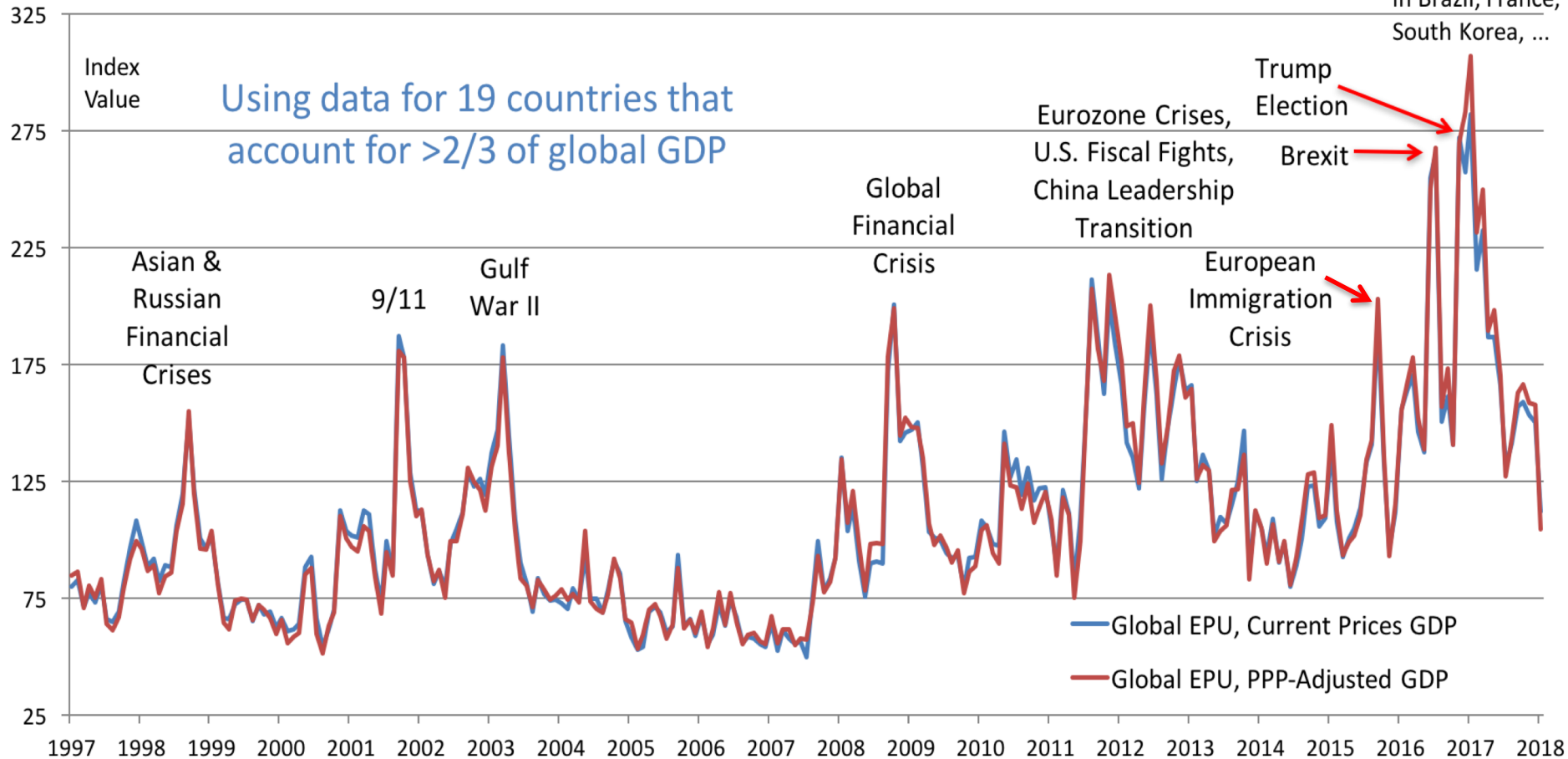# Policy Uncertainty in Japan

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Research with Elif C. Arbatli, Arata Ito, Naoko Miake and Ikuo Saito

RIETI Workshop on Uncertainty, Trade and Firms

Tokyo, 18 April 2018

After Reaching Historic Peaks, Global EPU Fell Sharply in 2017

Global Economic Policy Uncertainty Index, January 1997 to January 2018

Index Value

Using data for 19 countries that account for >2/3 of global GDP

Asian & Russian Financial Crises

9/11

Gulf War II

Global Financial Crisis

Eurozone Crises, U.S. Fiscal Fights, China Leadership Transition

European Immigration Crisis

Trump Election

Brexit

Political turmoil in Brazil, France, South Korea, ...

— Global EPU, Current Prices GDP
— Global EPU, PPP-Adjusted GDP

Notes: Global EPU calculated as the GDP-weighted average of monthly EPU index values for US, Canada, Brazil, Chile, UK, Germany, Italy, Spain, France, Mexico, Netherlands, Russia, India, China, South Korea, Japan, Ireland, Sweden, and Australia, using GDP data from the IMF's World Economic Outlook Database. National EPU index values are from www.PolicyUncertainty.com and Baker, Bloom and Davis (2016). Each national EPU Index is renormalized to a mean of 100 from 1997 to 2015 before calculating the Global EPU Index.

How Can High (Policy) Uncertainty Harm Economic Performance?

- By causing businesses to delay or forego investment and hiring when they are costly to reverse
- By raising the cost of debt and equity finance, thereby discouraging investment
- By causing households to behave more cautiously, cutting back on spending
- By intensifying monopoly pricing distortions when prices are sticky
- By undermining confidence?

Plan of Talk

1. New Economic Policy Uncertainty (EPU) indices for Japan, building on approach of Baker, Bloom and Davis.

    –   Each index reflects the frequency of newspaper articles that contain certain terms pertaining to the economy, policy matters and uncertainty.

2. Display and discuss results for our Japan EPU indices

3. Cover details of index construction, auditing, etc., if time permits.

What Do Our Policy Uncertainty Measures Seek to Capture?

All of the following:

- Uncertainty about *who* will make economic policy decisions – e.g., who will win the next election?

- Uncertainty about *what* economic policy actions decision makers will undertake, and *when*.

- Uncertainty about the economic *effects* of policy actions – past, present and future actions

- Economic uncertainty induced by policy inaction

- Uncertain economic ramifications of national security and other policy matters that may not be mainly economic in character

Constructing our Overall Japan EPU Index

1. Flag articles in four major Japanese papers (Yomiuri, Asahi, Mainichi and Nikkei) that contain at least one term in each of the E, P and U term sets listed to the right.
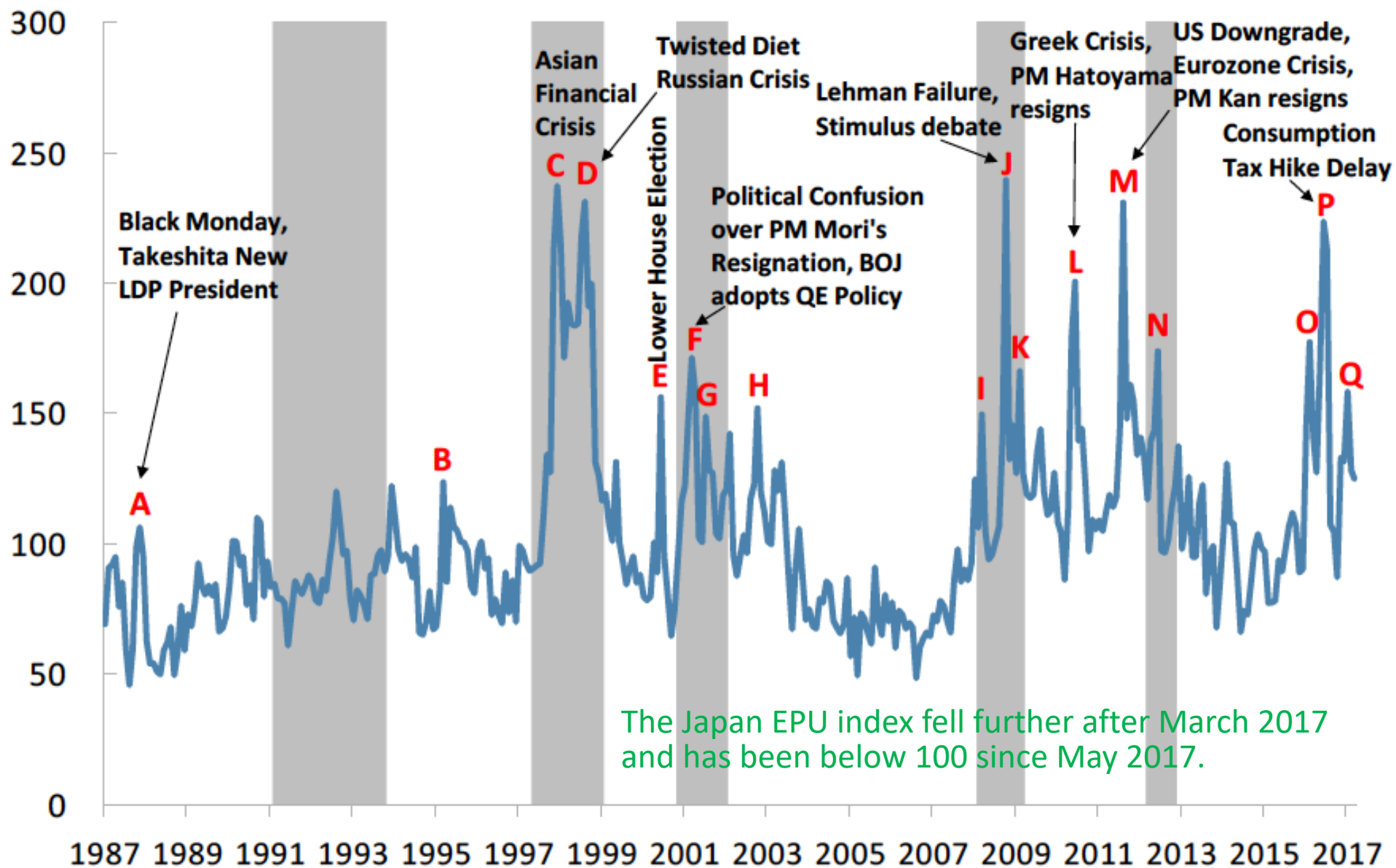
Japanese term	English term
A. Economy terms	
経済 or 景気	"economic" or "economy"
B. Uncertainty terms	
不透明 or 不確実 or 不確定	"uncertain" or "uncertainty"
不安	"concern"
C. Policy terms	
税	"tax(es)"
税制 or 課税	"taxation"
歳出	"government spending" or "government expenditure"
歳入 or 財源	"government revenue(s)"
予算 or 財政	"government budget"
公的債務	"public debt"
国債 or 国の借金 or 国の債務 or 政府債務 or 政府の債務	"government debt"
財政赤字	"government deficit(s)"
日銀	"BOJ"
日本銀行	"Bank of Japan"
中央銀行	"central bank(s)"
連銀	"The Fed"
連邦準備	"Federal Reserve"
規制 or 自由化	"regulation(s)" or "regulatory" or "regulate" or "deregulation" or "deregulate"
構造改革	"structural reform"
法案	"legislation"
参議院 or 参院	"upper house"
衆議院 or 衆院	"lower house"
国会	"Diet"
首相 or 総理	"Prime minister"
官邸	"Prime minister's office"

Constructing our Overall Japan EPU Index

2. For each newspaper and month, scale the raw EPU article count by the count of all articles.

3. Standardize each newspaper's series of scaled EPU counts to the same variability over time.

4. Adjust for seasonality at the newspaper level.

5. Average over papers by month to get EPU index.

6. Multiplicatively normalize the EPU index to a mean of 100 from 1987 to 2015.

We construct uncertainty indices for Monetary Policy, Fiscal Policy, Trade Policy and Exchange Rate Policy in the same manner by specifying additional criteria (beyond E, P and U)

Japan EPU Index, Jan. 1987 to March 2017

Asian Financial Crisis

Twisted Diet Russian Crisis

Lehman Failure, Stimulus debate

Greek Crisis, PM Hatoyama resigns

US Downgrade, Eurozone Crisis, PM Kan resigns Consumption Tax Hike Delay

Black Monday, Takeshita New LDP President

Lower House Election

Political Confusion over PM Mori's Resignation, BOJ adopts QE Policy

The Japan EPU index fell further after March 2017 and has been below 100 since May 2017.

