for the reconstruction spending was unveiled. Also, in January 2012, the government under the Liberal Democratic Party (LDP) of Prime Minister Abe significantly expanded the overall size of this extra budget. We include dummies that capture news about those events.
- (3) *Important election dates that represented major shifts in power*: The idea is similar to that appears in Fukuda (2014) who studies the impact of the general election outcome of December, 2012 (in which Abe's LDP scored a landslide victory), on the stock market. It is only recent that Japanese elections started to have important implications for the future course of fiscal policies. The tendency became clear only when the DP ran an election campaign on an anti-public-investment platform⁵ and won a big majority in the general election on August 30, 2009. We introduce dummy variables that correspond to Lower House and Upper House elections, starting from the aforementioned ones; those dummies correspond to each of the two days before the election and two days afterwards (elections are usually held on Sundays when the market is closed). In addition, we introduce a set of dummies for when the then-Prime Minister Noda suddenly announced dissolution of the Lower House in the middle of a parliamentary session on November 14, 2012 which led to the election mentioned above. For this event, we include dummies for three days starting the day of the surprise announcement.
- (4) *Disasters*: Natural disasters such as major earthquakes are undoubtedly tragic. At the same time, they induce people to expect large increases in public investment expenditure in the near future. We pick three such events: the Hanshin-Awaji Earthquake of January 17, 1995 which devastated Kobe, Chuetsu Earthquake on October 23, 2004, which killed 68 people, and the Great East Japan Earthquake of March 11, 2011. In addition, we also look at the ceiling collapse of the Sasako Tunnel which occurred on December 2, 2012; this major accident, which resulted in 9 deaths, made people aware of the depreciated state of the nation's public infrastructure, and

Stock Exchange.

⁵Their biggest campaign slogan was "From Concrete to People".

called for a thorough overhaul of its public infrastructure. For each of those four disaster events, we introduce a dummy which corresponds to the day of the event (unless it falls on a holiday), and three dummies that correspond to each of three business days that follow. We also include dummies for the dates on which the first official estimates for the pecuniary damages from the Hanshin-Awaji Earthquake and the Great East Japan Earthquake were published. This is because those estimates seem to have much to do with the sizes of the reconstruction budgets, that are to be introduced later.

(5) *Winning the right to host major sports events*: Large sports events such as the Olympics Games and the FIFA World Cup soccer games are big public investment projects. Those large expenditures are mostly anticipated in advance, when the announcement is made that such an event will take place⁶. We pick three such events. The first is the announcement that Nagano, a Japanese city, would hold the Winter Olympics Games of 1998. The news came on June 15, 1991. The second is the announcement on May 31, 1996, that Korea and Japan would co-host the 2002 FIFA World Cup. The third is the decision on September 7, 2013 by the IOC to hold the Summer Olympics Games of 2020 in Tokyo. For each of those events, we include a set of three dummies that correspond to three business days following the announcement (all of those announcements came on non-business days).

(6) *Negative Fiscal Events*: So far, all the events cited have been associated with potential increases in fiscal expenditure⁷. There have been some important turning points in the Japanese fiscal policy which have driven the policy stance toward austerity. We believe the following three events have been the most significant: (a) Fiscal Reform under the Cabinet of Ryutaro Hashimoto in 1996, (b) the Koizumi Reform which started in 2001, and (c) Major cutbacks in public investment expenditure which occurred soon after the DP took over the government in 2009 (the Maehara shock and the “Shiwake” shock).

We introduce dummies for dates on which important policy announcements were made,

⁶We owe this valuable insight to Tran Lam Anh Duong.

⁷It is however important to note that some news about spending increases may be regarded by the market as a disappointment. This happens when the announced increase falls short of the market expectation. Such news should also be considered to be a negative fiscal shock. An advantage of our methodology is that, by letting the market reaction determine the nature of each shock, we can correctly identify such a shock as a negative one.

based on our key-word based search and reading of the Nikkei Newspapers (stored electronically in *Nikkei Telecon*).

3. Stock returns data for construction firms

We have collected daily stock price data for construction firms listed on the Tokyo Stock Exchange (TSE). More specifically, our data set consists of 177 companies classified into the construction industry by the TSE, that were listed either in the First Section or the Second Section of the TSE, at some point in time between mid-1974 and early 2014⁸. Those stock prices are the day's closing prices. Stock returns are computed as the log differences in the stock prices from the previous business day (or the last day for which the price was recorded).

The first thing we did was to estimate excess returns for each firm. For that, we regress each of those individual stock returns on market returns (the log difference in the TOPIX, the most popular value-weighted average stock price index in Japan) to estimate the firm's beta. The residual series from this regression is our estimated series for the firm's excess returns.

To get a sense for the nature of the data, in each of the first five panels of Figure 1, we present the overall distribution of excess returns on some notable fiscal event dates. On the horizontal axis, from the left side, we first place 111 firms that were listed on the TSE as of the year 2012, in the order of their total market values at the end of that year. Then, on their right, we place firms that were not listed in 2012 (due, for example, to bankruptcy or merger) but could be found in the list as of 2002. There were 39 such firms. They are ordered by their total market values at the end of 2002. The remaining 27 firms were simply ordered by their TSE numerical codes which have no economic meaning.

Panels (a), (b), (c), (d) and (e) correspond to the Great East Japan Earthquake, the Sasako Tunnel Accident, Tokyo winning the Olympics bid for 2020, the FIFA announcement that the 2002 World Cup be co-hosted by Korea and Japan, and the DP's "shiwake" in 2009, respectively. We can see that the first three fiscal news were perceived by the market as positive news for most of those firms, as returns on most of the construction firms soared

⁸A few firms under the same company name have been listed twice under different TSE numerical codes.

on those dates. However, the 1996 FIFA decision was clearly perceived as a negative fiscal news: as many had anticipated Japan to be the sole host nation, the news prompted a downward adjustment in the market expectations about the future amount of public work.

