The World Uncertainty Index[°]

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(Preliminary)

We construct a new index of uncertainty—the World Uncertainty Index (WUI)—for 143 individual countries on a quarterly basis from 1996 onwards, and for 34 large advanced and emerging market economies from 1955. 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, the SARS outbreak, the Gulf War II, the failure of Lehman Brothers, the Euro debt crisis, El Niño, the European border crisis, the UK Brexit vote, the 2016 US election and the recent US-China trade tensions. 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 addition, there is an inverted U-shaped relationship between uncertainty and democracy. In a panel vector autoregressive setting, we find that innovations in the WUI foreshadow significant declines in output. This effect varies across countries and across sectors within the same country: across countries, the effect is larger and more persistent in those with lower institutional quality; across sectors, the effect is stronger in those more financially-constrained.

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I. INTRODUCTION

The global economy is now projected to grow at 3.3 percent in 2019, down from 3.6 percent in 2018, according to the April 2019 edition of the IMF's *World Economic Outlook* (IMF 2019). The IMF points out several developments that have prompted the downward revision of the global economy. A key element is rising uncertainty. For example, Chapter 1 of the *World Economic Outlook*—which focuses on the prospects and policies for the global economy—mentions the word "uncertain" and its variants 36 times. Some of the references discuss the impact of uncertainty on global economic growth. For instance, the report notes that "amid high policy uncertainty and weakening prospects for global demand, industrial production decelerated… The slowdown was broad based, notably across advanced economies". The report also points out that political uncertainties "add downside risk to global investment and growth. These include policy uncertainty about the agenda of new administrations or surrounding elections, geo-political conflict in the Middle East, and tensions in east Asia". On the impact of uncertainty and trade tensions, the report notes that "higher trade policy uncertainty and concerns of escalation and retaliation would reduce business investment, disrupt supply chains, and slow productivity growth".

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; and for 34 large advanced and emerging market economies from the first quarter of 1955.[1] 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, in the last two decades, WUI spikes have occurred near the 9/11 attacks, the

[1] The 34 countries are: Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, China, Denmark, Finland, France, Germany, Greece, Hungary, India, Ireland, Israel, Italy, Japan, Korea, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, Russia, South Africa, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States.

SARS outbreak, the Gulf War II, the failure of Lehman Brothers, the Euro debt crisis, El Niño, the Europe border-control crisis, the UK's referendum vote in favor of Brexit, the 2016 US presidential elections and the recent US-China trade tensions. Uncertainty spikes tend to be more synchronized within advanced economies and between economies with tighter trade and financial linkages. 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 addition, we find that there is an inverted U-shaped relationship between uncertainty and democracy.

In contrast to existing measures 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 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, and tends to rise close to political elections.

We use the WUI to provide new evidence of the effect of uncertainty on economic activity. Establishing casual inference is challenging because uncertainty responds to changes in economic activity. To make progress, we follow macro and micro approaches. At the macro level, we first use a vector autoregression (VAR) model to an international panel data and we 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. This effect is robust to several alternative specifications: alternative lag-structures, 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). We also apply a SVAR-IV approach

(Plagborg-Moller and Wolf 2019) in which we instrument the WUI with exogenous national election dates. The results of this exercise confirm that innovations in the WUI foreshadow significant declines in output.

Second, we exploit the large country coverage of the dataset to examine whether the effect of uncertainty on economic activity varies across countries. In particular, we use the WUI to investigate whether institutional quality facilitates or mitigates the transmission of economic and political uncertainty. The results strongly suggest that the effects of uncertainty on output and investment depend on the level of institutional quality. In particular, while the effect of uncertainty is large and persistent in countries with relatively low institutional quality, is smaller and short-lived in countries with relatively high institutional quality.

Finally, we use sector-level data and a differences-in-differences strategy, to exploit sectoral differences in the exposure to uncertainty. Consistent with the theoretical work Aghion et al. (2010), we find that uncertainty has larger effect in sectors with higher external financial dependence. These sector-level results are suggestive of a casual impact of uncertainty on output and productivity in sectors that are financially-constrained.

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 presents several analyses on the effect of uncertainty on economic activity. Section VI 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, and for 34 large advanced and emerging market economies from the first quarter of 1955.

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 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 for each country (from 1955 for 34 countries). [2]

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.[3] Thus, to make the WUI comparable across countries, we scale the raw counts by the total number of words in each report.[4] 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.

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

[3] 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.

[4] 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.

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 global GDP-weighted WUI, scaled by the total number of words and multiplied by 1,000 in Figure 1A.[5] The sample ranges from first quarter of 1996 to the first quarter of 2019. The index spikes near the 9/11 attacks, the SARS outbreak, the Gulf War II, the failure of Lehman Brothers, the Euro debt crisis, El Niño, Europe border-control crisis, the UK's referendum vote in favor of Brexit, the 2016 US presidential elections and the recent US-China trade tensions.

In Figure 1B, we show the global WUI index based on unweighted averages. The pattern is similar to the one show in Figure 1A, with the notable exception of the absence of spike near the failure of Lehman Brothers. Similar evidence emerges also when using the geometric mean and the arithmetic mean on winsorized data (see Figure A1 in Appendix A). Finally, 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 five 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) and is now close to its historical peak. 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.

[5] 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).

correlated at 0.1 with the US VIX).[6] 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. As argued by Pastor and Veronesi (2017), a reason behind the disconnect between uncertainty and volatility in recent years is that political news has been more unreliable and difficult for investor to interpret.

Fact 2: Uncertainty is higher in emerging and low-income economies than in advanced economies (Figure 3).[7] 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.

Fact 3: There is an inverted U-shaped relationship between uncertainty and democracy (Figure 4). As countries move from a regime of autocracy and anocracy towards democracy, uncertainty increases. As countries move from some degree of democracy to full democracy, uncertainty declines.

Fact 4: 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.[8] 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

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

[7] The income groups classification follows the IMF WEO. Figure A3 in Appendix A provides results by regions.

[8] Following the approach of Kalemli-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.

why in Figure 5 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).[9]

Fact 5: 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).

IV. RELIABILITY TESTS

We evaluate the WUI in several ways. First, we examine the narrative associated with the largest global spikes (see Figure A5 in the Appendix for those countries with WUI going back to the 1955). 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). Third, we check whether the WUI tends to spike during political elections.

A. 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

[9] 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.

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 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.[10] At the same 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 purging for country and time fixed effects (Table 6, Columns I-III). When looking at individual countries (see Figure A4 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

[10] 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.

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

B. The WUI versus Volatility and Risks

We then check the correlation between the WUI and existing measures 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.

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

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.[12]

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".[13] 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, 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.[14]

C. The WUI near Elections

There is evidence from the financial literature that uncertainty tends to increase around elections. Bialkowski, Gottschalk and Wisniewski (2008) and Boutchkova, Doshi, Durnev and Molchanov (2010) examine the stock market volatility around national elections and find that volatility is significantly higher than normal during the election period. Boutchkova et al. (2010) find that the return volatility is higher around elections for firms operating in politically sensitive industries, suggesting that the increased volatility reflects a higher political risk. Bernhard and Leblang (2006) document changes in bond yields,

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

[13] 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.

[14] 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.

exchange rates, and equity volatility around elections and other political changes and show that these changes are larger during elections with less predictable outcomes. Thus, a valuable check is whether the WUI is higher than normal during elections.

To test for this, we collect data on national elections in 72 countries from 1996q1 to 2019q1. The detailed election information is obtained from a variety of sources. Our main source is the official record published by each country's election authority. Among other sources we most commonly used were Bormann and Golder (2013), Adam Carr's Electoral Archive *Psephos*; Roberto Ortiz de Zárate's *World Political Leaders*; PARLINE database on national parliaments by the Inter-Parliamentary Union; *European Election Database* by Norwegian Centre for Research Data; and the "Elections in […]" series by Dieter Nohlen and coauthors.

The resulting dataset comprises 377 elections, among which 162 are exogenously specified by electoral law and cannot be dissolved before the expiry of the government full term.

Table 6 presents bivariate regressions between the WUI index and lags and leads of elections dates, purging for country and time fixed effects. It shows that the WUI tends to increase in the quarter preceding the election date and stays above its average up to one-to-two quarters after the election. The increase in uncertainty tends to be higher in the case of exogenous elections.

V. EMPIRICAL ANALYSIS

A. 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 5 (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 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.[15]

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.

Instrumenting WUI with Exogenous Elections

As discussed earlier, establishing casual inference is challenging. To make progress on this, we rely on an instrumental variable approach in which innovations in WUI are instrumented by exogenous elections dates. As discussed by Julio and Yook (2012a),

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

exogenous elections provide a natural experiment framework for studying the economic implication of political uncertainty and allow to disentangle some of the endogeneity between economic growth and uncertainty.

The approach we follow is the SVAR-IV proposed by Plagborg-Moller and Wolf (2019). It consists in ordering the instrument (election dates) first in the VAR and compute the IV impulse response function as the ratio between the impulse response function of output to innovations in the instrument and the initial response of the endogenous variable (the WUI) to innovation in the instrument. As discussed by Plagborg-Moller and Wolf (2019), the relative impulse responses obtained from this approach are (nonparametrically) identical to those obtained from the Local Projection-IV procedure of Jorda et al. (2018), Stock and Watson (2018) and Ramey and Zubairy (2018).

Figure 9 reports the model-implied impulse response of GDP to an exogenous 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 remain statistically significant through the entire estimation horizon and the effect is similar, albeit slightly larger to the baseline in Figure 7 (it peaks about 1.5 percent after 8 quarters of the shock).

While the instrument is strong (Table 6 and Figure 9), a possible concern with its validity is that political uncertainty is not the only mechanism through which elections can affect economic activity. Indeed, according to the political business cycle hypothesis (Nordhaus 1975), incumbents may have an incentive to manipulate fiscal and monetary policy to stimulate economic activity prior to an election in order to maximize the probability of re-election. This, however, would likely attenuate the negative effect of uncertainty on economic activity because WUI is counter-cyclical. In addition, controlling for stock market returns and growth in the VAR mitigate this concern.

In all, the results corroborate previous evidence on the negative effects of political uncertainty and instability on economic activity (Barro 1991; Alesina and Perotti 1996, Julio and Yook 2012a).

B. WUI and the Role of Institutional Quality

The economic literature has long established that the quality of institutions is an important driver of economic development and long-run growth (Acemouglu et al. 2001, and references therein). This section tests whether a channel through which institutional quality affects economic activity is by amplifying the effect of uncertainty shocks.

Daude and Stein (2007) argue that corruption may increase uncertainty, pointing to interactions between institutional quality and uncertainty. Julio and Yook (2012b) find the investment cycles are much less pronounced in countries with relatively stable political systems, higher control of corruption and more checks and balances on executive authority. They also find that institutional quality is an important channel through which political uncertainty affects capital flows. FDI cycles around elections are large for countries with lower institutional quality. Countries with well-functioning institutions quality experience mild-to-insignificant cycles in FDI around elections.

In this section, we use the WUI to investigate whether institutional quality facilitates or mitigates the transmission of economic and political uncertainty. For this purpose, we follow the local projection method proposed by Jordà (2005) to estimate impulse-response functions. This approach has been advocated by Auerbach and Gorodnichenko (2013) and Romer and Romer (2015), among others, as a flexible alternative to vector autoregression (autoregressive distributed lag) specifications since it does not impose dynamic restrictions. It is better suited to estimating nonlinearities in the dynamic response—such as, in our context, interactions between uncertainty shocks and institutional quality.

The baseline specification is:

$$y_{t+k,i} - y_{t-1,i} = \alpha_i + \gamma_t + \beta_k WUI_{i,t} + \theta X_{i,t} + \varepsilon_{i,t} \quad (1)$$

in which *y* is the variable of interest, namely the log of GDP, or investment; β_k denotes the (cumulative) response of the variable of interest in each *k* year after a shock to WUI; α_i are country fixed effects, included to take account of differences in countries' average growth rates; γ_t are time fixed effects, included to take account of global shocks; and X_{it} is a set a of control variables including two lags of WUI, as well as lags of GDP growth.

Equation (1) is estimated using OLS on annual data for the entire set of 143 countries for which the WUI is available. Impulse response functions (IRFs) are then obtained by plotting the estimated β_k for *k*= 0,1,..4, with 90 percent confidence bands computed using the standard deviations associated with the estimated coefficients β_k—based on clustered robust standard errors.

This baseline specification is then extended to allow the response to vary with business conditions or the stance of macroeconomic policy as follows:

$$y_{i,t+k} - y_{i,t-1} = \alpha_i + \gamma_t + \beta^l D_i WUI_{i,t} + \beta^h (1 - D_i) WUI_{i,t} + \theta' X_{i,t} + \varepsilon_{i,t} \qquad (2)$$

where *D* is a dummy variable which takes value 1 for countries with a score in the indicator of rule of law (our baseline indicator of quality of institutions).[16]

Figure 10 reports the impulse response functions of output and investment to a one standard deviation increase in the WUI. Both output and investment declines following an increase in the WUI.[17] These average effects, however, mask important differences across countries depending on the level of institutional quality. In particular, while the effect of uncertainty is large and persistent in countries with relatively low institutional quality, is smaller and short-lived in countries with relatively high institutional quality (Figure 11).

[16] The results, available upon requests, are qualitatively similar to those obtained with other governance indicators such as control for corruption and regulatory quality.

[17] Similar results, available upon requests, are obtained using a panel VAR approach.

Institutional quality is likely to be related to other countries structural features. To check the robustness of our findings we use three alternative specifications. First, we augment equation (1) to include the interaction between the level of GDP per capita and the WUI. Second, we modify the dummy variable to take value 1 for rule of law reforms (defined as those observation where the rule of law indicator increases by more than the 75th percentile of the distribution of the change in the indicator). This specification allows to test whether the effect of uncertainty in a given country is smaller (larger) after the country improved its institutional quality. Third, we estimate equation (2) by instrumenting the institutional quality dummy with European settler's mortality rates, in the same spirit of Acemoglu et al. (2001). The results obtained with this specification are consistent with the baseline results (Figure 12), suggesting that institutional quality is an important factor mediating the impact of uncertainty on the economy.

C. Sector-level analysis

In this section we extend the analysis in Choi et al. (2017) to examine the impact of uncertainty on productivity by testing a specific channel through which uncertainty can affect productivity growth: during periods of high uncertainty, firms that are credit constrained switch the composition of investment by reducing productivity-enhancing investment—such as on information and communication technology (ICT) capital—which is more subject to liquidity risks (Aghion et al., 2010).

For this purpose, we use industry-country to estimate the following specification:

$$\Delta y_{jit} = \alpha_{ij} + \gamma_{it} + \delta_{jt} + \sum_{k=0}^{3} \beta_k WUI_{i,t-k} EFD_j + \varepsilon_{jit} \quad (3)$$

where y is the log of sectoral output (or labor productivity); α_{ij} are sector-country fixed effects; γ_{it} are country-time fixed effects; δ_{jt} are sector-time fixed effects; EFD is the Rajan and Zingales's (1998) measure of the degree of dependence on external finance in each industry—measured as the median across all U.S. firms, in each industry, of the ratio of total capital expenditures minus the current cash flow to total capital expenditures.

Industry-level dependent variables are taken from the United Nations Industrial Development Organization (UNIDO) database. We measure industry output by value-added.[18] Nominal output is deflated by the Consumer Price Index taken from the World Economic Outlook database. All these variables are reported for 22 manufacturing industries based on the INDSTAT2 2016, ISIC Revision 3, and are available for 55 advanced and developing economies from 1970 to 2014.[19]

The advantage of having a three-dimensional (*j* industries, *i* countries, and *t* periods) panel dataset is twofold.[20] First, it allows controlling for various unobserved factors by including country-time (*i*, *t*), industry-country (*j*, *i*), and industry-time (*j*, *t*) fixed effects. The inclusion of country-time fixed effect is particularly important, as it allows controlling for any unobserved cross-country heterogeneity in the macroeconomic shocks that affect industry growth. In a pure cross-country analysis, this control would not be possible, leaving open the possibility that the impact attributed to uncertainty would be due to other unobserved macro shocks. Second, it mitigates concerns about reverse causality. While it is typically difficult to identify causal effects using aggregate data, it is much more likely that uncertainty affects industry-level outcomes than the other way around. This is because when one controls for country-time fixed effect—and, therefore, aggregate growth, reverse causality implies that differences in growth across sectors influence uncertainty at the aggregate level. Moreover, our main independent variable is the interaction between uncertainty and industry-specific technological characteristics obtained from the U.S. firm-level data, which makes it even less plausible that causality runs from industry-level growth to this composite variable.

[18] Similar results are obtained using gross output instead.

[19] While the original INDSTAT2 database includes 23 manufacturing industries, we exclude the "manufacture of recycling" industry due to insufficient observations. See Table A1 for the list countries covered in the analysis.

[20] While Braun and Larrain (2005) is the first one to exploit the time dimension using the Rajan and Zingales' (1998) approach, they do not use a complete set of fixed effects, which may bias their results. Instead, we follow Dell'Ariccia et al. (2009) and Samaniego and Sun (2015) and use three kinds of two-way fixed effects, which mitigates endogeneity concerns substantially.

Figure 13 and 14 reports the differential output and labor productivity effects to a one-standard deviation increase in the WUI—equal to the change in average value in the index from 2014 to 2016—of an industry with high external financial dependence (at the 75th percentile distribution of the indicator) compared to an industry with low external financial dependence (at the 25th percentile distribution of the indicator). The figures show that the response of output and productivity becomes statistically significant after one year of the uncertainty shocks. The effects are also moderate in size. In particular, a one-standard deviation increase in the WUI reduces output (productivity) of an industry with high external financial dependence compared to an industry with low external financial dependence by about 2½ (1½) percent three years after the uncertainty shock.

VI. CONCLUSIONS

We construct a new index of uncertainty (World Uncertainty Index-WUI) for 143 countries from the first quarter of 1996 onward, and from the first quarter of 1995 for 36 systemically large economies, 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.

We use the WUI to investigate the relationship of uncertainty to output, investment and productivity. Our findings are broadly consistent with theories and previous empirical studies highlighting negative economic effects of uncertainty shocks. The results suggest that the current historically-high world level of uncertainty may harm global economic activity. In particular, back-to-the envelope calculations based on our estimation results suggest that the increase in uncertainty observed in the first quarter of 2019 could be enough to knock up to 0.5 percent of global growth over the course of the year.

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***	129.064***	59.941***						
	(2.96)	(4.60)	(3.52)						
Stock Vol				0.353***	0.131**	0.128**			
				(3.30)	(2.08)	(2.19)			
Growth							-0.025***	-0.017***	-0.007*
							(-4.41)	(-3.58)	(-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.

Table 6. WUI and elections and shocks

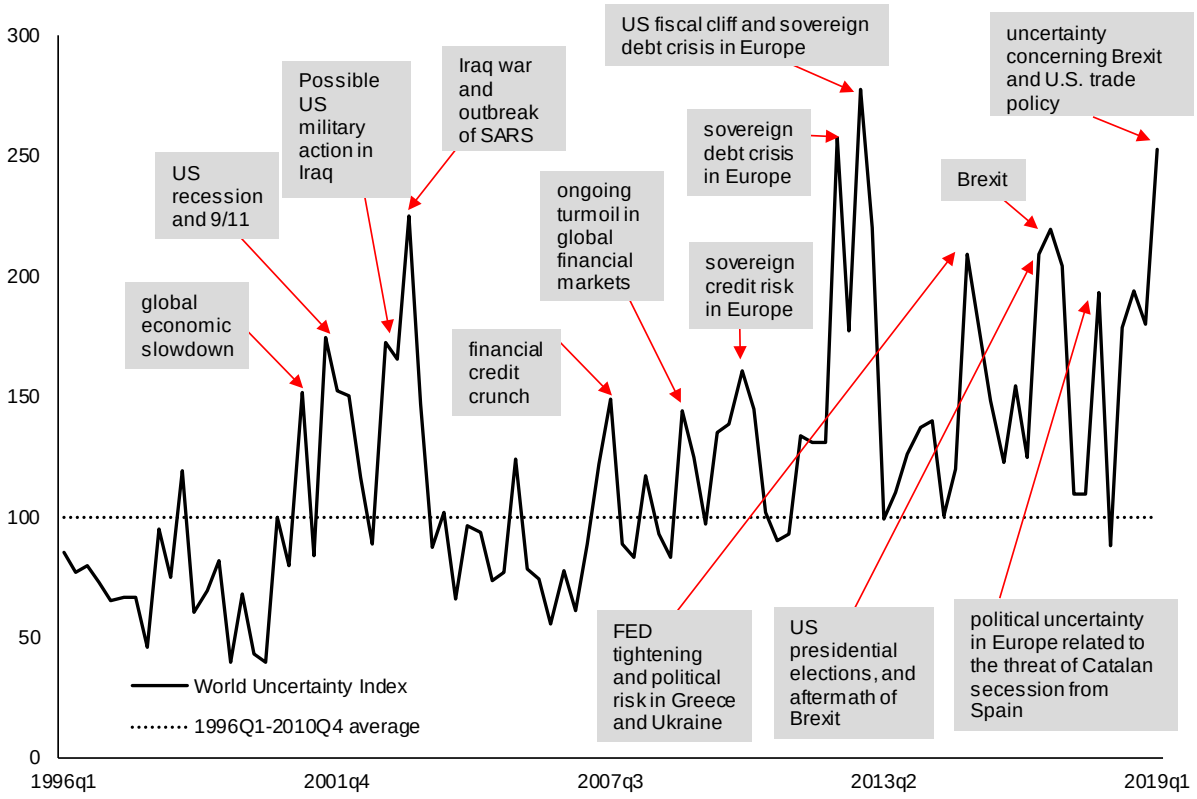
	t-2	t-1	t	t+1	t+2
All	-0.002	0.022***	0.044***	0.047***	0.023**
	(-0.29)	(2.63)	(4.64)	(4.78)	(2.90)
Exogenous	-0.003	0.036**	0.074***	0.053***	0.015
	(-0.19)	(2.44)	(4.21)	(3.54)	(1.17)

Note: *,**,*** denote statically significance at 10, 5, and 1 percent respectively. T-statics in parenthesis.

FIGURES

Figure 1A. Global WUI over time

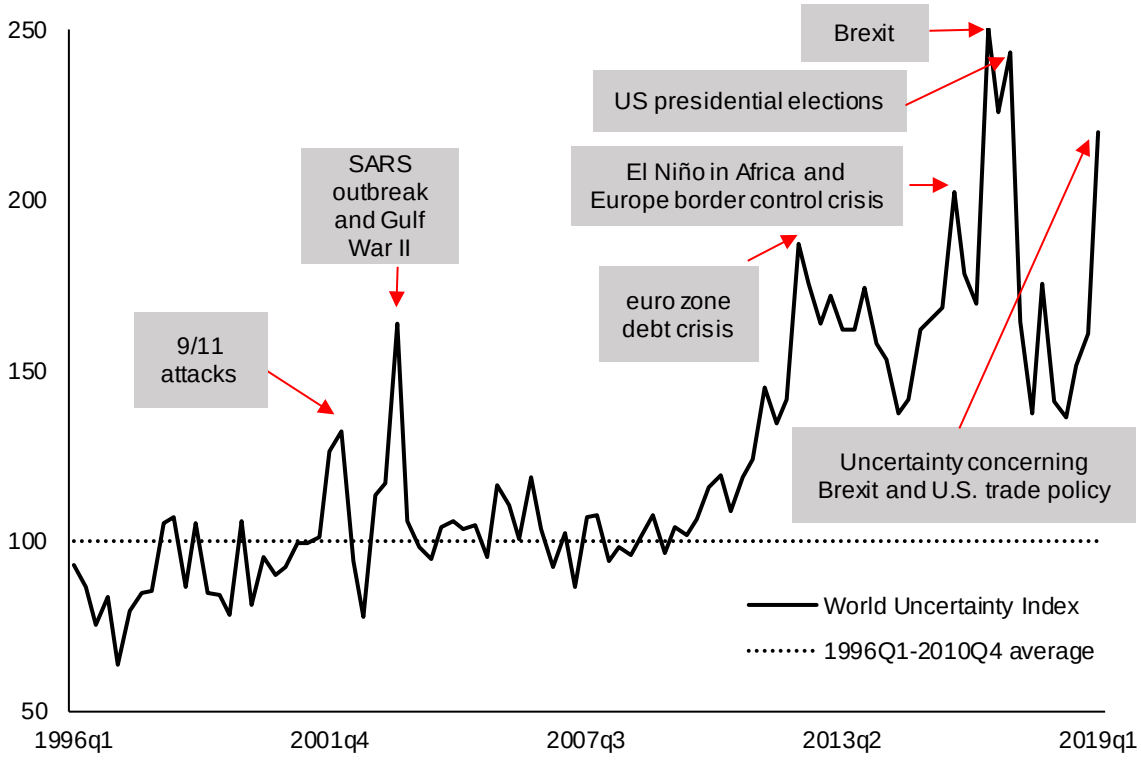
(weighted global average)



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 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 1B. Global WUI over time

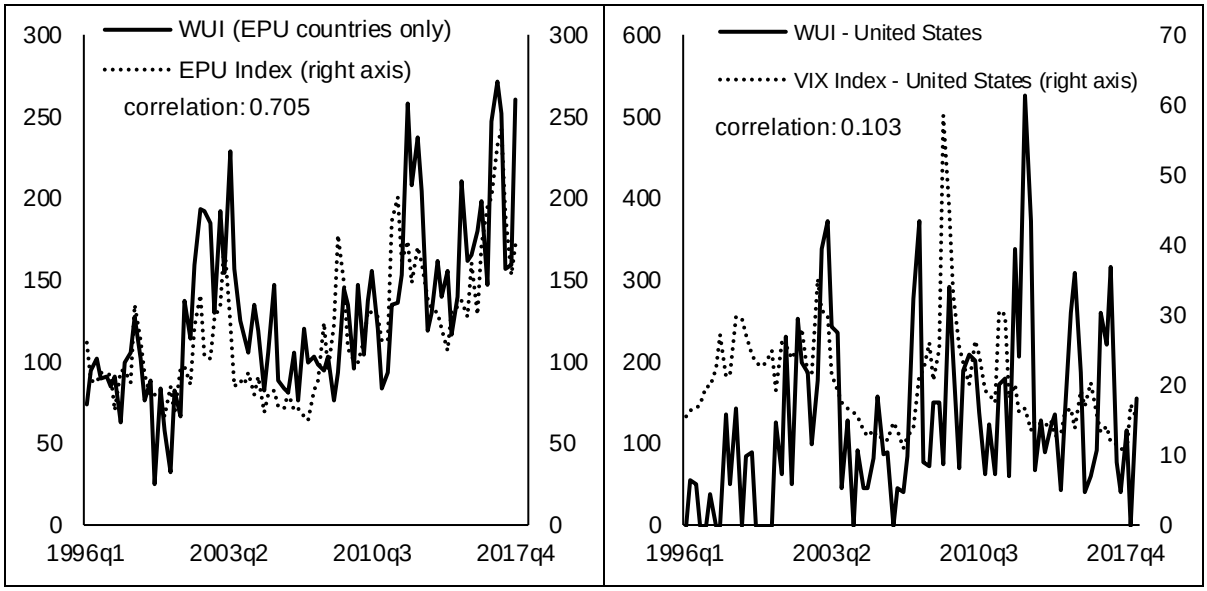
(unweighted global average)



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.

