# The World Uncertainty Index[°]

Hites Ahir[A], Nicholas Bloom[B] and Davide Furceri[F]

**October 29, 2018**

We construct a new index of uncertainty—the World Uncertainty Index (WUI)—for 143 individual countries on a quarterly basis from 1996 onwards. This is defined using the frequency of the word "uncertainty" in the quarterly Economist Intelligence Unit country reports. Globally, the Index spikes near the 9/11 attack, SARS outbreak, Gulf War II, Euro debt crisis, El Niño, European border crisis, UK Brexit vote and the 2016 US election. Uncertainty spikes tend to be more synchronized within advanced economies and between economies with tighter trade and financial linkages. The level of uncertainty is significantly higher in developing countries and is positively associated with economic policy uncertainty and stock market volatility, and negatively with GDP growth. In a panel vector autoregressive setting, we find that innovations in the WUI foreshadow significant declines in output.

JEL No. D80, E22, E66, G18, L50.

Keywords: uncertainty; political uncertainty; economic uncertainty; volatility.

Acknowledgements: We would like to thank the National Science Foundation for their financial support.

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[°] The views expressed in this paper are those of the author(s) and do not necessarily represent the views of the IMF, its Executive Board, or IMF management.

[A] International Monetary Fund; hahir@imf.org.

[B] Stanford University; nbloom@stanford.edu.

[F] International Monetary Fund; dfurceri@imf.org.

## I. INTRODUCTION

Concerns about uncertainty have increased all around the world since the global financial crisis. For example, IMF country reports suggest that uncertainty has recently been a key factor of weaker economic performance in many economies.[1] Until now, however, progress to measure economic and political uncertainty has been made only for a set of mostly, advanced economies.

To fill this gap, we build a new uncertainty index, World Uncertainty Index (WUI), for 143 countries from the first quarter of 1996 onward using the Economist Intelligence Unit (EIU) country reports. To the best of our knowledge, this is the first effort to construct a panel index of uncertainty for a large set of developed and developing countries. The index reflects the frequencies of the word "uncertainty" (and its variants) in the EIU country reports. To make the WUI comparable across countries, we scale the raw counts by the total number of words in each report. Globally, the WUI spikes near the 9/11 attacks, the SARS outbreak, the Gulf War II, the Euro debt crisis, El Niño, Europe border-control crisis, the UK's referendum vote in favor of Brexit, and the last US presidential elections. Uncertainty spikes tend to be more synchronized within advanced economies and between economies with tighter trade and financial linkages. In addition, cross-country comparisons reveal that the level of uncertainty significantly varies across countries and is, on average, smaller in advanced economies than in the rest of world.

In contrast to existing measure of economic policy uncertainty, two factors help improve the comparability of the WUI across countries. First, the index is based on a single source that has specific topic coverage—economic and political developments. Second, the reports follow a standardized process and structure. In addition, the process through which EIU country reports are produced helps to mitigate concerns about the accuracy, ideological bias and consistency of the WUI. On the downside, we only have one EIU report per country per quarter, leading to potentially quite large sampling noise.

To address potential concerns regarding accuracy, reliability and consistency of our dataset, we evaluate the WUI in several ways. First, we examine the narrative associated

[1] See, for example, the 2017 country reports for Nigeria, South Africa, the United Kingdom and the United States.

with the largest global spikes. Second, we show that the index is associated with greater economic policy uncertainty (EPU), stock market volatility, risk and lower GDP growth. Third, we fit a vector autoregression (VAR) model to an international panel data of 46 countries and show that innovations in the WUI foreshadow significant declines in output, with uncertainty innovations explaining about 3 percent of variation in GDP growth after 8 quarters.[2]

The rest of the paper is organized as follows. Section II describe the source and the methodology used to construct our uncertainty indexes. Section III presents key stylized facts of uncertainty around the world. Section IV provides reliability test. Section V concludes with some examples of potential use of the dataset.

## II. MEASURING UNCERTAINTY

We build a new country uncertainty index for 143 countries using the Economist Intelligence Unit (EIU) country reports. To the best of our knowledge, this is the first effort to construct a panel index of uncertainty for a large set of developed and developing countries. The index captures uncertainty related to economic and political developments, regarding both near-term (e.g. uncertainty created by the United Kingdom's referendum vote in favor of Brexit) and long-term concerns (e.g. uncertainty engendered by the impending withdrawal of international forces in Afghanistan, or tensions between North and South Korea).

This section will first briefly describe the EIU country reports, then turn to the construction of our quarterly indices for 143 countries from 1996 onwards.

### A. EIU country reports

The EIU—a leading company in the field of country intelligence—provides country reports on a regular basis for 189 countries. The country report typically covers politics, economic policy, the domestic economy, foreign and trade payments events, and on their

[2] The sample of countries is dictated by the availability of quarterly GDP.

overall impact on the country risk. In short, these reports examine and discuss the main economic, financial, and political trends in a country.

To put together the country reports, the EIU relies on a comprehensive network of experts that are based in the field, and country experts that are based at the headquarter. Country experts based at the headquarter have at least 5-7 years of experience. Each of the analysts is in charge of two to three countries, and visits them regularly, ensuring up-to-date and focused expertise (Musacchio 2004).

When putting together the country reports, the EIU follows a five-step process: writing the report, editing, second check, sub-editing, and production. In the writing the report step, field experts prepare a draft and send it to country experts based at headquarters. In the editing step, country experts at headquarters integrate the draft with their own inputs, and make sure the structure of the report is consistent and standardized. They also check that the report is consistent with the EIU's global and regional views. In the second check step, a senior staff at headquarters does a thorough check of the draft. In the sub-editing step, sub-editors do a check to make sure that the report is well drafted, consistent, accurate, and do fact checking. In the production step, the report is checked to make sure that the report is properly coded and styled adequately.

## B. Constructing the index

We construct the uncertainty index for the set 143 countries with a population of at least 2 million. To construct the indexes, we compiled the EIU country reports from 1996Q1 to 2018Q2 for each country. This gives us a total of 90 reports for each country, and a total of 12,868 reports. [3]

[3] When compiling the reports for each country, we have used the main reports for each country. From 2000 to 2007, and for countries with a monthly frequency, the EIU provides two reports called "Updater" and "Main report". The "Updater" is an update that is short and brief with single digit page length and available at a monthly frequency, while the "Main report" is a comprehensive report with a double-digit page length and available at a quarterly frequency. To construct the dataset, we have used the "Main report" for each quarter. Instead of 12,870 reports (143*90), there are 12,868 reports. This discrepancy is because there are two missing reports, one for Guinea-Bissau, and one for Nepal. It is also important to note that for some countries, the EIU used to bundle the reports for 2 to 7 countries in one PDF file. In these cases, we have separated each of these PDF files to create

The approach to construct the WUI is to count the number of times uncertainty is mentioned in the EIU country reports. Specifically, for each country and quarter, we search through the EIU country reports for the words "uncertain", "uncertainty", and "uncertainties".

An obvious difficulty with these raw counts is that the overall length of country reports varies across time, and across countries.[4] Thus, to make the WUI comparable across countries, we scale the raw counts by the total number of words in each report.[5] Two factors help improve the comparability of the WUI across countries. First, the index is based on a single source that has specific topic coverage—economic and political developments. Second, the reports follow a standardized process and structure. In addition, the five-step process described earlier helps to mitigate concerns about the accuracy, ideological bias and consistency of the WUI.

Table 1 shows the country coverage for our index. It covers 37 countries in Africa, 22 in Asia and the Pacific, 35 in Europe, 27 in Middle East and Central Asia, and 22 in Western Hemisphere. This set of countries constitute 99 percent of the world' GDP.

We display the WUI scaled by the total number of words and multiplied by 1,000 in Figure 1.[6] The sample ranges from first quarter of 1996 to second quarter of 2018. The index spikes near the 9/11 attacks, the SARS outbreak, the Gulf War II, the Euro debt crisis, El

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one report per country. During this process, we have used Optical Character Recognition (OCR) to make the files text searchable.

[4] While the number of pages (words) is on average larger in advanced economies than in emerging and low-income countries, we do not observe systematic differences across income groups. For example, country reports for countries such as Nigeria or Egypt have a larger number of pages (words) than many advanced economies. Similarly, while the number of pages (words) increases, on average, over time we do not find a systematic increase in the number of pages (words) for many countries in the sample.

[5] We also produce an index obtained by scaling the raw counts by the total number of pages in each report. This looks extremely similar to the index scaled by the number of words, since across the EIU reports words/page have little variation – reflecting in part the consistent editorial style across the reports.

[6] When showing the global average of the WUI and comparing it with EPU index, we also scale the index by its historical average (computed over the period 1996Q1-2010Q4).

Niño, Europe border-control crisis, the UK's referendum vote in favor of Brexit, and the US presidential elections.[7]

The same pattern also emerges when scaling the raw counts by the number of pages. Given the similarity of the two series, in what follows we will focus on the WUI scaled by the number of words, while all results apply also to the WUI scaled by the total number of pages (see Figure A2 in Appendix A).

## III. STYLIZED FACTS

In this section, we present four stylized facts based on the uncertainty index:

*Fact 1: Global uncertainty has increased significantly since 2012*. Figure 1 shows that average uncertainty has increased since 2012, well above its historical average (computed over the period 1996Q1-2010Q4). This trend is less marked when looking at GDP-based weighted average uncertainty (Figure A3 in the Appendix A), as uncertainty spiked in many advanced economies in the early 2000s. Figure 2 shows this rising trend in the Baker, Bloom and Davis (2016) Economic Policy Uncertainty index (to which the WUI is correlated at 0.7), but less similar to stock-market volatility (e.g. correlated at 0.1 with the US VIX).[8] This highlights an interesting fact that text based measures of uncertainty have been rising since the early 2000s but financial market measures after rising until about 2010 have fallen back to low levels.

*Fact 2: Uncertainty is higher in emerging and low-income economies than in advanced economies* (Figure 3).[9] At the same time, as evidenced by the high standard deviation within each income group, there is significant heterogeneity. For example, the WUI for the United Kingdom, because of the substantial increase in uncertainty associated by the United Kingdom's referendum to vote in favor of Brexit, is higher than those of many emerging market and low-income countries.

[7] Similar evidence emerges also when using the geometric mean and the arithmetic mean on winsorized data (see Figure A1 in Appendix A)

[8] The correlation between the EPU index and the US VIX is about 0.4.

[9] The income groups classification follows the IMF WEO. Figure A4 in Appendix A provides results by regions.