Shaded areas denote recessions.

Japan EPU Index and Option-implied Volatility Of Nikkei Equity Index Compared
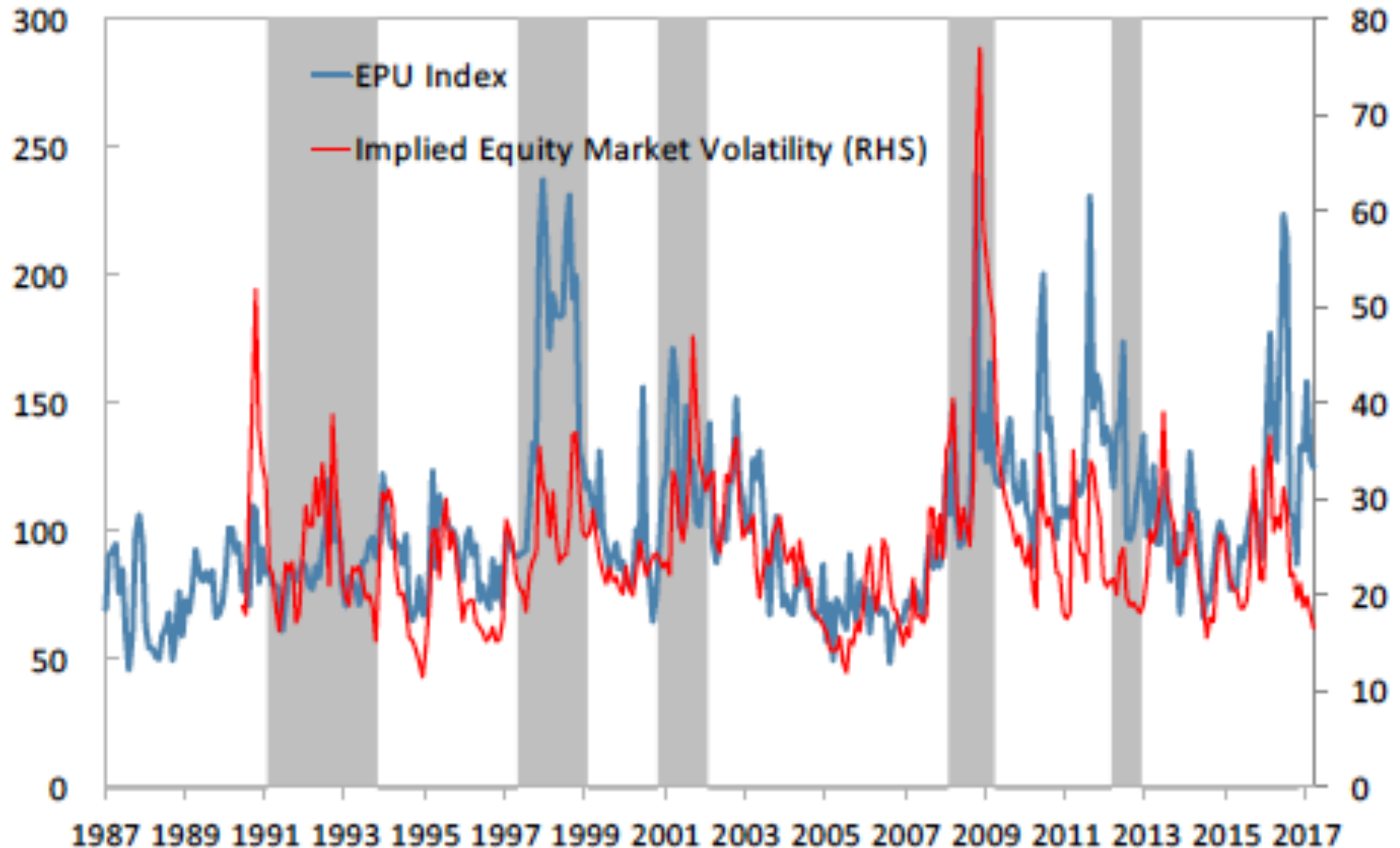
Sources: NIKKEI and authors' calculations.

Japan EPU Index Behavior

1. Our Japan EPU index rises around contested national elections and major leadership transitions, during the Asian Financial Crisis, and in reaction to the Lehman failure, the U.S. debt downgrade in 2011, the Brexit referendum and Japan's recent decision to defer a consumption tax hike.

2. The Japan EPU index tends to drift down during periods of political stability, as indicated by lack of turnover at the Prime Minister level

3. The index co-varies positively with implied volatilities for Japanese equities, exchange rates and interest rates and with a survey-based measure of political uncertainty.

Category-Specific PU Indices

To construct our Monetary Policy Uncertainty index, for example, we flag articles that meet the E, P and U criteria *and* contain one or more of these terms:

C. Monetary Policy

Japanese term	English term
金融政策	"monetary policy"
日本銀行	"Bank of Japan"
日銀	"BOJ"
金融緩和	"monetary easing"
追加緩和	"further easing"
量的緩和 or QE	"quantitative easing"
量的・質的緩和	"quantitative and qualitative easing"
金融引き締め	"monetary tightening"
マイナス金利	"negative interest rate"
政策金利	"policy rate"
公定歩合	"official discount rate"
金融調節	"monetary operation(s)"
市場調節 or 市場操作	"market operation(s)"
インフレ目標	"inflation target"
物価目標	"price target"

Japan Monetary Policy Uncertainty Index
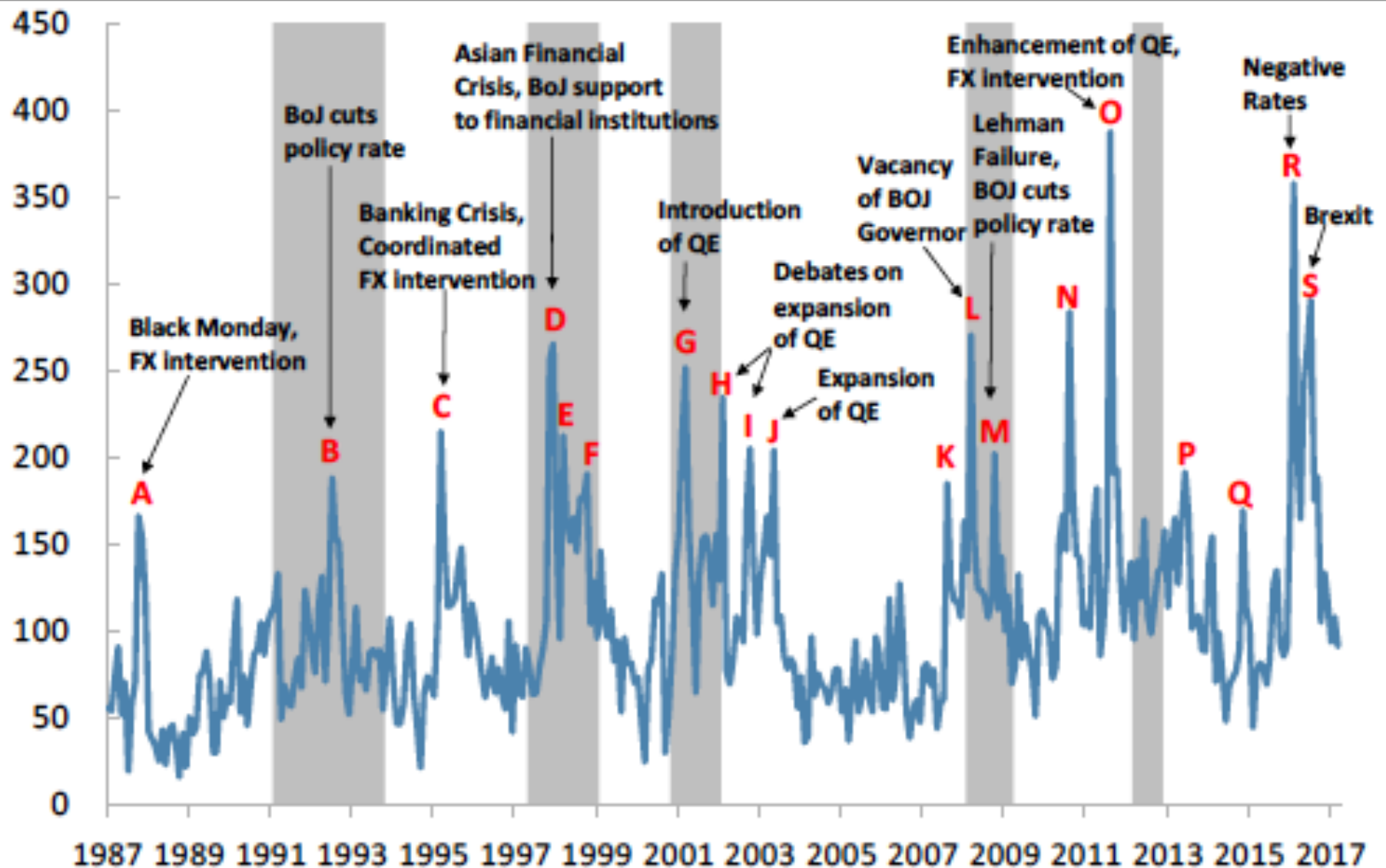
Japan & U.S. Uncertainty Indices for Monetary Policy Compared