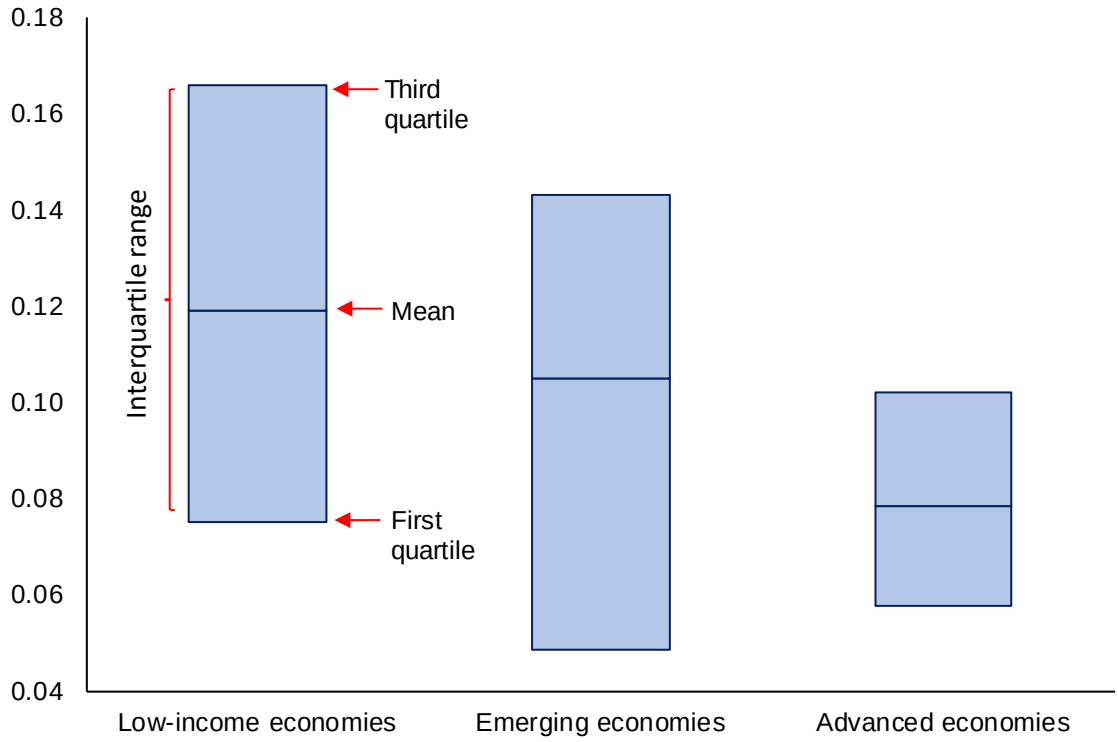
Figure 2. Global WUI vs. EPU and VIX Indexes

(unweighted global averages)



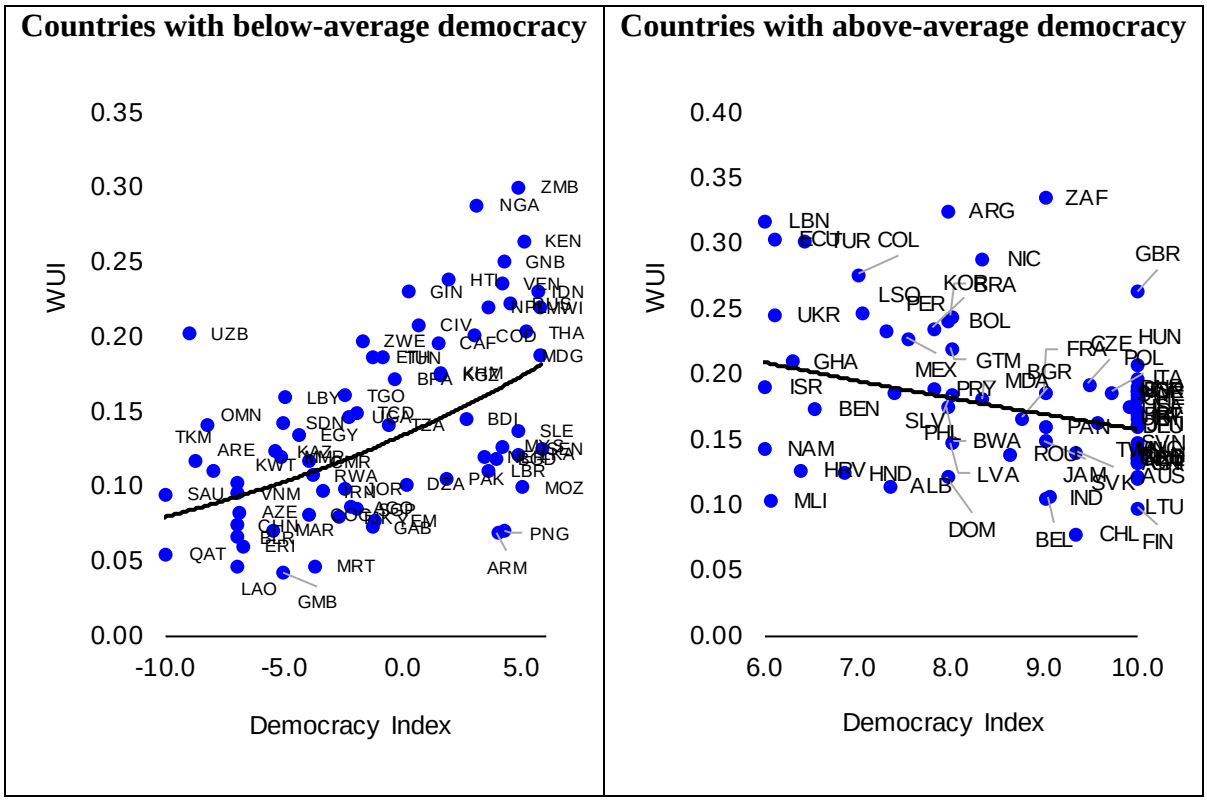
Note: The World Uncertainty Index (WUI) is computed by counting the frequency of uncertain (or the variant) in EIU country reports. The WUI is then normalized by total number of words, rescaled by multiplying by 1,000. Here is also rescaled by the global average of 1996Q1 to 2010Q4 such that 1996Q1-2010Q4=100.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



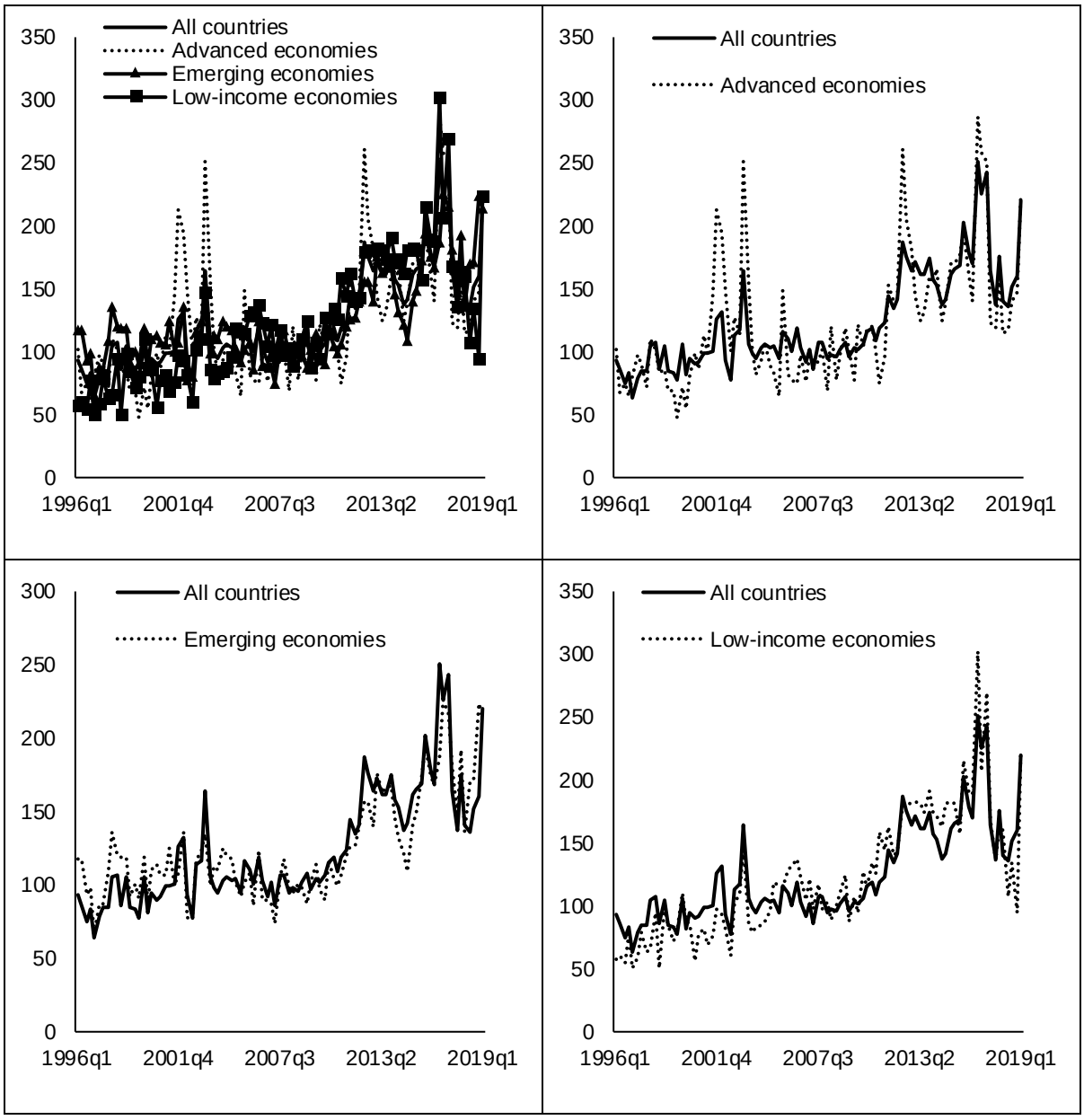
Note: The World Uncertainty Index (WUI) is computed by counting the frequency of uncertain (or the variant) in EIU country reports. The WUI is then normalized by total number of words and rescaled by multiplying by 1,000. A higher number means higher uncertainty and vice versa. For the list of countries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

Figure 4. Relationship between uncertainty and political regimes, 1996-2018



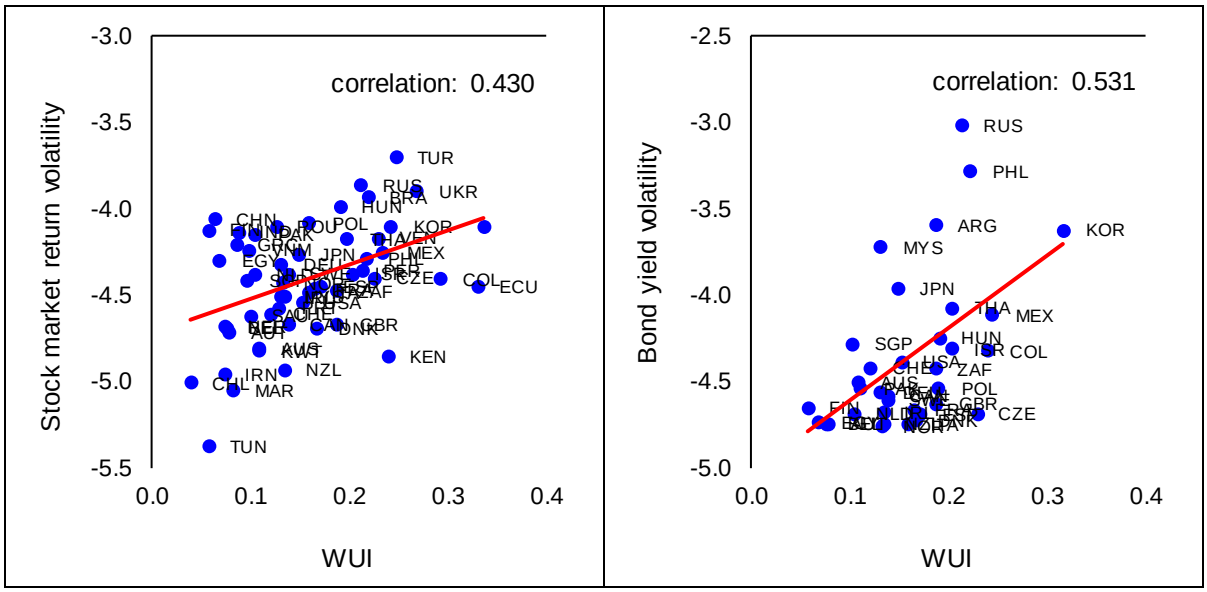
Note: The democracy index comes from the Center for Systemic Peace, which classifies the country regimes as 10: full democracy, 6-9: democracy, 1-5: open anocracy, -5-0: open anocracy, and -10 to -6: autocracy. The average democracy index is 5.8.

Figure 5. WUI by income group over time



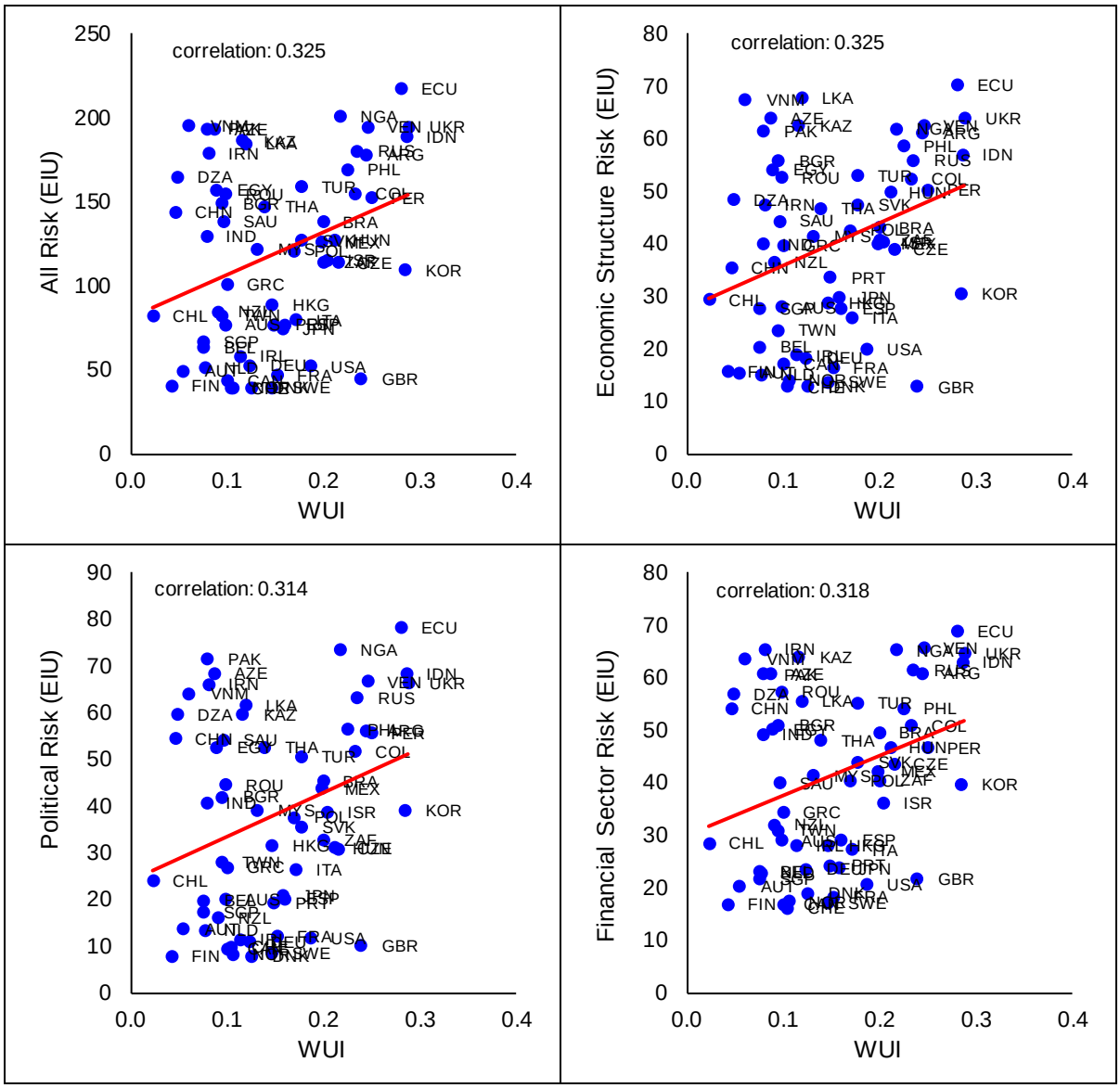
Note: The World Uncertainty Index (WUI) is computed by counting the frequency of uncertain (or the variant) in EIU country reports. The WUI is then normalized by total number of words, rescaled by multiplying by 1,000. Here is also rescaled by the global average of 1996Q1 to 2010Q4 such that 1996Q1-2010Q4=100.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

Figure 6. WUI vs. Market Volatility



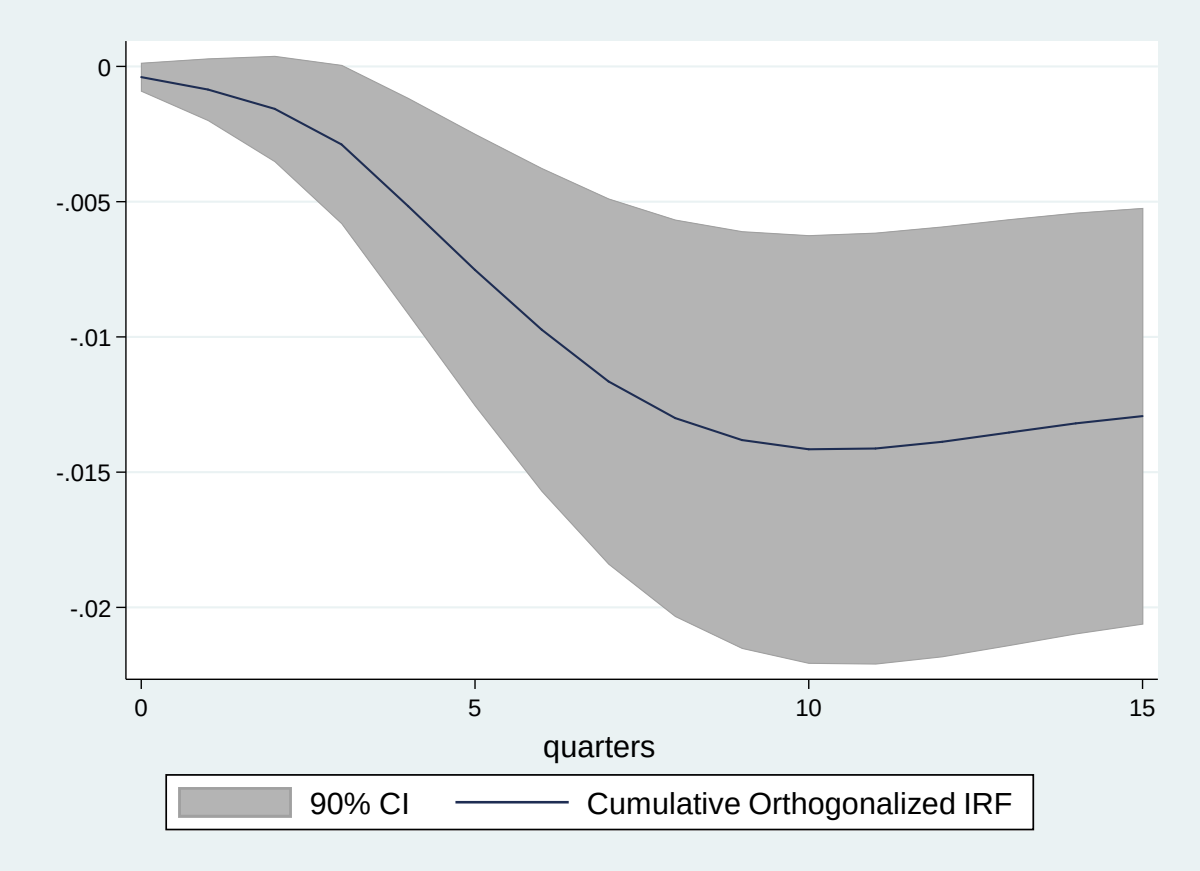
Note: The World Uncertainty Index (WUI) is computed by counting the frequency of uncertain (or the variant) in EIU country reports. The WUI is then normalized by total number of words and rescaled by multiplying by 1,000. The WUI is then normalized by total number of words, rescaled by multiplying by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

Figure 7. WUI vs. Risks



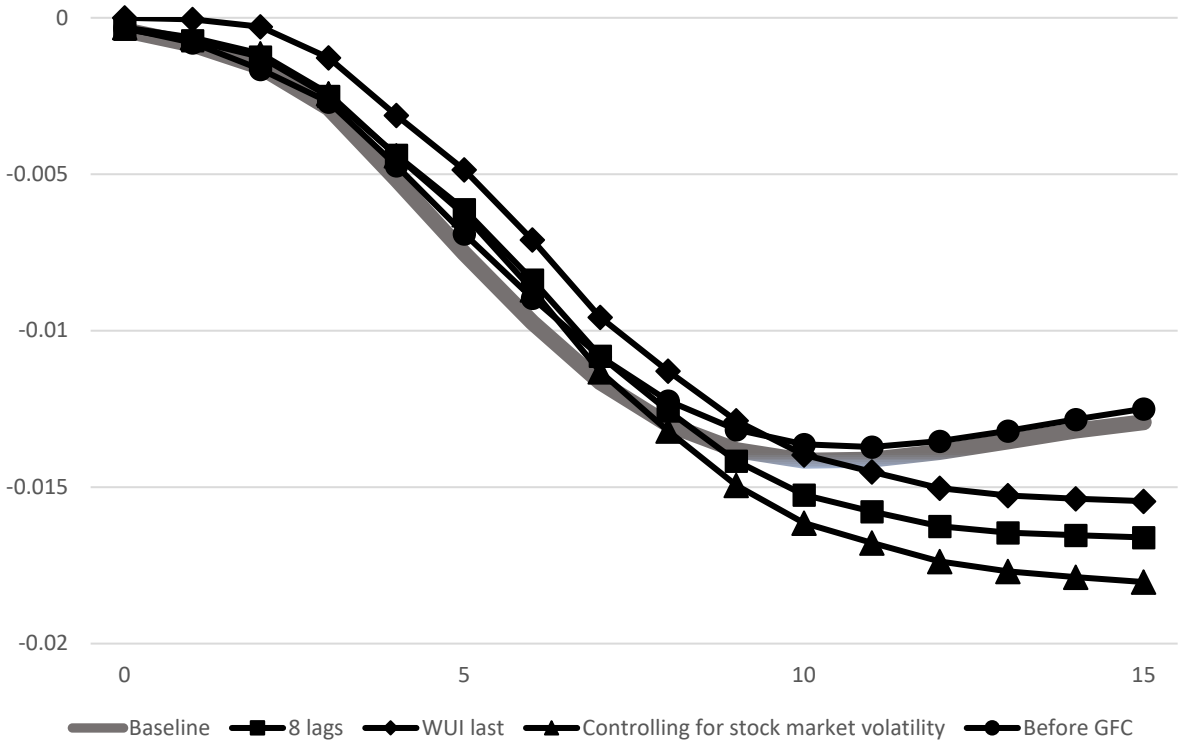
Note: The World Uncertainty Index (WUI) is computed by counting the frequency of uncertain (or the variant) in EIU country reports. The WUI is then normalized by total number of words and rescaled by multiplying by 1,000. The WUI is then normalized by total number of words, rescaled by multiplying by 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 8. GDP response to WUI innovations



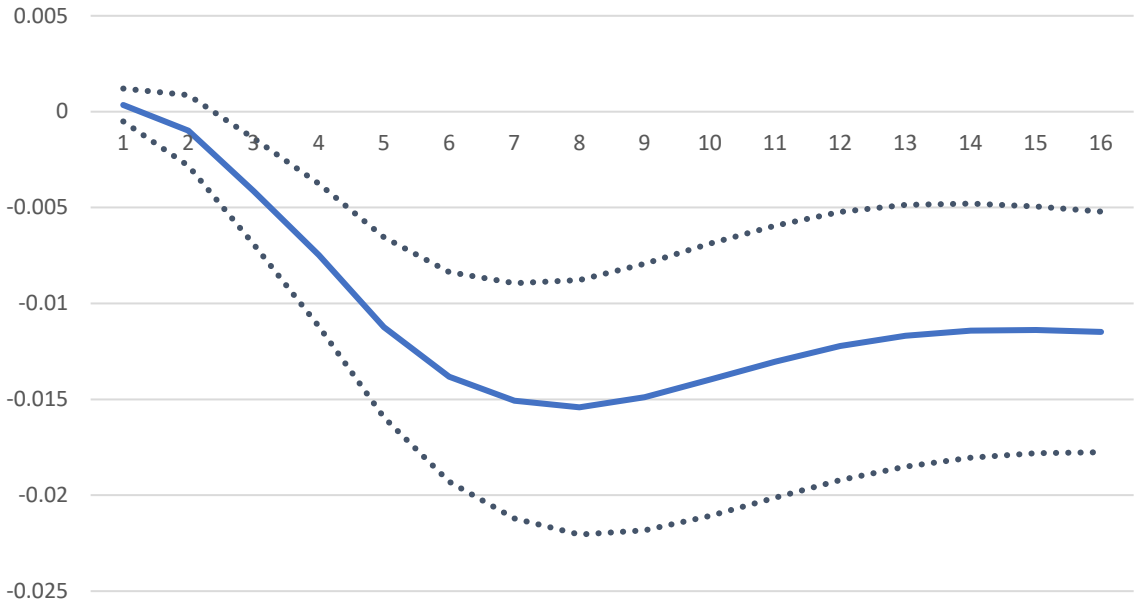
Note: VAR fit to quarterly data for a panel of 46 countries from 1996q1 to 2018q2. Impulse responses of GDP to a one-standard deviation increase in the WUI—equal to the change in average value in the index from 2014 to 2016—based on a Cholesky decomposition with the following order: the log of average stock return, the WUI and GDP growth. The specification includes four lags of all variables. Country and time fixed effects are included.

Figure 9. GDP response to WUI innovations—robustness checks



Note: VAR fit to quarterly data for a panel of 46 countries from 1996q1 to 2018q2. 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.

Figure 9. GDP response to WUI innovations—IV exogenous elections



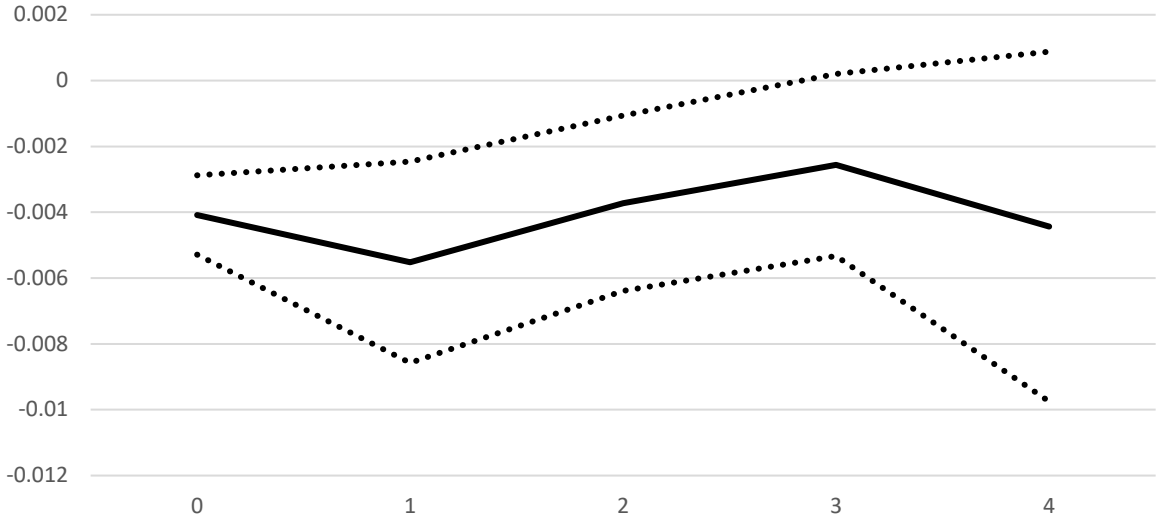
Note: VAR fit to quarterly data for a panel of 42 countries from 1996q1 to 2018q2. Impulse responses of GDP to a one-standard deviation increase in WUI—equal to the change in average value in the index from 2014 to 2016—using as instrument exogenous elections and based on a Cholesky decomposition with the following order: exogenous elections, 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. First stage:

$$WUI_{i,t} = 0.183 + 0.098 Exogenous$$
$$(6.47)$$

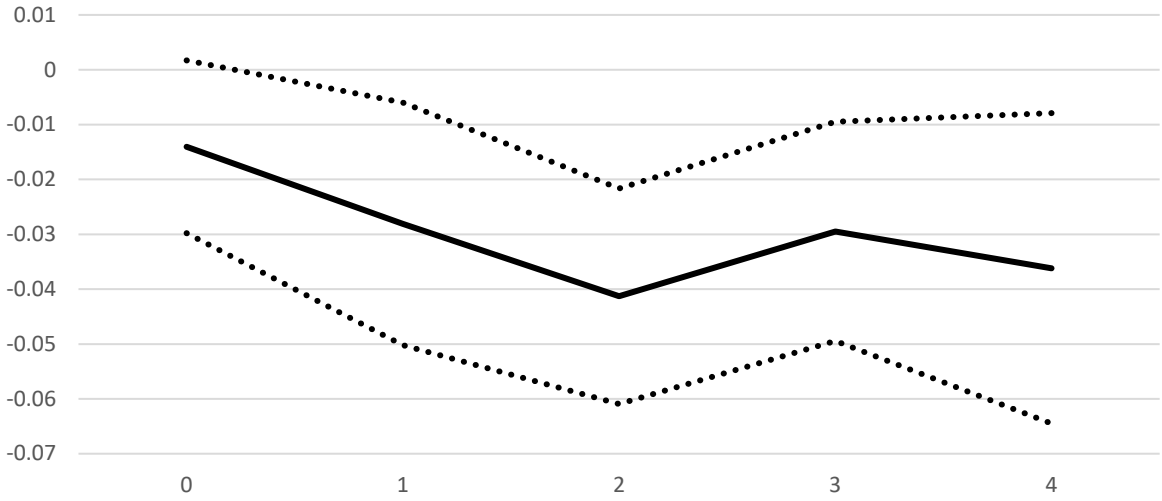
t-statistics in parenthesis.