*Fact 3: Uncertainty spikes are more synchronized in advanced economies than in emerging and low-income countries.* Table 2 (column I) reports the average synchronization of the uncertainty index for the various income groups.[10] It shows that uncertainty is significantly more synchronized in advanced economies than in emerging markets and low-income countries. In addition, within advanced economies, uncertainty synchronization is higher in the euro area countries. Similar findings are obtained when looking at the average pairwise correlation of the WUI (column II) and the common variance explained by the first component identified through a principal component analysis (column III). This explains why in Figure 4 uncertainty in emerging and low-income economies mostly follow the global average (because individual country shocks are not synchronized, so get averaged away). In contrast, uncertainty in advanced economies spike sharply because these countries tend to move together.

As for business cycle synchronization (IMF 2013), we find that trade and financial linkages are positively associated with uncertainty synchronization, even when controlling for business cycle synchronization (Table 3).[11]

*Fact 4: Uncertainty is counter-cyclical.* Across advanced and developing economies, average uncertainty is larger during recessions years—defined as years of negative growth—than during non-recession years (Table 4).

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[10] Following the approach of Kalamli-Ozcan, Papaioannou and Peydro (2013) to compute business cycle synchronization, we measure synchronization in uncertainty between country *i* and *j* at time *t* as: $\varphi_{i,j,t} = -\left|U_{i,t} - U_{j,t}\right|$, where *U* denotes the WUI.

[11] Estimates are based on the following equation: $\varphi_{i,j,t} = \alpha_{i,j} + \gamma_t + \beta_1 TR_{i,j,t} + \beta_1 FI_{i,j,t} + \delta O_{i,j,t} + \varepsilon_{i,j,t}$ where $TR_{i,j}$ denotes trade linkages—defined as bilateral trade between country *i* and *j*, normalized by the sum of total trade of country *i* and *j*; $FI_{i,j}$ denotes financial linkages—defined as bilateral assets and liabilities between country *i* and *j*, normalized by the sum of total assets and liabilities of country *i* and *j*. $O_{i,j}$ denotes output synchronization—defined as minus the absolute value GDP growth difference between country *i* and *j*, normalized by the sum of GDP growth of country *i* and *j*. **,*** denote significance at 5 and 1 percent, respectively.

## IV. RELIABILITY TESTS

We evaluate the WUI in several ways. First, we examine the narrative associated with the largest global spikes (Appendix A). Second, we test the relationship between our measures of uncertainty and other measures, such as the EPU index developed by Baker, Bloom and Davis (2016). Second, we fit a vector autoregression (VAR) model to an international panel data of 46 countries to examine the relationship of the World Uncertainty Index and GDP growth.

### A. Uncertainty index versus Other Measures of Uncertainty

#### Uncertainty index versus EPU

The WUI differs from the EPU along two key dimensions. First, the sources used to construct the indexes are different. While the EPU relies on a large set of newspapers, the WUI is constructed using country reports from the same Economist Intelligence Unit source tailored to national economic and political developments. As discussed earlier this has pros and cons. On the positive side, it mitigates concerns about the ideological bias and consistency of the WUI. Second, it can be more easily compared in levels across countries. This is makes the index particularly useful to researchers that are interested in examining how cross-country variations in the level of uncertainty affect economic outcomes (for example, whether foreign investor invest more in countries with lower level of uncertainty). On the downside, we only have one EIU report per country per quarter, so a far smaller body of text than the EPU index, so the sampling noise is likely to be substantial higher. Second, we are reliant on the accuracy of the EIU reports, which to our knowledge are extremely high quality, but it still raises potential concerns over reliance on one underlying source.

We start comparing the WUI and EPU index by plotting the average evolution of these two indicators, for the countries for which the EPU is available, in Figure 2. The global WUI shows a remarkably high correlation (0.705) with the global EPU index.[12] At the same

[12] The countries included are Brazil, Canada, Chile, China, France, Germany, India, Ireland, Italy, Japan, Korea, Mexico, the Netherlands, Russia, Singapore, Spain, Sweden, the United Kingdom, and the United States.

time, the magnitude of EPU spikes tend to be smaller than, and in some cases to precede, WUI spikes.

A strong statistically significant relationship is also found when regressing EPU on the WUI in a panel framework, and also purging for country and time fixed effects (Table 6, Columns I-III). When looking at individual countries (see Figure A5 in the Appendix A) we similarly see a reasonably strong relationship. In four countries (Brazil, Spain, the United Kingdom and the United States) the correlation is above 0.5, in seven countries (Canada, Chile, France, Ireland, Italy, Korea and Sweden) it is above 0.3, and for the remaining eight countries it is 0.2 or less.

Given the differences in the focus in the sources used to construct the WUI and the EPU (the WUI being based on country-specific reports focusing on economic and political developments, while the EPU is based on newspapers covering also global news) a possible explanation of the differences in correlations is that the EPU index tends to give more weights to global events than the WUI—that is, that EPU is more global in nature. [13] As a simple test of this conjecture, we regressed the EPU and the WUI against time fixed effects. We found results consistent with this in that while 36 percent of variation in the EPU index is explained by time fixed effects, the variance explained for the WUI by common time dummies is 17 percent (for the same set of countries which the EPU index is available).

Similar evidence also emerges when we look at country-specific cases. Chile is a remarkable example. EPU spikes for Chile are mostly related to global events (Asian Crisis, Sub-prime crisis, Euro zone crisis and China's slowdown) and only one spike is related to labor and tax reform (Cerda et al. 2016). In contrast, most of the WUI spikes are related to domestic uncertainty episodes (e.g., 1998Q1 uncertainty related to monetary policy decisions; 2001Q2 uncertainty related to December electoral outcomes; 2003Q3 regulatory uncertainty related to legislation for the electricity sector; 2004Q4 uncertainty regarding mining royalty; 2010Q3 uncertainty related to the earthquake; 2013Q1 uncertainty related to

[13] Of course another explanation is that the WUI has more idiosyncratic noise.

the electoral reform, the tax reform, and general economic conditions; 2017Q1 uncertainty regarding the presidential and legislative elections).

**The WUI versus Volatility and Risks**

We then check the correlation between the WUI and existing measure of volatility such as stock market price and bond yield volatility. Figure 5 reports the scatterplot between the average historical level of each of these measures against the average WUI for each country. It shows that the cross-country correlation between the WUI and the measures of volatility is positive, statistically significant and sizeable—0.430 for stock market rate price volatility and 0.531 for bond yield volatility. Similarly, the spearman's rank correlations are also positive and statistically significant: 0.382 for stock market rate price volatility and 0.498 for bond yield volatility.

As for the EPU, we also run panel regressions between the stock market volatility and the WUI, allowing also for country and time fixed effects. The results reported in Table 6 (Columns IV-VI) suggest that the two series are statistically significantly correlated, also when purging for country and time fixed effects.[14]

Given that uncertainty and risk are intrinsically related, we also check whether the WUI is positively correlated with measures of risks. For this purpose, we rely on the risk assessment provided by EIU Risk Analysis, which scores countries in terms of "economic, financial and political risk".[15] The results reported in Figure 6, suggest that the average level of uncertainty in each country is positively and statistically significantly correlated with these measures of risk. The correlations are very similar across different type of risk measures,

[14] Comparable results are obtained using the EPU index instead of the WUI.

[15] The EIU's economic risk indicator is derived from a series of macroeconomic variables of a structural rather than a cyclical nature. Consequently, the rating for economic structure risk will tend to be relatively stable, evolving in line with structural changes in the economy. The financial risk indicator assesses the risk of a systemic crisis whereby bank(s) holding 10 percent or more of total bank assets become insolvent and unable to discharge their obligations to depositors and/or creditors. The political risk indicator evaluates a range of political factors relating to political stability and effectiveness that could affect a country's ability and/or commitment to service its debt obligations and/or cause turbulence in the foreign-exchange market.

suggesting that the WUI captures different aspects of economic and political uncertainty. Interestingly, the correlation is lower than with other measures of volatility, confirming that uncertainty and risk are two related but conceptually distinct concepts.[16]

## B. VAR Analysis

Before turning to the VAR analysis, we repeat the panel regressions above using annualized quarterly GDP growth as the dependent variable. The results reported in Table 6 (Columns VII-IX) suggest that the WUI is negatively and statistically significantly correlated with growth.

We further explore the relationship between uncertainty and economic activity using VAR analysis. In particular, we fit a VAR to a quarterly panel of 46 countries from 1996Q1 to 2013Q2 (To be extended up to 2018Q2). To recover orthogonal shocks, we use a Cholesky decomposition with the following order: the log of average stock return, the Uncertainty index and GDP growth. Our baseline VAR specification includes four lags of all variables. Country and time fixed effects are included. Of course, these results have no implications for causality – future slowdowns in economic activity could increase current perceptions of uncertainty – but do provide results on whether rising uncertainty predicts future growth.

Figure 7 reports the model-implied impulse response of GDP to a one-standard deviation increase in the WUI—equal to the change in average value in the index from 2014 to 2016—and the associated 90 percent confidence bands. The figure shows that the response of output is statistically significant through the entire estimation horizon and picks at about 1.4 percent after 10 quarters of the shock. These responses are also moderate in sizes, with uncertainty innovations explaining about 3 percent of variation in GDP growth after 8 quarters.[17]

[16] Interestingly, the correlation of the WUI and measures of market volatility with the risk indicators, is similar (0.467 for the WUI, 0.512 for stock market price volatility and 0.448 for bond yield volatility ) over the common sample.

[17] As a term of comparison, innovations in the average stock return explain about 13 percent of variation in GDP growth after 8 quarters.

Figure 8 shows that the impulse response function is robust to several alternative specifications: including 8 lags instead of 4 in the VAR, placing the WUI last in the ordering, including the implied stock market volatility before the WUI, and limiting the sample to before the Global Financial Crisis (2008Q1). While we refrain in giving a causal interpretation to these results, they show that the innovations to the uncertainty index robustly foreshadow weaker economic performance.

## V. CONCLUSIONS

We construct a new index of uncertainty (World Uncertainty Index-WUI) for 143 countries from the first quarter of 1996 onward using the Economist Intelligence Unit country reports.

We believe that this dataset can be extremely valuable to researches for many applications. First, the fact that innovations to WUI foreshadows output declines suggest that the WUI could be used as alterative measures of economic activity when these are not available (such as quarterly GDP for many countries). Second, the dataset can be used to examine the impact of differences in the level of uncertainty across countries on key macroeconomic outcomes. Third, the very broad country coverage allows to tackle important research questions so far not explored because of data limitations, such as the role played by institutions and regulations in affecting uncertainty and shaping the response of economic variables to uncertainty shocks.