To demonstrate potential importance of taking into account cross-firm heterogeneity within the industry, in panel (f), we pick up three firms and compare their reactions to some big fiscal news. The three firms are Taisei, a mega general contractor, Maeda Corporation, a large-scale construction company, and Pana Home, which is a large construction firm specialized in home building, for the most part. The blue bars indicate each firm's reaction to the Great East Japan Earthquake (i.e., the same numbers as in panel (a)). The green bars are for when Tokyo won the bid to host the 2020 Summer Olympics Games (same as panel (c)). The brown ones are for the "shiwake" shock (same as in panel (e)). While the first two firms show strong reactions to those fiscal news, the last one, the home builder's response is muted, if any. Even between the first two, the reactions are not homogeneous. While the first firm's returns reacted more strongly to the news about the earthquake, the second firm shows a stronger response to the Olympics-related news. By combining information from various types of fiscal events, we hope to capture the average nature of the effects of spending related to public investment.

4. Construction of the fiscal news variables

Our construction of the daily fiscal news indicators proceeds in three steps.

- (1) We regress the excess returns series on the entire set of fiscal event date dummies, firm by firm.
- (2) We compute the series of fitted values from the regression in stage (1).
- (3) We compute the weighted average across firms of the above fitted value series for each date, where the weights are given by the R square's from the regression in stage (1). That is, larger weights are assigned to firms whose stocks are driven more strongly by the fiscal events. This measure will be called the *Weighted Fiscal News Indicator* (or "Weighted News", for short). We also construct another variable, by taking a weighted average of individual firms' excess returns, using the same fit-of-the-regression based weights. This alternative measure will be called the *Weighted Excess Returns Variable* (or simply, "Weighted Returns").

Thus, the former series takes the value of near-zero on the dates when there was no news about fiscal policy (i.e., those dates that do not show up in Table 1). On the news dates, the series takes a positive value if, on the average, the reaction of the excess returns of the construction firms was positive. A larger positive value corresponds to a larger positive news. The latter measure, on the other hand, is conceptually close to the industry returns data used by Morita (2014). The difference is that the weight attached to each firm is based on the estimated importance of the fiscal events to the firm, rather than its share in the industry's total market valuation. In Figure 2, we plot each firm's weight in our calculation against its share in the industry's total market valuation, both computed as of 2012. Thus, the sample is limited to those firms that were present in our data set at that point in time. Clearly, the two sets of weights are very different. Some firms with very large shares in the stock market valuation are not given large weights in our calculation⁹. In general, our weights tend to be more evenly distributed across the firms compared to the market valuation shares.

In Figure 3, we present the historical evolution of the Weighted Fiscal News Indicator. Panel A is the original daily series. In Panel B, the data is aggregated up to the monthly frequency. Panel C shows the quarterly data. The most visible spike appears in March 2011, when there was the Great East Japan Earthquake. In the daily and the monthly data, the second largest spike is related to the IOC announcement in 2013 that Tokyo will host the 2020 Summer Olympics Games. At the quarterly frequency, its size is surpassed by that of the last quarter of 2012, which marks the initiation of the "Abenomics". A closer scrutiny has revealed that much of the positive effect of the "Second Arrow" of the "Abenomics" (i.e., an expansionary fiscal policy) on the market expectations came during December of 2012, immediately after (or even prior to) the LDP took the power. Despite that some important policy announcements were made during January of the following year, the market reactions were, if anything, negative.

Figure 4 depicts the historical evolution of the Weighted Excess Returns Variable, again at the daily (Panel A), the monthly (Panel B), and the quarterly (Panel C) frequencies. Again, the largest spike comes at the time of the Great East Japan Earthquake of 2011. A notable

⁹ The firm with the top share in terms of the market value was Daiwa House, followed by Nikki (a plant engineering company), Daito Trust Construction (more of an apartment house builder and manager) and Sekisui House.

difference from the movement in the Weighted News presented in Figure 3 is the Weighted Returns' volatile fluctuations in the second half of the 1990s. Also, market declines in the middle of the 2000s are more visible with this series.

5. Do our fiscal variables predict future public investment?

If our measures capture the market's expectations about future public investment, and if the private sector's expectation formation has at least some element of rationality, innovations in our measures should help predict future changes in government spending related to public investment. In this section, we examine if this is indeed the case. For that purpose, we run simple VARs with one of our measures and data on the actual amount of public investment.

Evidence from monthly data

As the Japanese GDP statistics are not available on the monthly basis, we utilize a proxy for public investment. The data source is the *Current Survey on Orders Received for Construction* by the Ministry of Land, Infrastructure, Transport and Tourism. We utilize two series. The first is the total amount of "Value of contract" for the "Public Sector". Unfortunately, the series is rather noisy and seasonally adjusted data is not available. That is the reason we also use the second series for the "Big 50 constructors", for which a seasonally adjusted data is publicly available. As those series are related to the orders for construction work placed by the government, they are expected to move slightly before the actual investment spending is carried out.

Figure 5 presents results of simple bi-variate VARs between our measures and the proxies for public investment. In the figures, W_NEWS denotes our Weighted News variable, while W_RETURNS stands for Weighted Returns. Also, TOTALD is the log first differences in the total amount of construction orders from the public sector (seasonally adjusted by the X12 with the EViews default settings) and BIG50D is the log first differences for the construction orders received by the top 50 contractors that came from the public sector. All the impulse responses presented are cumulative ones. The number of lags is set at 12, and the constant term as well as three dummy variables that correspond to three major earthquakes (the Hanshin-Awaji, the Chuetsu, and the Great East Japan Earthquakes) are

included. Our measures are always placed on top of the Cholesky contemporaneous causal ordering.