Figure 10. GDP and investment response to WUI innovations-annual data—Local Projection

Panel A. GDP



Panel A. Investment

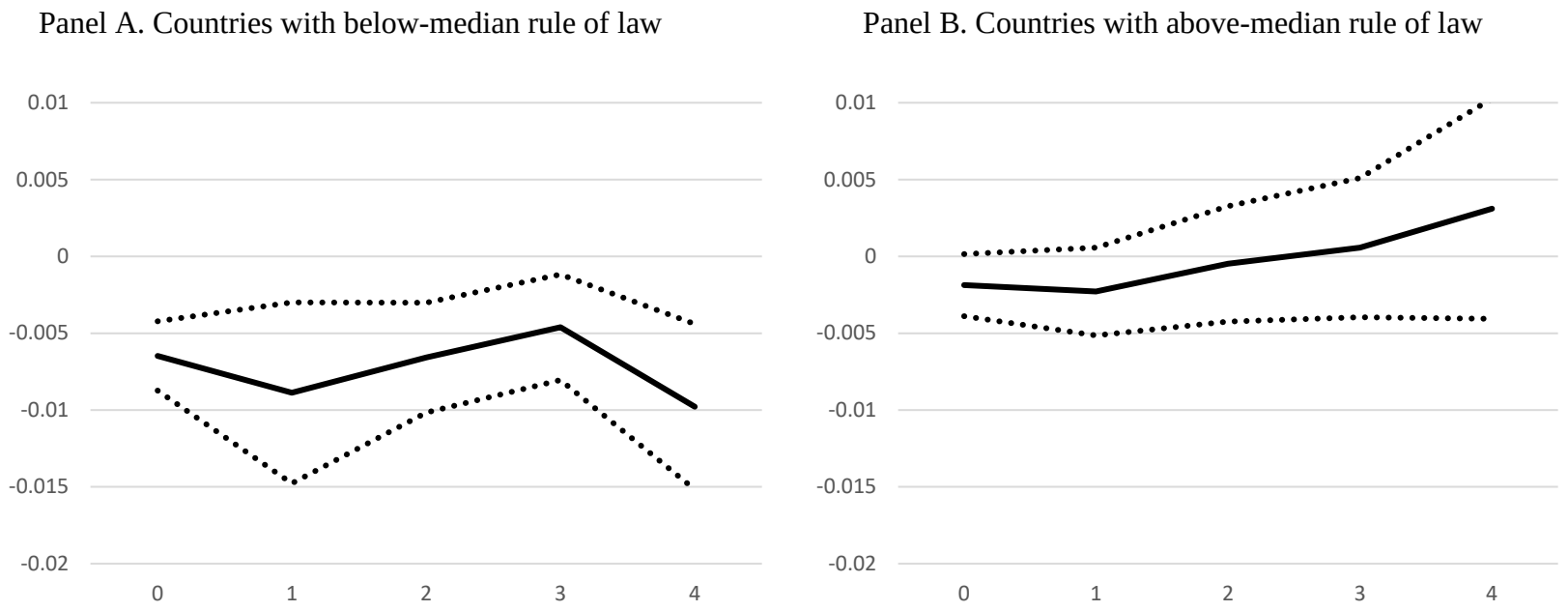


Note: Response estimated using the local projection method (Jorda 2005):

$$y_{i,t+k} - y_{i,t-1} = \alpha_i + \gamma_t + \beta WUI_{i,t} + \theta' X_{i,t} + \varepsilon_{i,t}$$

where y is the log of output (investment); α_i are country-fixed effects; γ_t are time-fixed effects; X is a set of controls including lags of the growth rate of output and of the WUI index. Estimates based on annual data for a panel of 143 countries from 1996 to 2017. Solid line denoted the 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. Dotted lines denote 90 percent confidence bands.

Figure 11A. GDP response to WUI innovations-annual data—Local Projection, the role of institutions.



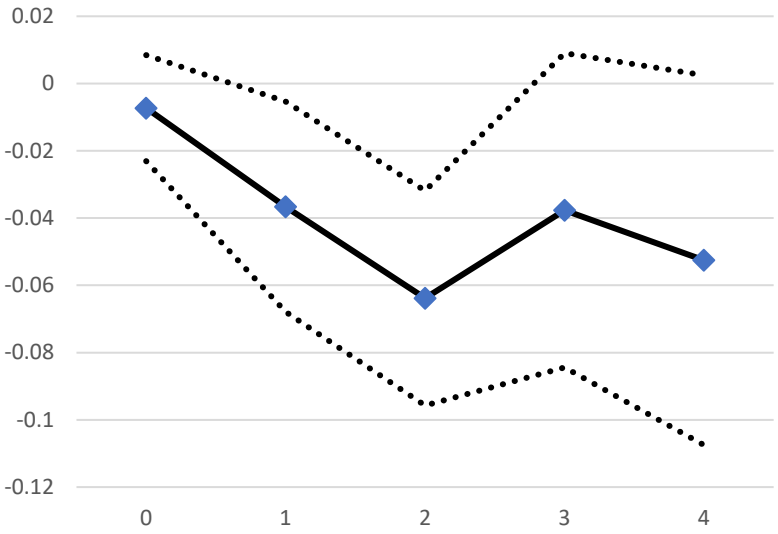
Note: Response estimated using the local projection method (Jorda 2005):

$$y_{i,t+k} - y_{i,t-1} = \alpha_i + \gamma_t + \beta^l D_i WUI_{i,t} + \beta^h (1 - D_i) WUI_{i,t} + \theta' X_{i,t} + \varepsilon_{i,t}$$

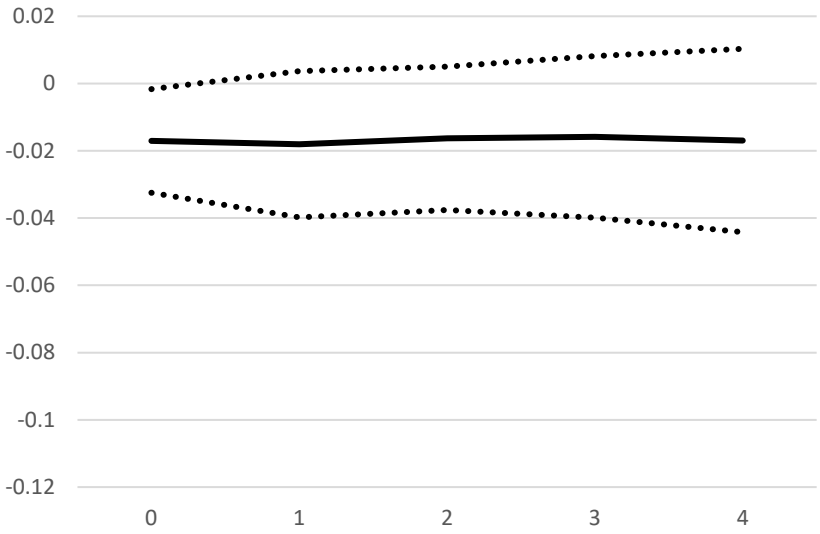
where y is the log of output; α_i are country-fixed effects; γ_t are time-fixed effects; D is a dummy variable which takes value 1 for countries with a score in the indicator of rule of law below median; *X* is a set of controls including lags of the growth rate of output and of the WUI index. Estimates based on annual data for a panel of 143 countries from 1996 to 2017. Solid line denoted the 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. Dotted lines denote 90 percent confidence bands.

Figure 11B. Investment response to WUI innovations-annual data—Local Projection, the role of institutions.

Panel A. Countries with below-median rule of law



Panel B. Countries with above-median rule of law



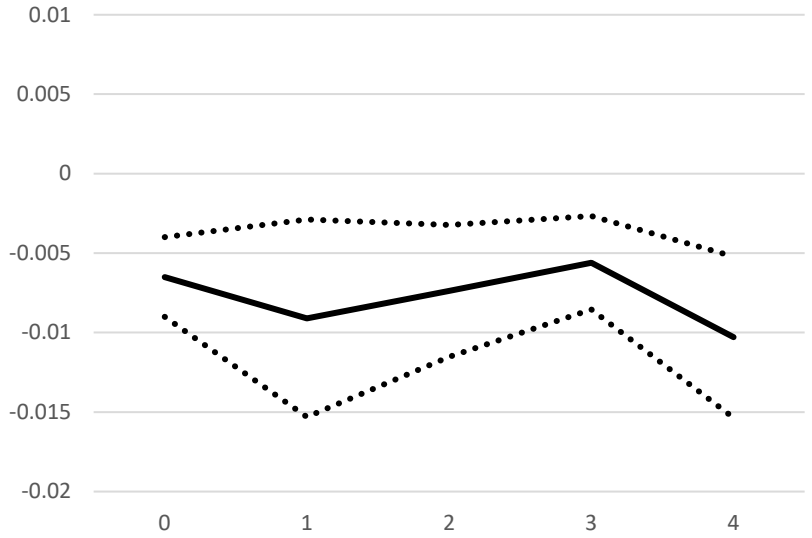
Note: Response estimated using the local projection method (Jorda 2005):

$$y_{i,t+k} - y_{i,t-1} = \alpha_i + \gamma_t + \beta^l D_i WUI_{i,t} + \beta^h (1 - D_i) WUI_{i,t} + \theta' X_{i,t} + \varepsilon_{i,t}$$

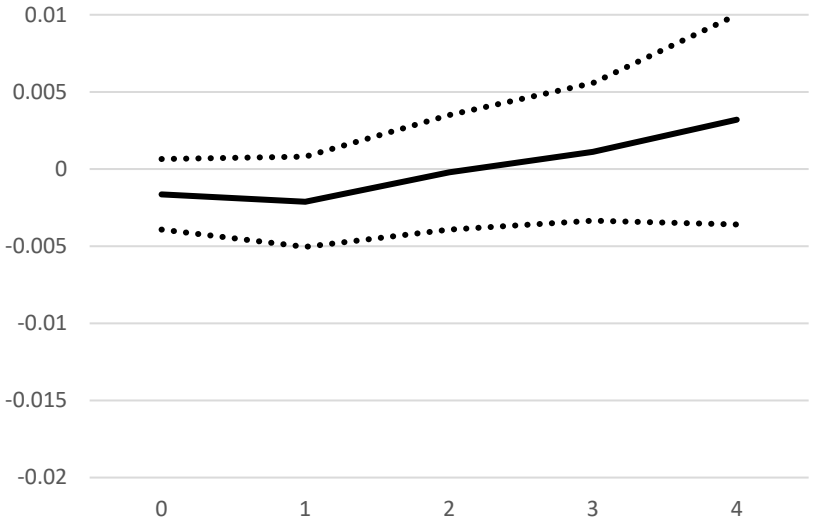
where y is the log of private investment; α_i are country-fixed effects; γ_t are time-fixed effects; D is a dummy variable which takes value 1 for countries with a score in the indicator of rule of law below median; X is a set of controls including lags of the growth rate of output and of the WUI index. Estimates based on annual data for a panel of 143 countries from 1996 to 2017. Solid line denoted the impulse responses of private investment to a one-standard deviation increase in the WUI—equal to the change in average value in the index from 2014 to 2016. Dotted lines denote 90 percent confidence bands.

Figure 12A. GDP response to WUI innovations-annual data—Local Projection, the role of institutions, controlling for the interaction of WUI with GDP per capita.

Panel A. Countries with below-median rule of law



Panel B. Countries with above-median rule of law



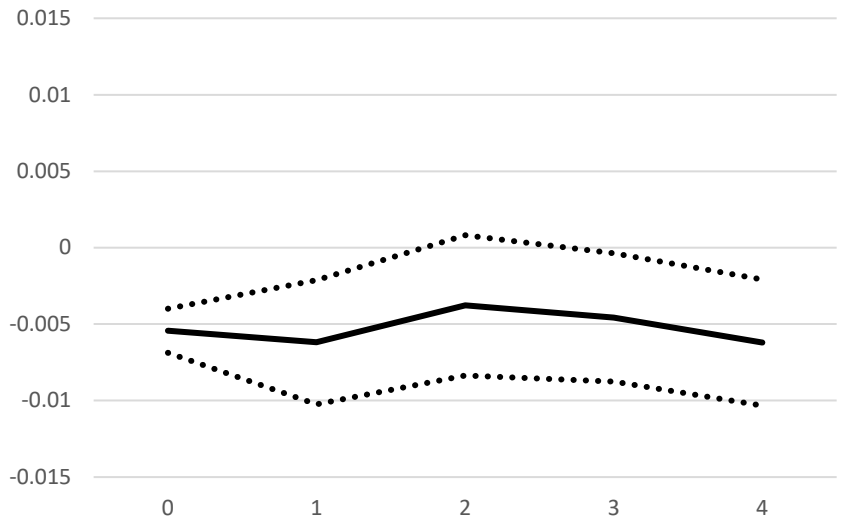
Note: Response estimated using the local projection method (Jorda 2005):

$$y_{i,t+k} - y_{i,t-1} = \alpha_i + \gamma_t + \beta^l D_i WUI_{i,t} + \beta^h (1 - D_i) WUI_{i,t} + \theta' X_{i,t} + \varepsilon_{i,t}$$

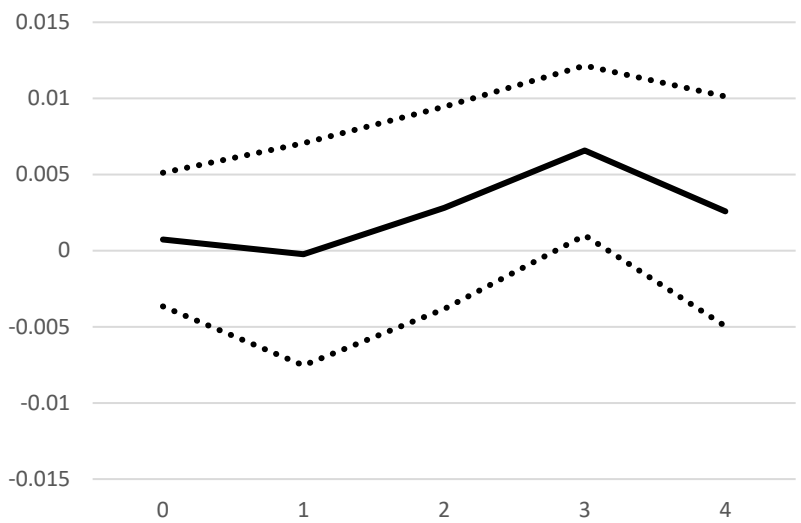
where y is the log of output; α_i are country-fixed effects; γ_t are time-fixed effects; D is a dummy variable which takes value 1 for countries with a score in the indicator of rule of law below median; *X* is a set of controls including lags of the growth rate of output and of the WUI index. Estimates based on annual data for a panel of 143 countries from 1996 to 2017. Solid line denoted the 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. Dotted lines denote 90 percent confidence bands.

Figure 12B. GDP response to WUI innovations-annual data—Local Projection, the role of institutional reforms

Panel A. After major rule of law reforms



Panel B. Before major rule of law reforms



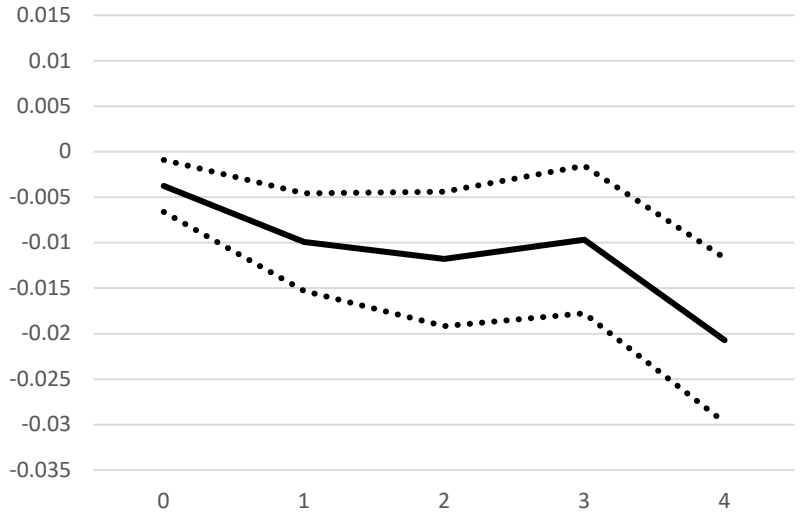
Note: Response estimated using the local projection method (Jorda 2005):

$$y_{i,t+k} - y_{i,t-1} = \alpha_i + \gamma_t + \beta^l D_i WUI_{i,t} + \beta^h (1 - D_i) WUI_{i,t} + \theta' X_{i,t} + \varepsilon_{i,t}$$

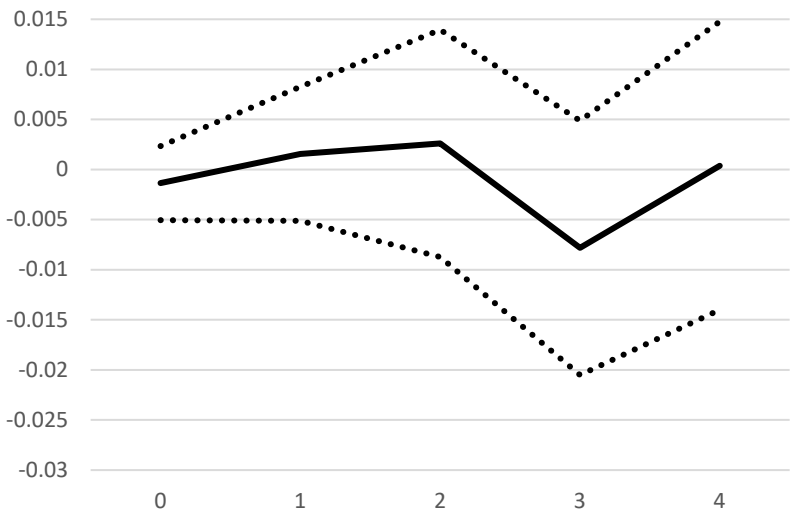
where y is the log of output; α_i are country-fixed effects; γ_t are time-fixed effects; D is a dummy variable which takes value 1 when the indicator of rule of law increases above the 75th percentile of the distribution of the change in the indicator; *X* is a set of controls including lags of the growth rate of output and of the WUI index. Estimates based on annual data for a panel of 143 countries from 1996 to 2017. Solid line denoted the 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. Dotted lines denote 90 percent confidence bands.

Figure 12C. GDP response to WUI innovations-annual data—Local Projection, the role of institutions, IV.

Panel A. Countries with below-median rule of law



Panel B. Countries with above-median rule of law

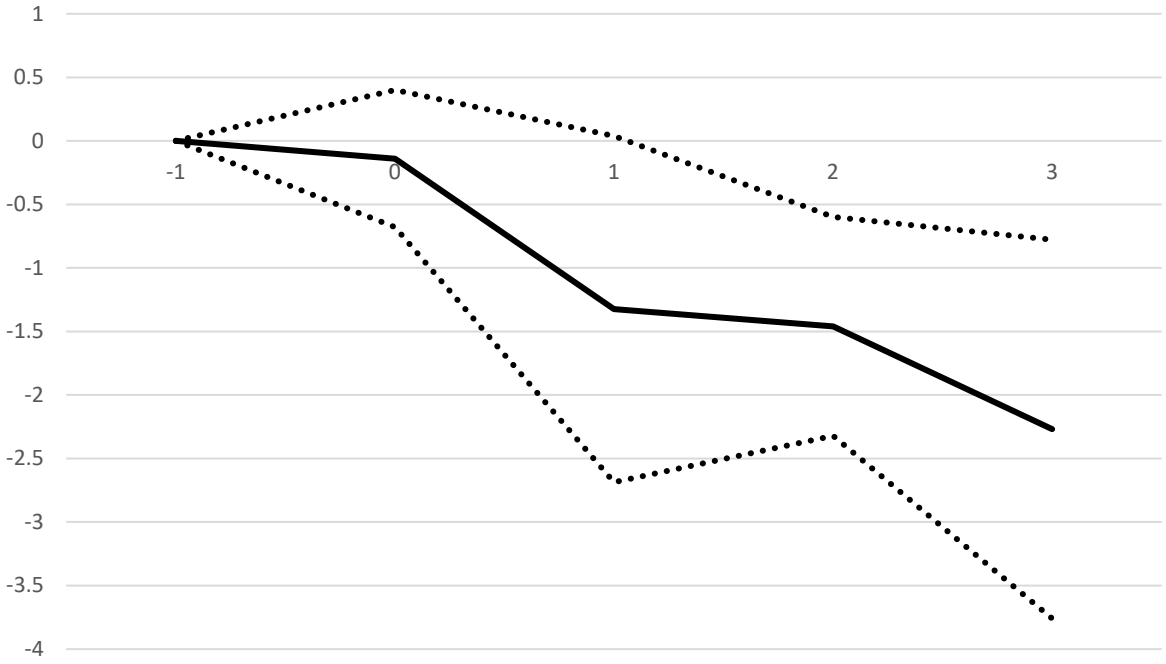


Note: Response estimated using the local projection method (Jorda 2005):

$$y_{i,t+k} - y_{i,t-1} = \alpha_i + \gamma_t + \beta^l D_i WUI_{i,t} + \beta^h (1 - D_i) WUI_{i,t} + \theta' X_{i,t} + \varepsilon_{i,t}$$

where y is the log of output; α_i are country-fixed effects; γ_t are time-fixed effects; D is a dummy variable which takes value 1 for countries with a score in the indicator of rule of law below median; X is a set of controls including lags of the growth rate of output and of the WUI index. Estimates based on annual data for a panel of 143 countries from 1996 to 2017. Solid line denoted the 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. Dotted lines denote 90 percent confidence bands. The rule of law dummy is instrumented using European settler mortality rates (Acemoglu et al. 2010). The Kleibergen-Paap rk Wald F-statistic is above the 10% Stock-Yogo critical value for non-homoskedastic error for each horizon k.

Figure 13. Sectoral output response to WUI innovations—role of financial constraints

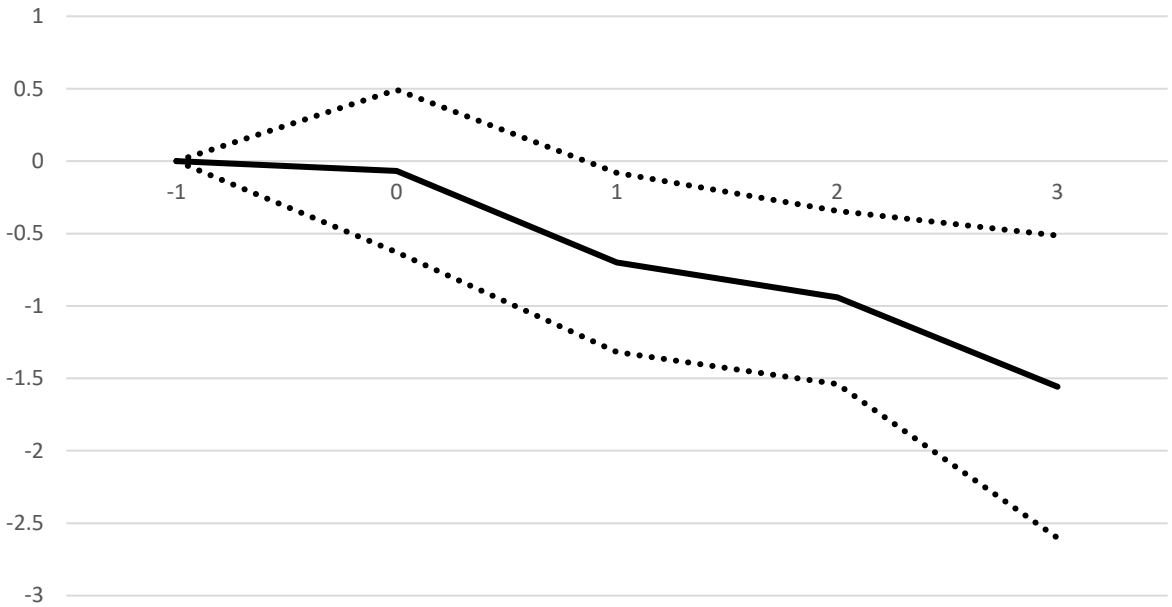


Note: Response estimated using the following specification:

$$\Delta y_{jit} = \alpha_{ij} + \gamma_{it} + \delta_{jt} + \sum_{k=0}^{3} \beta_k WUI_{i,t-k} EFD_j + \varepsilon_{jit}$$

where y is the log of sectoral output; α_{ij} are sector-country fixed effects; γ_{it} are country-time fixed effects; δ_{jt} are sector-time fixed effects; EFD is the Rajan and Zingales's (1998) measure of the degree of dependence on external finance in each industry—measured as the median across all U.S. firms, in each industry, of the ratio of total capital expenditures minus the current cash flow to total capital expenditures. Estimates based on annual data for a panel of 22 industries, 56 countries from 1995 to 2017 (the size of the estimation sample is 25,618 observations). Solid line denotes the differential output effect to a one-standard deviation increase in the WUI—equal to the change in average value in the index from 2014 to 2016—of an industry with high external financial dependence (at the 75th percentile distribution of the indicator) compared to an industry with low external financial dependence (at the 25th percentile distribution of the indicator). Dotted lines denote 90 percent confidence bands.

Figure 14. Sectoral labor productivity response to WUI innovations—role of financial constraints



Note: Response estimated using the following specification:

$$\Delta y_{jit} = \alpha_{ij} + \gamma_{it} + \delta_{jt} + \sum_{k=0}^{3} \beta_k WUI_{i,t-k} EFD_j + \varepsilon_{jit}$$

where y is the log of sectoral labor productivity (the output-to-employment ratio); α_{ij} are sector-country fixed effects; γ_{it} are country-time fixed effects; δ_{jt} are sector-time fixed effects; EFD is the Rajan and Zingales's (1998) measure of the degree of dependence on external finance in each industry—measured as the median across all U.S. firms, in each industry, of the ratio of total capital expenditures minus the current cash flow to total capital expenditures. Estimates based on annual data for a panel of 22 industries, 56 countries from 1995 to 2017 (the size of the estimation sample is 24,098 observations). Solid line denotes the differential productivity effect to a one-standard deviation increase in the WUI—equal to the change in average value in the index from 2014 to 2016—of an industry with high external financial dependence (at the 75th percentile distribution of the indicator) compared to an industry with low external financial dependence (at the 25th percentile distribution of the indicator). Dotted lines denote 90 percent confidence bands.