Correlation of about 0.3, although the US and Japan Monetary PU indices co-move closely in certain periods, e.g., 2007-2011.
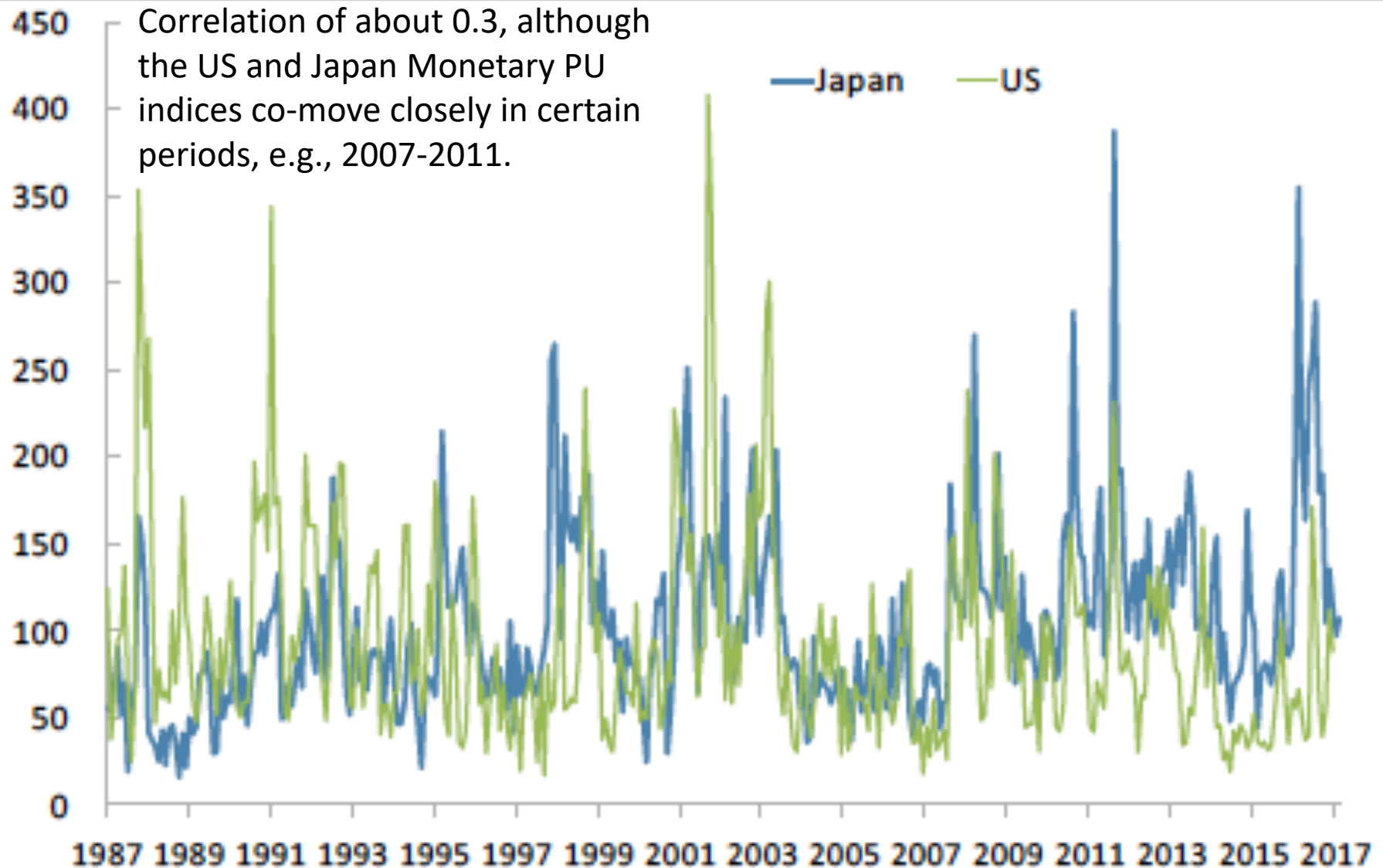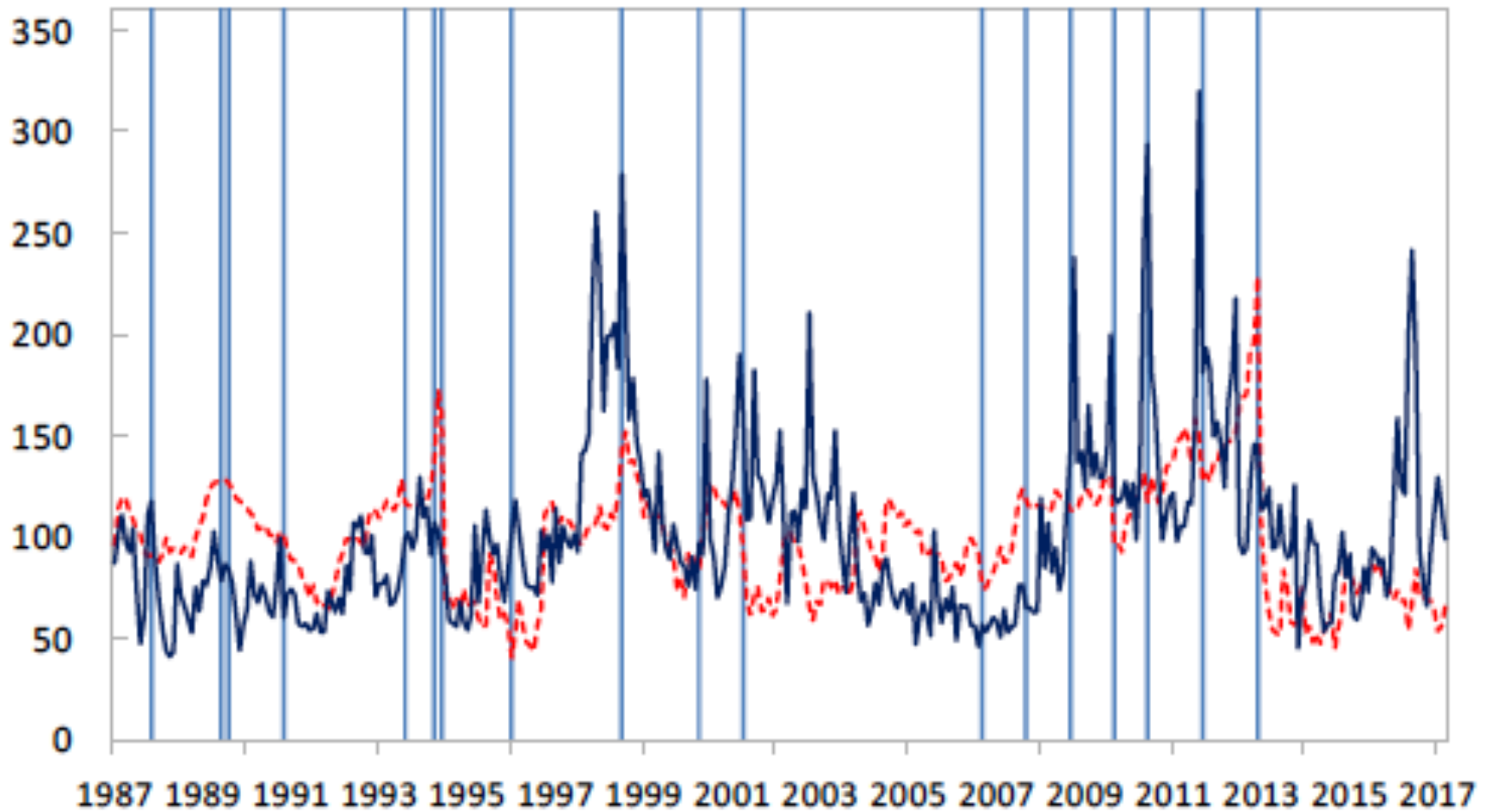
Japan Fiscal Policy Uncertainty Index

Correlation with Japan Monetary Policy Uncertainty Index is 0.68.
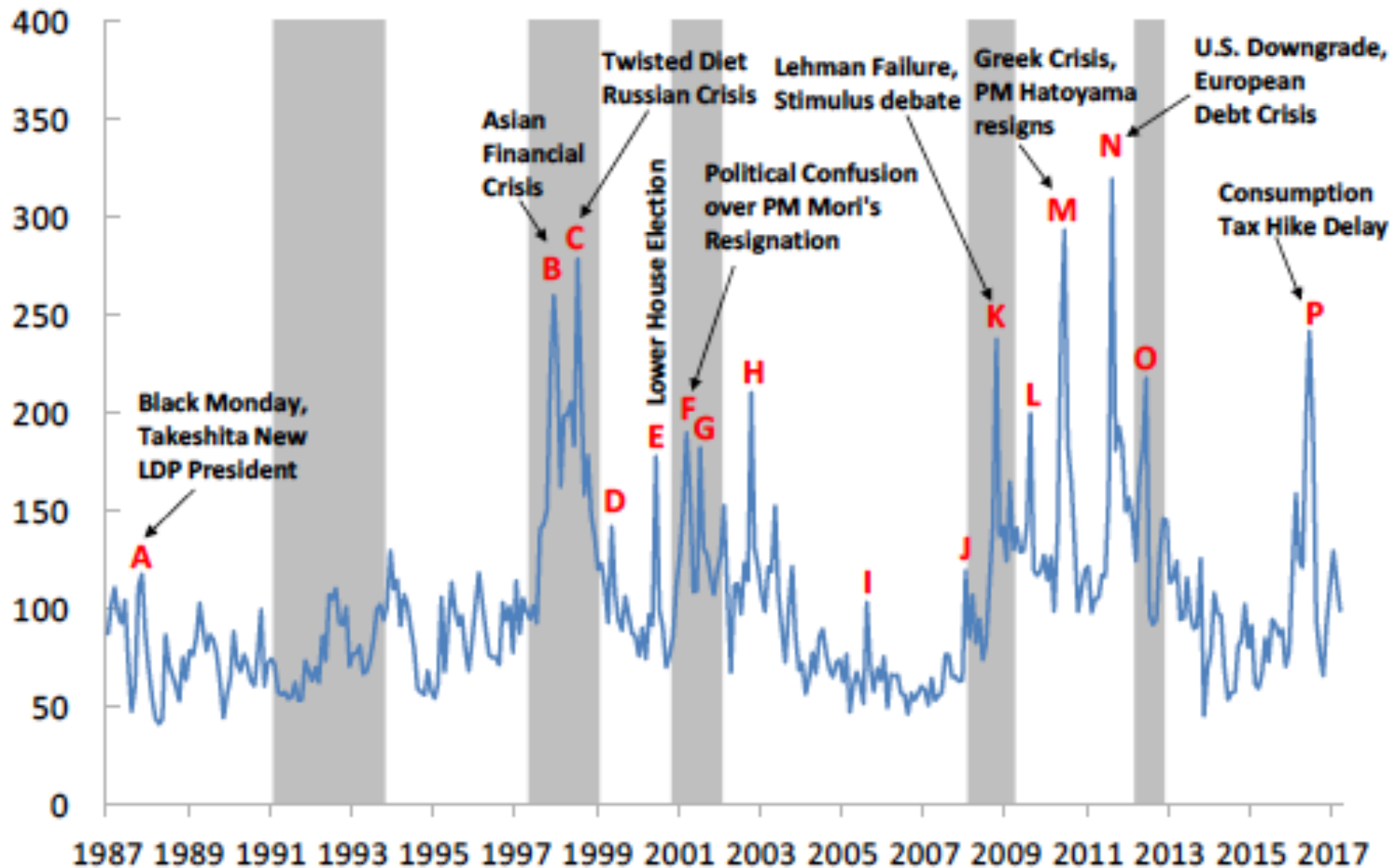
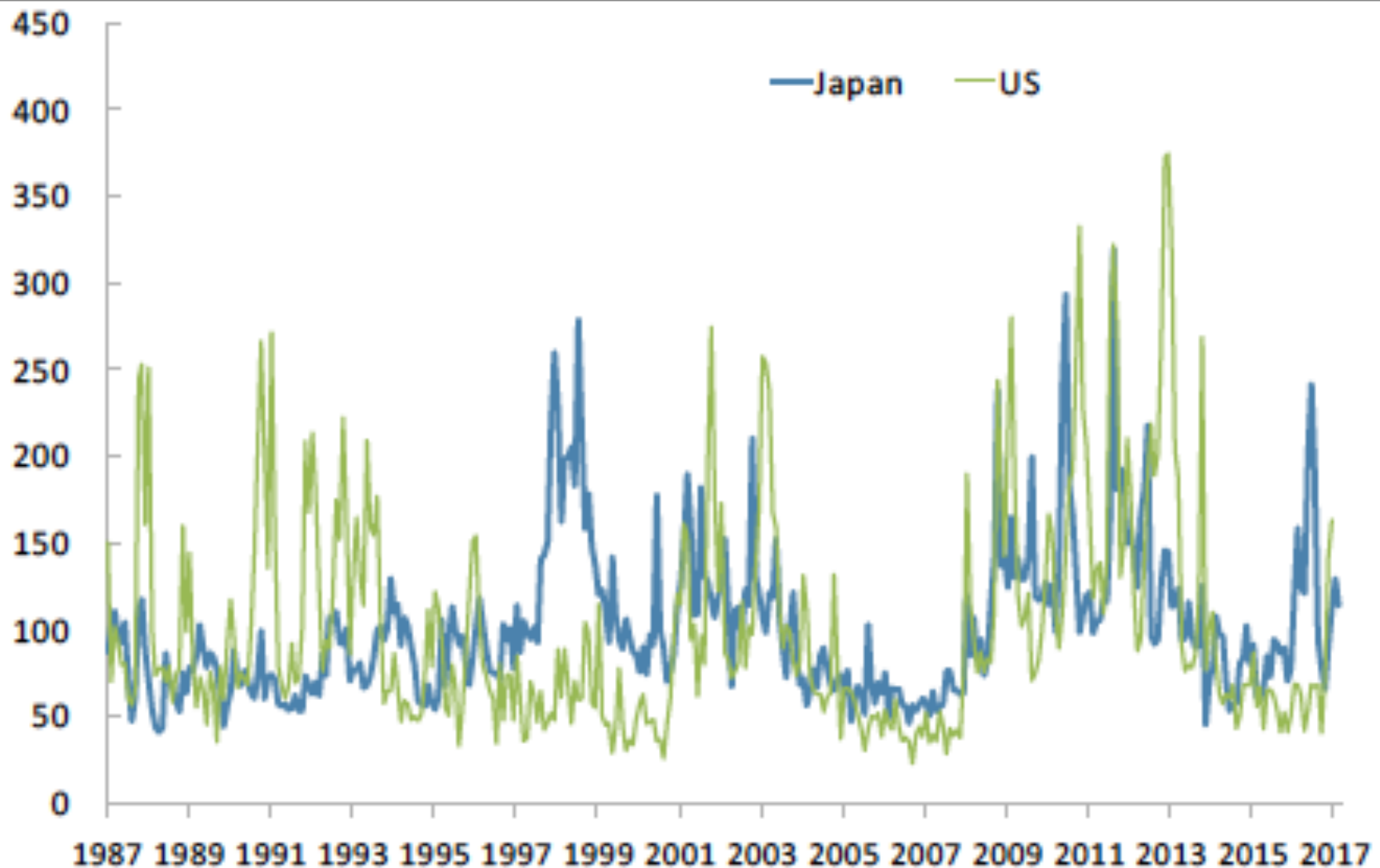# Japan Fiscal Policy Uncertainty Index and Ito's Political Uncertainty Index Compared