# TABLES

## Table 1. Country coverage

| Africa (37): | Asia and the Pacific (22): | Europe (35): | Middle East and Central Asia (27): | Western Hemisphere (22): |
|---|---|---|---|---|
| Angola | **Australia** | Albania | Afghanistan | Argentina |
| Benin | Bangladesh | **Austria** | Algeria | Bolivia |
| Botswana | Cambodia | Belarus | Armenia | Brazil |
| Burkina Faso | China | **Belgium** | Azerbaijan | **Canada** |
| Burundi | **Hong Kong** | Bosnia and Herzegovina | Egypt | Chile |
| Cameroon | India | Bulgaria | Georgia | Colombia |
| Central African Republic | Indonesia | Croatia | Iraq | Costa Rica |
| Chad | **Japan** | **Czech Republic** | Iran | Dominican Republic |
| Côte d'Ivoire | **Korea** | **Denmark** | Jordan | Ecuador |
| Dem. Rep. of the Congo | Lao P.D.R. | **Finland** | Kazakhstan | El Salvador |
| Eritrea | Malaysia | **France** | Kyrgyz Republic | Guatemala |
| Ethiopia | Mongolia | FYR Macedonia | Kuwait | Haiti |
| Gabon | Myanmar | **Germany** | Lebanon | Honduras |
| Ghana | Nepal | **Greece** | Libya | Jamaica |
| Guinea | **New Zealand** | Hungary | Mauritania | Mexico |
| Guinea-Bissau | Papua New Guinea | **Ireland** | Morocco | Nicaragua |
| Kenya | Philippines | **Israel** | Oman | Panama |
| Lesotho | **Singapore** | **Italy** | Pakistan | Paraguay |
| Liberia | Sri Lanka | **Latvia** | Qatar | Peru |
| Madagascar | **Taiwan** | Lithuania | Saudi Arabia | **United States** |
| Malawi | Thailand | Moldova | Sudan | Uruguay |
| Mali | Vietnam | **Netherlands** | Tajikistan | Venezuela |
| Mozambique | | **Norway** | Tunisia | |
| Namibia | | Poland | Turkmenistan | |
| Niger | | **Portugal** | United Arab Emirates | |
| Nigeria | | Romania | Uzbekistan | |
| Republic of Congo | | Russia | Yemen | |
| Rwanda | | **Slovak Republic** | | |
| Senegal | | **Slovenia** | | |
| Sierra Leone | | **Spain** | | |
| South Africa | | **Sweden** | | |
| Tanzania | | **Switzerland** | | |
| The Gambia | | Turkey | | |
| Togo | | Ukraine | | |
| Uganda | | **United Kingdom** | | |
| Zambia | | | | |
| Zimbabwe | | | | |

Note: Font in blue = advanced economies, red = emerging economies, and black = low-income economies. Income and regional classification based on IMF WEO.

**Table 2. WUI Co-movements**

| | Synchronization | Correlation | Variance Explained by 1st Factor—PCA |
|---|---|---|---|
| All countries | -0.167 | 0.071 | 0.150 |
| Advanced economies | -0.146 | 0.121 | 0.221 |
| Emerging and low-income economies | -0.185 | 0.011 | 0.144 |
| European | -0.134 | 0.224 | 0.283 |

Note: synchronization between country *i* and *j* at time *t* is defined as: $\varphi_{i,j,t} = -\left|U_{i,t} - U_{j,t}\right|$, where *U* denotes the WUI.

**Table 3. Synchronization of WUI and trade and financial linkages**

| | (I)[a] | (II)[a] | (III) | (IV) | (V) | (IV) |
|---|---|---|---|---|---|---|
| Trade linkages | 0.113** | | 0.741** | | 0.738** | 0.746** |
| | (2.37) | | (2.47) | | (2.49) | (2.52) |
| Financial linkages | | 0.131** | | 0.314** | 0.313** | 0.317** |
| | | (2.32) | | (1.95) | (2.01) | (2.06) |
| Output synchronization | | | | | | 0.011*** |
| | | | | | | (3.10) |
| Country-pair FE | No | No | Yes | Yes | Yes | Yes |
| Time FE | Yes | Yes | Yes | Yes | Yes | Yes |
| N | 15,393 | 15,393 | 15,393 | 15,393 | 15,393 | 15,393 |

Note: synchronization between country *i* and *j* at time *t* defined as: $\varphi_{i,j,t} = -\left|U_{i,t} - U_{j,t}\right|$, where *U* denotes the WUI. Estimates are based on the following equation: $\varphi_{i,j,t} = \alpha_{i,j} + \gamma_t + \beta_1 TR_{i,j,t} + \beta_1 FI_{i,j,t} + \delta O_{i,j,t} + \varepsilon_{i,j,t}$ where $TR_{i,j}$ denotes trade linkages—defined as bilateral trade between country *i* and *j*, normalized by the sum of total trade of country *i* and *j*; $FI_{i,j}$ denotes financial linkages—defined as bilateral assets and liabilities between country *i* and *j*, normalized by the sum of total assets and liabilities of country *i* and *j*. $O_{i,j}$ denotes output synchronization—defined as minus the absolute value GDP growth difference between country *i* and *j*, normalized by the sum of GDP growth of country *i* and *j*. **,*** denote significance at 5 and 1 percent, respectively. Country-pair and time fixed effects included but not reported. [a] dummy for common language and past or present colonial relationship included.

**Table 4. The WUI during recession and non-recession years**

| | Recessions years | Non-recession years | P-value for difference |
|---|---|---|---|
| All countries | 0.178 | 0.164 | 0.008*** |
| Advanced economies | 0.175 | 0.163 | 0.125 |
| Emerging and low-income economies | 0.179 | 0.164 | 0.018** |

Note: The World Uncertainty Index (WUI) is computed by counting the frequency of uncertain (or the variant) in EIU country reports. The WUI is then normalized by total number of words and rescaled by multiplying by 1,000. The WUI is then normalized by total number of words, rescaled by multiplying by 1,000. A higher number means higher uncertainty and vice versa. For the list of countries in each income group, see Table 1. Recession years identified as those with negative growth.

**Table 5. Correlation of WUI with EPU, Stock Market Volatility and Growth**

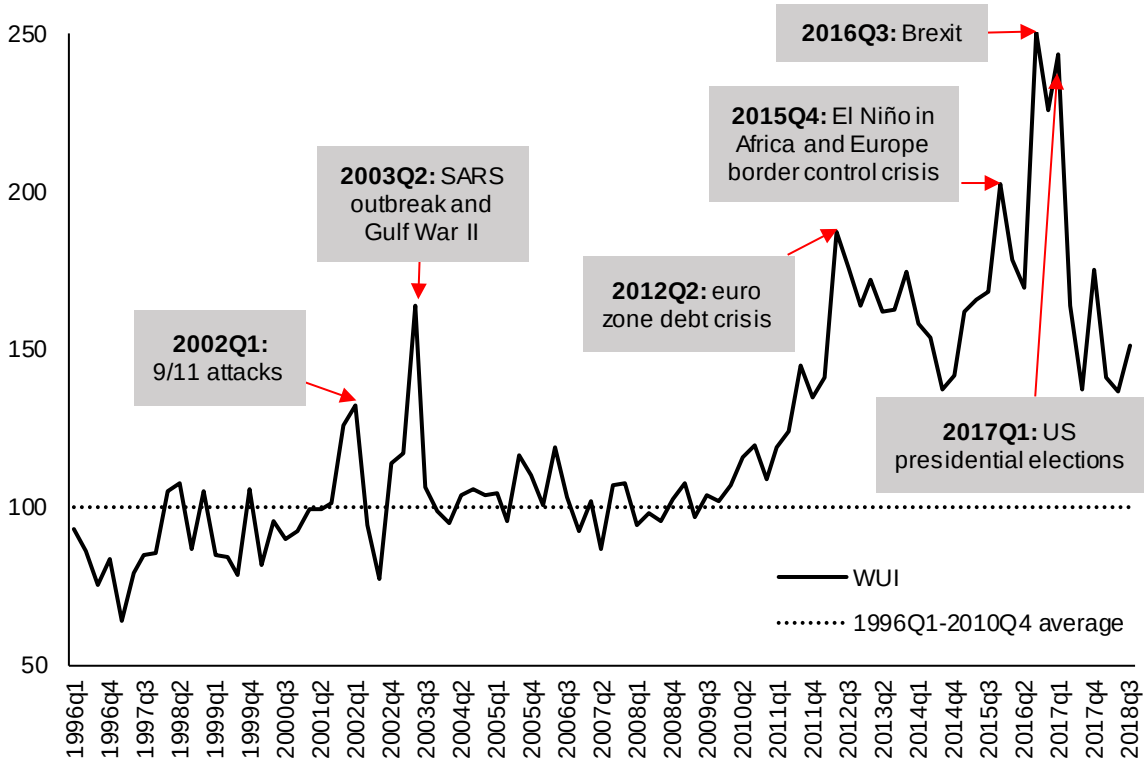
| Dependent Variable WUI | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | (I) | (II) | (III) | (IV) | (V) | (VI) | (VII) | (VIII) | (IX) |
| EPU | 123.843***<br>(2.96) | 129.064***<br>(4.60) | 59.941***<br>(3.52) | | | | | | |
| Stock Vol | | | | 0.353***<br>(3.30) | 0.131**<br>(2.08) | 0.128**<br>(2.19) | | | |
| Growth | | | | | | | -0.025***<br>(-4.41) | -0.017***<br>(-3.58) | -0.007*<br>(-1.90) |
| Country FE | No | Yes | Yes | No | Yes | Yes | No | Yes | Yes |
| Year FE | No | No | Yes | No | No | Yes | No | No | Yes |
| N | 1558 | 1558 | 1558 | 3766 | 3766 | 3766 | 4768 | 4768 | 4768 |
| $R^2$ (within R2) | 0.10 | 0.10 | 0.42 | 0.02 | 0.00 | 0.38 | 0.01 | 0.01 | 0.29 |

Note: *,**,*** denote statically significance at 10, 5, and 1 percent respectively. T-statics in columns (I), (IV) and (VII) based on clustered standard errors. T-statics in the remaining columns based on Driscoll-Kraay standard errors. $R^2$ reported for columns (I), (IV) and (VII); otherwise within $R^2$ reported.