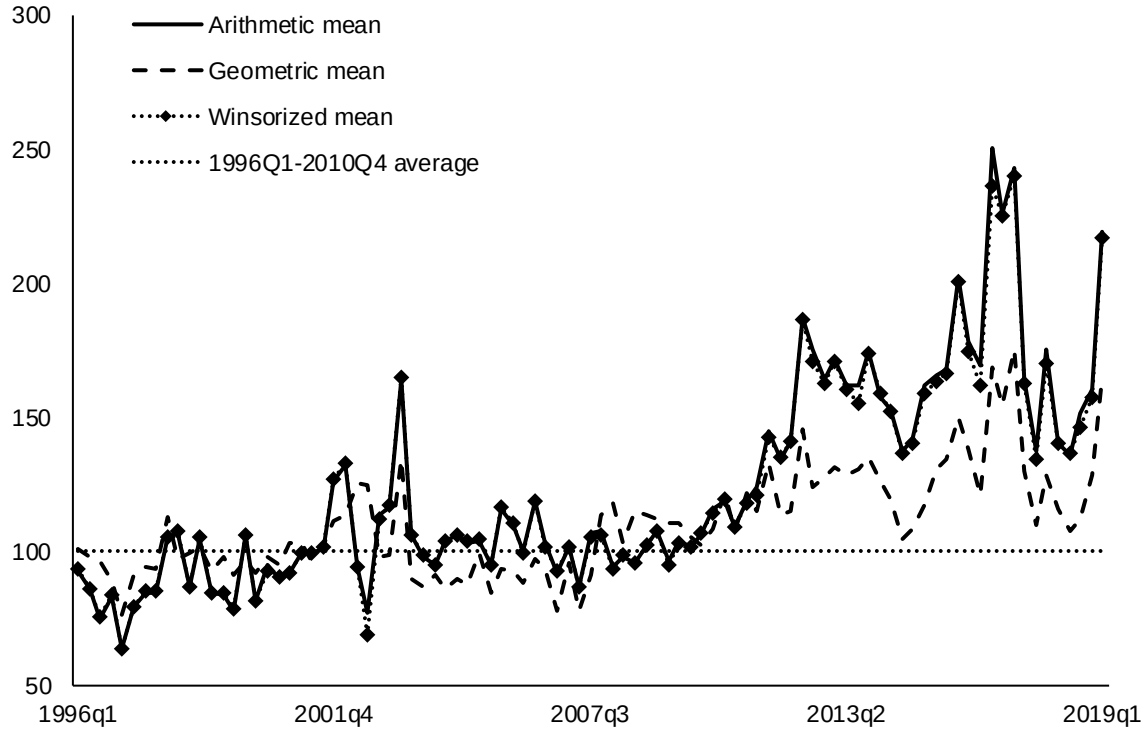
APPENDIX A. ADDITIONAL TABLES AND FIGURES

Table A1. Country coverage of the industry analysis

Table 3. Country coverage

Advanced economies			Developing economies		
Country	Number of observations	Maximum coverage	Country	Number of observations	Maximum coverage
Australia	378	1988-2013	Algeria	56	1990-1996
Austria	545	1988-2014	Bahrain	25	2001-2005
Belgium	623	1980-2014	Bangladesh	318	1980-2011
Canada	733	1979-2014	Bolivia	405	1981-2010
Denmark	700	1979-2014	Chile	306	1990-2013
Finland	722	1979-2014	China	493	1982-2007
France	699	1980-2014	Colombia	602	1982-2012
Greece	669	1976-2013	Costa Rica	244	1990-2003
Hong Kong	460	1984-2014	El Salvador	104	1993-1998
Iceland	237	1980-1996	Ethiopia	420	1990-2014
Italy	577	1988-2014	Gabon	56	1991-1995
Japan	797	1970-2010	Ghana	178	1980-2003
Netherlands	651	1981-2014	Honduras	107	1990-1995
New Zealand	187	1985-2012	India	550	1988-2014
Norway	723	1978-2014	Iran	554	1990-2014
Portugal	580	1986-2014	Jamaica	63	1990-1996
Singapore	532	1990-2014	Jordan	554	1985-2013
Spain	722	1980-2014	Kenya	315	1982-2013
Sweden	711	1980-2014	Kuwait	430	1990-2013
Switzerland	316	1986-2013	Lebanon	39	1998-2007
U.K.	716	1978-2013	Madagascar	172	1980-2006
			Malaysia	429	1990-2012
			Mexico	348	1990-2013
			Mongolia	345	1990-2011
			Morocco	458	1990-2013
			Oman	437	1993-2014
			Paraguay	55	2001-2010
			Philippines	389	1989-2012
			Qatar	330	1990-2013
			Romania	469	1990-2013
			Sri Lanka	369	1990-2012
			Swaziland	155	1980-2011
			Trinidad and Tobago	236	1988-2003
			Venezuela	188	1988-1998

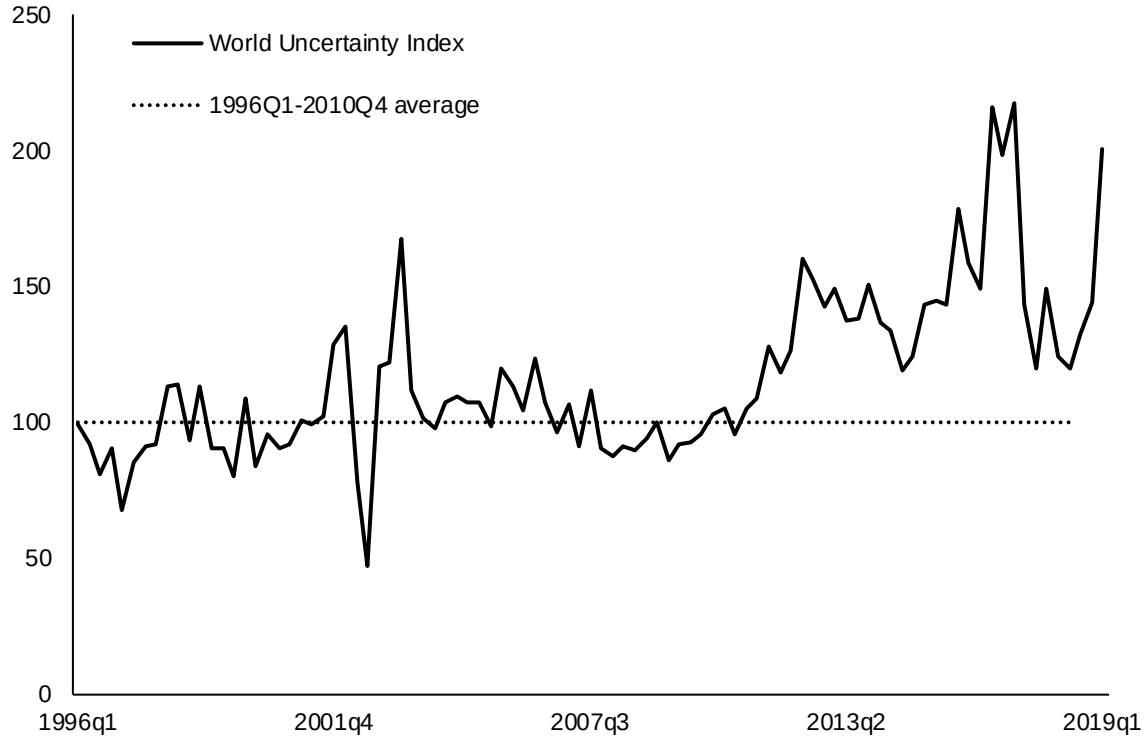
Figure A1. Global WUI



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.

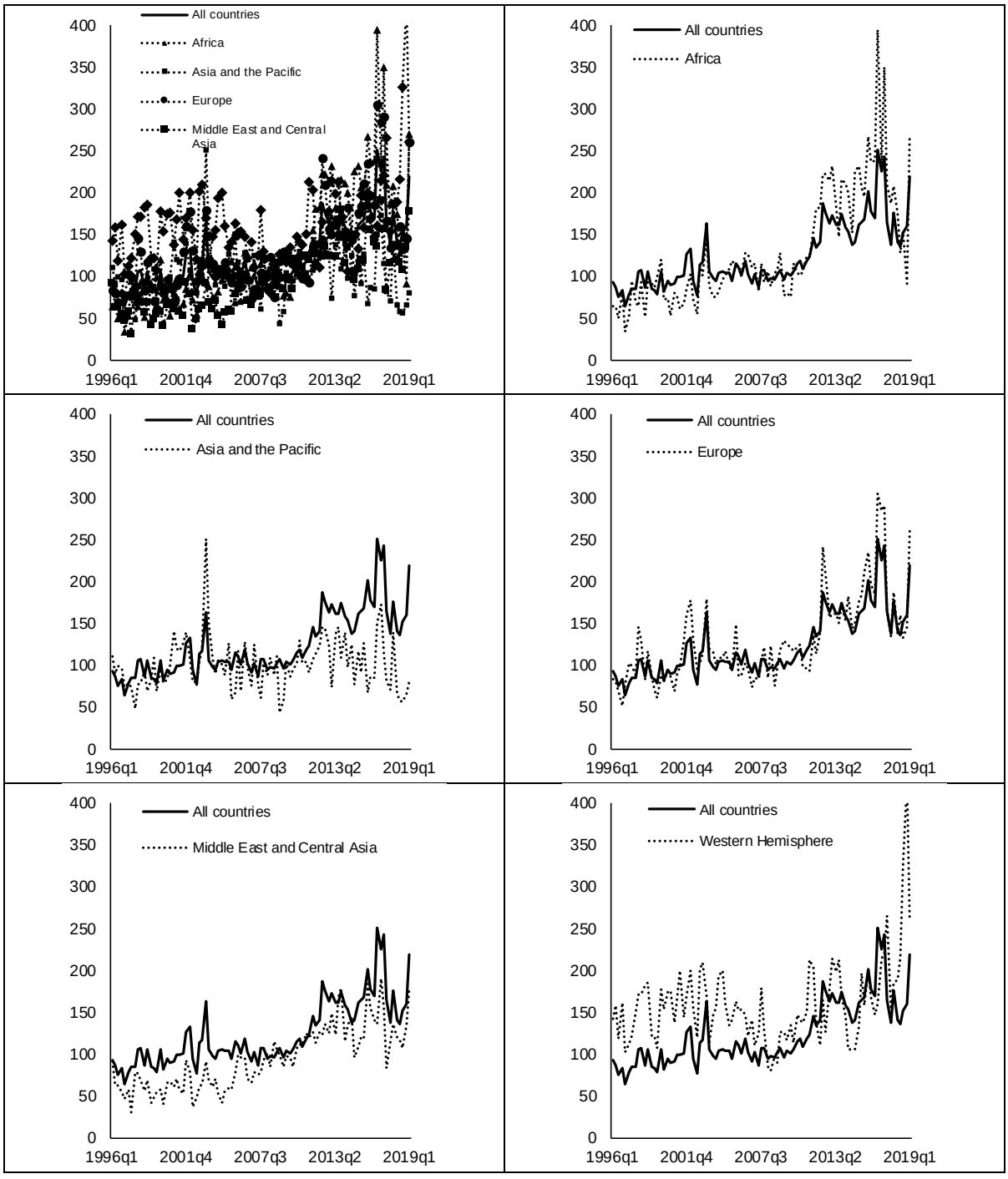
Figure A2. Global WUI scaled by number of pages

(unweighted global average)



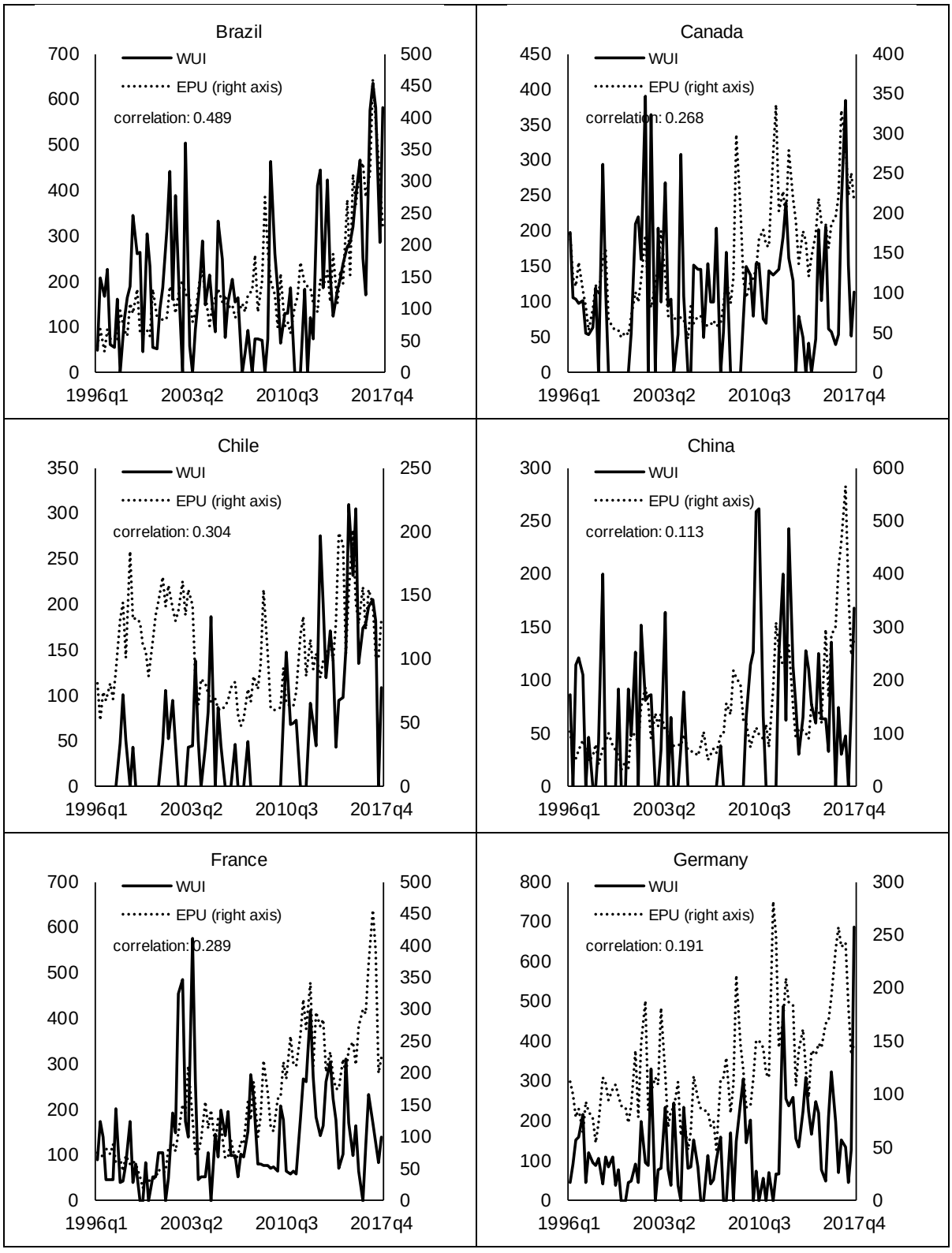
Note: The World Uncertainty Index (WUI) is computed by counting the frequency of uncertain (or the variant) in EIU country reports. The WUI is then normalized by total number of words, rescaled by multiplying by 1,000. Here is also rescaled by the global average of 1996Q1 to 2010Q4 such that 1996Q1-2010Q4=100.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

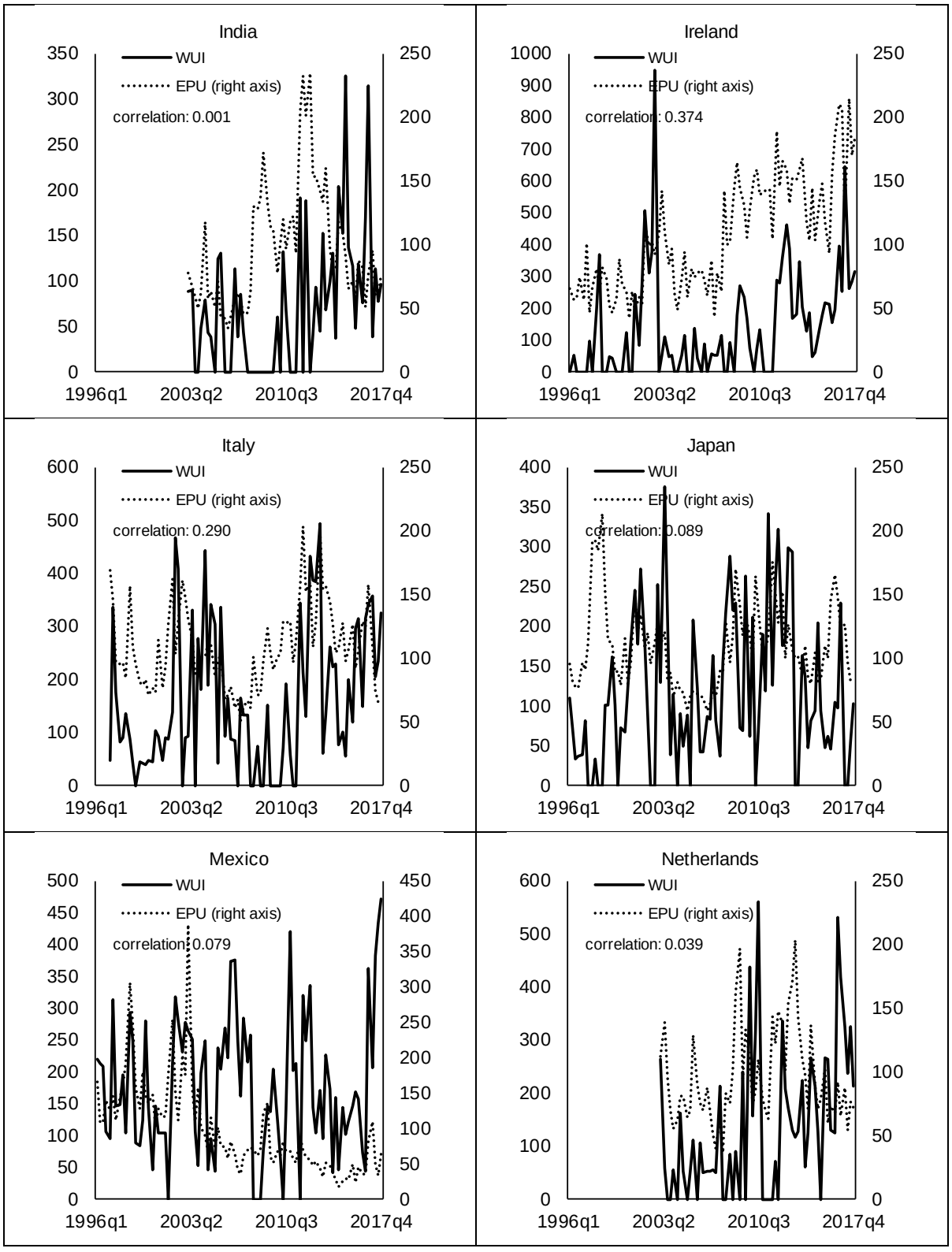
Figure A3. WUI by region

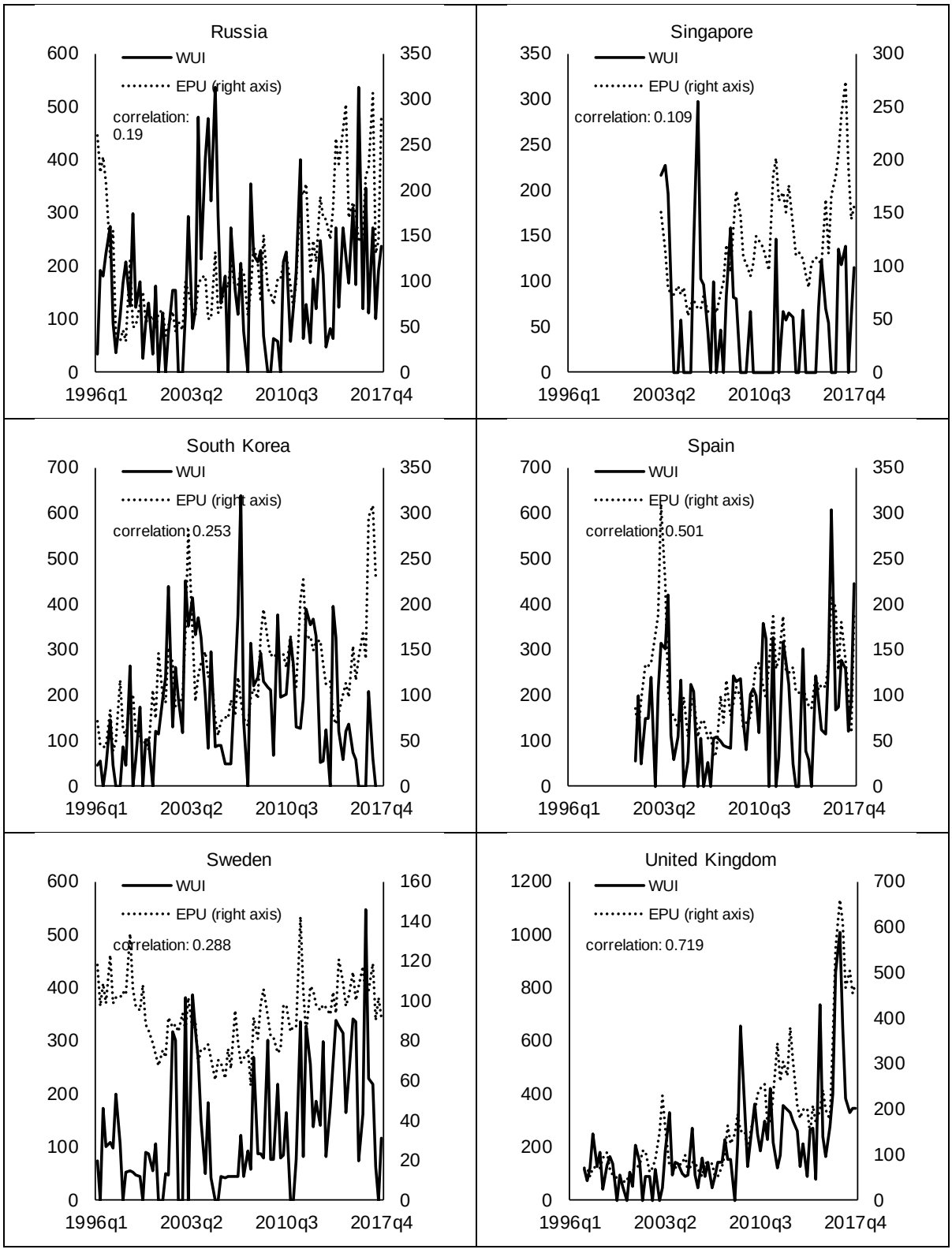


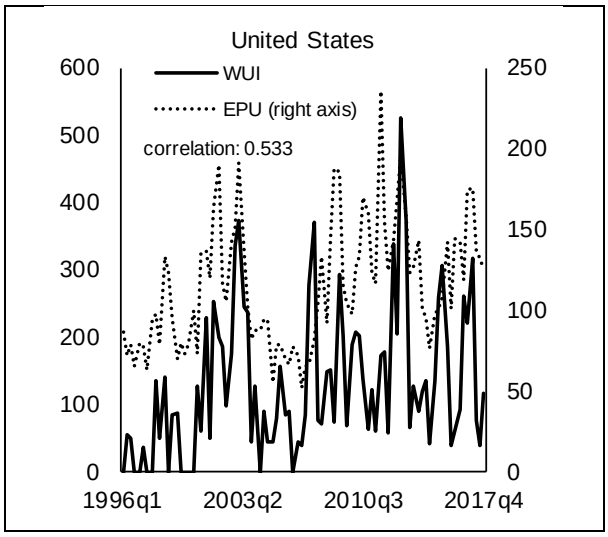
Note: The World Uncertainty Index (WUI) is computed by counting the frequency of uncertain (or the variant) in EIU country reports. The WUI is then normalized by total number of words, rescaled by multiplying by 1,000. Here is also rescaled by the global average of 1996Q1 to 2010Q4 such that 1996Q1-2010Q4=100.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

Figure A4. WUI vs. EPU



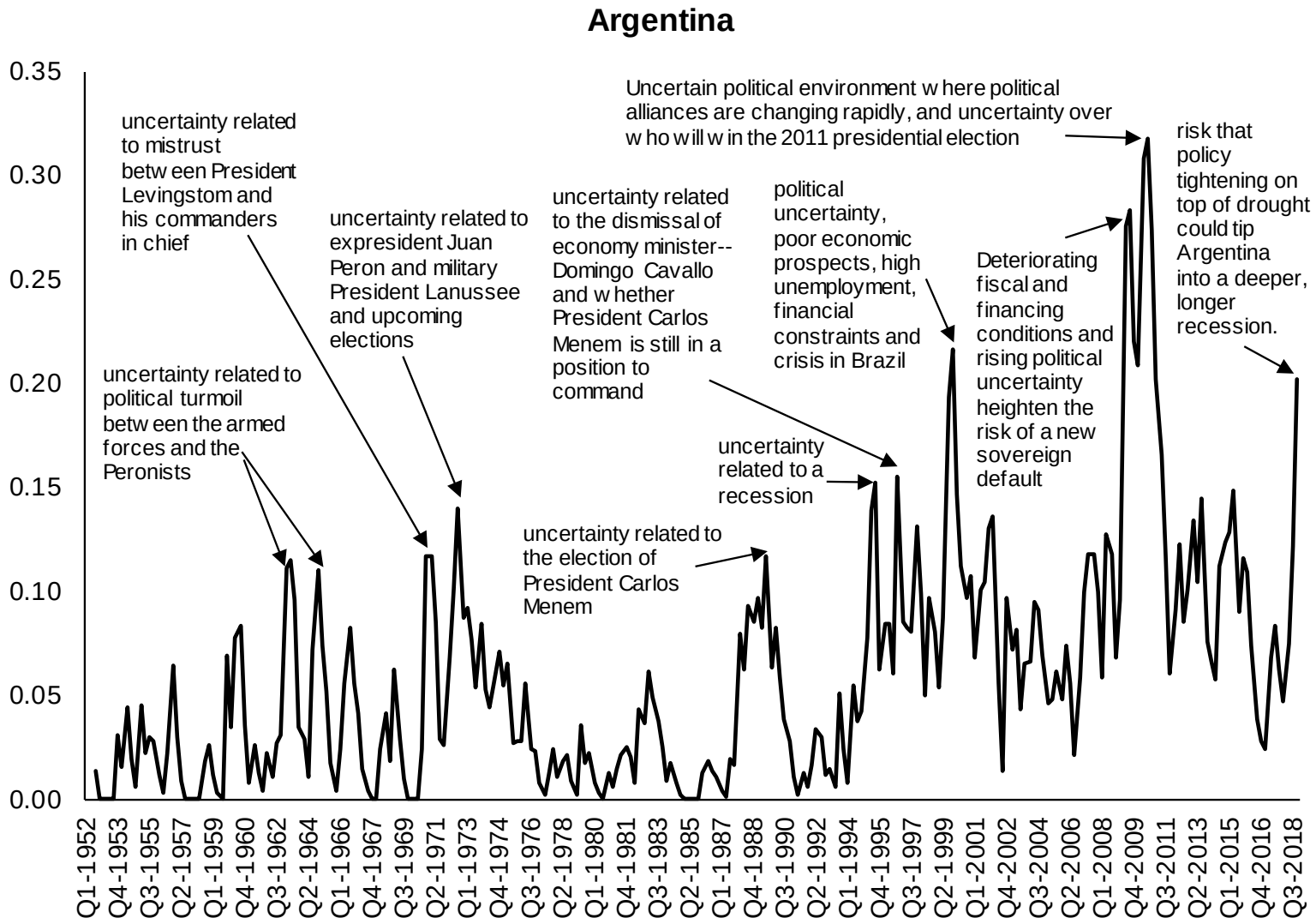

India
WUI
EPU (right axis)
correlation: 0.001
Ireland
WUI
EPU (right axis)
correlation: 0.374
Italy
WUI
EPU (right axis)
correlation: 0.290
Japan
WUI
EPU (right axis)
correlation: 0.089
Mexico
WUI
EPU (right axis)
correlation: 0.079
Netherlands
WUI
EPU (right axis)
correlation: 0.039
1996q1
2003q2
2010q3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