Panel A is taken from the result of a VAR with W_NEWS and TOTALD. In Panel B, our measure is again W_NEWS but the proxy for public investment is now BIG50D. Both of the responses are positive, which implies that our Weighted News measure correctly predicts future changes in public investment. In Panel A, the response is significant only for one month, perhaps reflecting the noisiness of the total orders series. In Panel B, the response turns significant after about half a year and remains mostly significant afterwards. In both panels, it is noteworthy that the responses of the orders are initially weak and gain strength after 6 months or so. We think this pattern reflects the lag between the arrival of the first news and placement of actual orders.

In Panel C and Panel D, we use our W_RETURNS series in place of the news series and redo the exercises carried out in the previous two panels. Unfortunately, the responses are insignificantly different from zero. We must conclude that our Weighted Returns measure, at least by itself, does not successfully capture future changes in public investment.

Evidence from quarterly data

We now aggregate our series up to the quarterly frequency and estimate VARs with three variables, by adding Real Public Investment from the National Accounts (denoted “IGD” in the figures). The data is the seasonally adjusted series. We take log first differences of this series as well. The rest of the details of the analysis are the same, except that the number of lags is now set at 4.

In Panel A and Panel B, we use W_NEWS as our fiscal policy measure. Panel A uses Total Orders as the second variable, while it is replaced by Orders for Top 50 Contractors in Panel B. In both panels, we confirm that our Weighted News measure successfully predicts future changes in both construction orders from the public sector as well as Public Investment in the System of National Accounts.

We also tried using W_RETURNS, but the responses were not significant. It appears that we need some more work to “purify” this variable before it can be useful¹⁰.

¹⁰ We are currently undertaking VAR analyses with sign restrictions similar to the one estimated by Morita (2014) to further examine usefulness of this series.

6. Is anticipated public investment expansionary?

Finally in this section, we investigate whether anticipated changes in public investment spending, as captured by our Weighted News variable, cause changes in the private sector's real economic activities. We focus on the quarterly data and estimate a series of VARs that consist of three variables, namely a measure of private economic activities, our Weighted News variable, and Public Investment. The first variable, like Public Investment, is in real terms¹¹, seasonally adjusted, and in first differences. The number of lags is always set at 4. The sample period is from 1990Q1 to 2013Q4.

In Panel A, we use GDP as our measure of private economic activities. The response of GDP to our Weighted News is positive, as expected, but the response is insignificantly different from zero. In Panel B, we use Private Consumption instead. The response of private consumption is positive and is at least significant in the sixth month. In the results not shown, we found that our Weighted News has a positive but insignificant effect on business non-residential investment, while the effect on residential investment is positive and significant.

7. Conclusions

In this paper, we have constructed a new daily time series that represents the magnitude of adjustment in market expectations about future public investment, which occurs in reaction to news about future fiscal policy. This has been done by combining the narrative approach about fiscal policy which identifies dates on which major news about future fiscal policy emerged, and the approach based on information about the private sector's expectations that are reflected in stock prices. Although we have applied the idea to the Japanese data, we believe a similar idea can be applied to other countries. In the VAR analysis in section 5, we have seen that our measure does predict future changes in public investment. It turns out that the anticipated fiscal policy does not have a significant impact on future GDP, but it does lead to a future increase in private consumption.

¹¹ They are in chained series with 2005 as the reference year. The data construction is based on the UN's 1993 System of National Accounts.

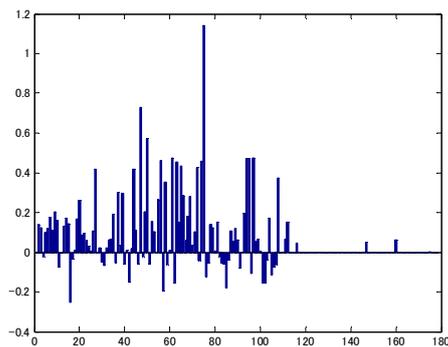
An important course for future research is to conduct empirical analyses of the effects of fiscal anticipation which allows us to exploit the high frequency nature of our fiscal news variable. We intend, for example, to study effects of our news variable on various financial variables.

References

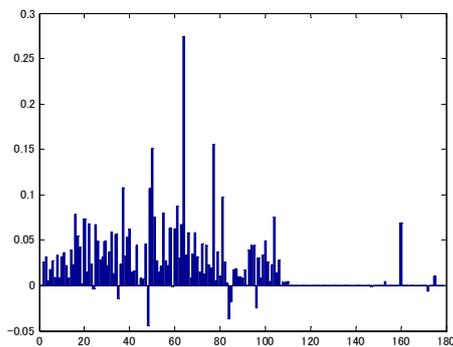
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Figure 1: Responses of excess returns on individual construction firm to fiscal news
(Along the horizontal axis, firms are basically ordered according to their total market values; refer to the main text for details.)

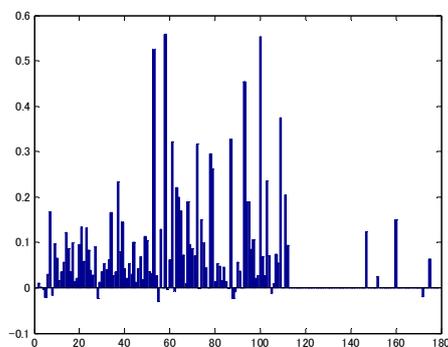
(a) Great East Japan Earthquake, March 11, 2011 (cumulative excess return: March 14-16.)