# FIGURES

## Figure 1. Global WUI over time

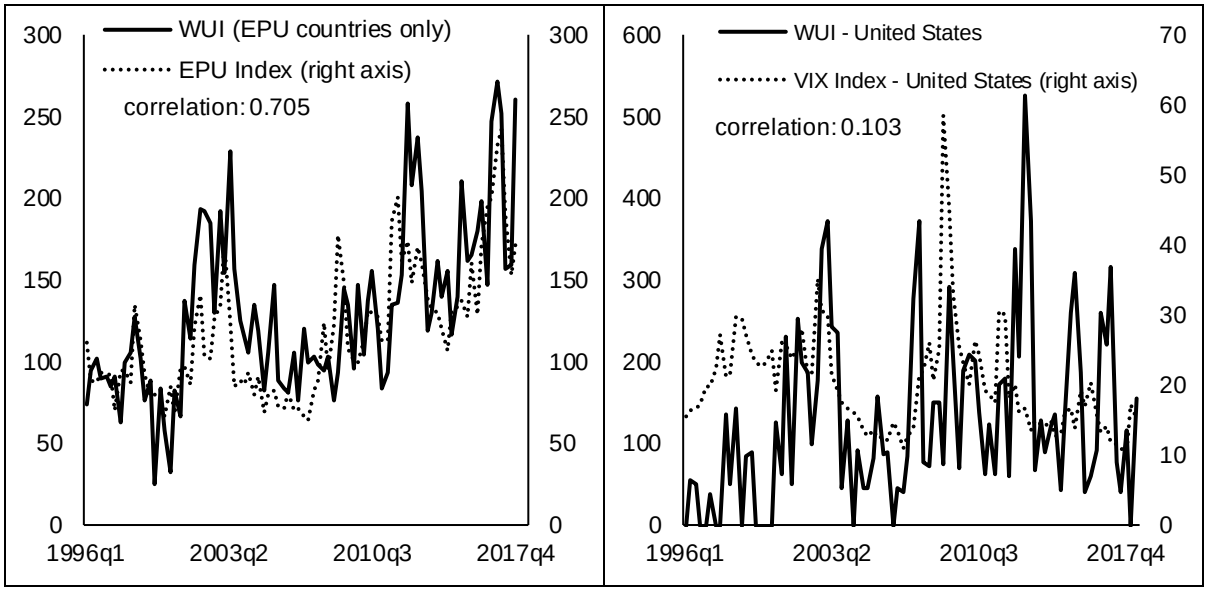
(unweighted global average)




Note: The World Uncertainty Index (WUI) is computed by counting the frequency of uncertain (or the variant) in EIU country reports. The WUI is then normalized by total number of words, rescaled by multiplying by 1,000. Here is also rescaled by the global average of 1996Q1 to 2010Q4 such that 1996Q1-2010Q4=100. A higher number means higher uncertainty and vice versa.

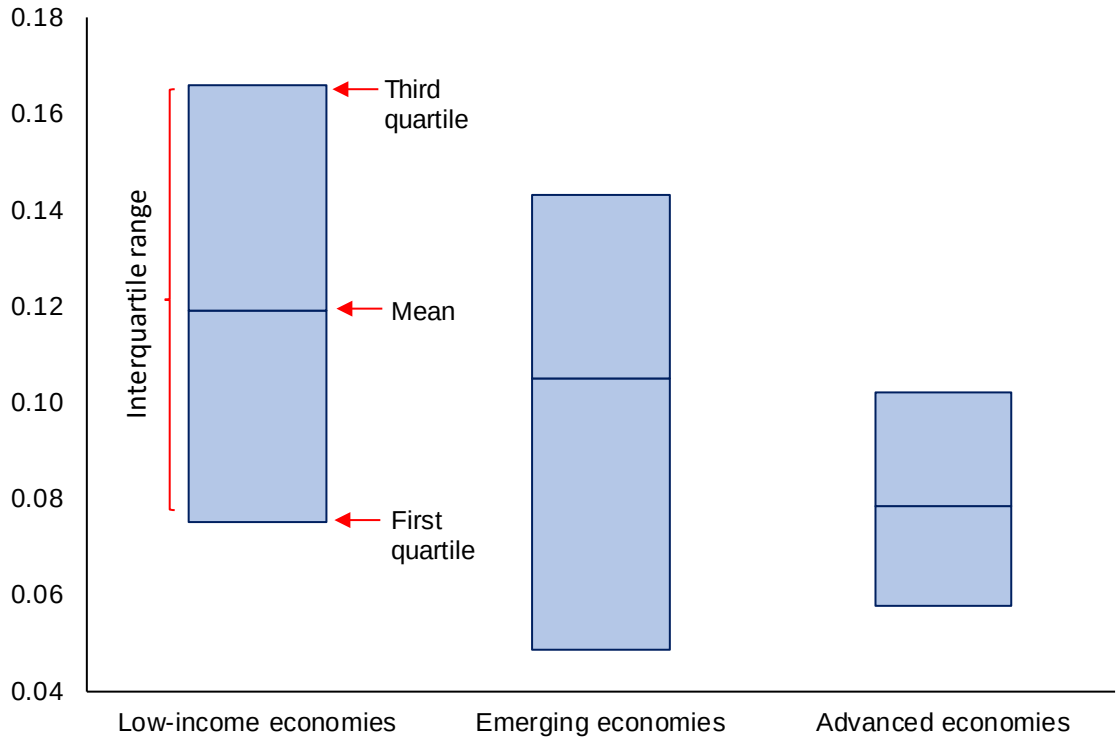
**Figure 2. Global WUI vs. EPU and VIX Indexes**

(unweighted global averages)



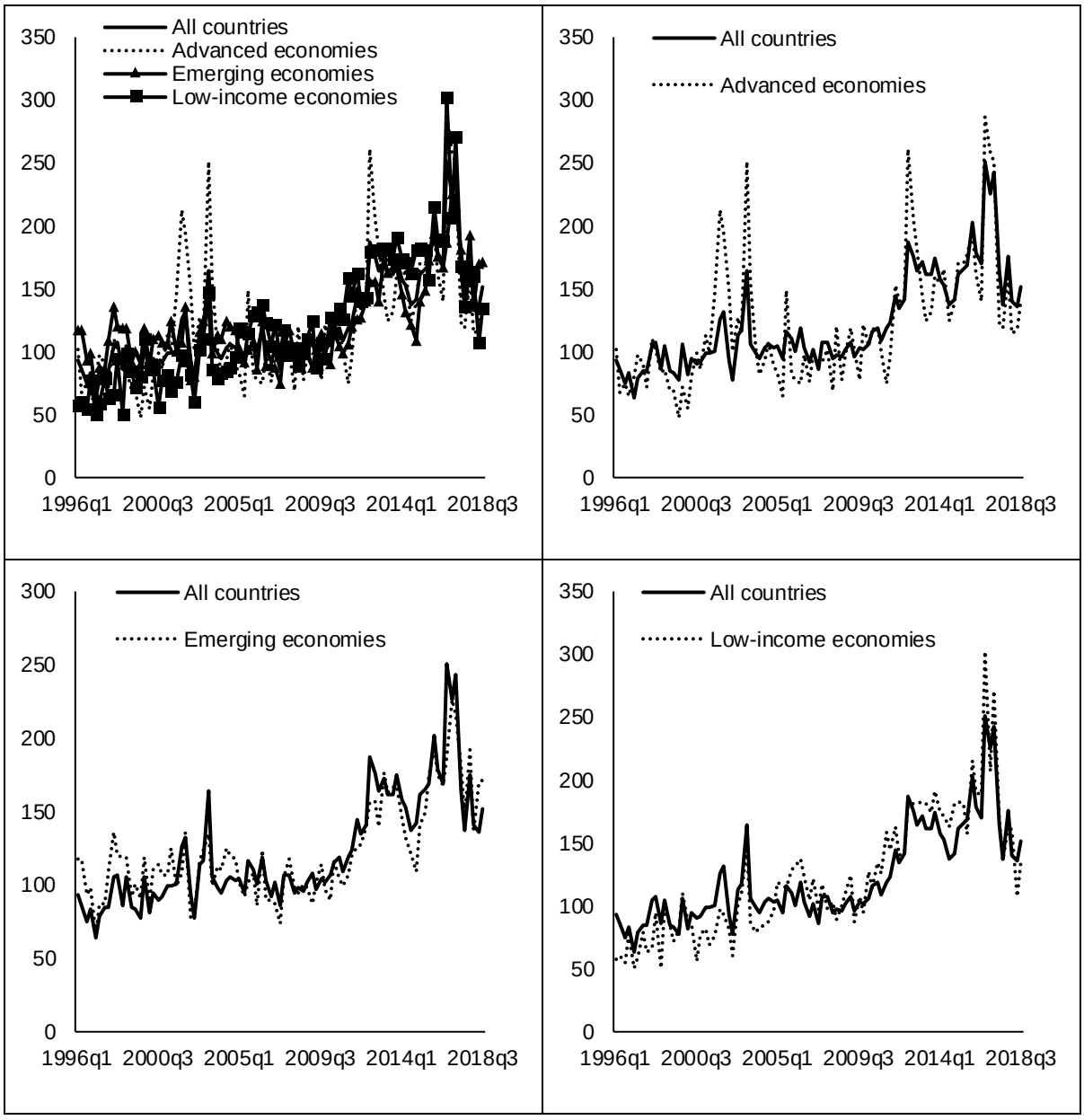

Note: The World Uncertainty Index (WUI) is computed by counting the frequency of uncertain (or the variant) in EIU country reports. The WUI is then normalized by total number of words, rescaled by multiplying by 1,000. Here is also rescaled by the global average of 1996Q1 to 2010Q4 such that 1996Q1-2010Q4=100. A higher number means higher uncertainty and vice versa. The EPU series come from Economic Policy Uncertainty website. Countries included: Brazil, Canada, Chile, China, France, Germany, India, Ireland, Italy, Japan, Korea, Mexico, Netherlands, Russia, Singapore, Spain, Sweden, United Kingdom, and United States. The US VIX index comes from the Federal Reserve Bank of St. Louis. Series

**Figure 3. Average WUI by income group**



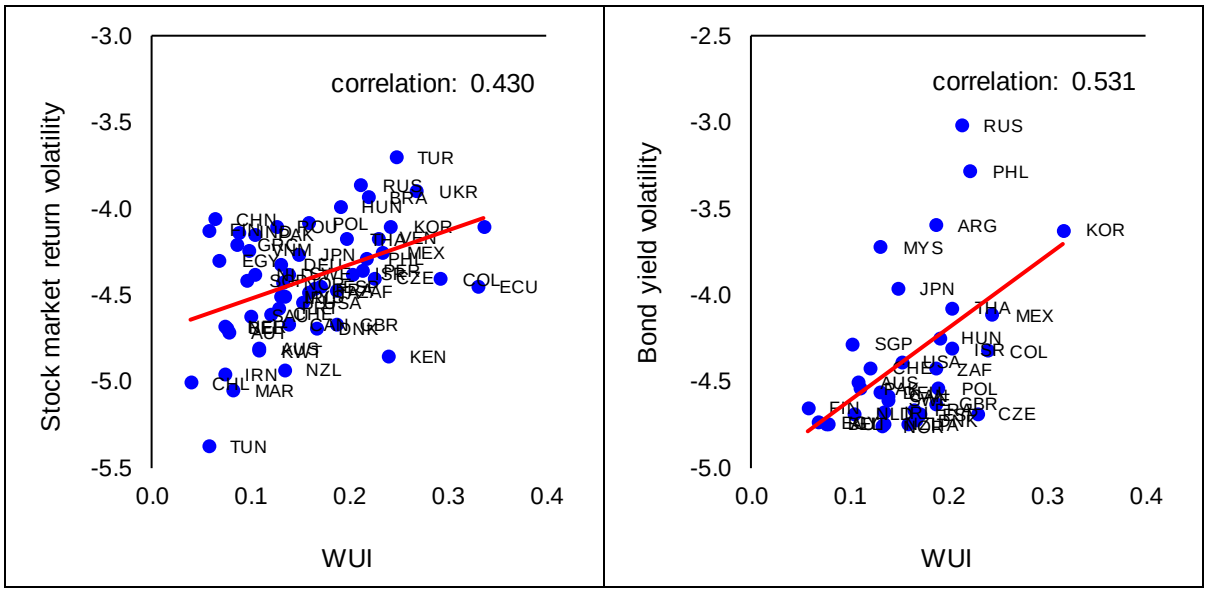

Note: The World Uncertainty Index (WUI) is computed by counting the frequency of uncertain (or the variant) in EIU country reports. The WUI is then normalized by total number of words and rescaled by multiplying by 1,000. A higher number means higher uncertainty and vice versa. For the list of countries in each income group, see Table 1.