Sources: Ito (2016) and authors' calculations.
Note: The blue lines indicate changes in Prime Minister.

- Ito's survey-based measure of political uncertainty in Japan weighs the approval ratings of ruling and opposition parties.

- His measure and our Japan Fiscal PU index reflect some of the same underlying developments. Both rose during 1997-98, peaking with the LDP's defeat in July 1998 and the resulting Twisted Diet. They rose again in the 2007-12 period characterized by frequent turnover of the Prime Minister.

- His measure correlates with our Japan Fiscal PU Index at 0.31 in monthly data and 0.44 at the annual frequency. In contrast, his measure correlates at only 0.07 with our Monetary PU index.
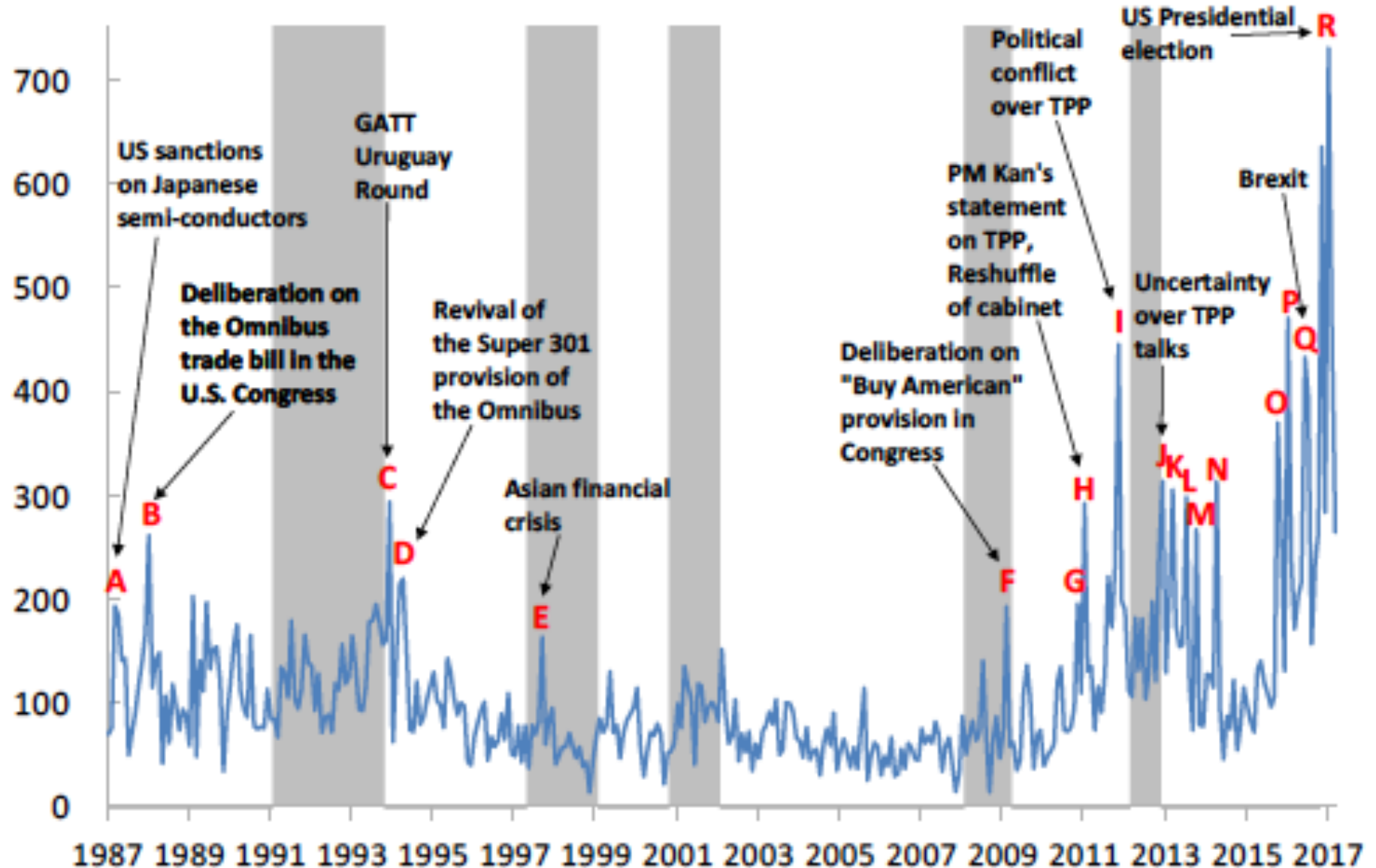
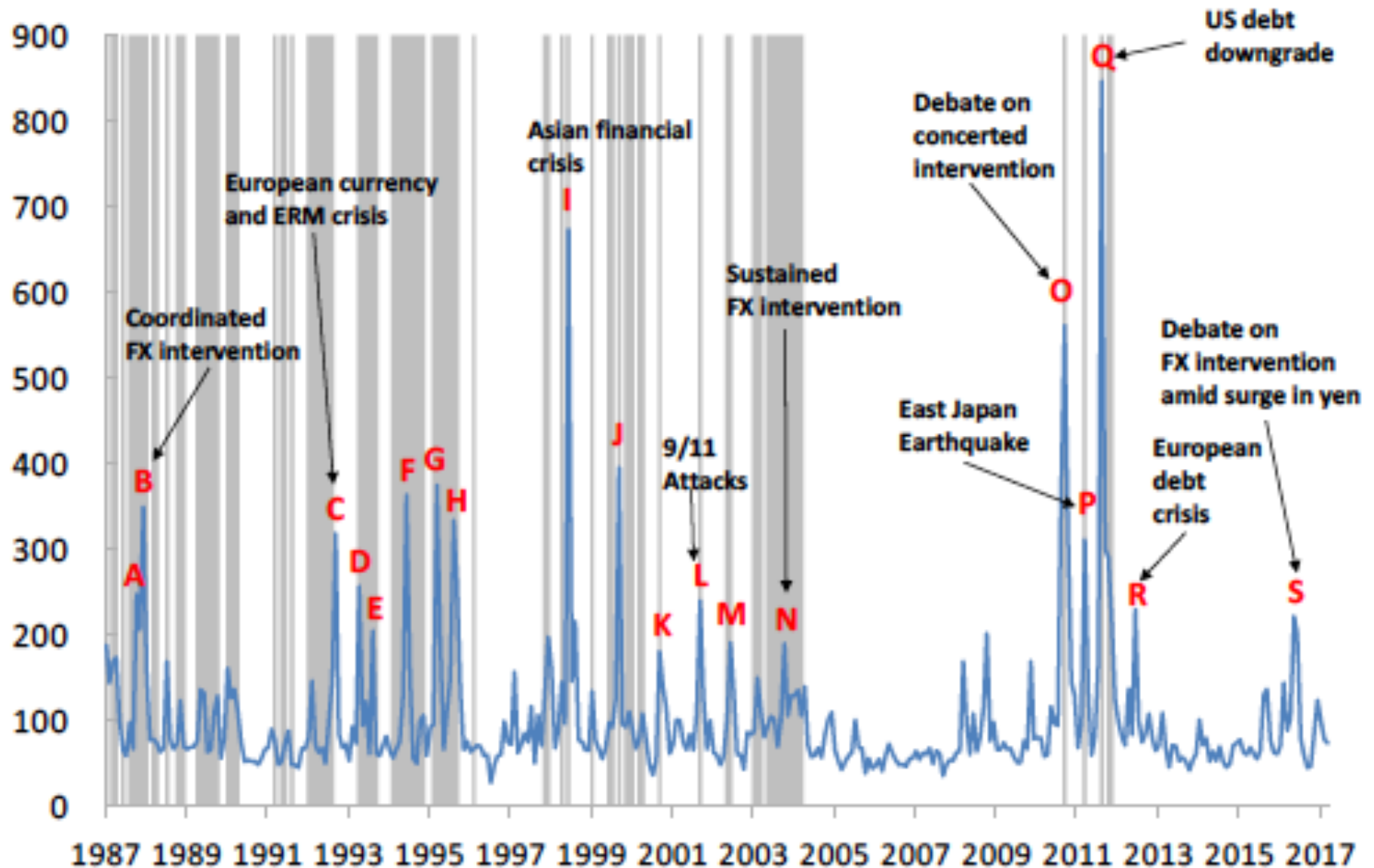# Japan & U.S. Uncertainty Indices for Fiscal Policy Compared

Sources: Baker et al. (2016) and authors' calculations.