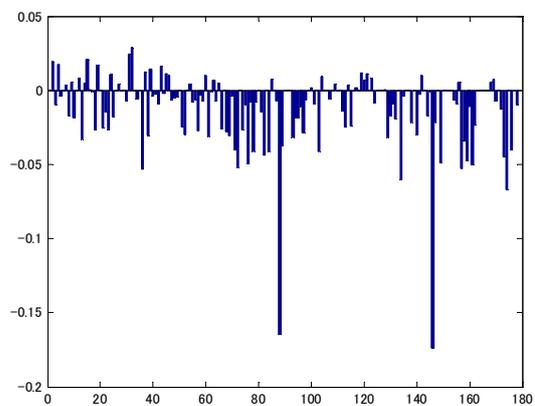
(b) Sasako Tunnel collapses, December 2, 2012 (cumulative excess returns: December 3-5)



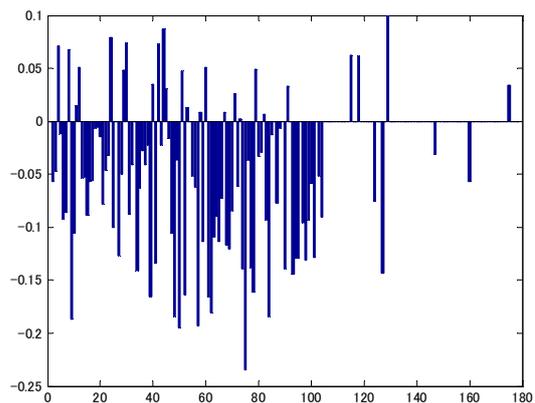
(c) IOC decides to give the 2020 Olympics Games to Tokyo, September 7, 2013. (cumulative excess returns, September 9-11).



(d) FIFA World Cup 2002 to be shared with Korea, May 31, 1996 (excess return on June 3).



(e) "Shiwake" (cumulative excess returns, November 10-27, 2009)



(f) Cross-firm heterogeneity in responses: some examples

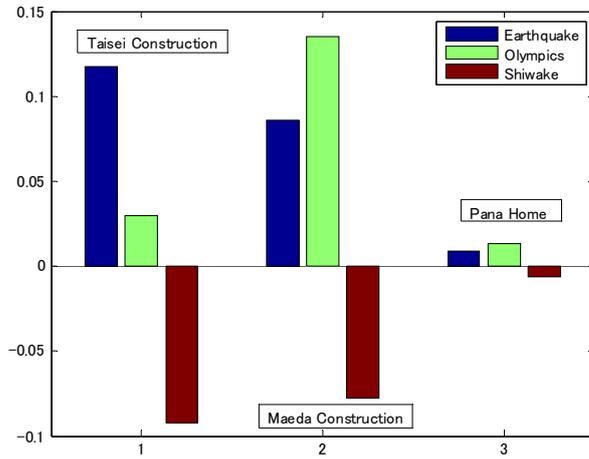


Figure 2 Each firm's share in the industry's total market value (horizontal axis) vs its share in our weighted variables (vertical axis)

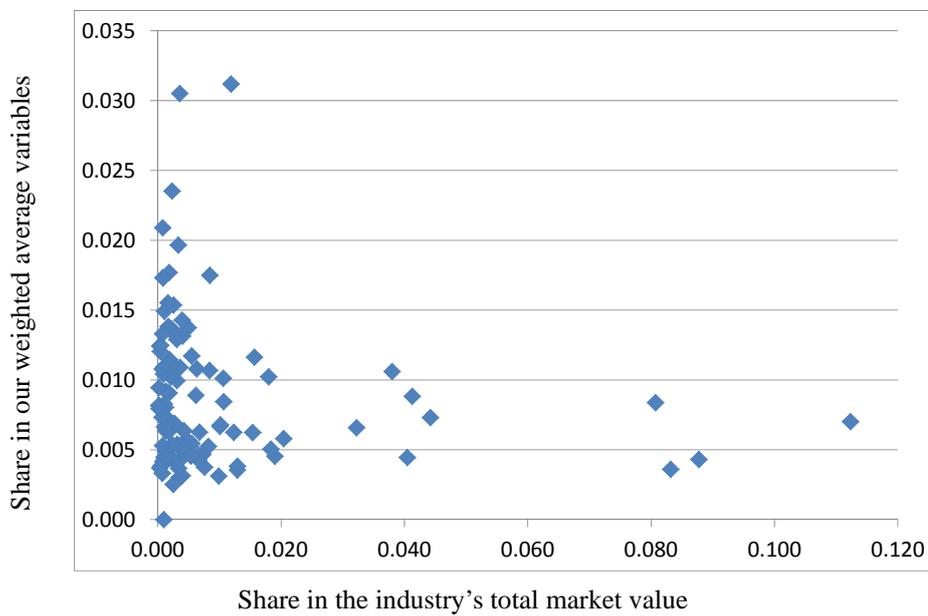
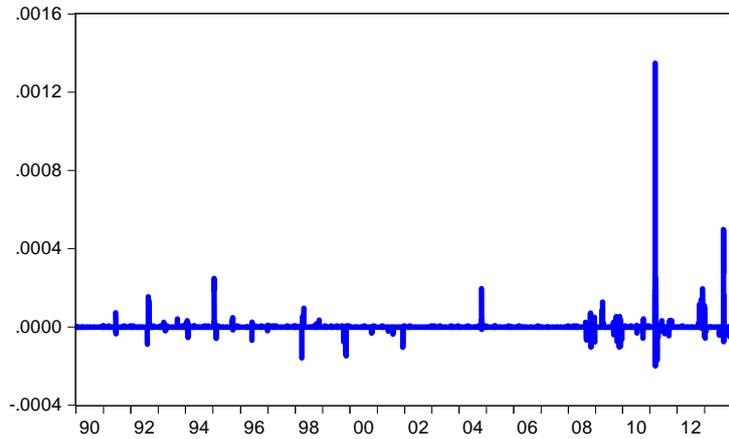
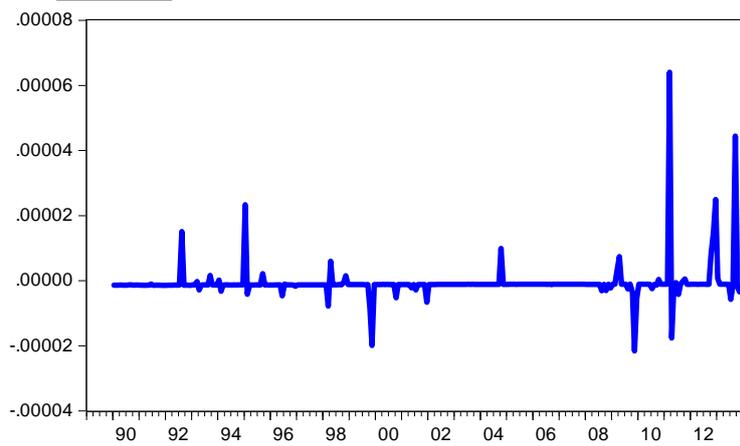