**Figure 4. WUI by income group over time**



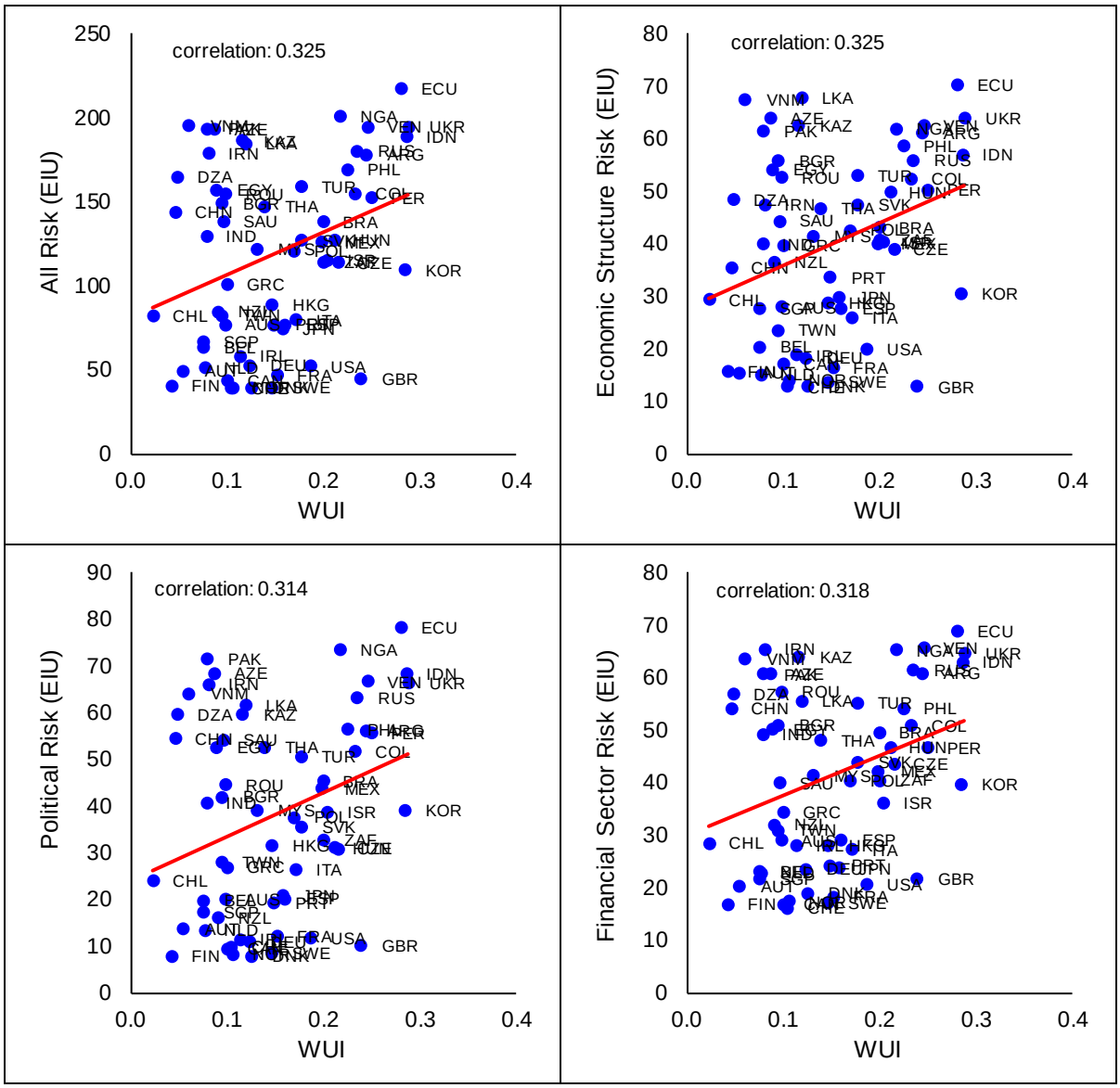

Note: The World Uncertainty Index (WUI) is computed by counting the frequency of uncertain (or the variant) in EIU country reports. The WUI is then normalized by total number of words, rescaled by multiplying by 1,000. Here is also rescaled by the global average of 1996Q1 to 2010Q4 such that 1996Q1-2010Q4=100. A higher number means higher uncertainty and vice versa. For the list of countries in each income group, see Table 1.

**Figure 5. WUI vs. Market Volatility**



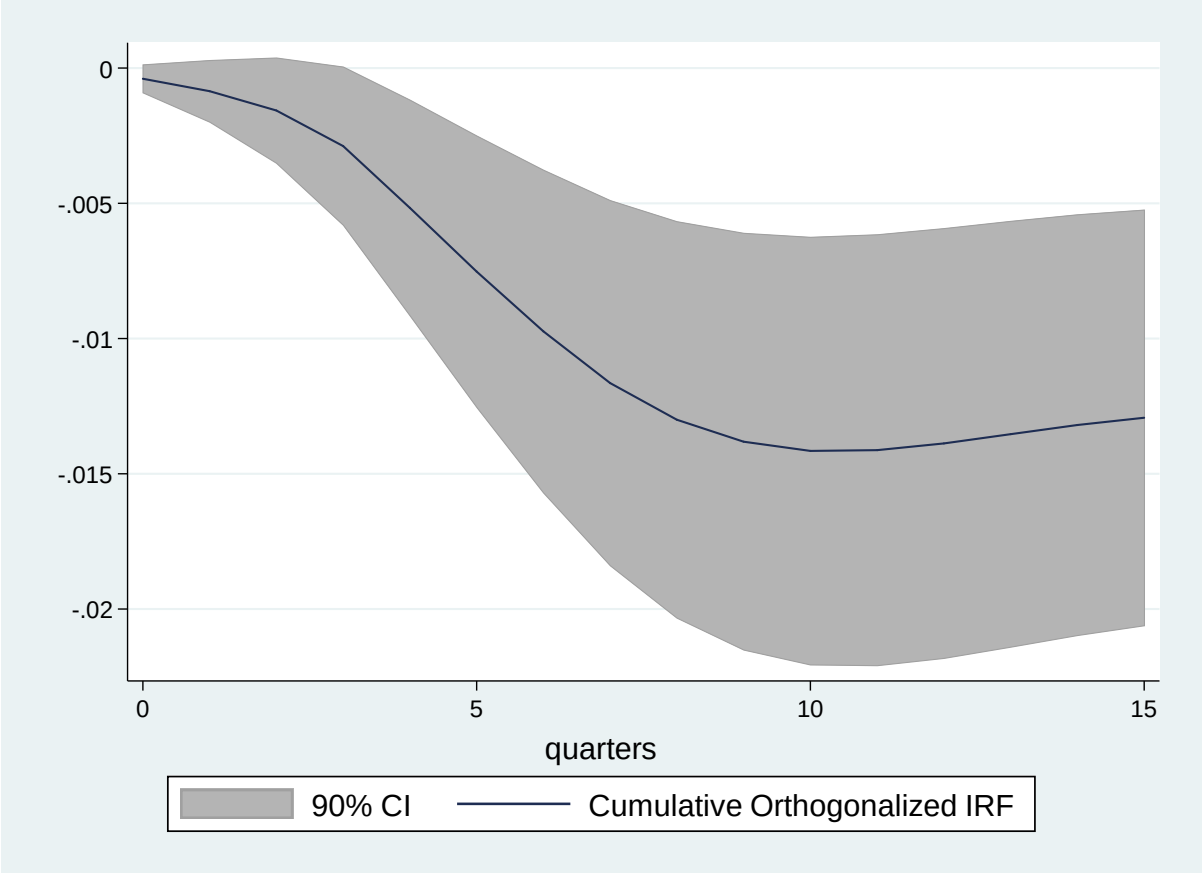

Note: The World Uncertainty Index (WUI) is computed by counting the frequency of uncertain (or the variant) in EIU country reports. The WUI is then normalized by total number of words and rescaled by multiplying by 1,000. The WUI is then normalized by total number of words, rescaled by multiplying by 1,000. A higher number means higher uncertainty and vice versa.