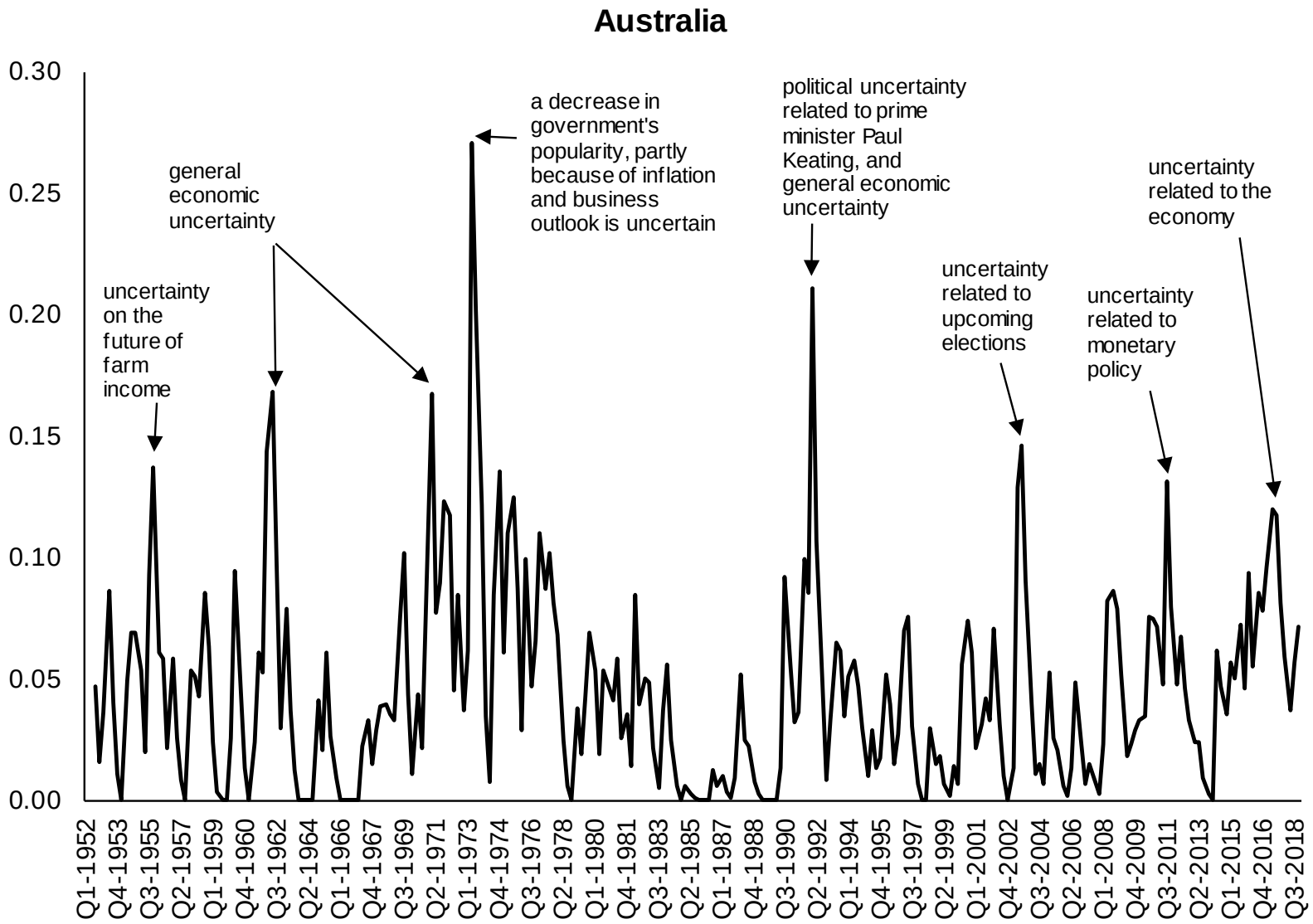

Russia
WUI
EPU (right axis)
correlation: 0.19
600
500
400
300
200
100
0
350
300
250
200
150
100
50
0
1996q1
2003q2
2010q3
2017q4
Singapore
WUI
EPU (right axis)
correlation: 0.109
350
300
250
200
150
100
50
0
300
250
200
150
100
50
0
1996q1
2003q2
2010q3
2017q4
South Korea
WUI
EPU (right axis)
correlation: 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

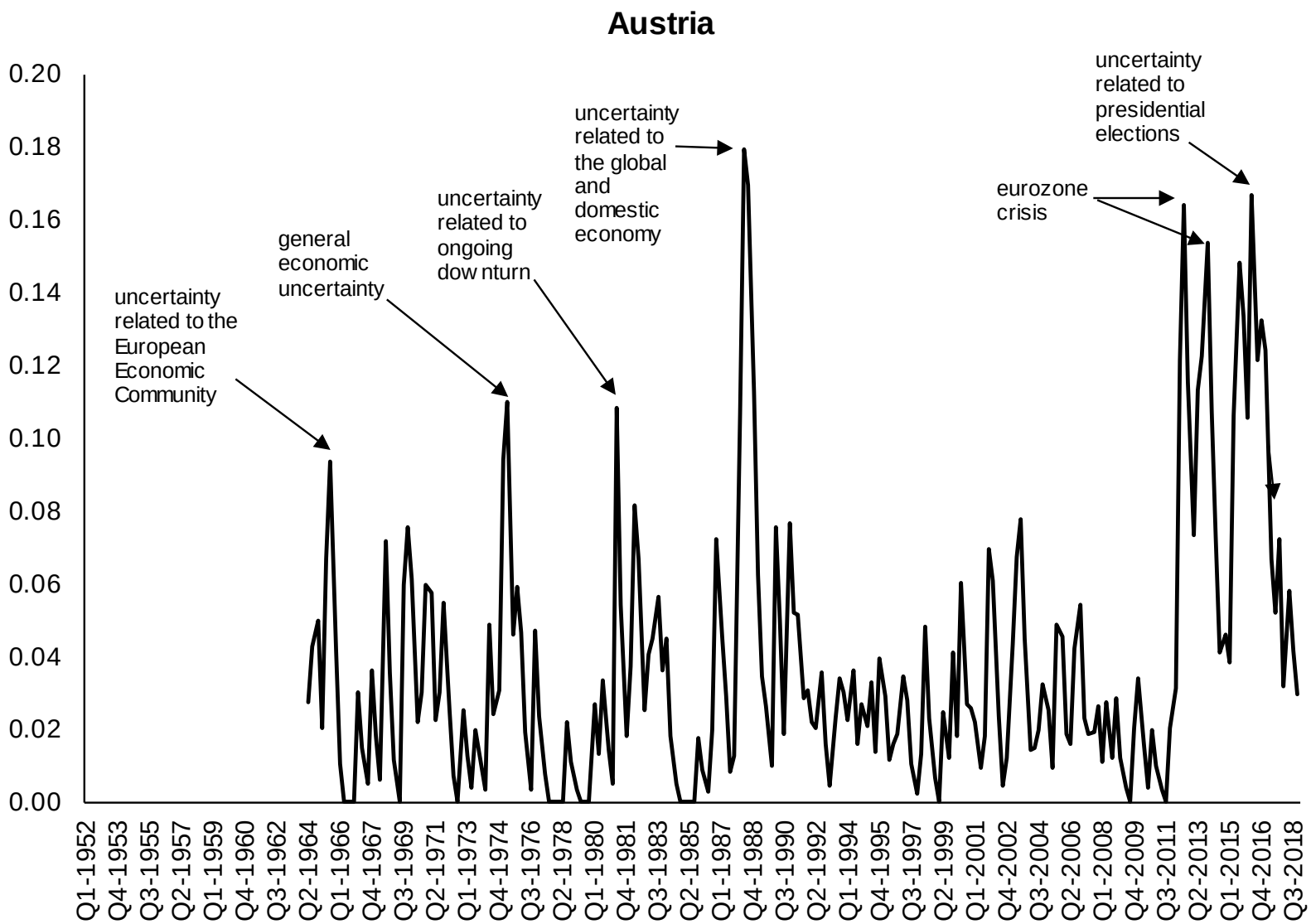


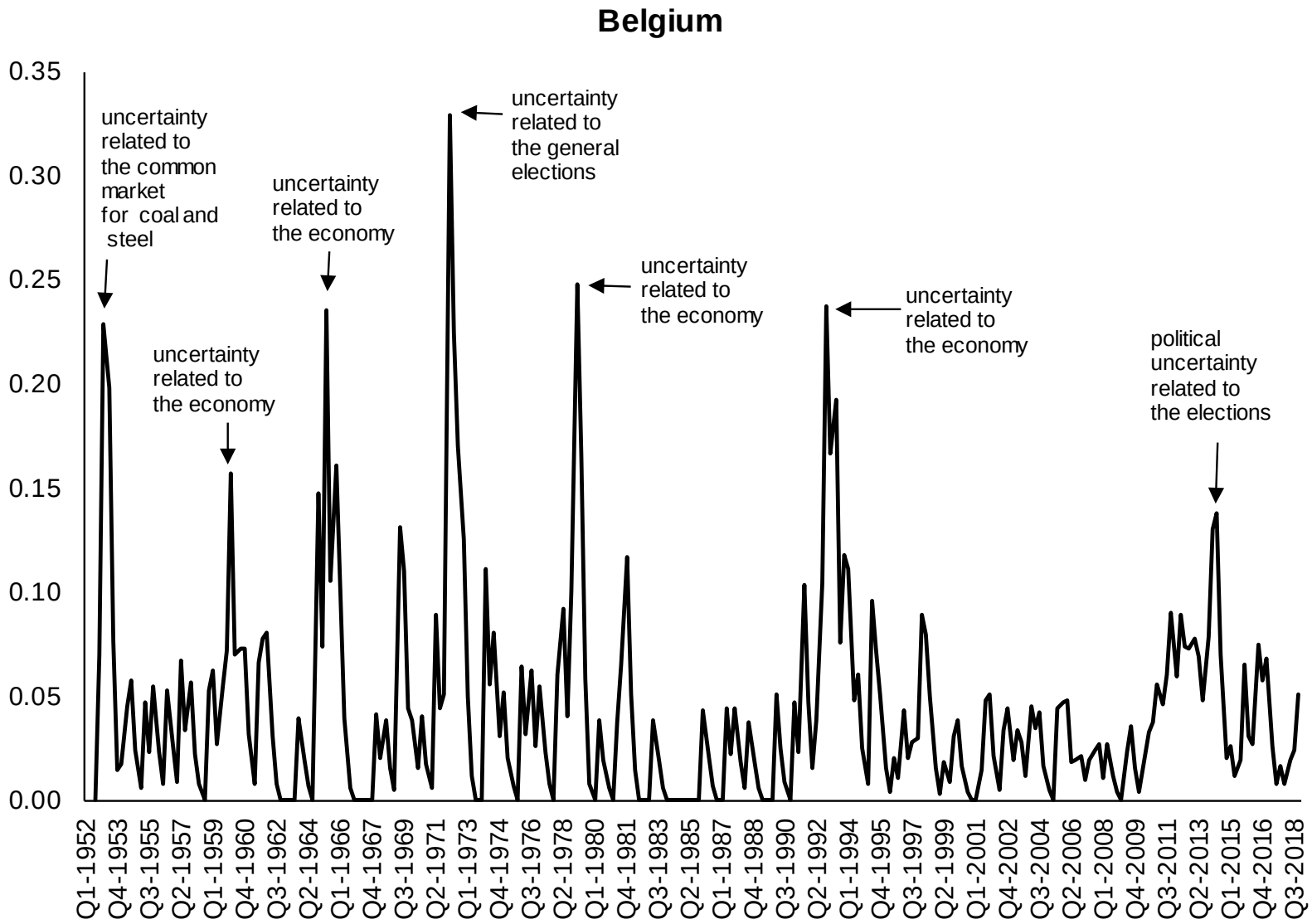
Note: The World Uncertainty Index (WUI) is computed by counting the frequency of uncertain (or the variant) in EIU country reports. The WUI is then normalized by total number of words, rescaled by multiplying by 1,000. Here is also rescaled by the global average of 1996Q1 to 2010Q4 such that 1996Q1-2010Q4=100.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

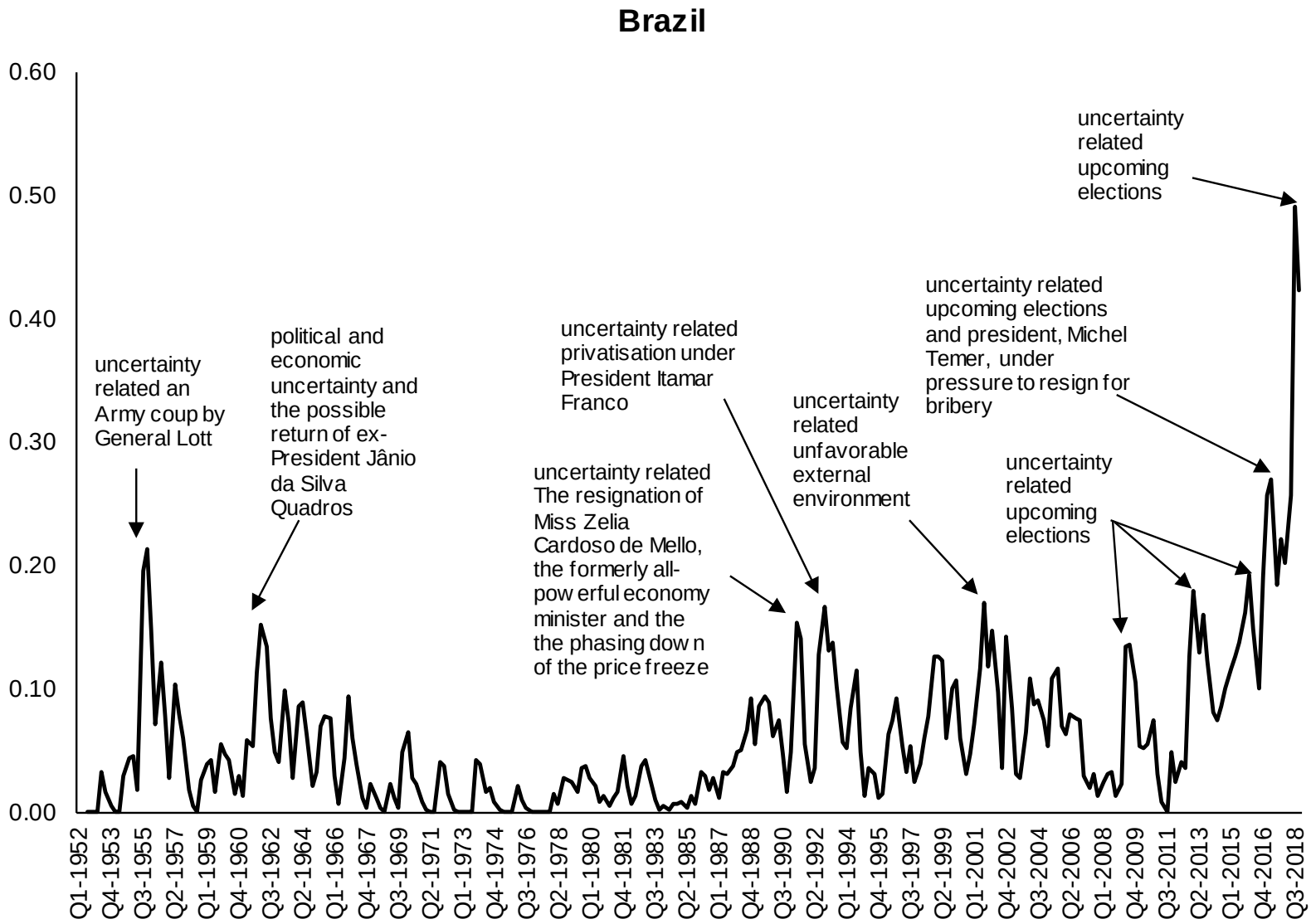
Figure A5. Historical WUI

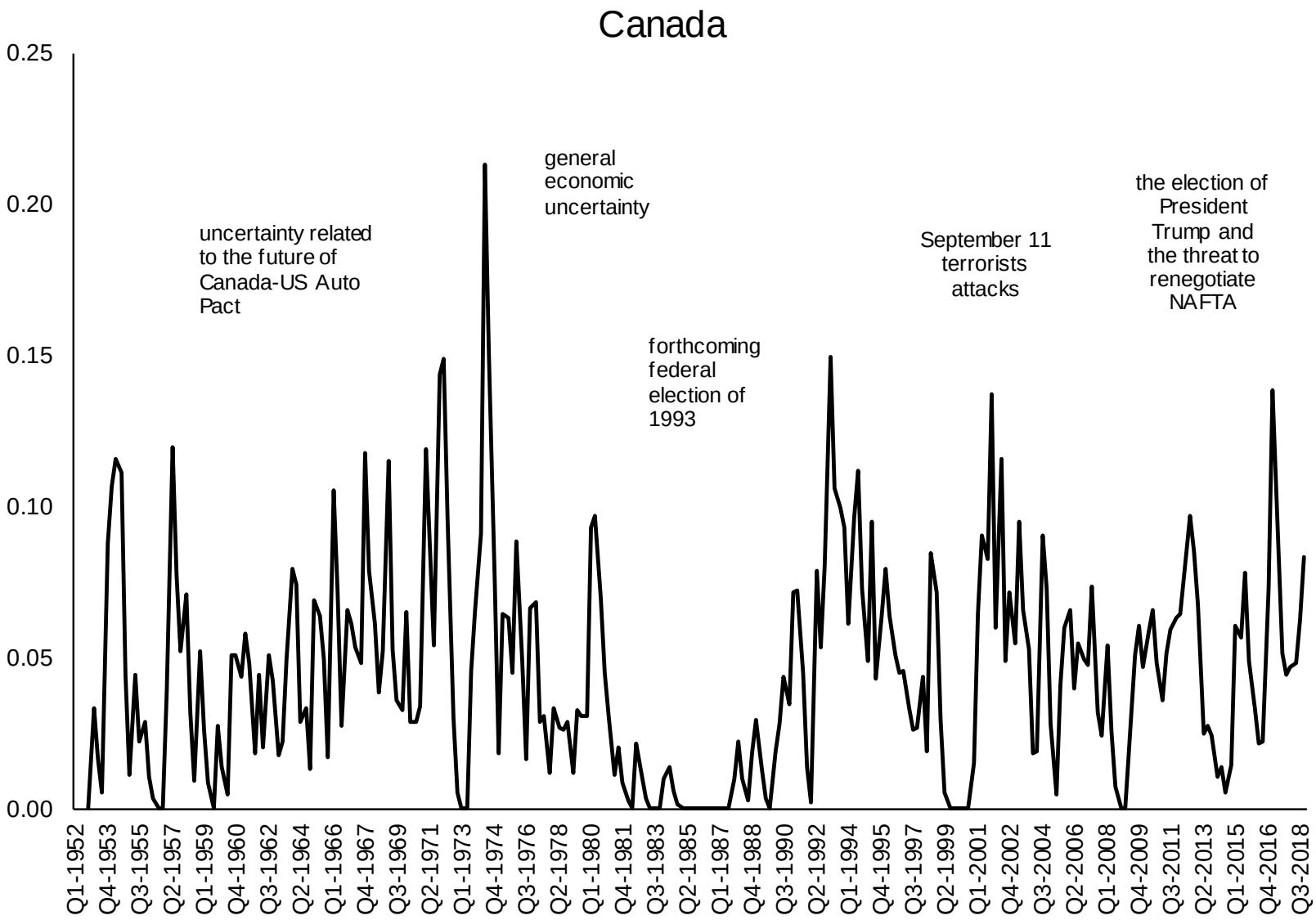


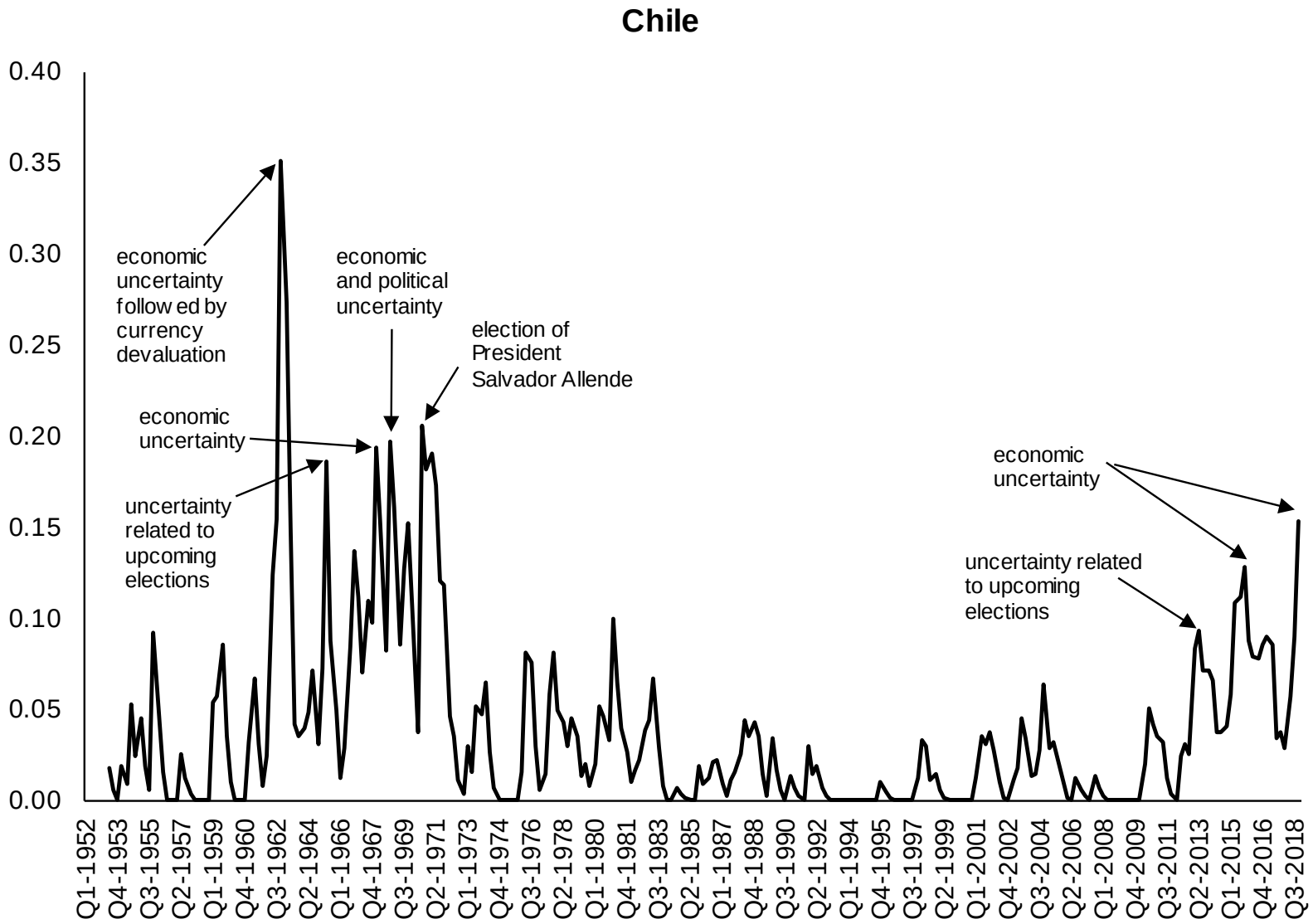

Australia
0.30
0.25
0.20
0.15
0.10
0.05
0.00
uncertainty on the future of farm income
general economic uncertainty
a decrease in government's popularity, partly because of inflation and business outlook is uncertain
political uncertainty related to prime minister Paul Keating, and general economic uncertainty
uncertainty related to upcoming elections
uncertainty related to monetary policy
uncertainty related to the economy
Q1-1952
Q4-1953
Q3-1955
Q2-1957
Q1-1959
Q4-1960
Q3-1962
Q2-1964
Q1-1966
Q4-1967
Q3-1969
Q2-1971
Q1-1973
Q4-1974
Q3-1976
Q2-1978
Q1-1980
Q4-1981
Q3-1983
Q2-1985
Q1-1987
Q4-1988
Q3-1990
Q2-1992
Q1-1994
Q4-1995
Q3-1997
Q2-1999
Q1-2001
Q4-2002
Q3-2004
Q2-2006
Q1-2008
Q4-2009
Q3-2011
Q2-2013
Q1-2015
Q4-2016
Q3-2018

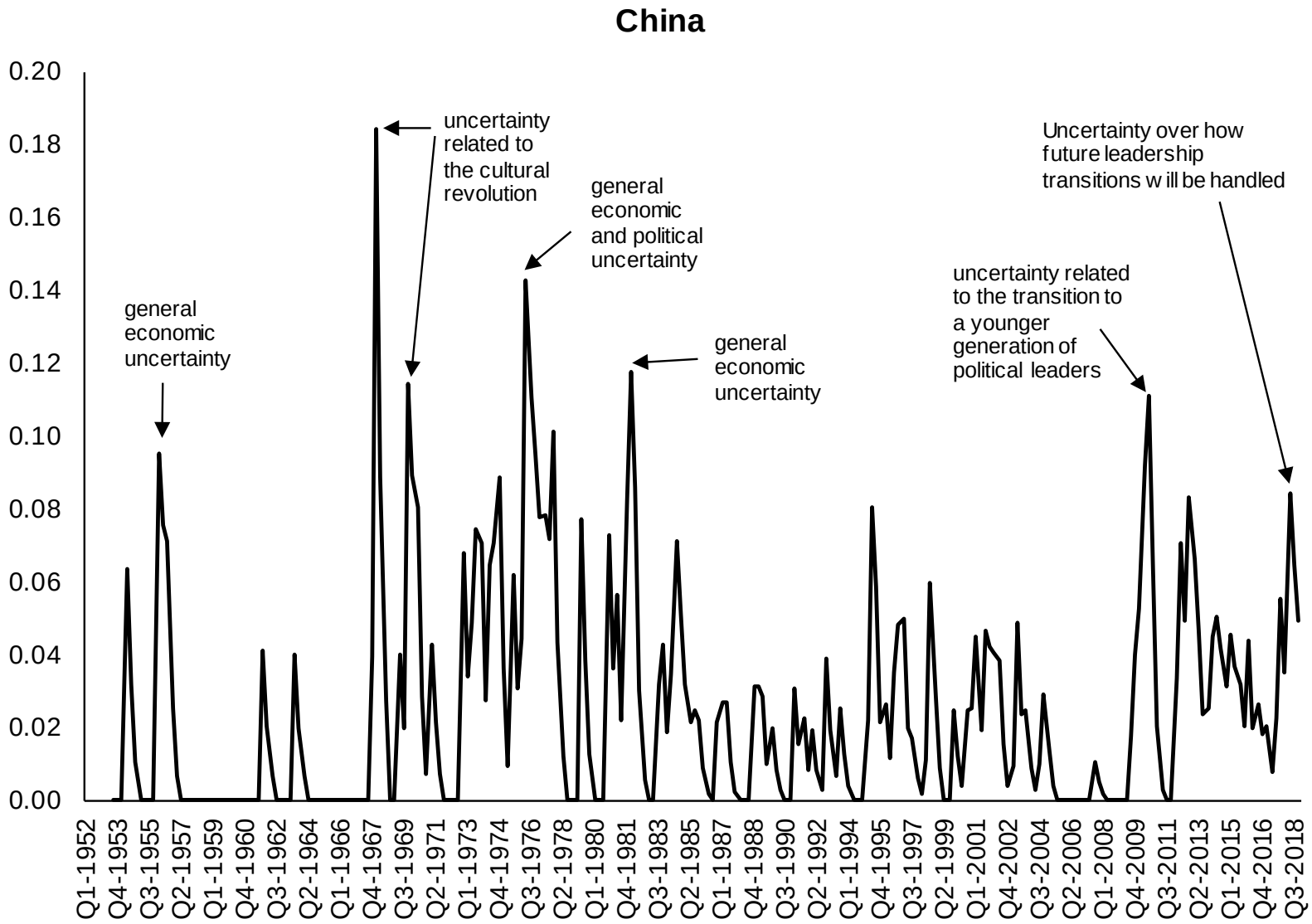

Austria
0.20
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
uncertainty related to the European Economic Community
general economic uncertainty
uncertainty related to ongoing dow nturn
uncertainty related to the global and domestic economy
eurozone crisis
uncertainty related to presidential elections
Q1-1952
Q4-1953
Q3-1955
Q2-1957
Q1-1959
Q4-1960
Q3-1962
Q2-1964
Q1-1966
Q4-1967
Q3-1969
Q2-1971
Q1-1973
Q4-1974
Q3-1976
Q2-1978
Q1-1980
Q4-1981
Q3-1983
Q2-1985
Q1-1987
Q4-1988
Q3-1990
Q2-1992
Q1-1994
Q4-1995
Q3-1997
Q2-1999
Q1-2001
Q4-2002
Q3-2004
Q2-2006
Q1-2008
Q4-2009
Q3-2011
Q2-2013
Q1-2015
Q4-2016
Q3-2018