Japan Trade Policy Uncertainty Index

After falling sharply in 2017, this index rose to 230 in March 2018, probably in reaction to the latest round of developments and concerns related to U.S. trade policy.
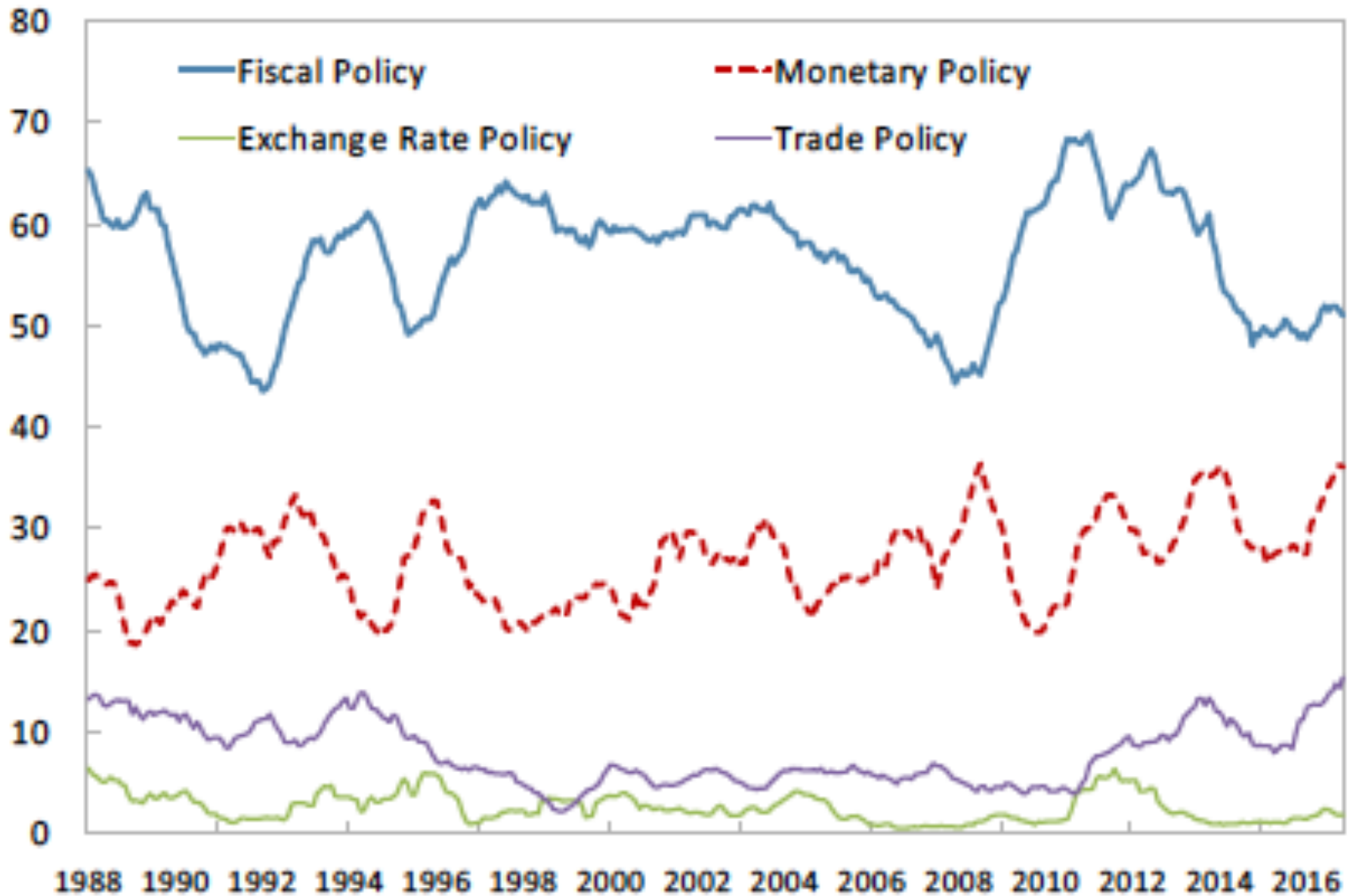
Japan Exchange Rate Policy Uncertainty Index

Shaded areas denote FX intervention periods.

Proximate Sources of Japan EPU

# Policy Uncertainty and Aggregate Economic Performance

- We consider VAR models that yield response functions for output, employment, consumption, investment, etc.

- Shocks identified by standard Cholesky decompositions. Log(Japan EPU) ordered first, unless noted otherwise.

- Other variables: log Nikkei stock price index, nominal interest rate (yield on 2-year JGBs), log employment, log GDP or industrial production (or major components), log household consumption expenditures or synthetic consumption index, and log gross private investment.
  - Some specs include log(option-implied Japanese equity volatility) and log(Global EPU)

# Policy Uncertainty and Aggregate Economic Performance

- Two lags in all specs, selected based on Akaike and Schwarz information criteria.

- Baseline samples run from 1994M1 to 2016M12 for monthly data and from 1987Q1 to 2016Q4 for quarterly data.
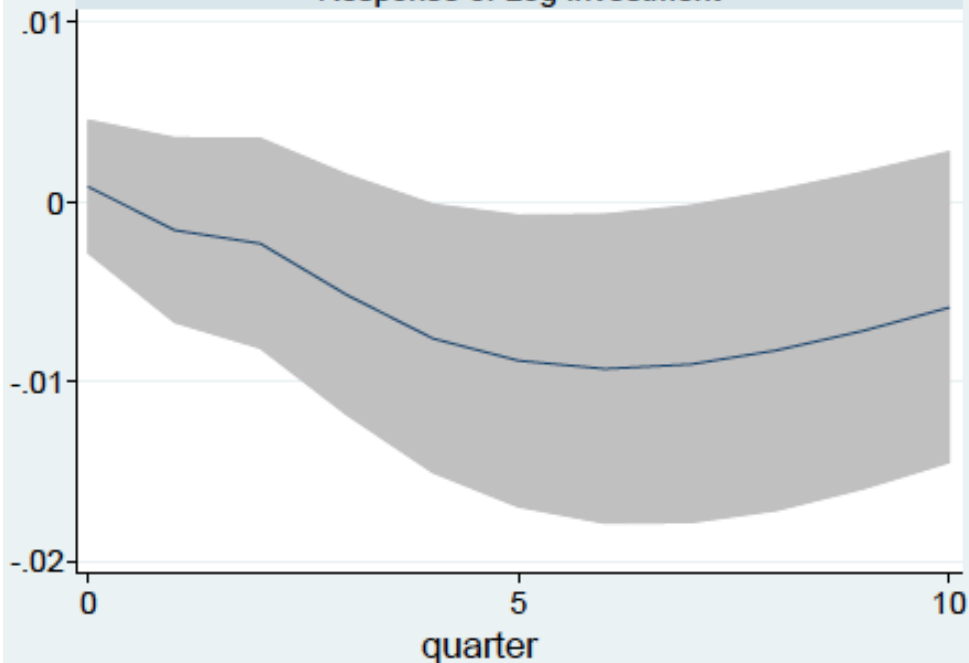
IRFs to Unit St. Dev. EPU Innovation
1987Q1 to 2016Q4

Response of Log EPU Index — 95% Confidence Intervals
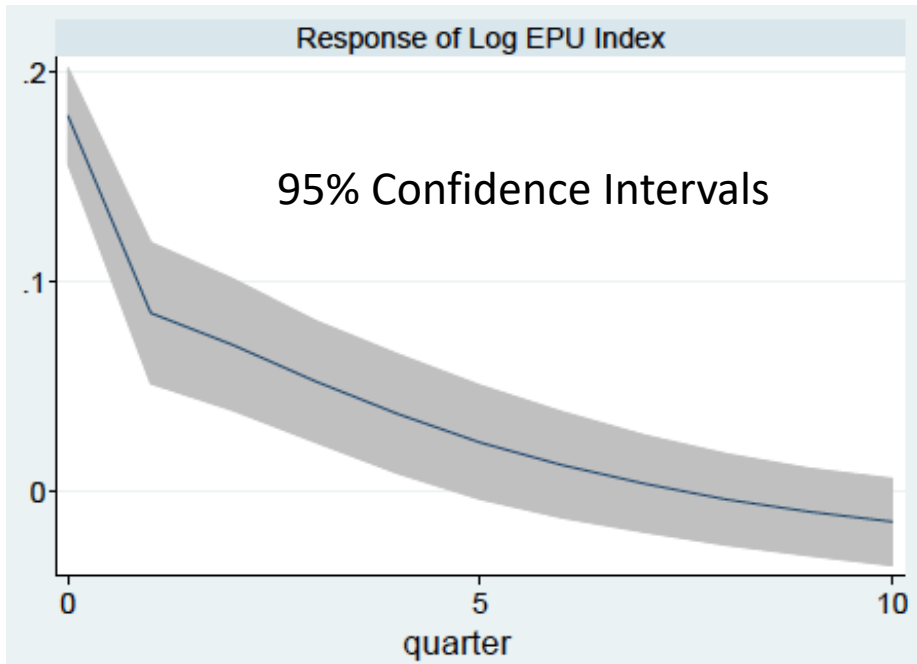
Response of Log GDP

A unit standard deviation upward EPU innovation foreshadows a peak fall in real GDP of about 0.3 percent after 4-5 quarters.
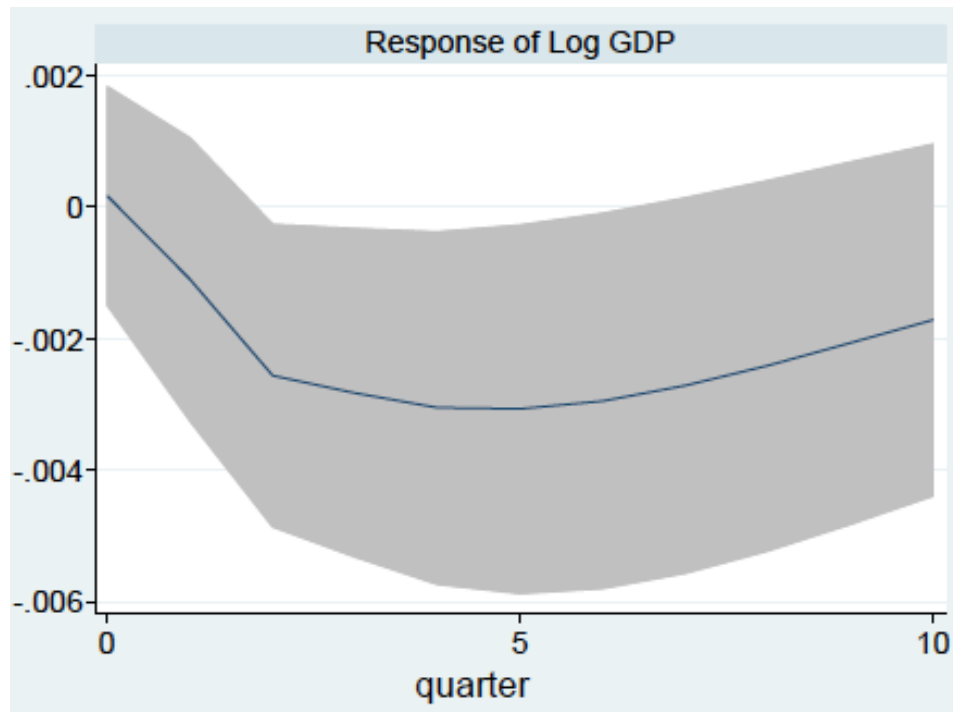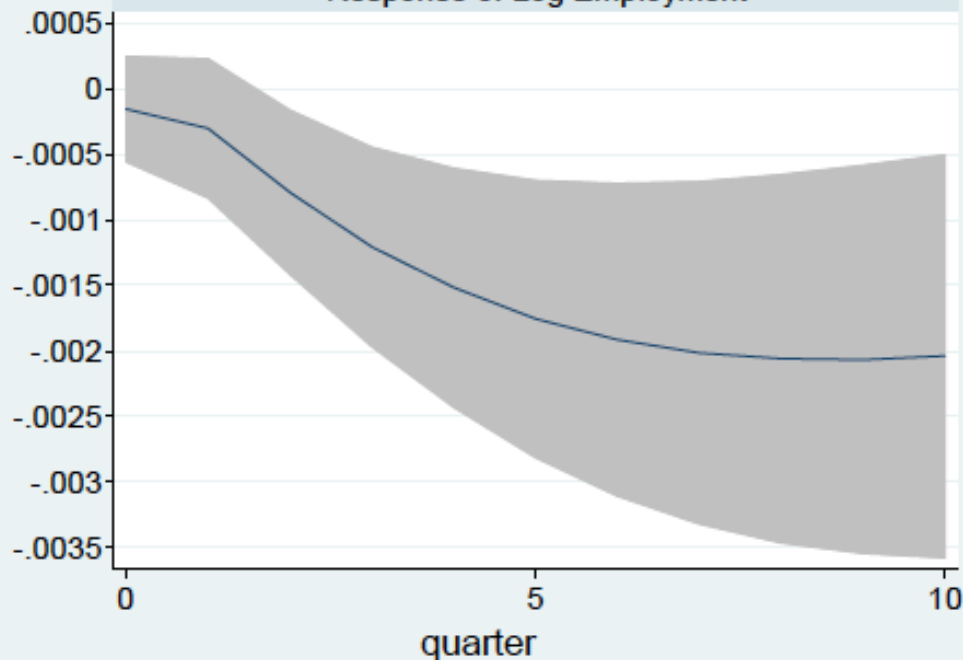
Response of Log Investment