**Figure 6. WUI vs. Risks**



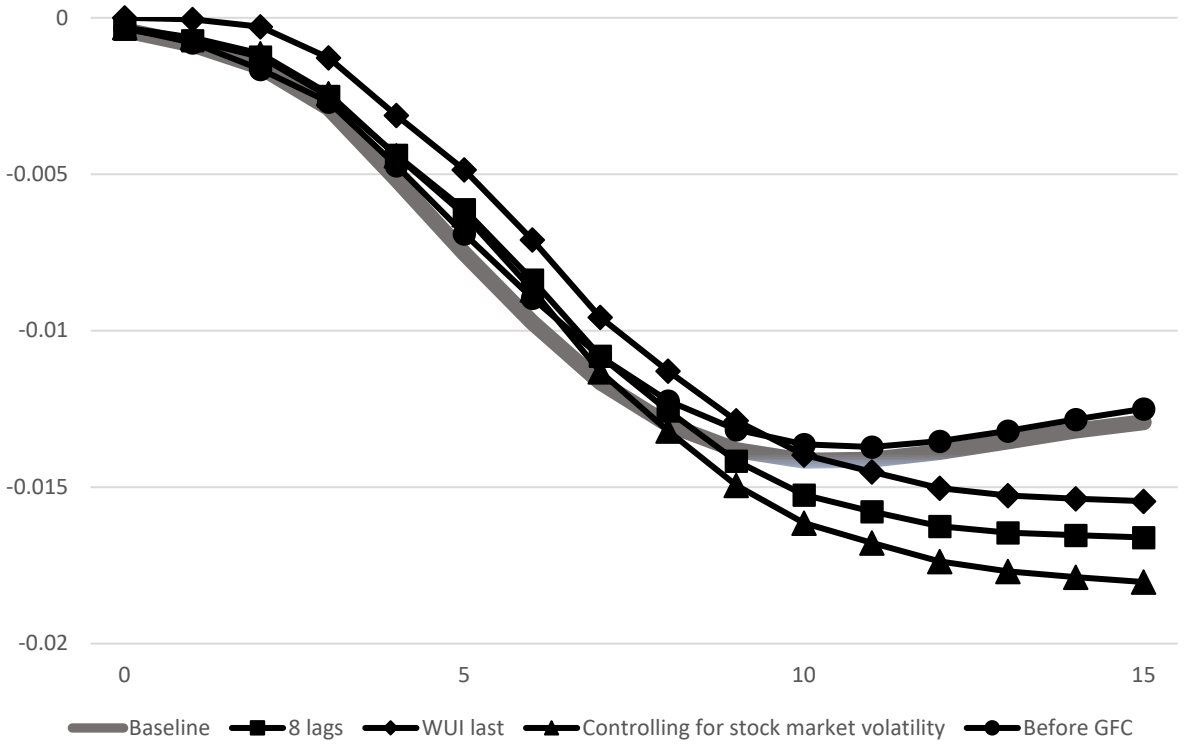

Note: The World Uncertainty Index (WUI) is computed by counting the frequency of uncertain (or the variant) in EIU country reports. The WUI is then normalized by total number of words and rescaled by multiplying by 1,000. The WUI is then normalized by total number of words, rescaled by multiplying by 1,000. A higher number means higher uncertainty and vice versa. The EIU's economic risk indicator is derived from a series of macroeconomic variables of a structural rather than a cyclical nature. Consequently, the rating for economic structure risk will tend to be relatively stable, evolving in line with structural changes in the economy. The financial risk indicator assesses the risk of a systemic crisis whereby bank(s) holding 10 percent or more of total bank assets become insolvent and unable to discharge their obligations to depositors and/or creditors. The political risk indicator evaluates a range of political factors relating to political stability and effectiveness that could affect a country's ability and/or commitment to service its debt obligations and/or cause turbulence in the foreign-exchange market. The All-risk indicator is the sum of the three indicators.

**Figure 7. GDP response to WUI innovations**




Note: VAR fit to quarterly data for a panel of 46 countries from 1996q1 to 2013q2. Impulse responses of GDP to a one-standard deviation increase in the WUI—equal to the change in average value in the index from 2014 to 2016—based on a Cholesky decomposition with the following order: the log of average stock return, the WUI and GDP growth. The specification includes four lags of all variables. Country and time fixed effects are included.

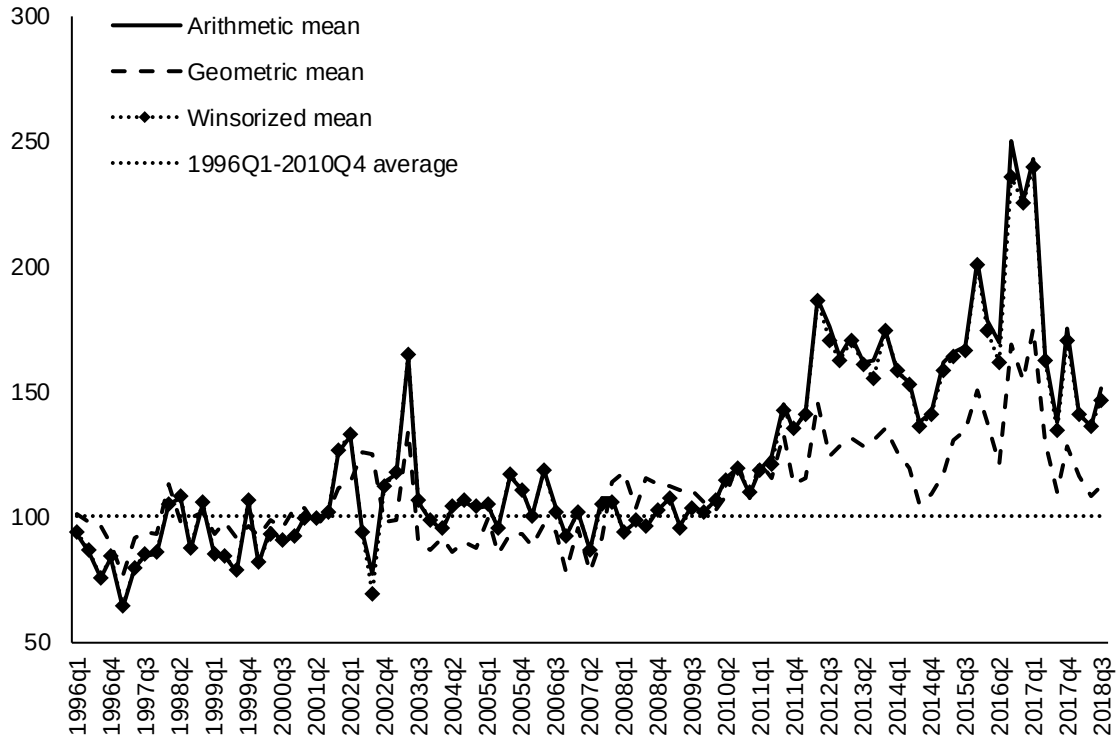
**Figure 8. GDP response to WUI innovations—robustness checks**




Note: VAR fit to quarterly data for a panel of 46 countries from 1996q1 to 2013q2. Impulse responses of GDP to a one-standard deviation increase in the WUI—equal to the change in average value in the index from 2014 to 2016—based on a Cholesky decomposition with the following order: the log of average stock return, the WUI and GDP growth. The baseline specification includes four lags of all variables. Country and time fixed effects are included. x-axis denotes quarter after the shock.

# APPENDIX A. ADDITIONAL FIGURES

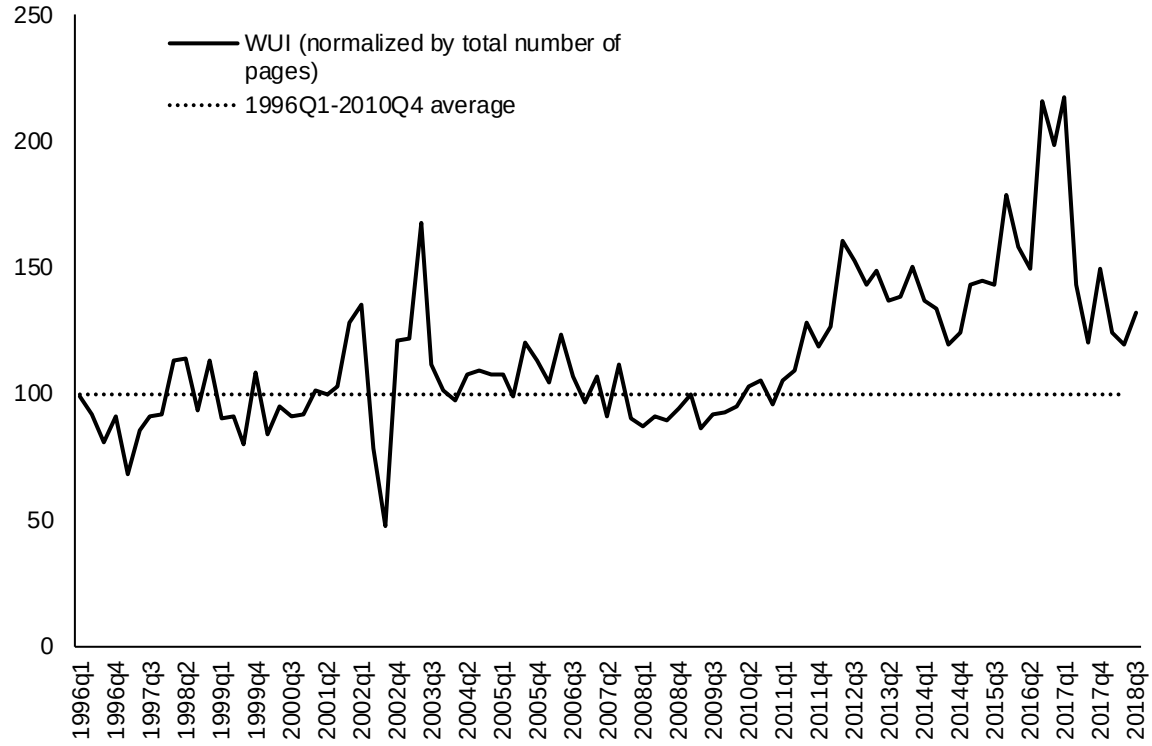
**Figure A1. Global WUI**




Note: The World Uncertainty Index (WUI) is computed by counting the frequency of uncertain (or the variant) in EIU country reports. The WUI is then normalized by total number of words, rescaled by multiplying by 1,000. Here is also rescaled by the global average of 1996Q1 to 2010Q4 such that 1996Q1-2010Q4=100. A higher number means higher uncertainty and vice versa. For the list of countries in each income group, see Table 1.