Figure 3 Fiscal News variable (1): *Weighted Fiscal News Indicator*

A. Daily



B. Monthly



C. Quarterly

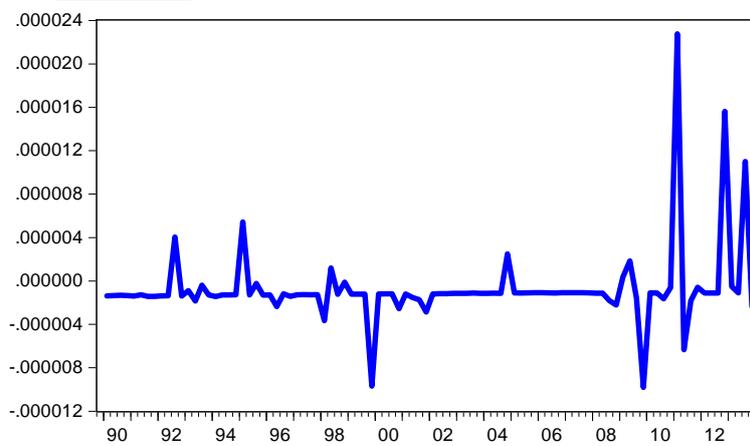
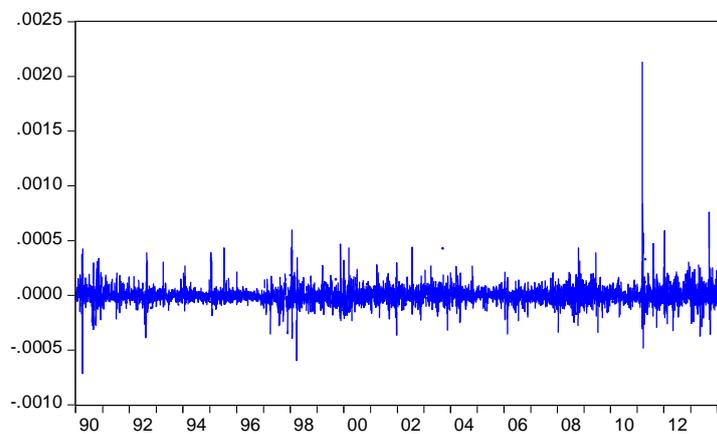
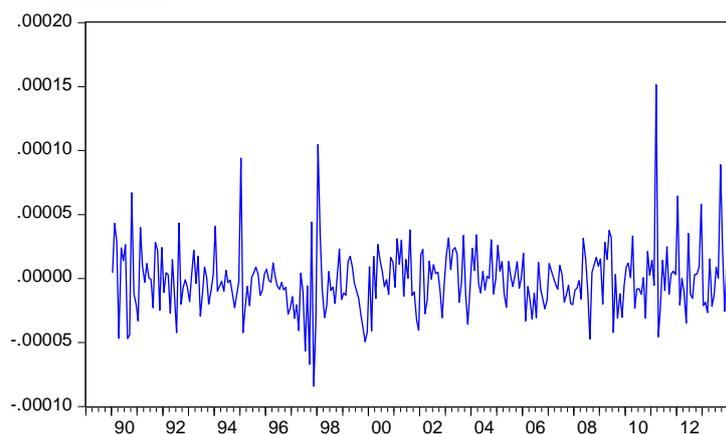