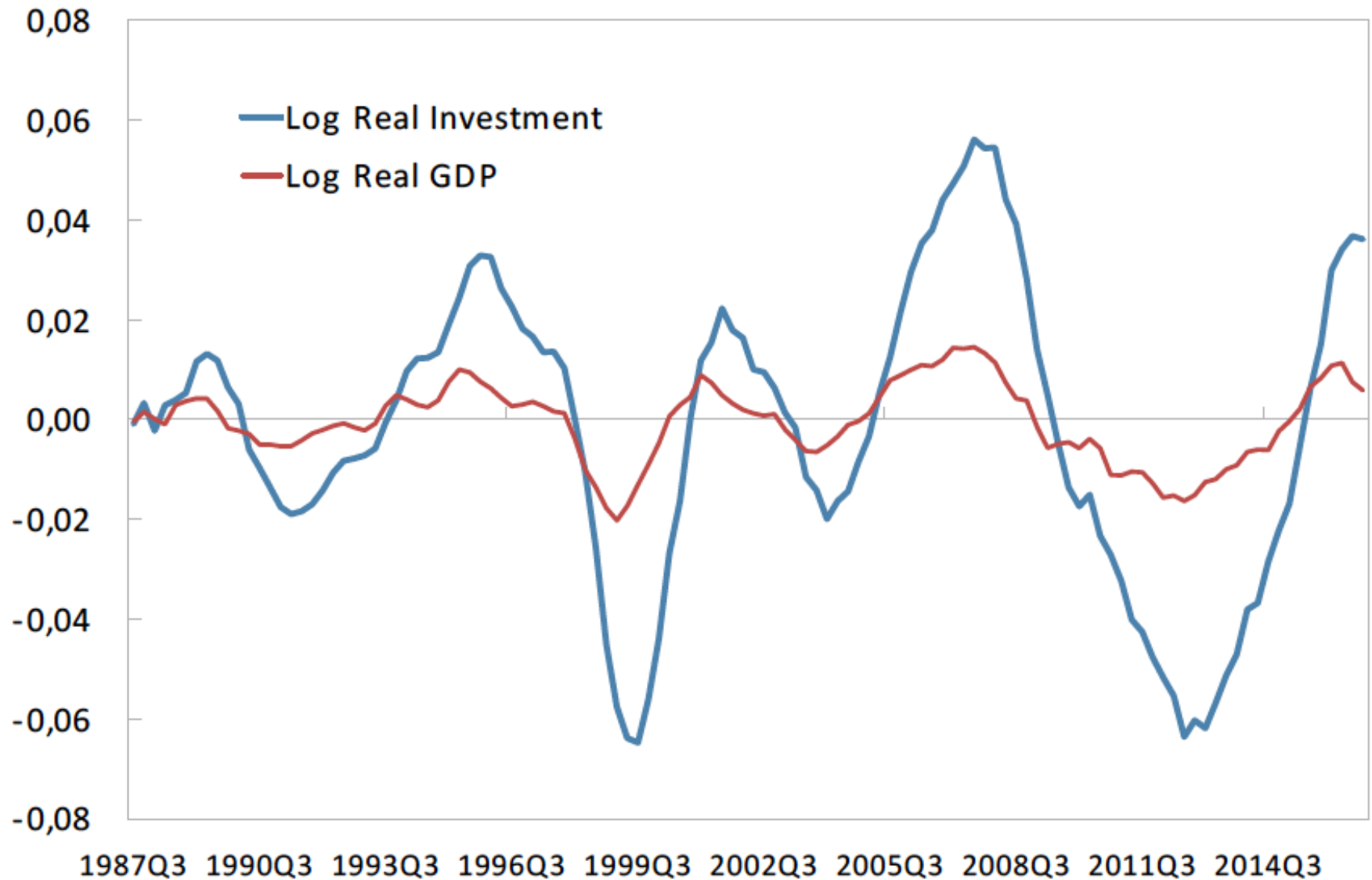Peak investment response is much larger – about 1% after 6 quarters.

Employment response smaller but more drawn out, with a peak response of about 0.2%
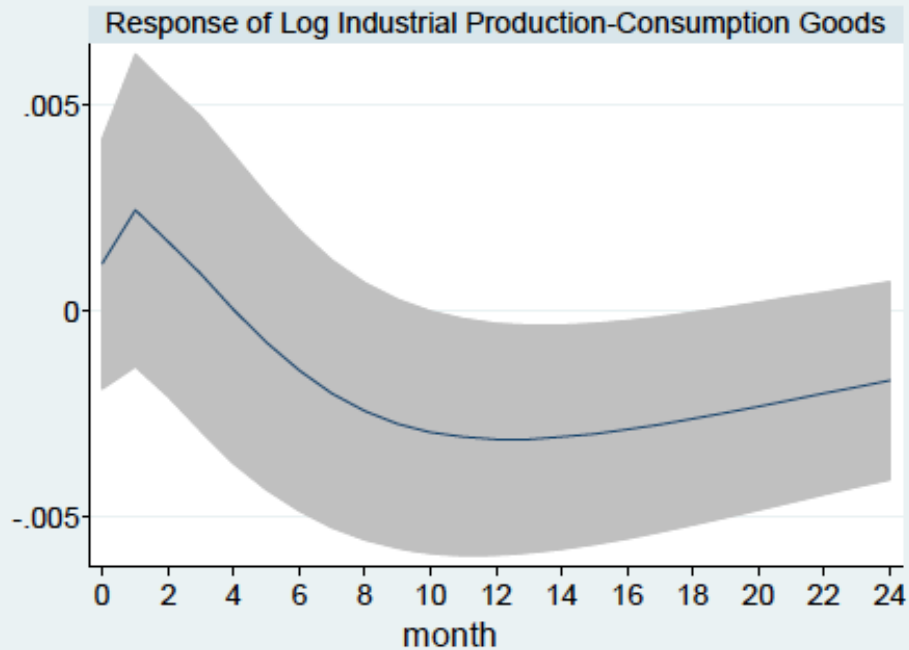

Response of Log Employment

Historical Contributions of Japan EPU Shocks to GDP and Investment Fluctuations, Quarterly Data

Monthly Data, Selected IRFs to Unit Standard Deviation EPU Innovation, 1996:1 to 2016:12

Response of Log Industrial Production-Consumption Goods

Response of Log Industrial Production-Investment Goods

A much larger industrial production response for sectors that produce investment goods.
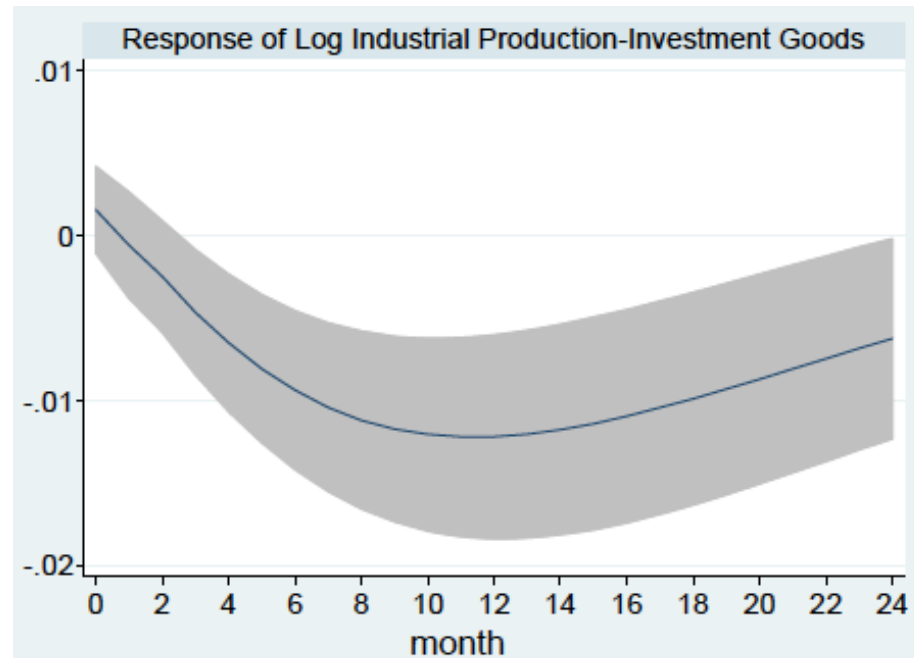
Standardized Residuals from EPU Equation, Baseline Monthly VAR Specification

Nov. 1997: Policy Debates over Fiscal Consolidation and Asian Financial Crisis
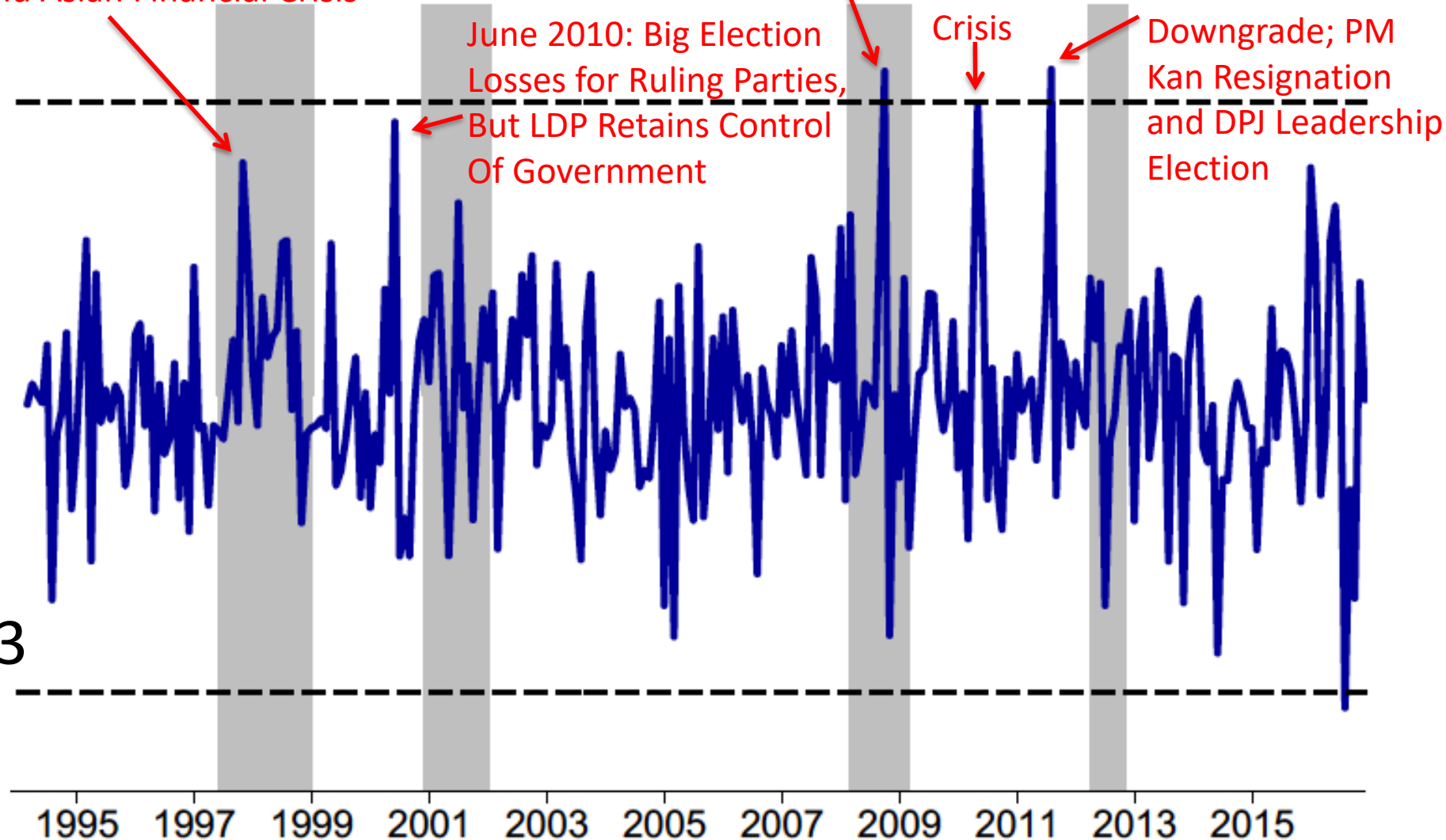
October 2008: Global Financial Crisis

May 2010: European Debt Crisis

August 2011: U.S. Debt-Ceiling Crisis and Debt Downgrade; PM Kan Resignation and DPJ Leadership Election

June 2010: Big Election Losses for Ruling Parties, But LDP Retains Control Of Government

3

-3

1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015

Taking Stock of the VAR Results

- Big EPU shocks occur outside recessions. Recessions do not necessarily involve big EPU shocks.