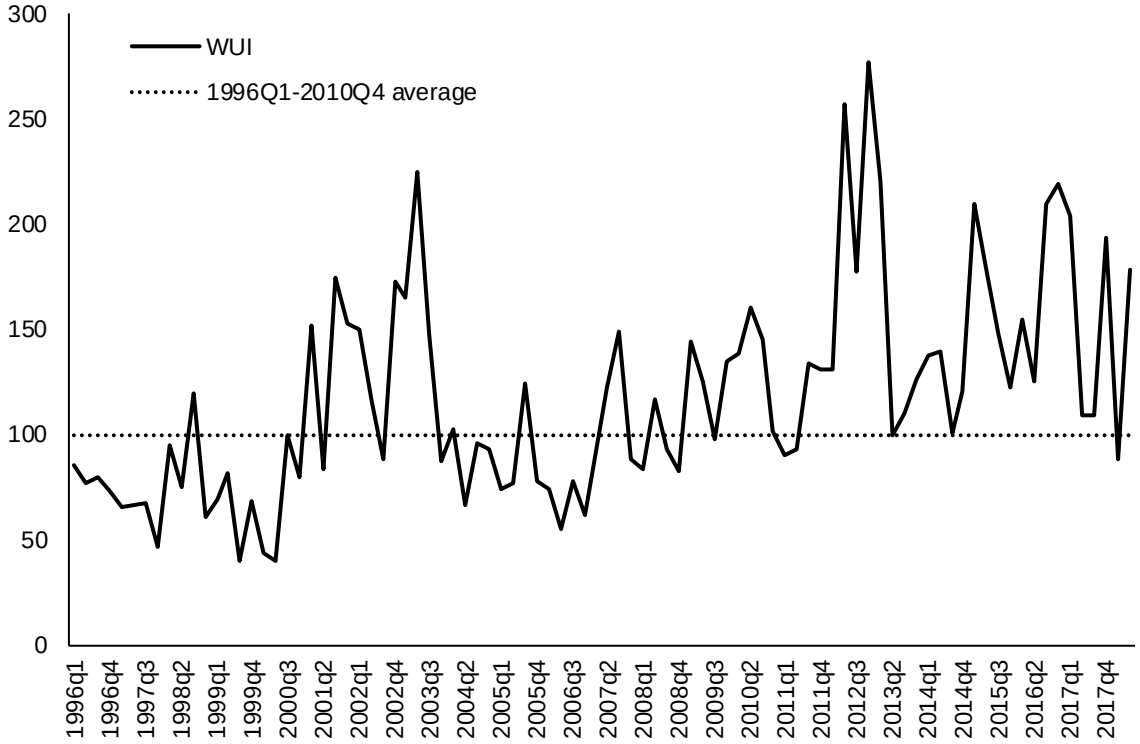
**Figure A2. Global WUI scaled by number of pages**

(unweighted global average)



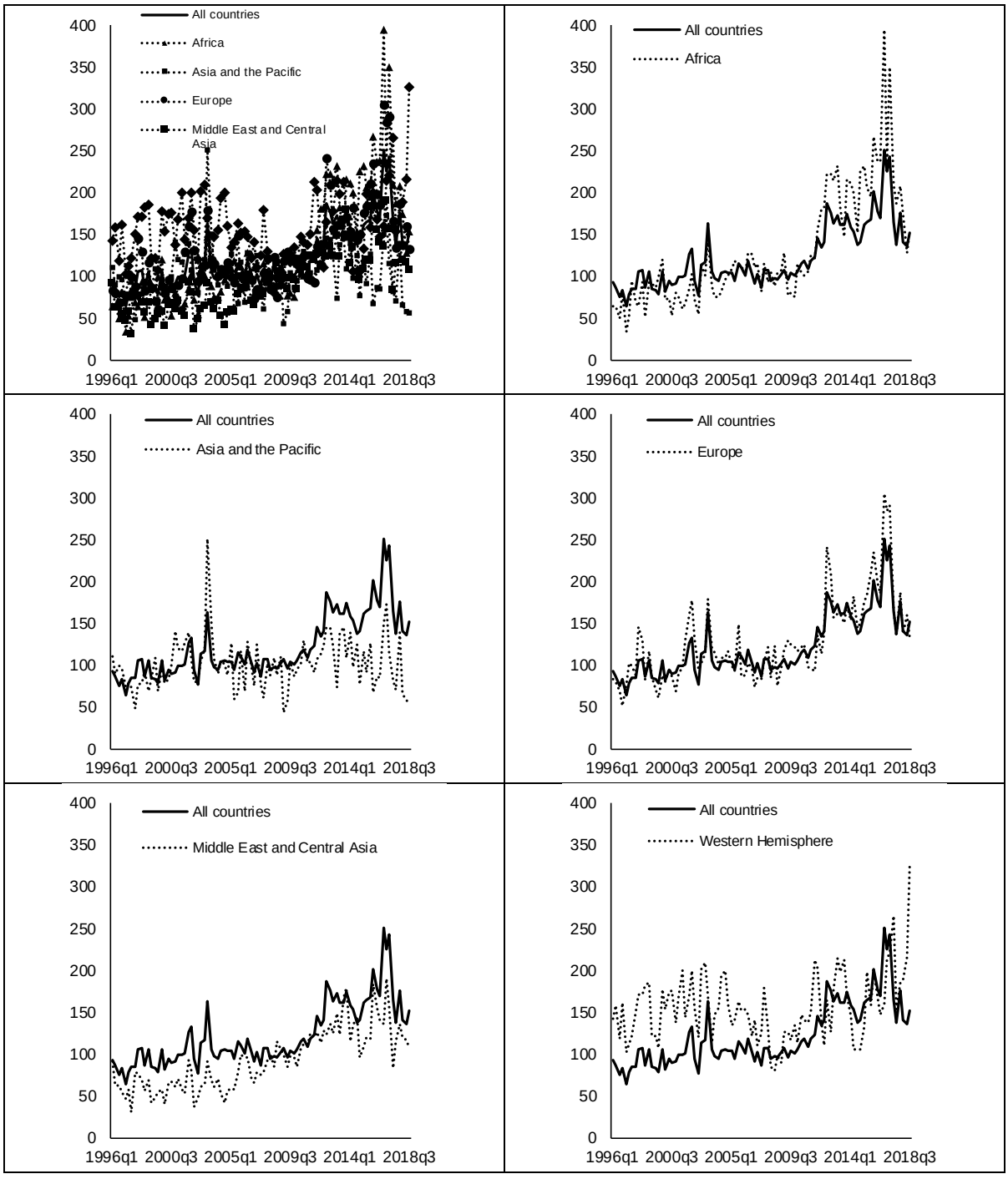

Note: The World Uncertainty Index (WUI) is computed by counting the frequency of uncertain (or the variant) in EIU country reports. The WUI is then normalized by total number of words, rescaled by multiplying by 1,000. Here is also rescaled by the global average of 1996Q1 to 2010Q4 such that 1996Q1-2010Q4=100. A higher number means higher uncertainty and vice versa. For the list of countries in each income group, see Table 1.

**Figure A3. Global WUI—GDP-Weighted Average**



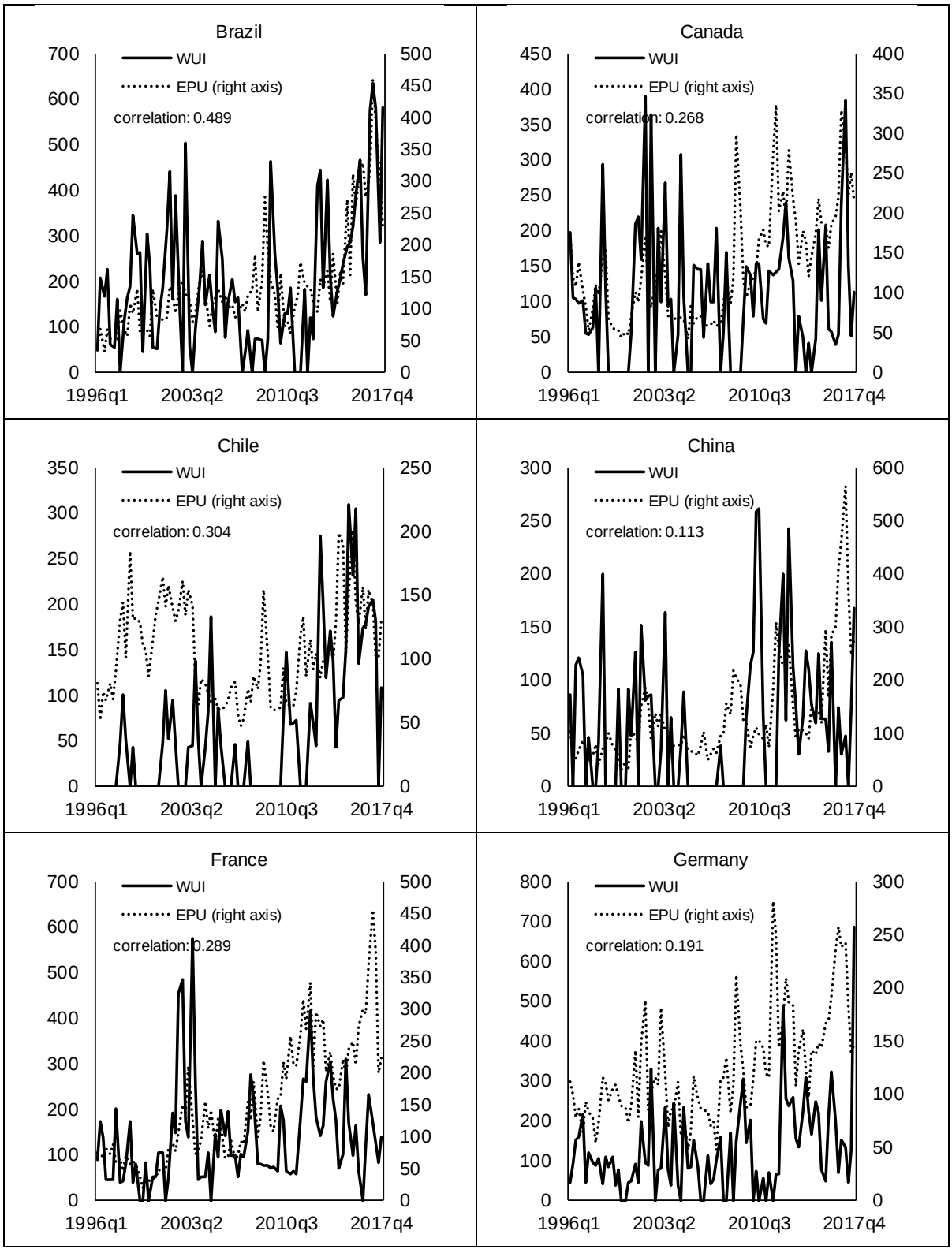

Note: The World Uncertainty Index (WUI) is computed by counting the frequency of uncertain (or the variant) in EIU country reports. The WUI is then normalized by total number of words and rescaled by multiplying by 1,000. The WUI is then normalized by total number of words, rescaled by multiplying by 1,000, and using the average of 1996Q1 to 2010Q4 such that 1996Q1-2010Q4=100.A higher number means higher uncertainty and vice versa. For the list of countries in each income group, see Table 1.