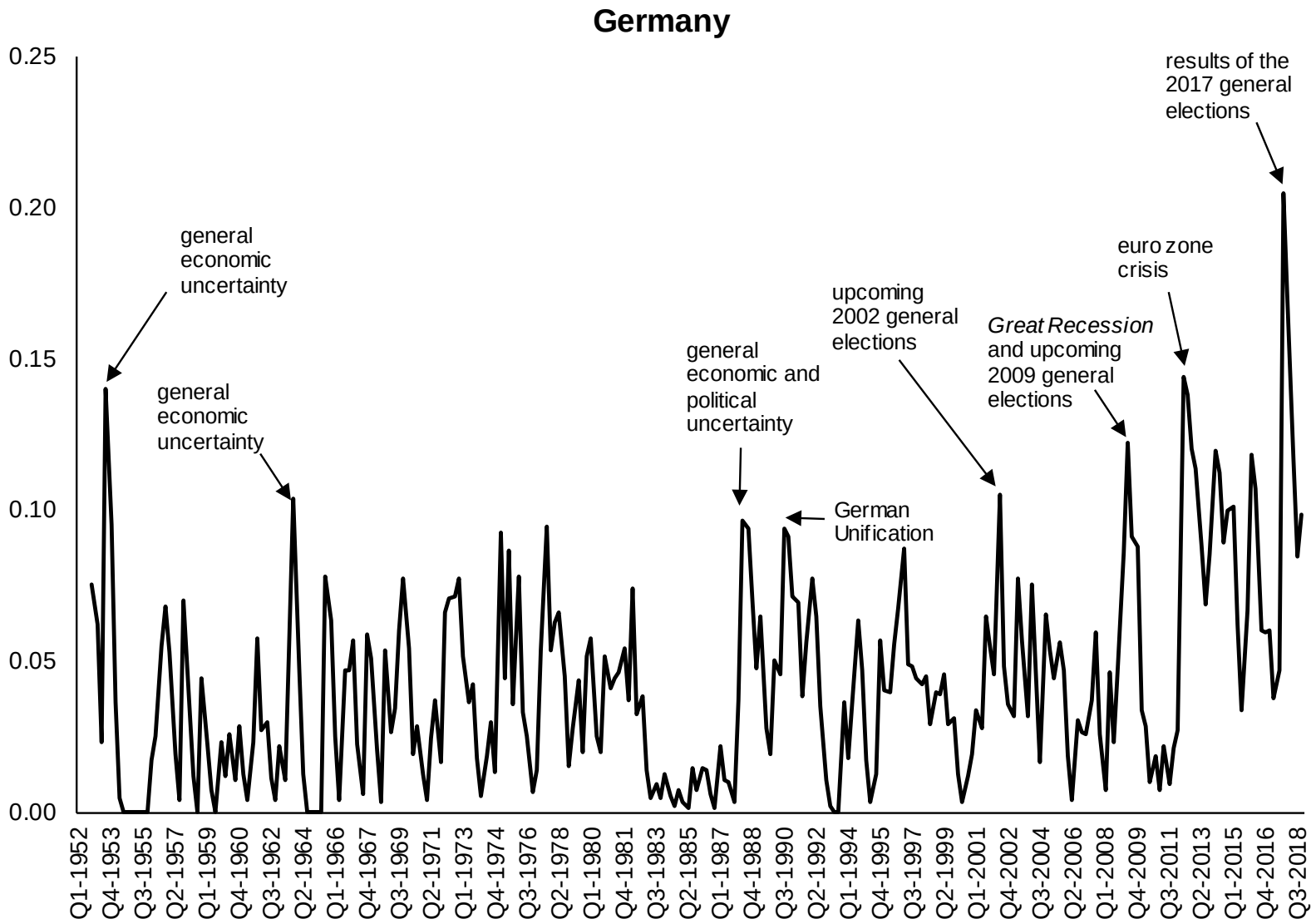

Belgium
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
uncertainty related to the common market for coal and steel
uncertainty related to the economy
uncertainty related to the economy
uncertainty related to the general elections
uncertainty related to the economy
uncertainty related to the economy
political uncertainty related to the elections
Q1-1952
Q4-1953
Q3-1955
Q2-1957
Q1-1959
Q4-1960
Q3-1962
Q2-1964
Q1-1966
Q4-1967
Q3-1969
Q2-1971
Q1-1973
Q4-1974
Q3-1976
Q2-1978
Q1-1980
Q4-1981
Q3-1983
Q2-1985
Q1-1987
Q4-1988
Q3-1990
Q2-1992
Q1-1994
Q4-1995
Q3-1997
Q2-1999
Q1-2001
Q4-2002
Q3-2004
Q2-2006
Q1-2008
Q4-2009
Q3-2011
Q2-2013
Q1-2015
Q4-2016
Q3-2018

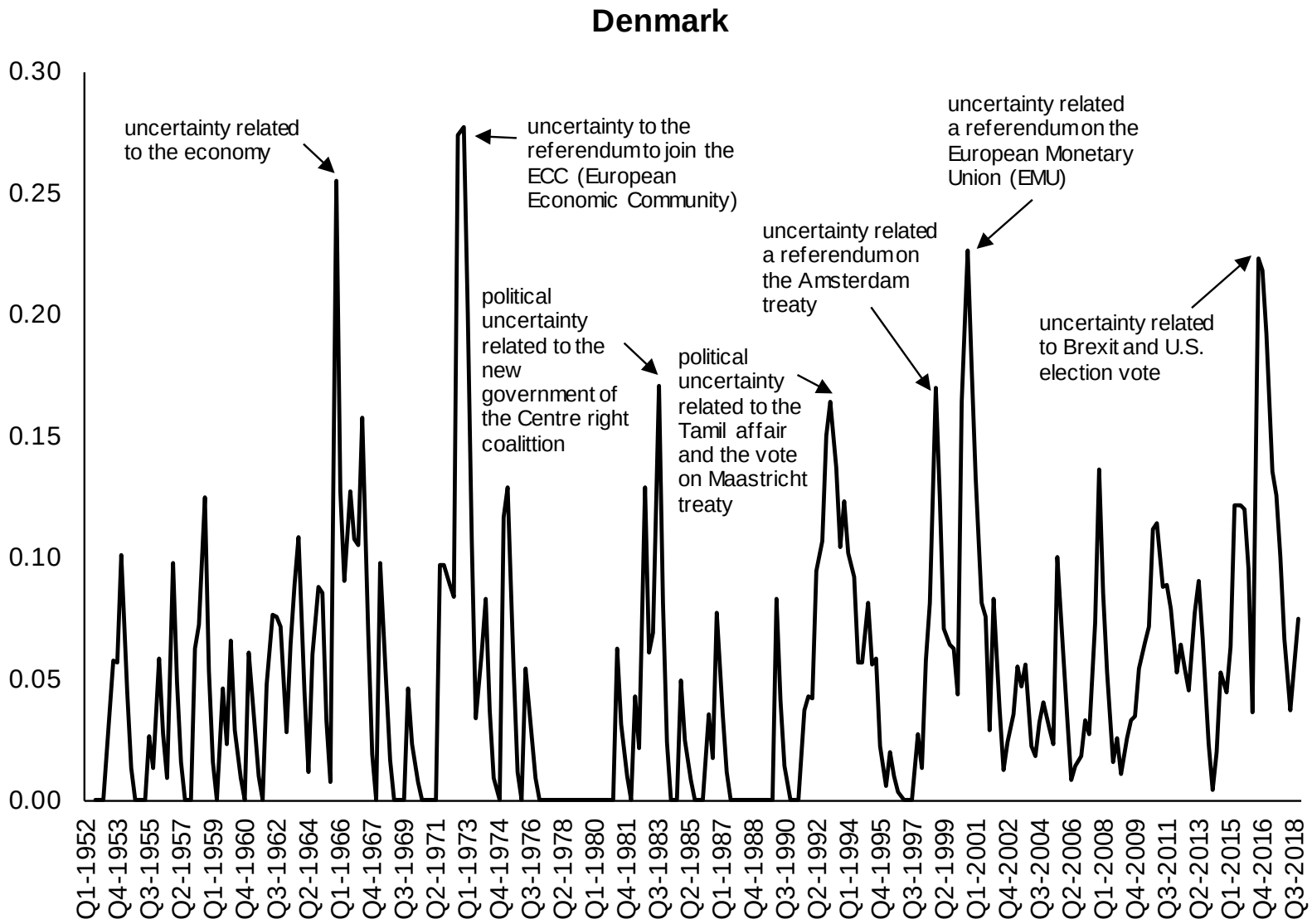

Brazil
0.60
0.50
0.40
0.30
0.20
0.10
0.00
uncertainty related an Army coup by General Lott
political and economic uncertainty and the possible return of ex-President Jânio da Silva Quadros
uncertainty related privatisation under President Itamar Franco
uncertainty related The resignation of Miss Zelia Cardoso de Mello, the formerly all-powerful economy minister and the the phasing down of the price freeze
uncertainty related unfavorable external environment
uncertainty related upcoming elections and president, Michel Temer, under pressure to resign for bribery
uncertainty related upcoming elections
uncertainty related upcoming elections
Q1-1952
Q4-1953
Q3-1955
Q2-1957
Q1-1959
Q4-1960
Q3-1962
Q2-1964
Q1-1966
Q4-1967
Q3-1969
Q2-1971
Q1-1973
Q4-1974
Q3-1976
Q2-1978
Q1-1980
Q4-1981
Q3-1983
Q2-1985
Q1-1987
Q4-1988
Q3-1990
Q2-1992
Q1-1994
Q4-1995
Q3-1997
Q2-1999
Q1-2001
Q4-2002
Q3-2004
Q2-2006
Q1-2008
Q4-2009
Q3-2011
Q2-2013
Q1-2015
Q4-2016
Q3-2018

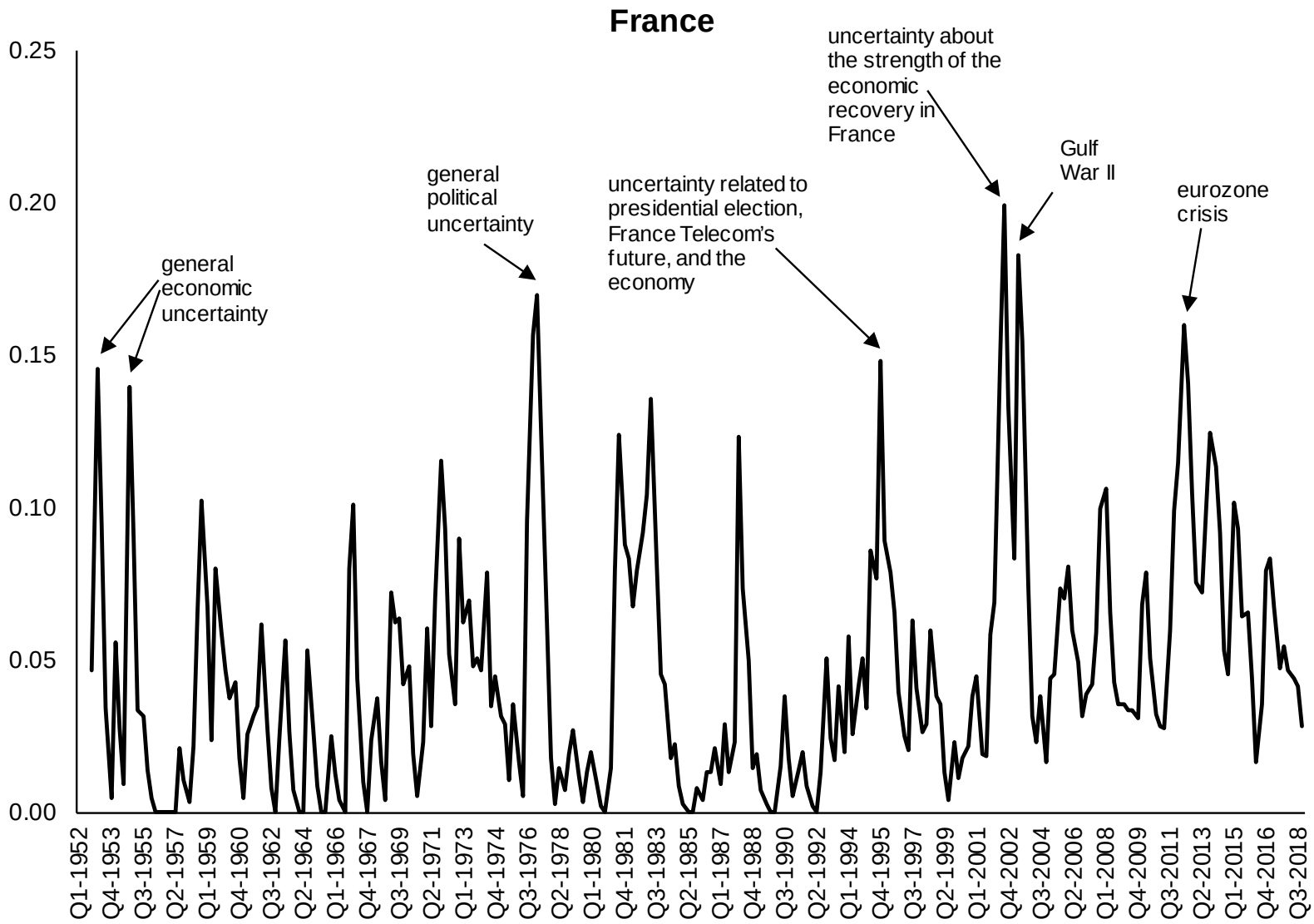

Canada
0.25
0.20
0.15
0.10
0.05
0.00
uncertainty related to the future of Canada-US Auto Pact
general economic uncertainty
forthcoming federal election of 1993
September 11 terrorists attacks
the election of President Trump and the threat to renegotiate NAFTA
Q1-1952
Q4-1953
Q3-1955
Q2-1957
Q1-1959
Q4-1960
Q3-1962
Q2-1964
Q1-1966
Q4-1967
Q3-1969
Q2-1971
Q1-1973
Q4-1974
Q3-1976
Q2-1978
Q1-1980
Q4-1981
Q3-1983
Q2-1985
Q1-1987
Q4-1988
Q3-1990
Q2-1992
Q1-1994
Q4-1995
Q3-1997
Q2-1999
Q1-2001
Q4-2002
Q3-2004
Q2-2006
Q1-2008
Q4-2009
Q3-2011
Q2-2013
Q1-2015
Q4-2016
Q3-2018

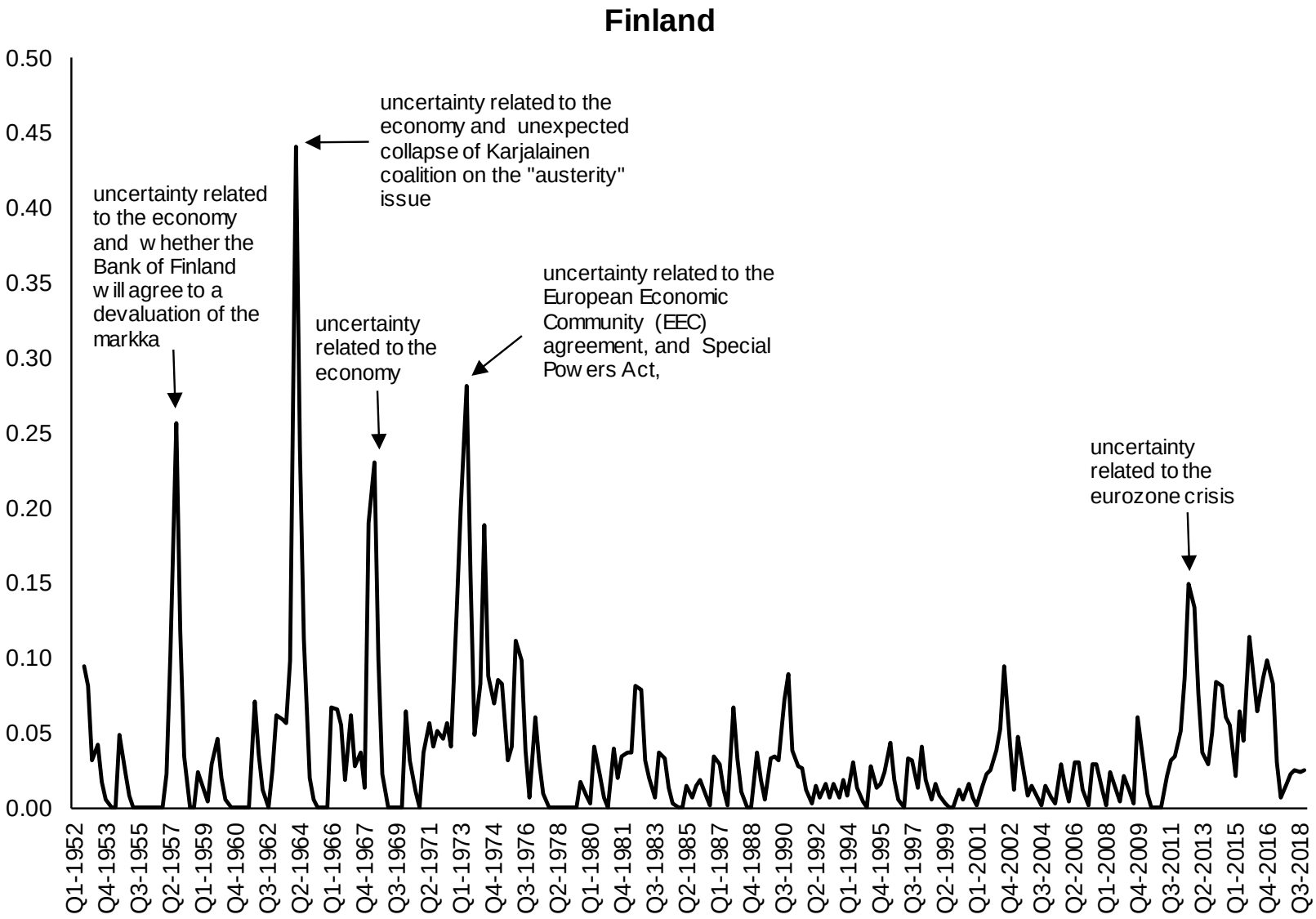

Chile
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
economic uncertainty followed by currency devaluation
economic and political uncertainty
election of President Salvador Allende
economic uncertainty
uncertainty related to upcoming elections
economic uncertainty
uncertainty related to upcoming elections
Q1-1952
Q4-1953
Q3-1955
Q2-1957
Q1-1959
Q4-1960
Q3-1962
Q2-1964
Q1-1966
Q4-1967
Q3-1969
Q2-1971
Q1-1973
Q4-1974
Q3-1976
Q2-1978
Q1-1980
Q4-1981
Q3-1983
Q2-1985
Q1-1987
Q4-1988
Q3-1990
Q2-1992
Q1-1994
Q4-1995
Q3-1997
Q2-1999
Q1-2001
Q4-2002
Q3-2004
Q2-2006
Q1-2008
Q4-2009
Q3-2011
Q2-2013
Q1-2015
Q4-2016
Q3-2018

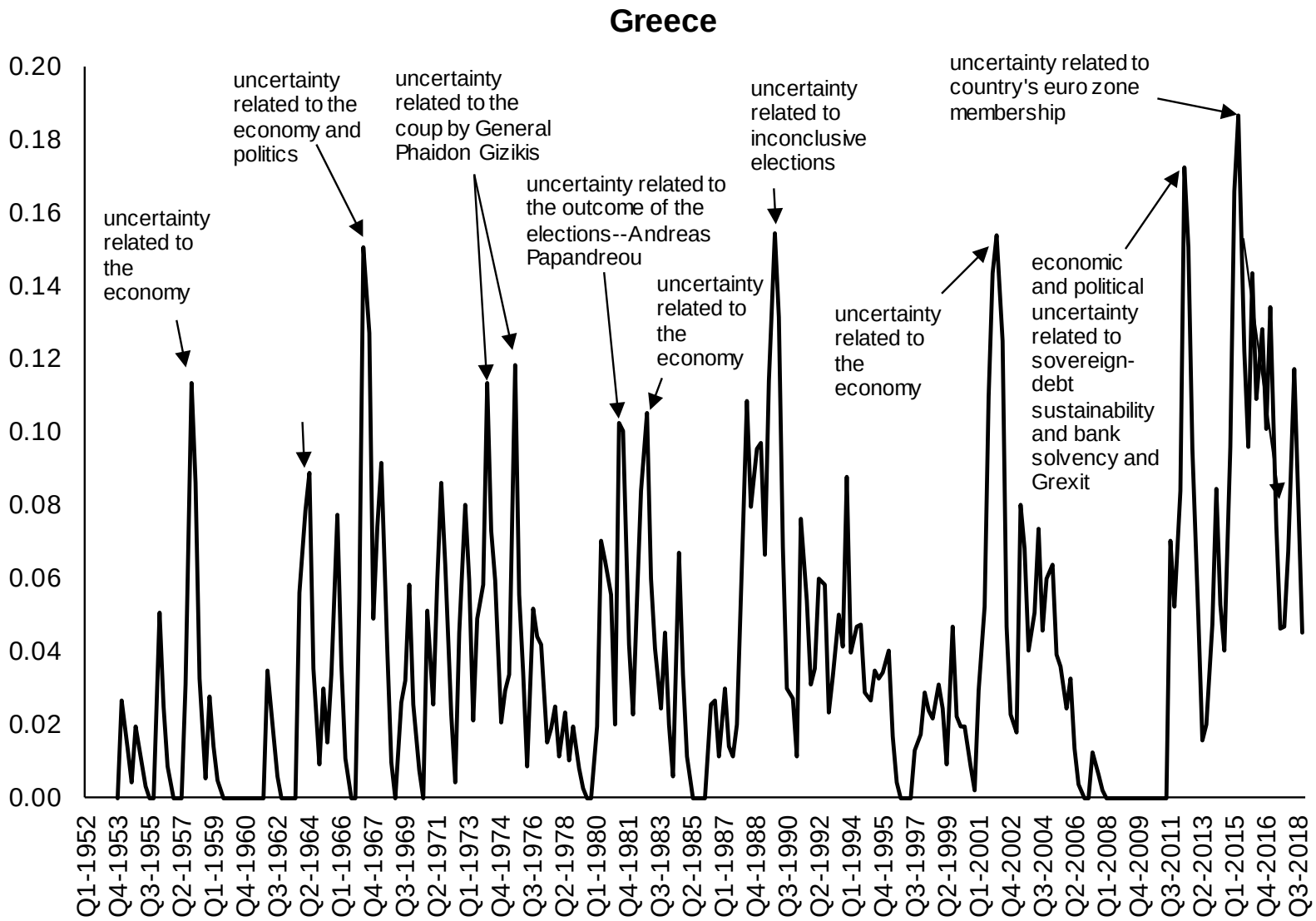

China
0.20
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
general economic uncertainty
uncertainty related to the cultural revolution
general economic and political uncertainty
general economic uncertainty
uncertainty related to the transition to a younger generation of political leaders
Uncertainty over how future leadership transitions will be handled
Q1-1952
Q4-1953
Q3-1955
Q2-1957
Q1-1959
Q4-1960
Q3-1962
Q2-1964
Q1-1966
Q4-1967
Q3-1969
Q2-1971
Q1-1973
Q4-1974
Q3-1976
Q2-1978
Q1-1980
Q4-1981
Q3-1983
Q2-1985
Q1-1987
Q4-1988
Q3-1990
Q2-1992
Q1-1994
Q4-1995
Q3-1997
Q2-1999
Q1-2001
Q4-2002
Q3-2004
Q2-2006
Q1-2008
Q4-2009
Q3-2011
Q2-2013
Q1-2015
Q4-2016
Q3-2018

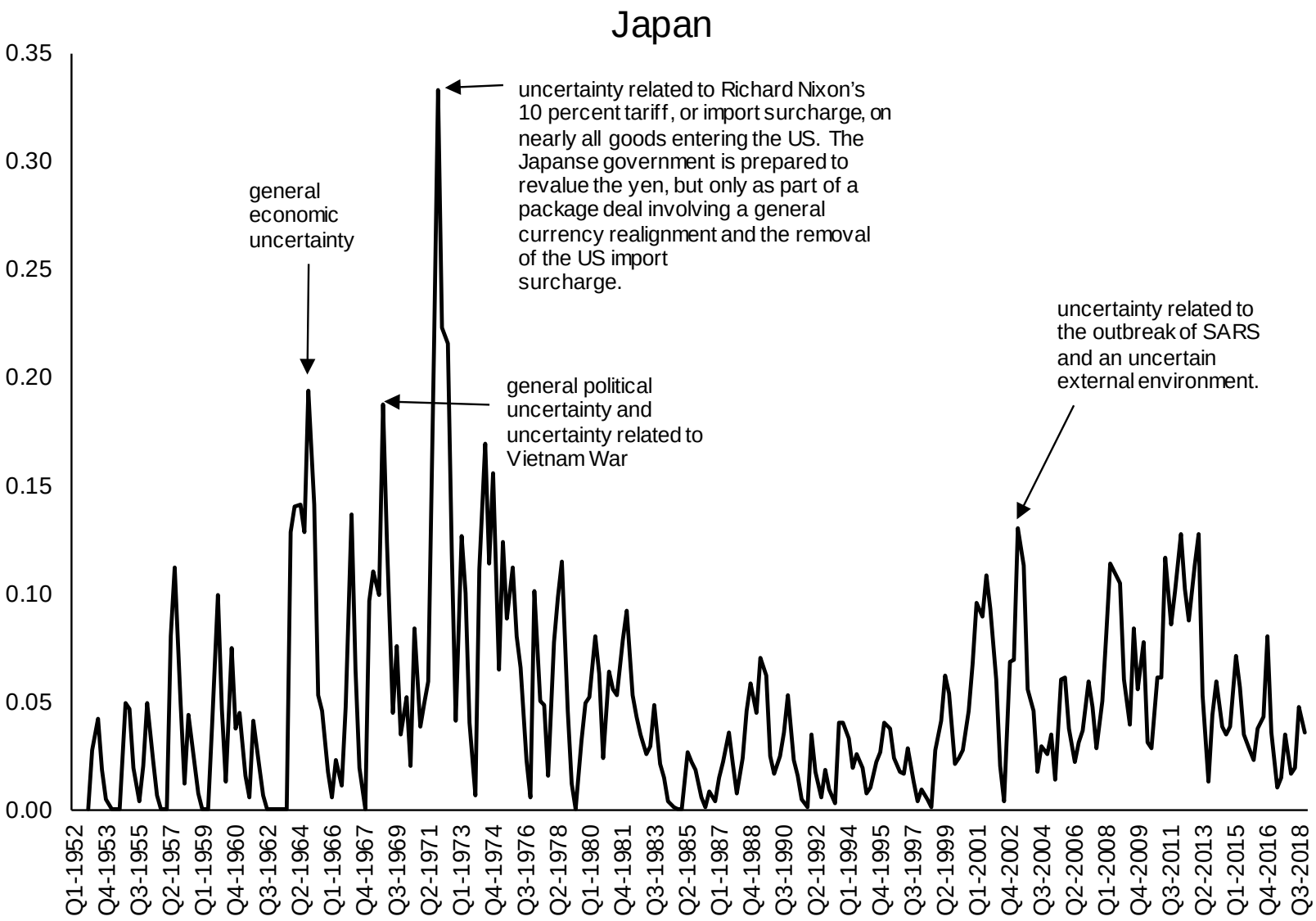

Germany
0.25
0.20
0.15
0.10
0.05
0.00
general economic uncertainty
general economic uncertainty
general economic and political uncertainty
German Unification
upcoming 2002 general elections
Great Recession and upcoming 2009 general elections
euro zone crisis
results of the 2017 general elections
Q1-1952
Q4-1953
Q3-1955
Q2-1957
Q1-1959
Q4-1960
Q3-1962
Q2-1964
Q1-1966
Q4-1967
Q3-1969
Q2-1971
Q1-1973
Q4-1974
Q3-1976
Q2-1978
Q1-1980
Q4-1981
Q3-1983
Q2-1985
Q1-1987
Q4-1988
Q3-1990
Q2-1992
Q1-1994
Q4-1995
Q3-1997
Q2-1999
Q1-2001
Q4-2002
Q3-2004
Q2-2006
Q1-2008
Q4-2009
Q3-2011
Q2-2013
Q1-2015
Q4-2016
Q3-2018