Figure 4 Fiscal News variable (2): *Weighted Excess Returns Variable*

A. Daily



B. Monthly



C. Quarterly

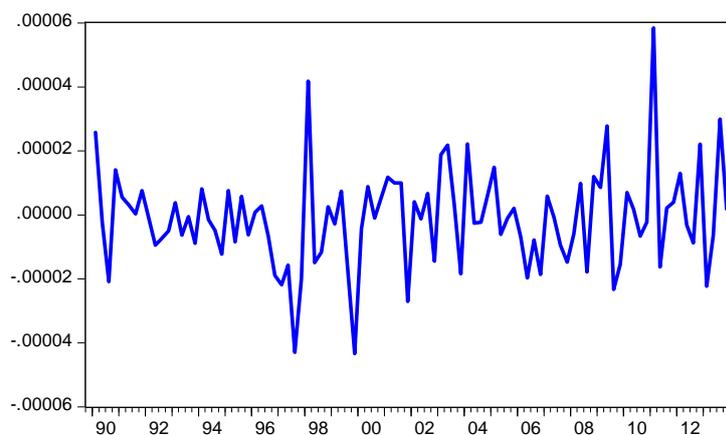
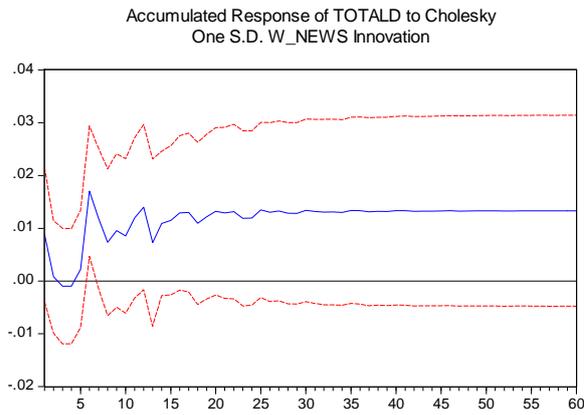
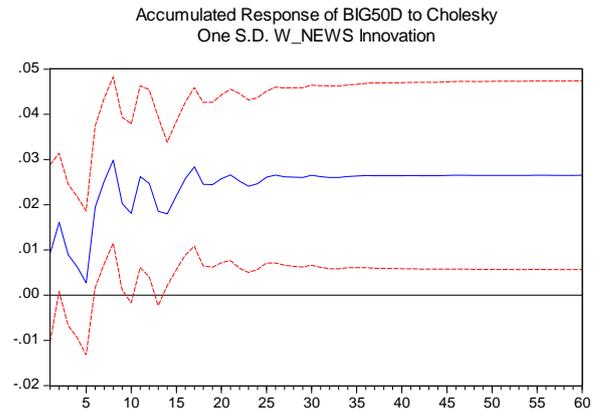


Figure 5 Results from bi-variate VARs, monthly data

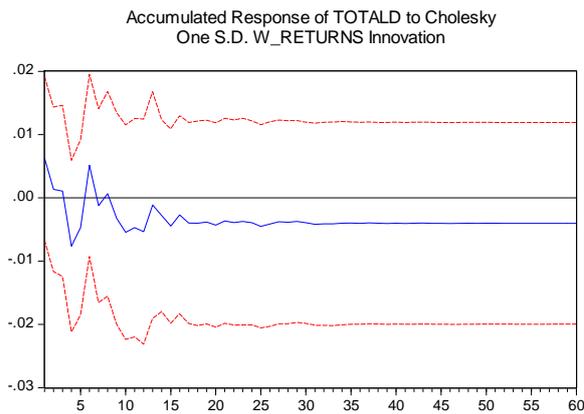
(A) Weighted News vs Total Orders



(B) Weighted News vs Orders for Top 50



(C) Weighted Returns vs Total Orders



(D) Weighted Returns vs Orders for Top 50

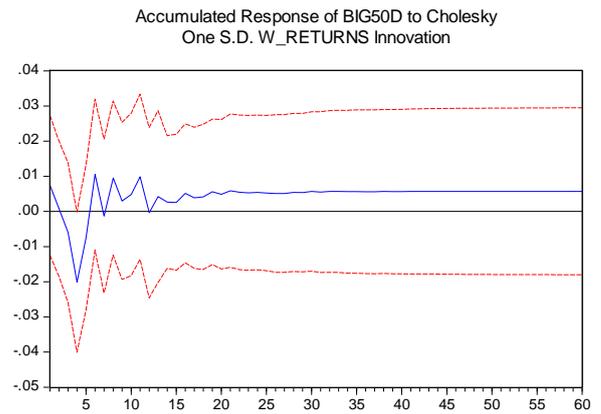
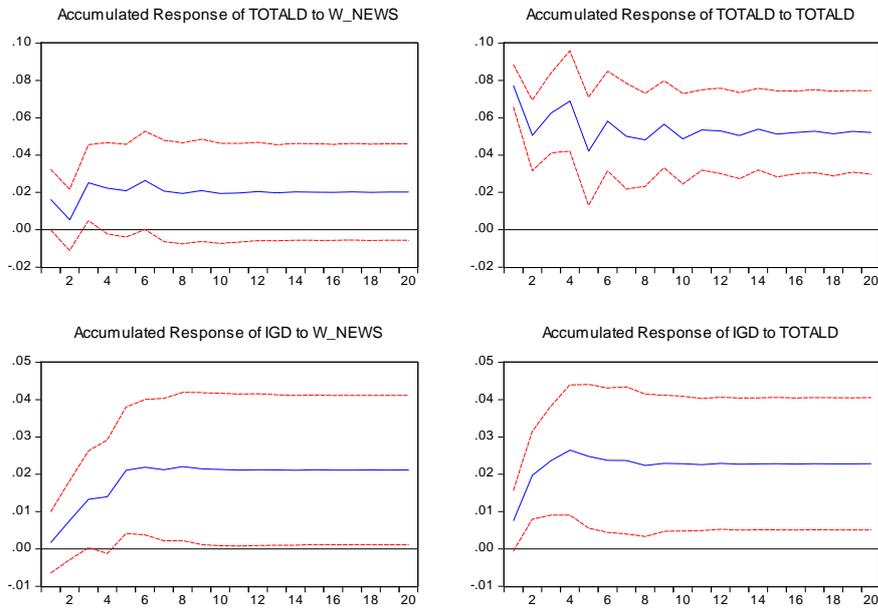


Figure 6 Results from tri-variate VARs, quarterly data

(A) Weighted News vs Total Orders and Public Investment

Accumulated Response to Cholesky One S.D. Innovations ± 2 S.E.



(B) Weighted News vs Orders for Top 50 and Public Investment

Accumulated Response to Cholesky One S.D. Innovations ± 2 S.E.