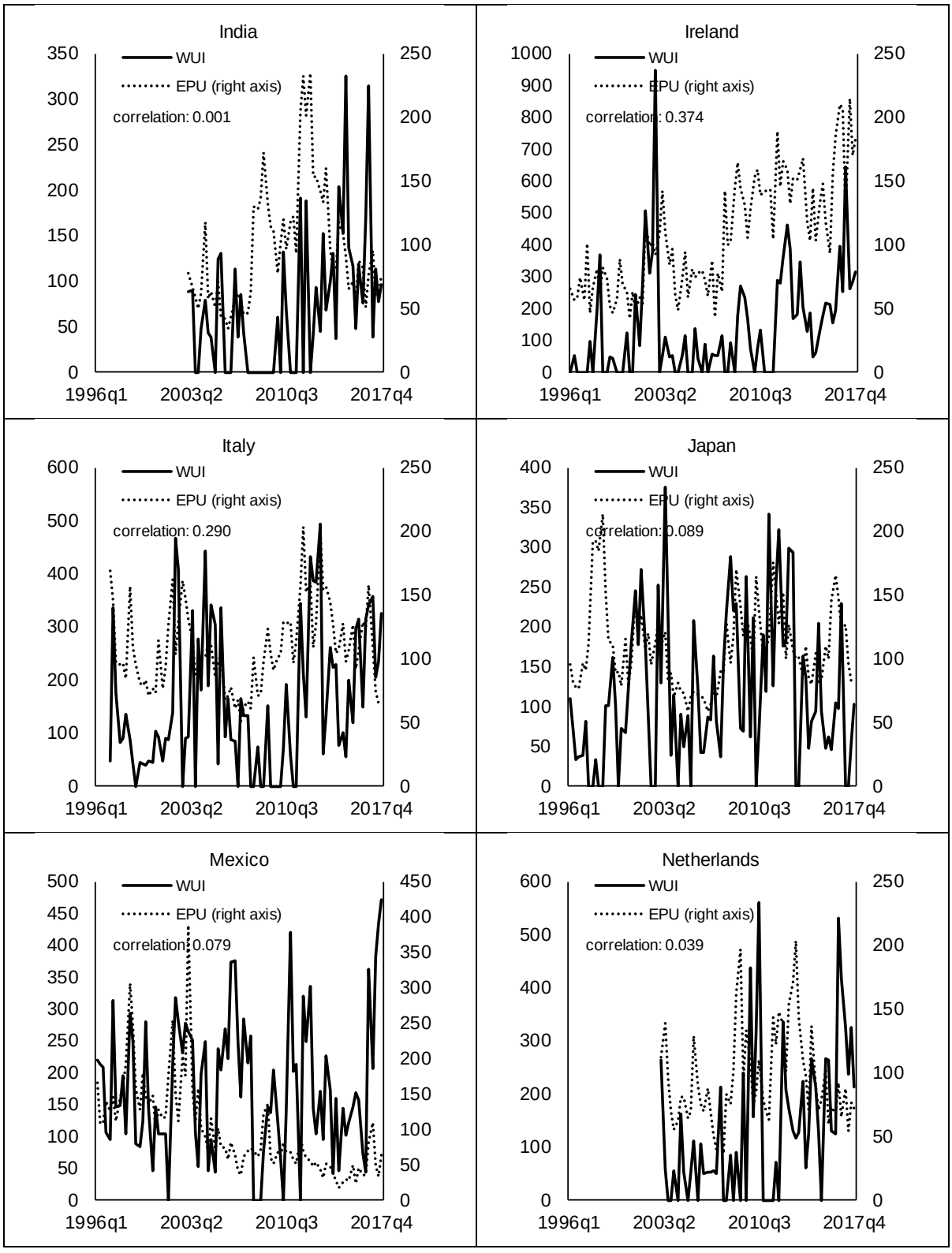
**Figure A4. WUI by region**

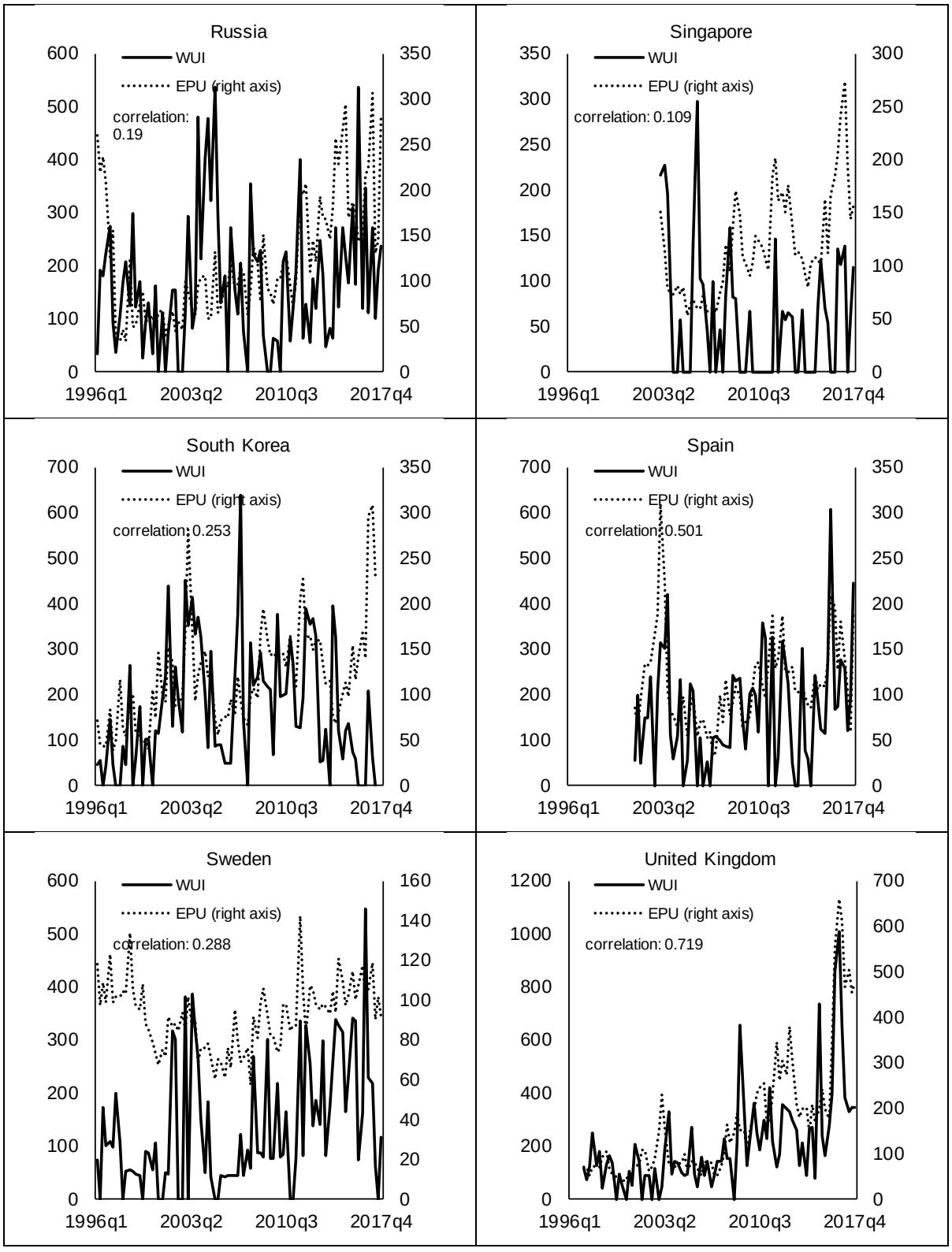


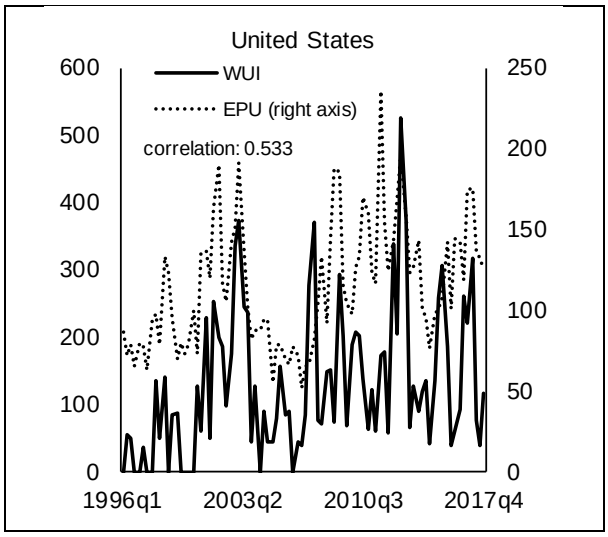

Note: The World Uncertainty Index (WUI) is computed by counting the frequency of uncertain (or the variant) in EIU country reports. The WUI is then normalized by total number of words, rescaled by multiplying by 1,000. Here is also rescaled by the global average of 1996Q1 to 2010Q4 such that 1996Q1-2010Q4=100. A higher number means higher uncertainty and vice versa. For the list of countries in each income group, see Table 1.

**Figure A5. WUI vs. EPU**




India
WUI
EPU (right axis)
correlation: 0.001
Ireland
WUI
EPU (right axis)
correlation: 0.374
Italy
WUI
EPU (right axis)
correlation: 0.290
Japan
WUI
EPU (right axis)
correlation: 0.089
Mexico
WUI
EPU (right axis)
correlation: 0.079
Netherlands
WUI
EPU (right axis)
correlation: 0.039
1996q1
2003q2
2010q3
2017q4


Russia
WUI
EPU (right axis)
correlation: 0.19
600
500
400
300
200
100
0
350
300
250
200
150
100
50
0
1996q1
2003q2
2010q3
2017q4
Singapore
WUI
EPU (right axis)
correlation: 0.109
350
300
250
200
150
100
50
0
300
250
200
150
100
50
0
1996q1
2003q2
2010q3
2017q4
South Korea
WUI
EPU (right axis)
correlation: 0.253
700
600
500
400
300
200
100
0
350
300
250
200
150
100
50
0
1996q1
2003q2
2010q3
2017q4
Spain
WUI
EPU (right axis)
correlation: 0.501
700
600
500
400
300
200
100
0
350
300
250
200
150
100
50
0
1996q1
2003q2
2010q3
2017q4
Sweden
WUI
EPU (right axis)
correlation: 0.288
600
500
400
300
200
100
0
160
140
120
100
80
60
40
20
0
1996q1
2003q2
2010q3
2017q4
United Kingdom
WUI
EPU (right axis)
correlation: 0.719
1200
1000
800
600
400
200
0
700
600
500
400
300
200
100
0
1996q1
2003q2
2010q3
2017q4




Note: The World Uncertainty Index (WUI) is computed by counting the frequency of uncertain (or the variant) in EIU country reports. The WUI is then normalized by total number of words, rescaled by multiplying by 1,000. Here is also rescaled by the global average of 1996Q1 to 2010Q4 such that 1996Q1-2010Q4=100. A higher number means higher uncertainty and vice versa.