- Upward EPU innovations foreshadow deteriorations in Japan's macroeconomic performance, as reflected in impulse response functions for investment, employment and output.
    – These results are similar to results in Baker et al. (2016) for the United States and for a panel of a dozen countries

- These VAR results do not prove a causal effect of policy uncertainty on economic performance, but they show that our EPU index contains useful information not captured by other (standard) forward-looking indicators.

- Upward innovations to our EPU index for Japan foreshadow larger declines in macroeconomic aggregates than innovations to the Japan EPU index in Baker et al. (2016), suggesting that our efforts to improve the index deliver a better measure and stronger results in downstream econometric work.

Broadly speaking, three possible interpretations:

1. An upward EPU innovation corresponds to an unforeseen policy uncertainty shock that worsens macroeconomic performance through real options effects, cost-of-capital effects or other mechanisms.

2. An upward EPU innovation reflects bad news about the economic outlook that is not (fully) captured by the other variables in the VAR system, *and* that bad news triggers a rise in EPU that has harmful effects on the economy. Under this interpretation, EPU amplifies and propagates a causal impulse that originates elsewhere.

3. EPU has no role as either an impulse or a propagation mechanism; instead, it simply acts as a useful summary statistic for information missing from the other variables in our system. It's hard to reconcile with evidence of policy uncertainty effects in studies that use micro data, which allows for more compelling identification strategies.

The Complex Interplay between Policy Uncertainty and Economic Performance

1. **Causal effects operate in both directions, through multiple channels, and differently across episodes.**

- Consider potential causal effects of (bad) shocks/performance on policy uncertainty.

    – In the near term, the Global Financial Crisis of 2008-09 confronted policymakers with extraordinary and complex challenges. There was great uncertainty about how they should and would respond, and what would be the economic consequences.

- Re longer term effects: Funke, Schularick and Trebesch (2016) draw on data for many countries over roughly a century to document a pattern of rising political polarization in the years following systemic financial crises, contributing to higher levels of policy uncertainty.

- In the other direction, policy uncertainty potentially affects economic performance through several channels.

- According to New Keynesian models, the harmful effects of policy uncertainty are greater when the economy is at the ZLB or the monetary authority is otherwise unable to respond.

2. Policy uncertainty co-moves with other factors that can influence economic performance through other channels.

- Some of these other factors are themselves hard to measure with precision:

    – Confidence about future economic performance

    – Political polarization

    – Governance quality in the public sector

3. **The potential for negative shocks to create harmful policy uncertainty depends on the underlying environment, which in turn is shaped by institutions and previous policy decisions.**

– <u>Example 1</u>: The case for discretionary fiscal stimulus in response to negative shocks is weaker when robust automatic fiscal stabilizers (AFS) are in place. AFS diminish the need for discretionary fiscal stimulus, along with the political conflicts and policy uncertainty that often accompanies efforts to deploy discretionary tools.

– <u>Example 2</u>: Stronger capital requirements, living wills, stress tests, and bankruptcy reforms for financial institutions all aim to make the financial system more resilient to shocks and curtail negative spillovers. If successful in these aims, such reforms lower the likelihood of another Lehman moment and the need for extraordinary, discretionary policymaker actions, and the attendant policy uncertainty.

– <u>Example 3</u>: The Asian Financial Crisis in 1997 prompted several governments to accumulate large foreign exchange reserves and adopt more flexible exchange rate regimes. Both strengthened their resilience and reduced domestic policy uncertainty in the wake of the GFC two decades later.

– <u>Example 4</u>: Consider proposals to raise the central bank's target rate of inflation (e.g., Blanchard et al., 2010 and Ball, 2014). The logic behind these proposals is straightforward: Raising the underlying rate of inflation reduces the likelihood that monetary policy bumps against the ZLB in future downturns. In this way, a higher target rate enlarges the scope for using traditional monetary policy tools to stabilize the economy and lessens the need for quantitative easing, forward guidance, direct credit market interventions and discretionary fiscal stimulus. Because less is known about the effectiveness of less conventional policy tools, their use involves greater uncertainty about effects.

4. **Employment and investment are less responsive to cuts in interest rates and taxes in the wake of an increase in (policy) uncertainty, according to real options theory.**

  – Greater uncertainty widens inaction regions.

  – Thus, a rise in policy uncertainty near the onset of a recession reduces the potency of countercyclical stabilization policy.

5. Aspects of the complex interplay for Japan

- Contested elections, major political transitions and Twisted Diet outcomes are often associated with higher levels of EPU in Japan.

- PM Abe's election at the end of 2012 brought greater political stability, a clearer policy direction, and several years of declining or low policy uncertainty. A similar pattern held during the long tenure of PM Koizumi.

- These periods of political stability contributed to a moderation of policy uncertainty, and the relatively benign/hopeful economic outlook during these episodes helped sustain stable political leadership.

- The Asian and Global Financial Crises triggered large upward Japan EPU innovations.

On Our Measurement And Index Assessment Efforts

1. Compared to the Japan EPU index in Baker et al. (2016), we:

   – Expand coverage from 2 to 4 major newspapers.

   – Investigate & adjust for changes in archive coverage.

   – Deploy better term sets that reflect our auditing efforts and expertise in Japanese economic policy.

   – Seasonally adjust scaled frequency counts at the newspaper level to deal with pronounced and distinctive seasonal patterns in certain papers, due to their coverage of periodic company reports.

2. Unlike Baker et al. (2016), we also:

  – Develop indices for several policy categories, which are helpful in diagnosing the proximate sources of policy uncertainty and useful in analyzing policy uncertainty effects on industry- and firm-level outcomes.

  – Conduct a detailed descriptive assessment of key economic and policy developments associated with heightened levels of policy uncertainty according to our Japan EPU indices.

Next Steps

1. We have gathered daily data on equity returns for listed firms in Japan.

2. We are investigating how the realized volatility of firm-level equity returns respond to our Japan Policy Uncertainty measures.

3. Which firms respond? And by how much?

4. Do movements in our policy uncertainty measures account for sizable shifts over time in the firm-level structure of equity returns volatility?

Summary and Conclusions

1. Our Japan EPU index rises around contested national elections and major leadership transitions in Japan, during the Asian Financial Crisis, and in reaction to the Lehman failure, 2011 U.S. debt-ceiling crisis, Brexit referendum, and uncertainty over consumption tax hikes in Japan.

2. Our indices for fiscal, monetary, trade and exchange rate policy uncertainty co-vary positively but display distinct dynamics.

- Our fiscal and monetary policy uncertainty indices for Japan correlate positively with their U.S. counterparts, but they mainly reflect Japanese developments.

3. Fiscal matters are the most important proximate source of policy uncertainty in Japan, according to our newspaper-based results.

4. Upward EPU innovations foreshadow deteriorations in Japan's macroeconomic performance, as reflected by impulse response functions for investment, employment and output.

- Peak responses are modest for output and employment, larger for investment.

5. Our results favor the view that high policy uncertainty undermines macroeconomic performance.

   – By acting as an impulse behind fluctuations, a mechanism for amplifying and propagating causal impulses that originate elsewhere, or both.

6. Past policy decisions and institutions shape the policy uncertainty response to contemporaneous economic shocks. In particular, well-designed policy institution and rules can limit the scope for negative shocks to trigger large jumps in policy uncertainty.

EXTRA SLIDES

Correlation of Japan EPU Indices with Other Uncertainty Measures

| Different EU Indicators	Our Japan EPU Indices					Sample
	Overall	Fiscal	Monetary	Trade	Exchange Rate	
Equity Market Volatility	0,50	0,42	0,44	-0,01	0,16	1990M6-2017M3
Exchange Rate Volatility	0,53	0,43	0,34	0,04	0,13	2003M1-2017M2
Interest Rate Volatility	0,22	0,06	0,27	-0,12	-0,04	2007M1-2016M8
Political Uncertainty	0,23	0,30	0,07	-0,04	0,19	1987M1-2017M3
EPU-Global	0,50	0,40	0,47	0,69	0,22	1997M1-2017M3
EPU-US	0,49	0,44	0,48	0,36	0,26	1987M1-2017M3
EPU-Japan (Old)	0,66	0,61	0,52	0,22	0,20	1988M6-2016M4
EPU-Europe	0,49	0,42	0,51	0,57	0,15	1987M1-2017M3
VIX - US	0,52	0,51	0,33	-0,14	0,17	1990M1-2017M3

Note: Equity market volatility is the Nikkei Stock Average Volatility Index over one month calculated from Nikkei 225 futures and options. Exchange rate volatility is the option implied volatility over the next month for the USD-Japanese yen exchange rate. Interest rate volatility is the option-implied volatility over the next three months based on Japanese government bonds with 1-year tenor. The political uncertainty measure from Ito (2016) reflects the relative approval ratings of ruling and opposition parties. The Global EPU index from Davis (2016) is the GDP-weighted average of newspaper-based EPU indices for 18 countries. The EPU indices for the US, Japan and Europe are from Baker et al. (2016).