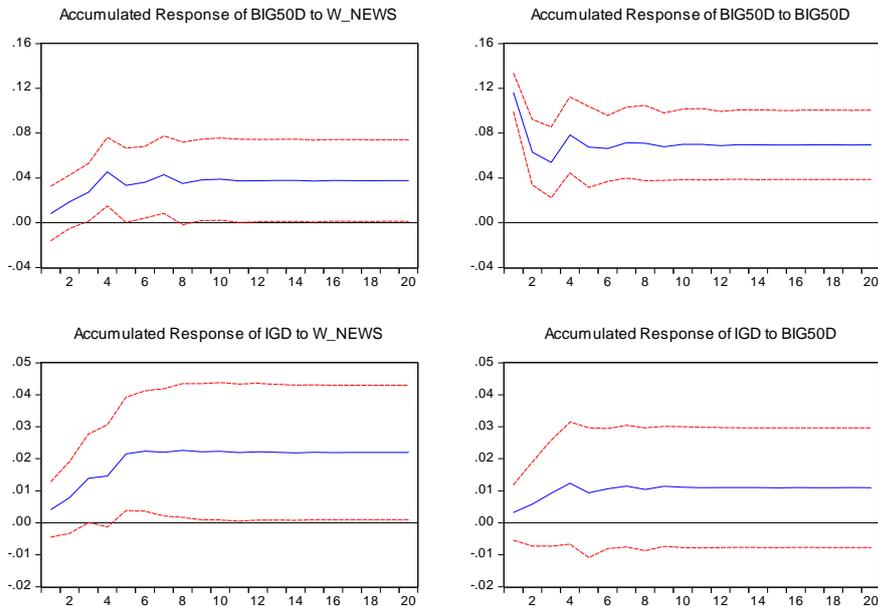
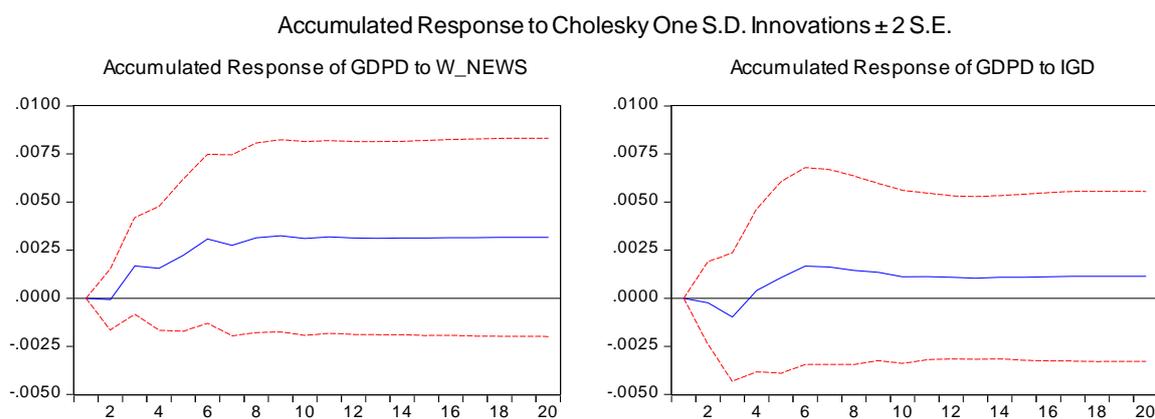


Figure 7 Cumulative Impulse Responses from tri-variate VARs with macro variables
 (Note: “GDPD” denotes GDP in log differences, “PRIVCONSD” is Private Consumption in log differences, “IGD” denotes Public Investment in log differences, and “W_NEWS” is our Weighted News variable.)

(A) VAR with GDP



(B) VAR with Private Consumption

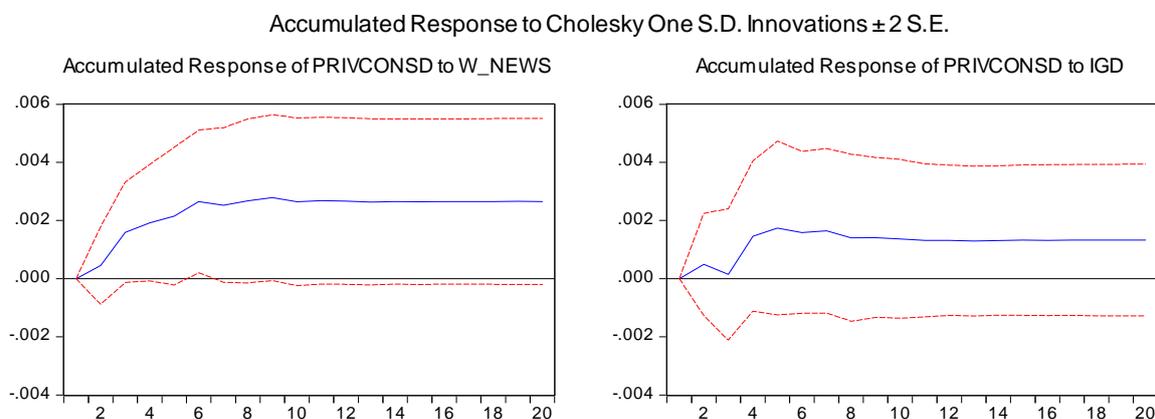


Table 1: Identified fiscal events, fiscal news dates and their brief descriptions