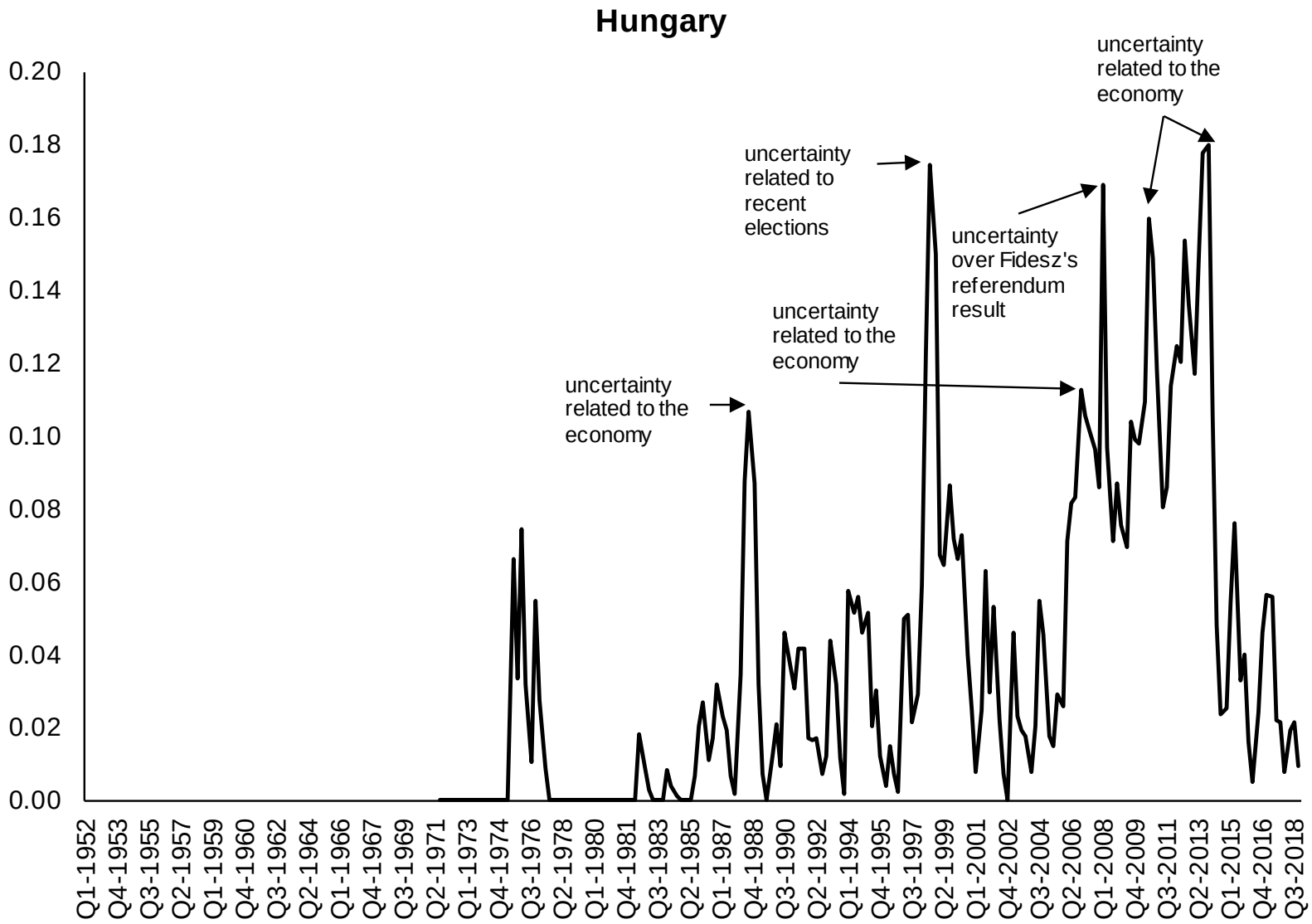

Denmark
0.30
0.25
0.20
0.15
0.10
0.05
0.00
uncertainty related to the economy
uncertainty to the referendum to join the ECC (European Economic Community)
political uncertainty related to the new government of the Centre right coalittion
political uncertainty related to the Tamil affair and the vote on Maastricht treaty
uncertainty related a referendum on the Amsterdam treaty
uncertainty related a referendum on the European Monetary Union (EMU)
uncertainty related to Brexit and U.S. election vote
Q1-1952
Q4-1953
Q3-1955
Q2-1957
Q1-1959
Q4-1960
Q3-1962
Q2-1964
Q1-1966
Q4-1967
Q3-1969
Q2-1971
Q1-1973
Q4-1974
Q3-1976
Q2-1978
Q1-1980
Q4-1981
Q3-1983
Q2-1985
Q1-1987
Q4-1988
Q3-1990
Q2-1992
Q1-1994
Q4-1995
Q3-1997
Q2-1999
Q1-2001
Q4-2002
Q3-2004
Q2-2006
Q1-2008
Q4-2009
Q3-2011
Q2-2013
Q1-2015
Q4-2016
Q3-2018

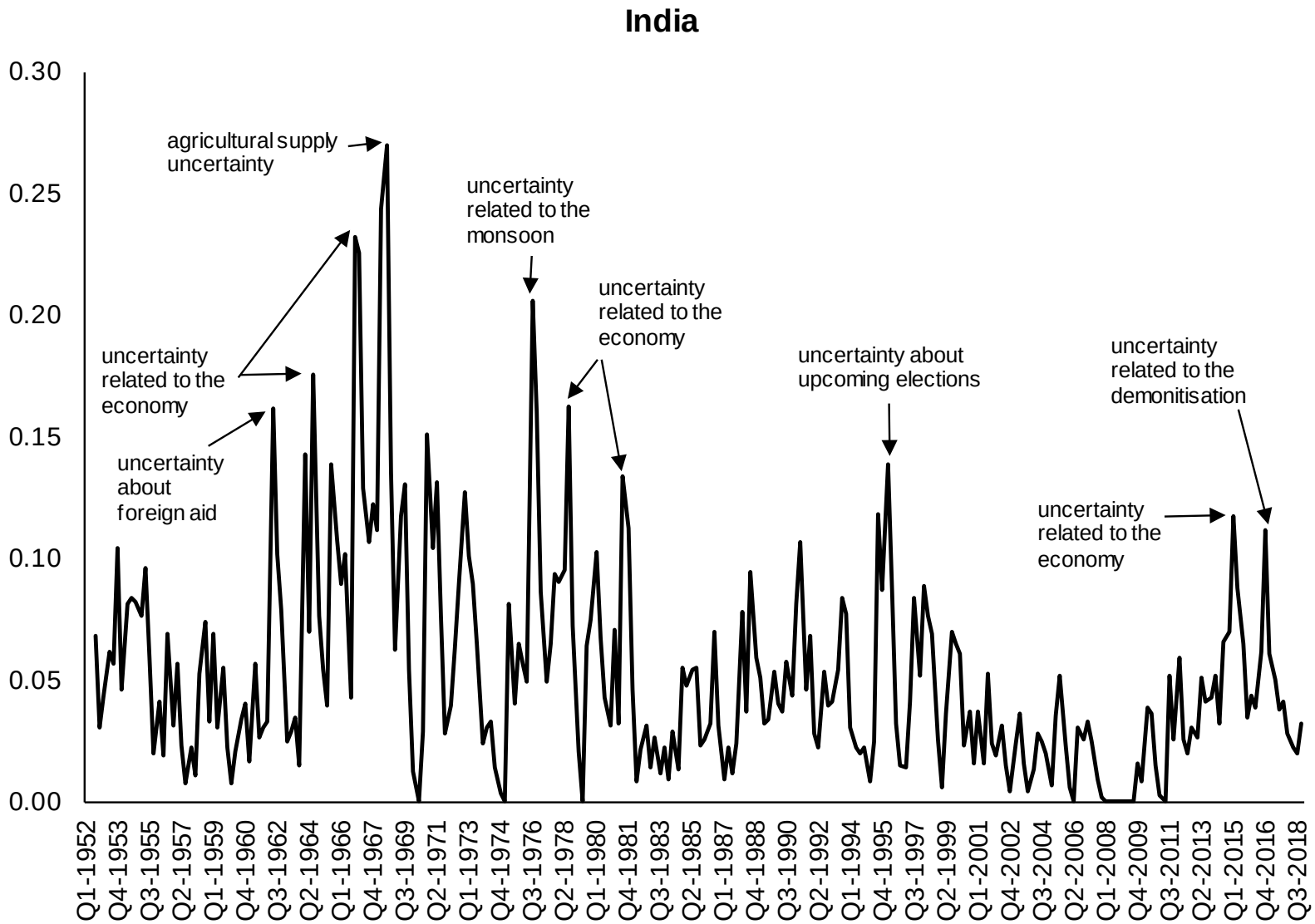

France
0.25
0.20
0.15
0.10
0.05
0.00
general economic uncertainty
general political uncertainty
uncertainty related to presidential election, France Telecom's future, and the economy
uncertainty about the strength of the economic recovery in France
Gulf War II
eurozone crisis
Q1-1952
Q4-1953
Q3-1955
Q2-1957
Q1-1959
Q4-1960
Q3-1962
Q2-1964
Q1-1966
Q4-1967
Q3-1969
Q2-1971
Q1-1973
Q4-1974
Q3-1976
Q2-1978
Q1-1980
Q4-1981
Q3-1983
Q2-1985
Q1-1987
Q4-1988
Q3-1990
Q2-1992
Q1-1994
Q4-1995
Q3-1997
Q2-1999
Q1-2001
Q4-2002
Q3-2004
Q2-2006
Q1-2008
Q4-2009
Q3-2011
Q2-2013
Q1-2015
Q4-2016
Q3-2018

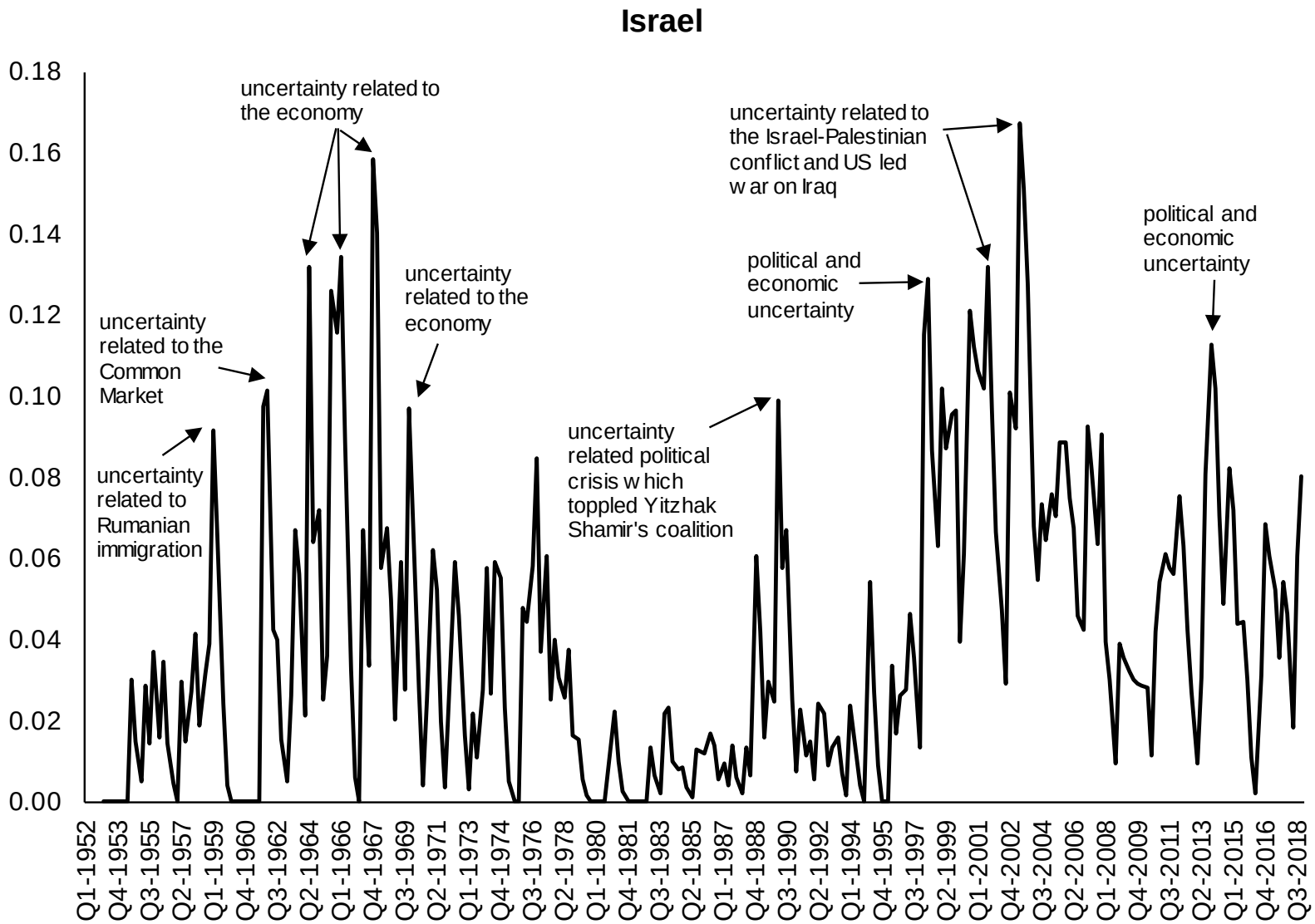

Finland
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
uncertainty related to the economy and whether the Bank of Finland will agree to a devaluation of the markka
uncertainty related to the economy and unexpected collapse of Karjalainen coalition on the "austerity" issue
uncertainty related to the economy
uncertainty related to the European Economic Community (EEC) agreement, and Special Powers Act,
uncertainty related to the eurozone crisis
Q1-1952
Q4-1953
Q3-1955
Q2-1957
Q1-1959
Q4-1960
Q3-1962
Q2-1964
Q1-1966
Q4-1967
Q3-1969
Q2-1971
Q1-1973
Q4-1974
Q3-1976
Q2-1978
Q1-1980
Q4-1981
Q3-1983
Q2-1985
Q1-1987
Q4-1988
Q3-1990
Q2-1992
Q1-1994
Q4-1995
Q3-1997
Q2-1999
Q1-2001
Q4-2002
Q3-2004
Q2-2006
Q1-2008
Q4-2009
Q3-2011
Q2-2013
Q1-2015
Q4-2016
Q3-2018

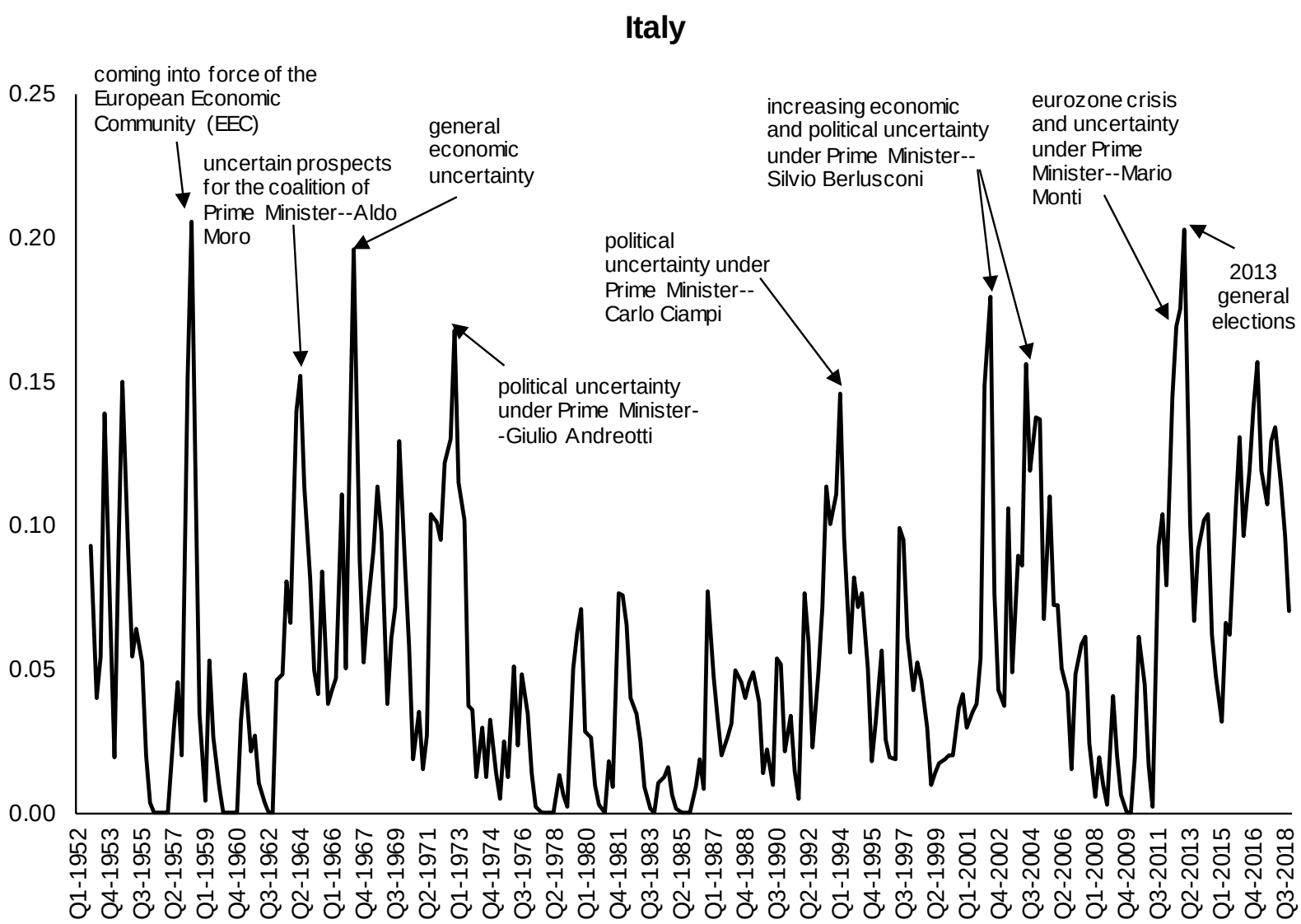

Greece
0.20
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
uncertainty related to the economy
uncertainty related to the economy and politics
uncertainty related to the coup by General Phaidon Gizikis
uncertainty related to the outcome of the elections--Andreas Papandreou
uncertainty related to the economy
uncertainty related to inconclusive elections
uncertainty related to the economy
uncertainty related to country's euro zone membership
economic and political uncertainty related to sovereign-debt sustainability and bank solvency and Grexit
Q1-1952
Q4-1953
Q3-1955
Q2-1957
Q1-1959
Q4-1960
Q3-1962
Q2-1964
Q1-1966
Q4-1967
Q3-1969
Q2-1971
Q1-1973
Q4-1974
Q3-1976
Q2-1978
Q1-1980
Q4-1981
Q3-1983
Q2-1985
Q1-1987
Q4-1988
Q3-1990
Q2-1992
Q1-1994
Q4-1995
Q3-1997
Q2-1999
Q1-2001
Q4-2002
Q3-2004
Q2-2006
Q1-2008
Q4-2009
Q3-2011
Q2-2013
Q1-2015
Q4-2016
Q3-2018

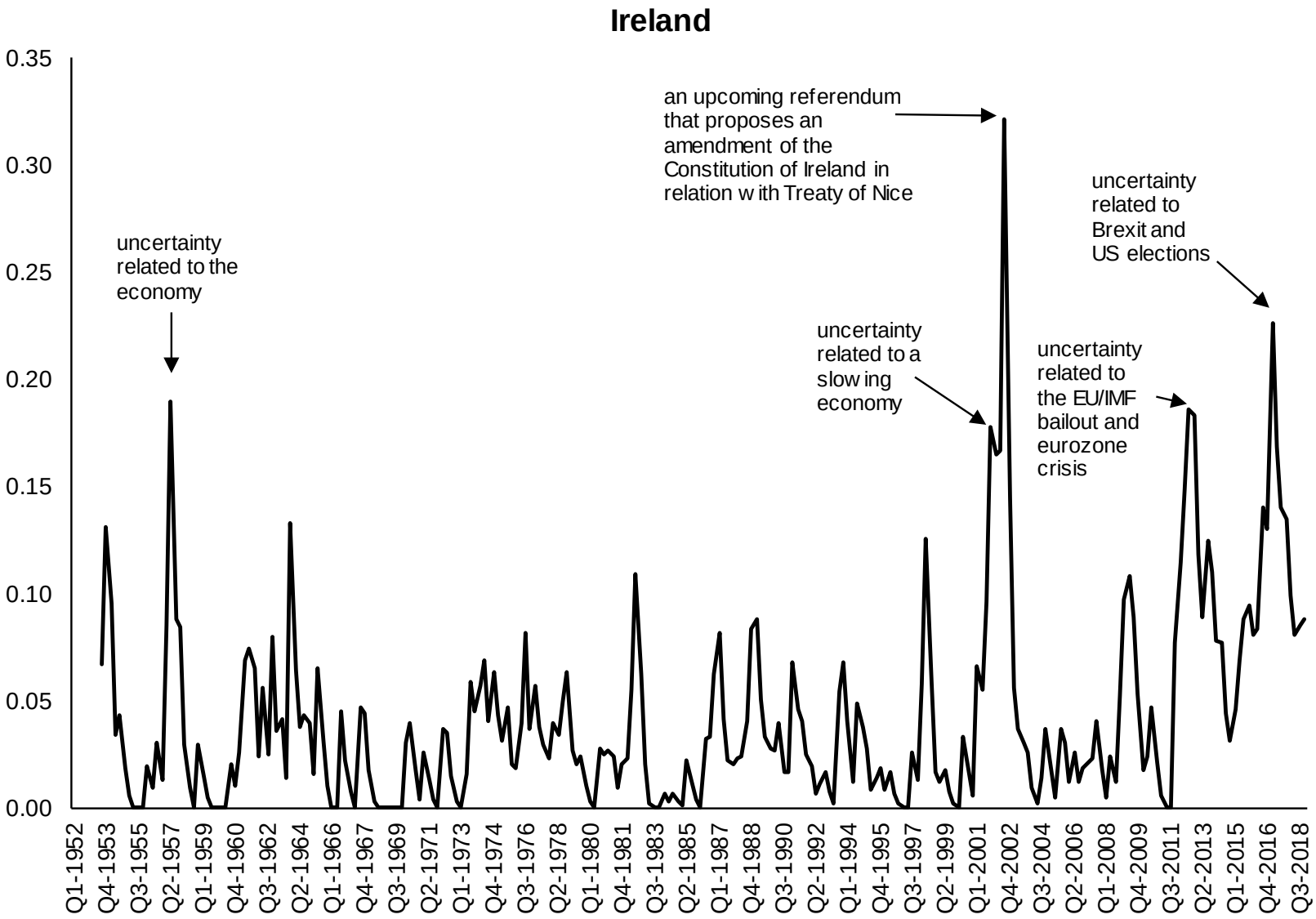

Japan
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
general economic uncertainty
uncertainty related to Richard Nixon's 10 percent tariff, or import surcharge, on nearly all goods entering the US. The Japanse government is prepared to revalue the yen, but only as part of a package deal involving a general currency realignment and the removal of the US import surcharge.
general political uncertainty and uncertainty related to Vietnam War
uncertainty related to the outbreak of SARS and an uncertain external environment.
Q1-1952
Q4-1953
Q3-1955
Q2-1957
Q1-1959
Q4-1960
Q3-1962
Q2-1964
Q1-1966
Q4-1967
Q3-1969
Q2-1971
Q1-1973
Q4-1974
Q3-1976
Q2-1978
Q1-1980
Q4-1981
Q3-1983
Q2-1985
Q1-1987
Q4-1988
Q3-1990
Q2-1992
Q1-1994
Q4-1995
Q3-1997
Q2-1999
Q1-2001
Q4-2002
Q3-2004
Q2-2006
Q1-2008
Q4-2009
Q3-2011
Q2-2013
Q1-2015
Q4-2016
Q3-2018