Standardized Residuals from EPU Equation, Baseline Quarterly VAR Specification
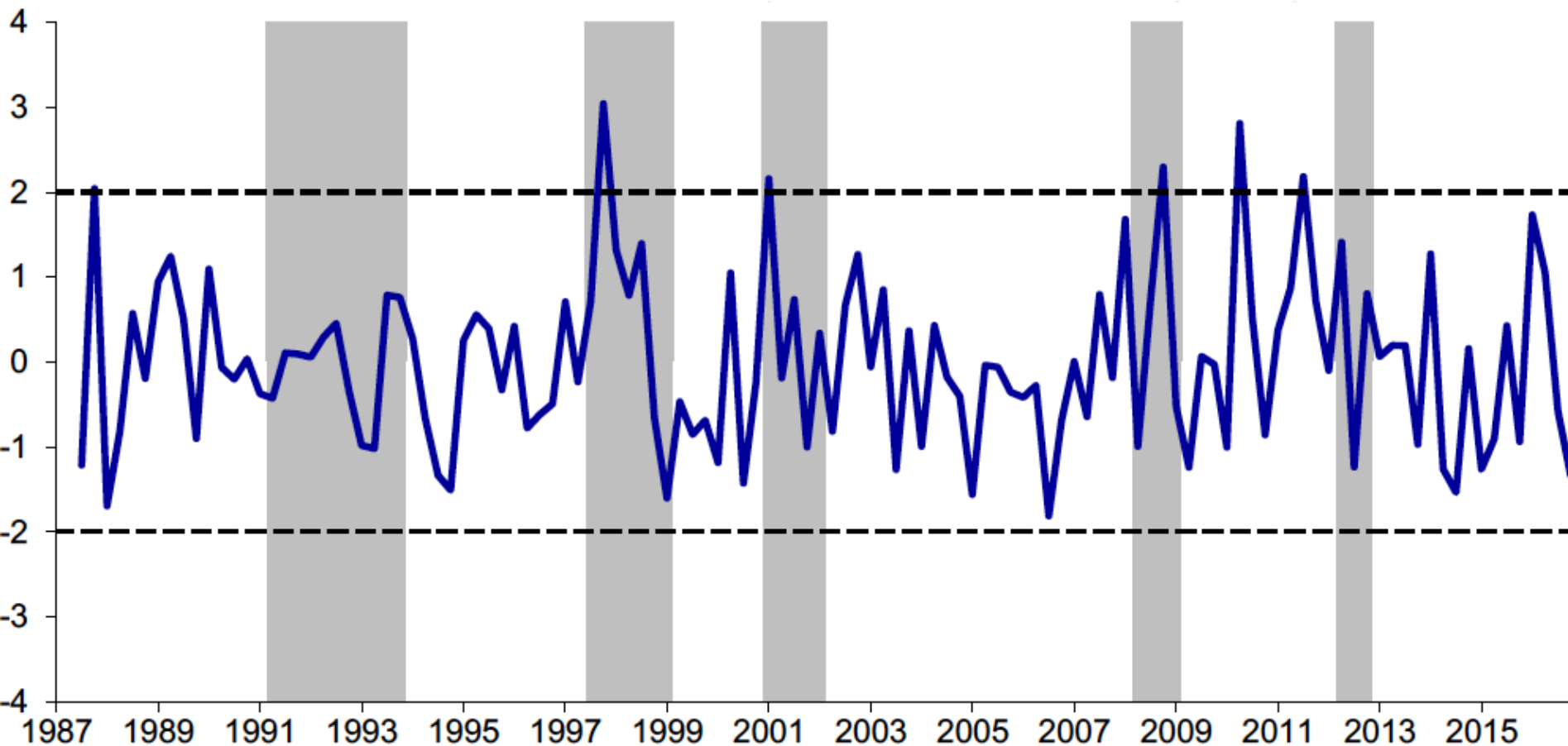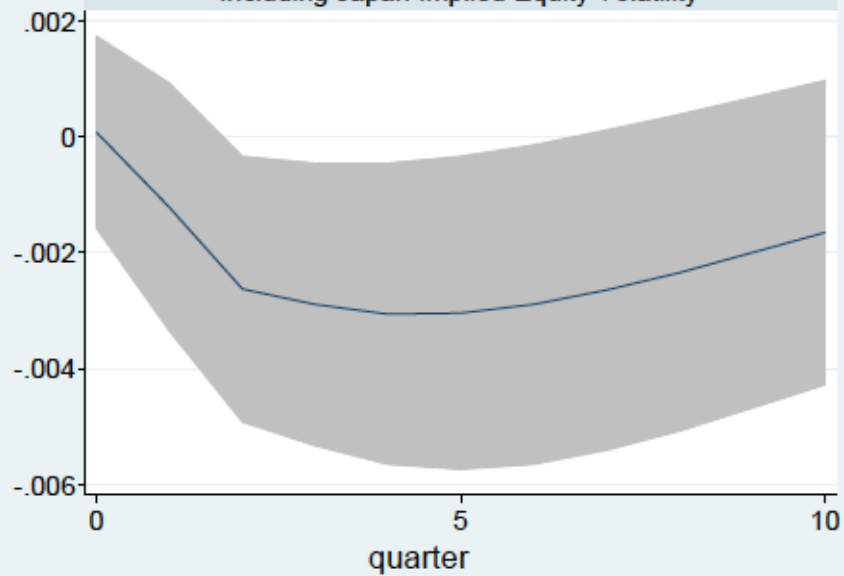

Two points: (1) Big EPU shocks occur outside recessions.
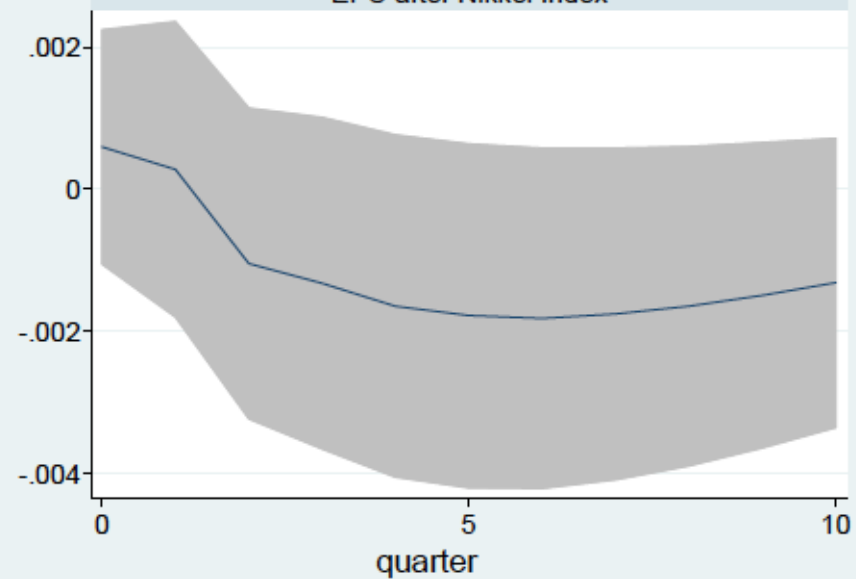(2) Recessions do not necessarily involve big EPU shocks.

Alternative Specs & Samples with Quarterly Data: GDP Responses to Unit St. Dev. EPU Innovations
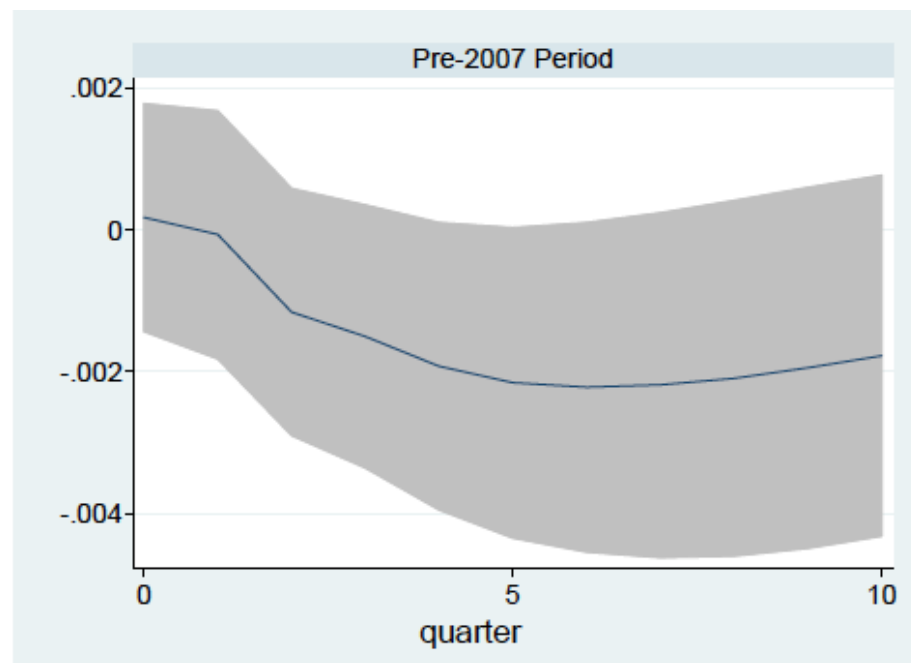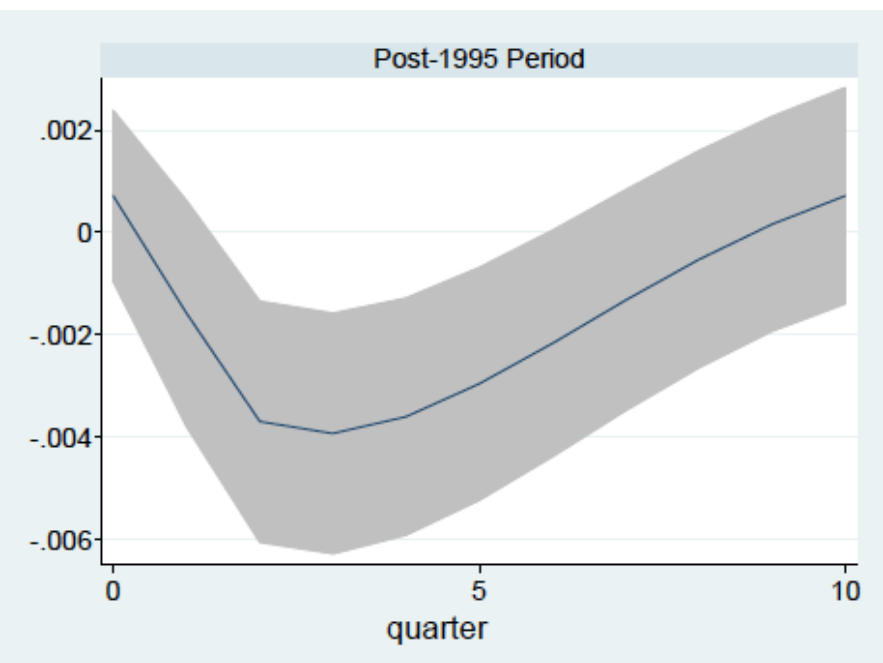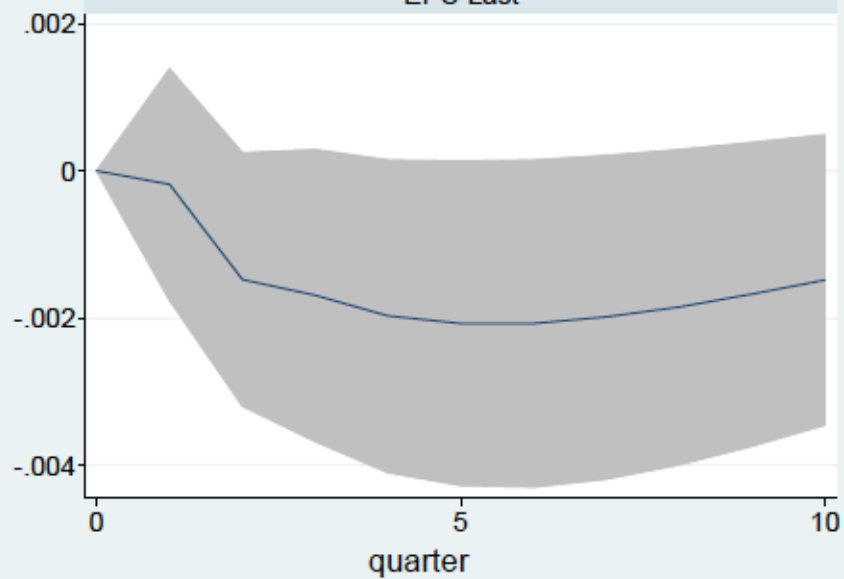
Including Japan Implied Equity Volatility

EPU after Nikkei Index

EPU Last

Including Global EPU, Ordering It First