A. Emergency Economic Measures

Episode	Date	Description
15 Measures for the period 1990–2010	(63 dates in total)	See Fukuda and Yamada (2011) (Table 3 and 4).
Program for Accelerating the Rebirth of Japan (Prime Minister Noda), November 30, 2012	10/17	Noda orders a new emergency measure.
	10/20	The first wave of spending to be less than 0.3 trillion yen, says Nikkei.
	10/25	Cabinet Meeting determines the budget size of the first wave to be 0.7 trillion yen.
	11/14	Government begins to prepare the second wave of spending, Nikkei says the size will be some 3 trillion yen.
	11/27	Nikkei reports the second wave of spending will be around 1 trillion yen.
Emergency Economic Measures for Revitalizing the Japanese Economy (Prime Minister Abe), January 11, 2013	12/20	Amari orders a new emergency economic measure.
	12/25	On Dec. 24 (non-business day) Nikkei reports the government will make it possible to move the budget money for public works, scheduled for the next fiscal year, to the current fiscal year. On Dec. 25, Nikkei reports a new budget space for building additional highways.
	12/26	Amari leaves strong comment about the size of the new measure.
	12/27	Abe's speech on <i>Three Arrows</i> (Dec. 26, night).
	1/7	Nikkei reports the size of the new measure to be over 20 trillion yen.
	1/8	Follow-up report in the morning edition of Nikkei.
	1/11	Nikkei reports on the final Draft Budget.
Economic Measures for Realization of Virtuous Cycles (Prime Minister Abe), December 5, 2013.	9/10	Abe orders a new emergency measure.
	9/12	Abe orders the spending size of the measure to be over 5 trillion yen.
	10/1	Abe formally decides on the new measure (and the consumption tax hike).
	11/28	Nikkei reports on the skeleton of the new measure, 1 trillion yen on public works spending.
	12/5	Cabinet Meeting decision on the new measure, the budget size is 5.5 trillion yen.

B. Reconstruction Budget (Great East Japan Earthquake)

Episode	Date	Description
First Supplementary Budget, April 2011	3/30	Government initiates budget compilation, Nikkei says the size will be around 2 trillion yen.
	4/6	Nikkei reports the budget size will be over 3 trillion yen.
	4/7	Nikkei reports the budget size will be around 4 trillion yen.
	4/22	Decision by the Cabinet Meeting, the budget size is 4 trillion yen.
Second Supplementary Budget, July 2011	6/14	Kan orders a mini supplementary budget for reconstruction.
	6/24	Nikkei reports the budget size will be about 2 trillion yen.
	7/15	Decision by Cabinet Meeting, the reconstruction budget size is about 2 trillion yen.
Fundamental Action Plan, July 2011	7/15	Cabinet member meeting discusses 5 year plan for additional 14–18 trillion yen of spending.
	7/21	Cabinet member meeting, spending for the first 5 years to be 19 trillion yen, and the 10 year total will be 21 trillion.
	7/29	Government reaches a decision.
	9/12	Nikkei says the size of the construction budget is going to be around 7–8 trillion yen (on Saturday, Sept. 10).

Third Supplementary Budget, October 2011	9/16	Nikkei says the budget size will be 8.2 trillion yen.
	9/27	Maehara suggests an addition of a few hundred billion yen.
	10/21	Decision by Cabinet Meeting, the reconstruction budget size is 9.2 trillion yen.
Expansion of the Budget Size, January 2012	1/10	Abe announces intention to expand the budget.
	1/22	Budget size announced to be 3 trillion yen.
	1/28	Budget scaled up to 6 trillion yen.
	1/29	Governmental Draft Budget.

C. Important Elections (all on non-business days)

Episode	Date	Description
Lower House, August 30, 2009 (DP takes)	8/27, 28, 31, 9/1	Two business days each, before and after voting.
Upper House, July 11, 2010 (DP loses.)	7/8, 9, 12, 13	Same as above.
Noda declares dissolution of Lower House, Nov. 14, 2012.	11/14, 15, 16	Day of the announcement and the next two business days (actual dissolution on Nov. 16).
Lower House, Dec. 16, 2012 (LDP takes over.)	12/13, 14, 17, 18	Two business days each, before and after voting.
Upper House, July 21, 2013 (LDP wins.)	7/18, 19, 22, 23	Same as above.

D. Disasters

Episode	Date	Description
Hanshin-Awaji Earthquake, Jan. 17, 1995	1/17, 18, 19, 20	Day of the event and three business days that follow.
	2/14	Damage Estimate
Chuetsu Earthquake, Oct. 23, 2004	10/25, 26, 27	Three business days that follow the event. (The event occurred on a non-business day.)
Great East Japan Earthquake, Mar. 11, 2011	3/11, 14, 15, 16	Day of the event and three business days that follow.
	3/23	Damage Estimate
Sasako Tunnel Collapse, Dec. 3, 2012	12/3, 4, 5	Day of the event and two business days that follow.

E. Winning the Right to Host Major Sports Event

Episode	Date	Description
Nagano Olympics Games, June 15, 1991	6/17,18,19	Three business days that follow the event. (The event occurred on a non-business day.)
FIFA World Cup to be co-hosted with Korea, May 31, 1996 (June 1 in Japan)	6/3,4,5	Same as above.
Tokyo Olympics Games, September 7, 2013	9/9, 10, 11	Same as above.

F. Negative Fiscal Events

Episode	Date	Description
Hashimoto Reform, 1996	7/22	Skelton for Budgetary Request Guidelines. (News came on 7/20, a non-business day.)
	12/24	MOF Draft Budget. (News came on 12/21, a non-business day.)
	12/26	Governmental Draft Budget (News came on late 12/25).
Koizumi Reform, 2001	5/28	Draft for Fundamental Guideline (News came on 5/27, a non-business day.)
	7/31	Shiokawa mentions slashing the public work budget by 10%.
	12/5	Fundamental Guideline for Budget Compilation.
DP Budget Slashing ("shiwake" ver. 1), 2009	10/7	Execution of Supplementary Budget halted.
	10/9	Maehara orders 48 dam projects to be halted.
	10/16	Maehara declares a 14% cut in public works budget related to his ministry.
	11/10,11,12,13,16,17,18,19,20,24,25,26,27	"shiwake" (televised slashing of public spending)
	12/22	Ozawa Intervention.
	12/24	Skelton for Governmental Draft Budget.