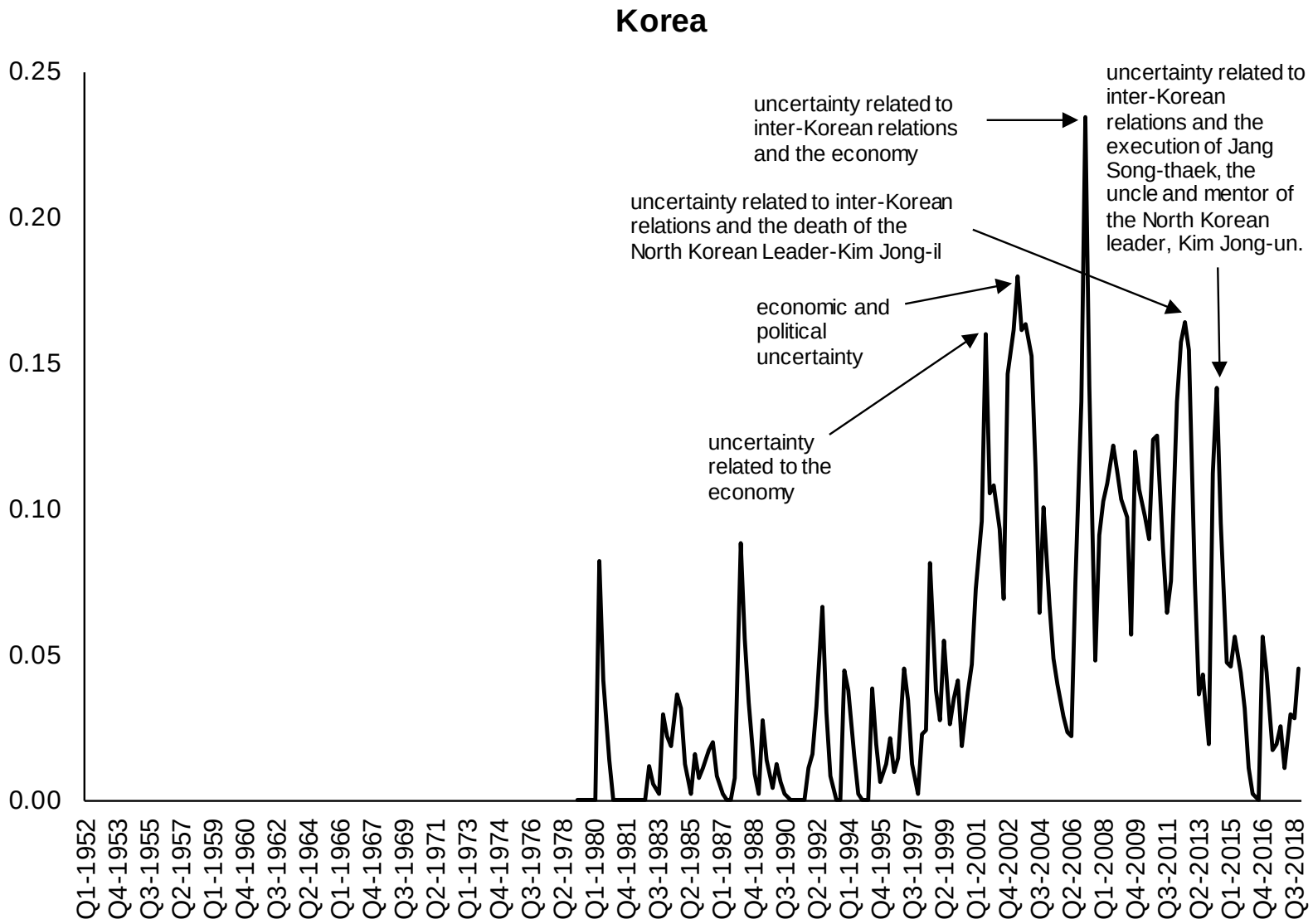

Hungary
uncertainty related to the economy
uncertainty related to recent elections
uncertainty over Fidesz's referendum result
uncertainty related to the economy
uncertainty related to the economy
0.20
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Q1-1952
Q4-1953
Q3-1955
Q2-1957
Q1-1959
Q4-1960
Q3-1962
Q2-1964
Q1-1966
Q4-1967
Q3-1969
Q2-1971
Q1-1973
Q4-1974
Q3-1976
Q2-1978
Q1-1980
Q4-1981
Q3-1983
Q2-1985
Q1-1987
Q4-1988
Q3-1990
Q2-1992
Q1-1994
Q4-1995
Q3-1997
Q2-1999
Q1-2001
Q4-2002
Q3-2004
Q2-2006
Q1-2008
Q4-2009
Q3-2011
Q2-2013
Q1-2015
Q4-2016
Q3-2018

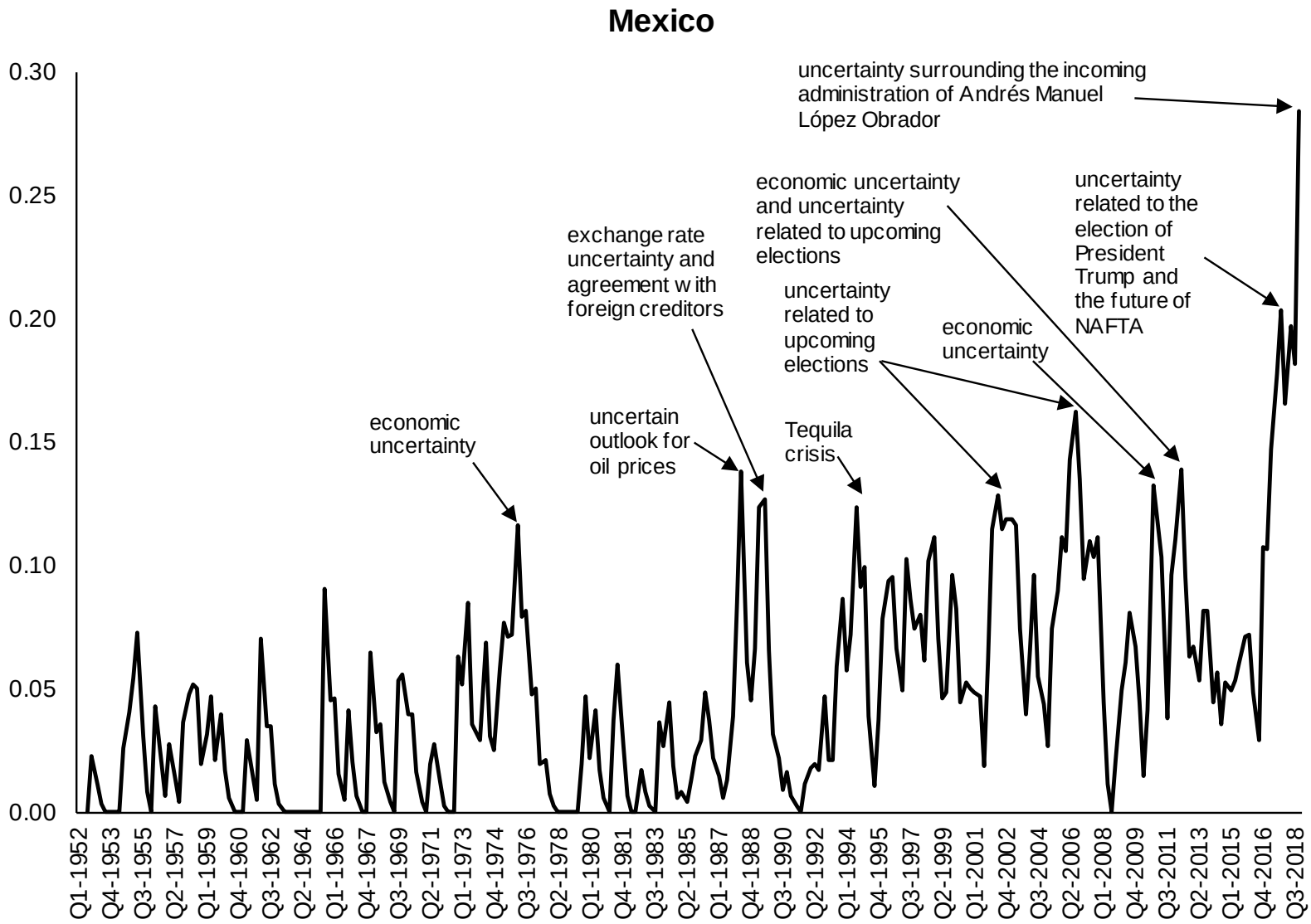

India
0.30
0.25
0.20
0.15
0.10
0.05
0.00
agricultural supply uncertainty
uncertainty related to the monsoon
uncertainty related to the economy
uncertainty related to the economy
uncertainty about foreign aid
uncertainty about upcoming elections
uncertainty related to the demonitisation
uncertainty related to the economy
Q1-1952
Q4-1953
Q3-1955
Q2-1957
Q1-1959
Q4-1960
Q3-1962
Q2-1964
Q1-1966
Q4-1967
Q3-1969
Q2-1971
Q1-1973
Q4-1974
Q3-1976
Q2-1978
Q1-1980
Q4-1981
Q3-1983
Q2-1985
Q1-1987
Q4-1988
Q3-1990
Q2-1992
Q1-1994
Q4-1995
Q3-1997
Q2-1999
Q1-2001
Q4-2002
Q3-2004
Q2-2006
Q1-2008
Q4-2009
Q3-2011
Q2-2013
Q1-2015
Q4-2016
Q3-2018

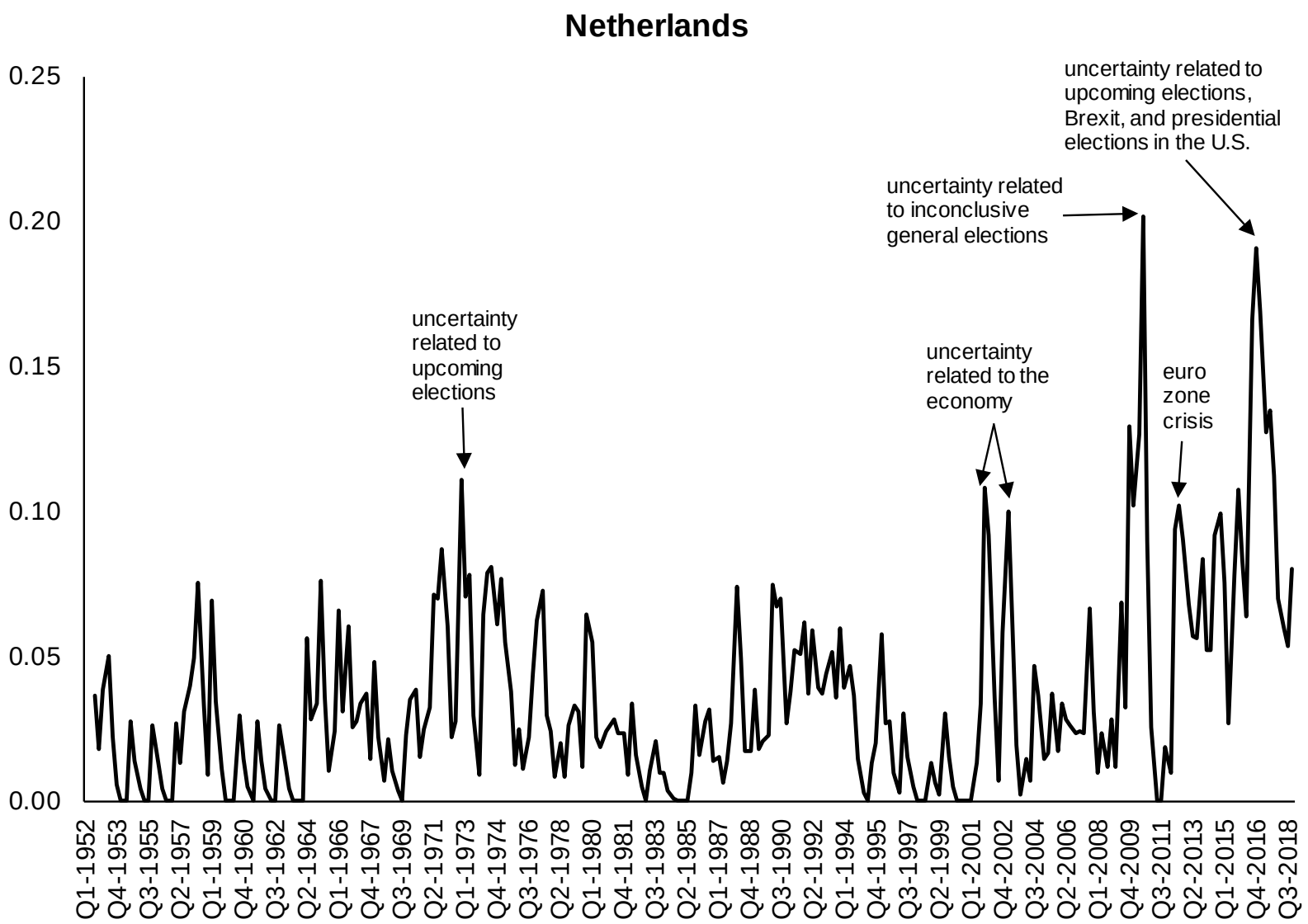

Israel
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
uncertainty related to the economy
uncertainty related to the Common Market
uncertainty related to Rumanian immigration
uncertainty related to the economy
uncertainty related political crisis which toppled Yitzhak Shamir's coalition
uncertainty related to the Israel-Palestinian conflict and US led war on Iraq
political and economic uncertainty
political and economic uncertainty
Q1-1952
Q4-1953
Q3-1955
Q2-1957
Q1-1959
Q4-1960
Q3-1962
Q2-1964
Q1-1966
Q4-1967
Q3-1969
Q2-1971
Q1-1973
Q4-1974
Q3-1976
Q2-1978
Q1-1980
Q4-1981
Q3-1983
Q2-1985
Q1-1987
Q4-1988
Q3-1990
Q2-1992
Q1-1994
Q4-1995
Q3-1997
Q2-1999
Q1-2001
Q4-2002
Q3-2004
Q2-2006
Q1-2008
Q4-2009
Q3-2011
Q2-2013
Q1-2015
Q4-2016
Q3-2018

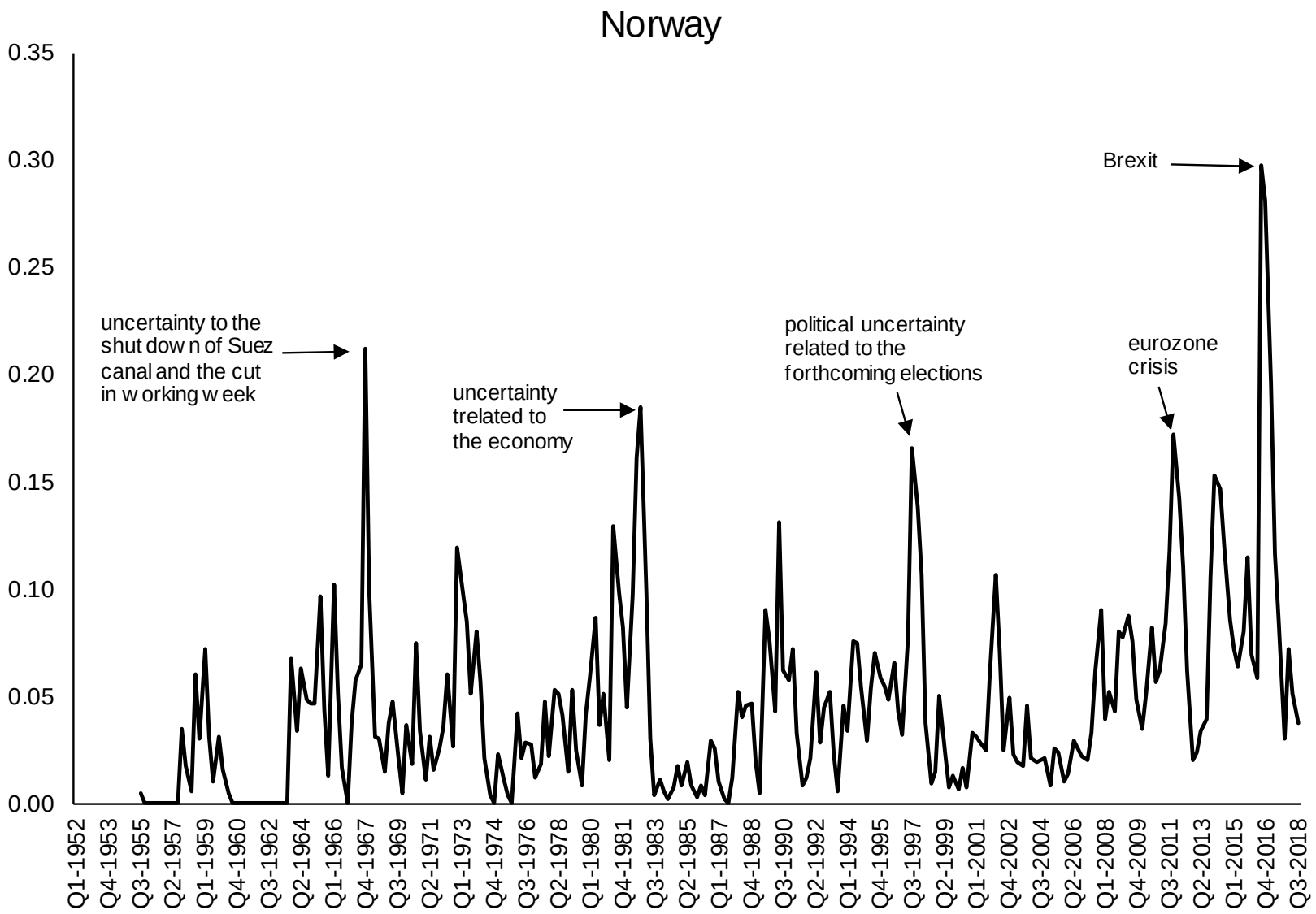

Italy
coming into force of the European Economic Community (EEC)
uncertain prospects for the coalition of Prime Minister--Aldo Moro
general economic uncertainty
political uncertainty under Prime Minister--Giulio Andreotti
political uncertainty under Prime Minister--Carlo Ciampi
increasing economic and political uncertainty under Prime Minister--Silvio Berlusconi
eurozone crisis and uncertainty under Prime Minister--Mario Monti
2013 general elections
0.25
0.20
0.15
0.10
0.05
0.00
Q1-1952
Q4-1953
Q3-1955
Q2-1957
Q1-1959
Q4-1960
Q3-1962
Q2-1964
Q1-1966
Q4-1967
Q3-1969
Q2-1971
Q1-1973
Q4-1974
Q3-1976
Q2-1978
Q1-1980
Q4-1981
Q3-1983
Q2-1985
Q1-1987
Q4-1988
Q3-1990
Q2-1992
Q1-1994
Q4-1995
Q3-1997
Q2-1999
Q1-2001
Q4-2002
Q3-2004
Q2-2006
Q1-2008
Q4-2009
Q3-2011
Q2-2013
Q1-2015
Q4-2016
Q3-2018

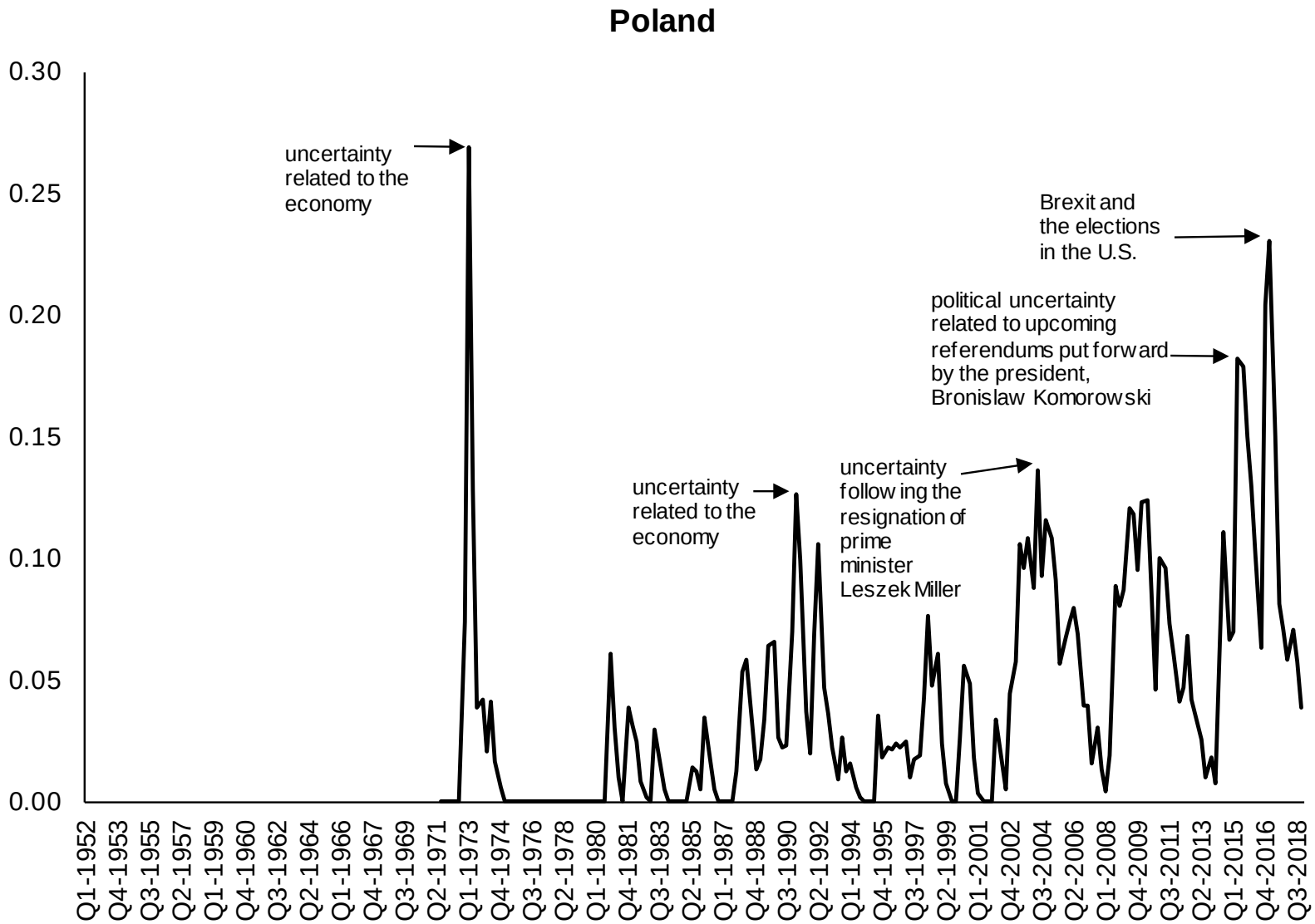

Ireland
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
uncertainty related to the economy
an upcoming referendum that proposes an amendment of the Constitution of Ireland in relation with Treaty of Nice
uncertainty related to a slowing economy
uncertainty related to the EU/IMF bailout and eurozone crisis
uncertainty related to Brexit and US elections
Q1-1952
Q4-1953
Q3-1955
Q2-1957
Q1-1959
Q4-1960
Q3-1962
Q2-1964
Q1-1966
Q4-1967
Q3-1969
Q2-1971
Q1-1973
Q4-1974
Q3-1976
Q2-1978
Q1-1980
Q4-1981
Q3-1983
Q2-1985
Q1-1987
Q4-1988
Q3-1990
Q2-1992
Q1-1994
Q4-1995
Q3-1997
Q2-1999
Q1-2001
Q4-2002
Q3-2004
Q2-2006
Q1-2008
Q4-2009
Q3-2011
Q2-2013
Q1-2015
Q4-2016
Q3-2018

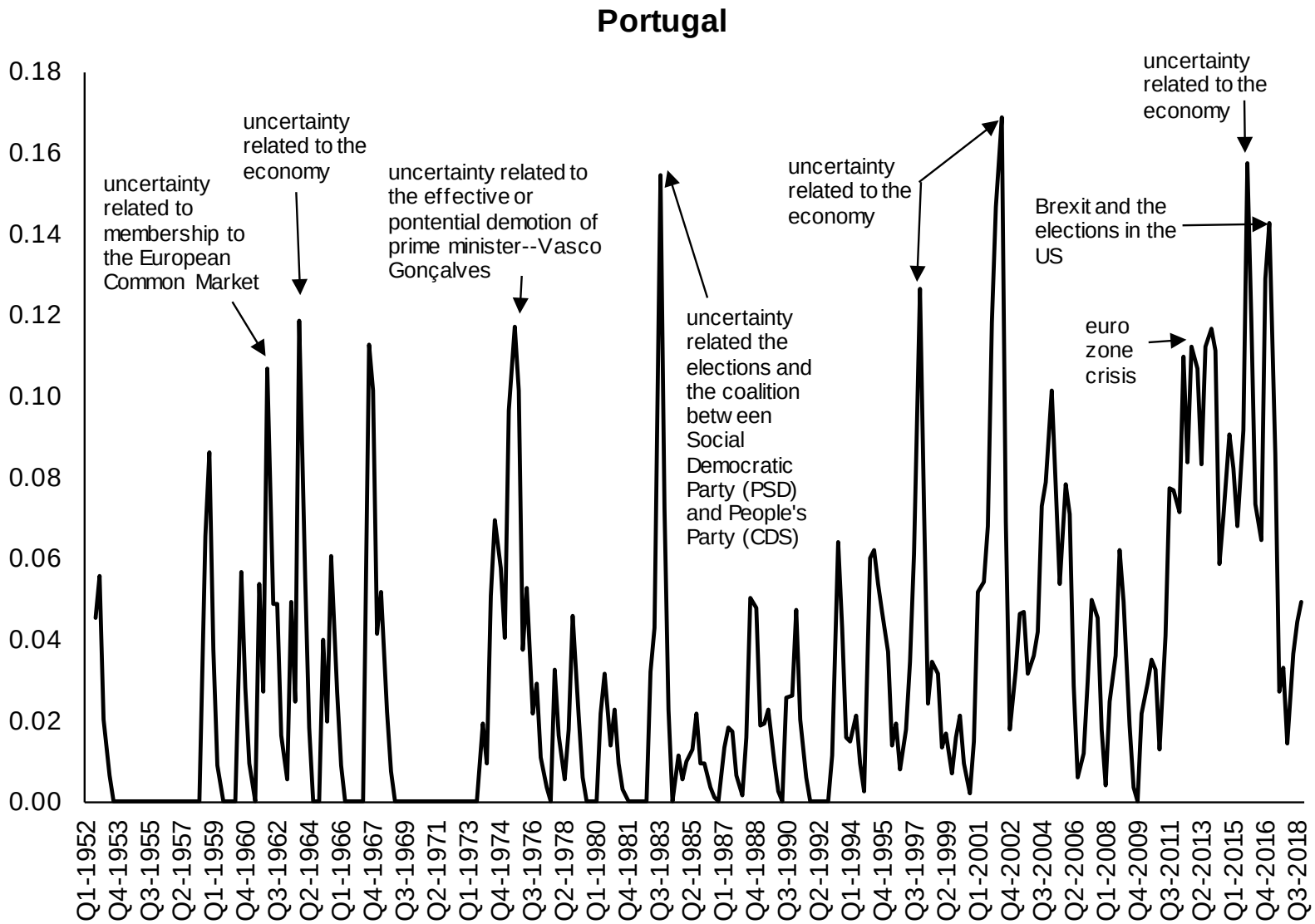

Korea
0.25
0.20
0.15
0.10
0.05
0.00
uncertainty related to inter-Korean relations and the economy
uncertainty related to inter-Korean relations and the death of the North Korean Leader-Kim Jong-il
economic and political uncertainty
uncertainty related to the economy
uncertainty related to inter-Korean relations and the execution of Jang Song-thaek, the uncle and mentor of the North Korean leader, Kim Jong-un.
Q1-1952
Q4-1953
Q3-1955
Q2-1957
Q1-1959
Q4-1960
Q3-1962
Q2-1964
Q1-1966
Q4-1967
Q3-1969
Q2-1971
Q1-1973
Q4-1974
Q3-1976
Q2-1978
Q1-1980
Q4-1981
Q3-1983
Q2-1985
Q1-1987
Q4-1988
Q3-1990
Q2-1992
Q1-1994
Q4-1995
Q3-1997
Q2-1999
Q1-2001
Q4-2002
Q3-2004
Q2-2006
Q1-2008
Q4-2009
Q3-2011
Q2-2013
Q1-2015
Q4-2016
Q3-2018


Mexico
0.30
0.25
0.20
0.15
0.10
0.05
0.00
uncertainty surrounding the incoming administration of Andrés Manuel López Obrador
economic uncertainty and uncertainty related to upcoming elections
uncertainty related to the election of President Trump and the future of NAFTA
exchange rate uncertainty and agreement with foreign creditors
uncertainty related to upcoming elections
economic uncertainty
economic uncertainty
uncertain outlook for oil prices
Tequila crisis
Q1-1952
Q4-1953
Q3-1955
Q2-1957
Q1-1959
Q4-1960
Q3-1962
Q2-1964
Q1-1966
Q4-1967
Q3-1969
Q2-1971
Q1-1973
Q4-1974
Q3-1976
Q2-1978
Q1-1980
Q4-1981
Q3-1983
Q2-1985
Q1-1987
Q4-1988
Q3-1990
Q2-1992
Q1-1994
Q4-1995
Q3-1997
Q2-1999
Q1-2001
Q4-2002
Q3-2004
Q2-2006
Q1-2008
Q4-2009
Q3-2011
Q2-2013
Q1-2015
Q4-2016
Q3-2018

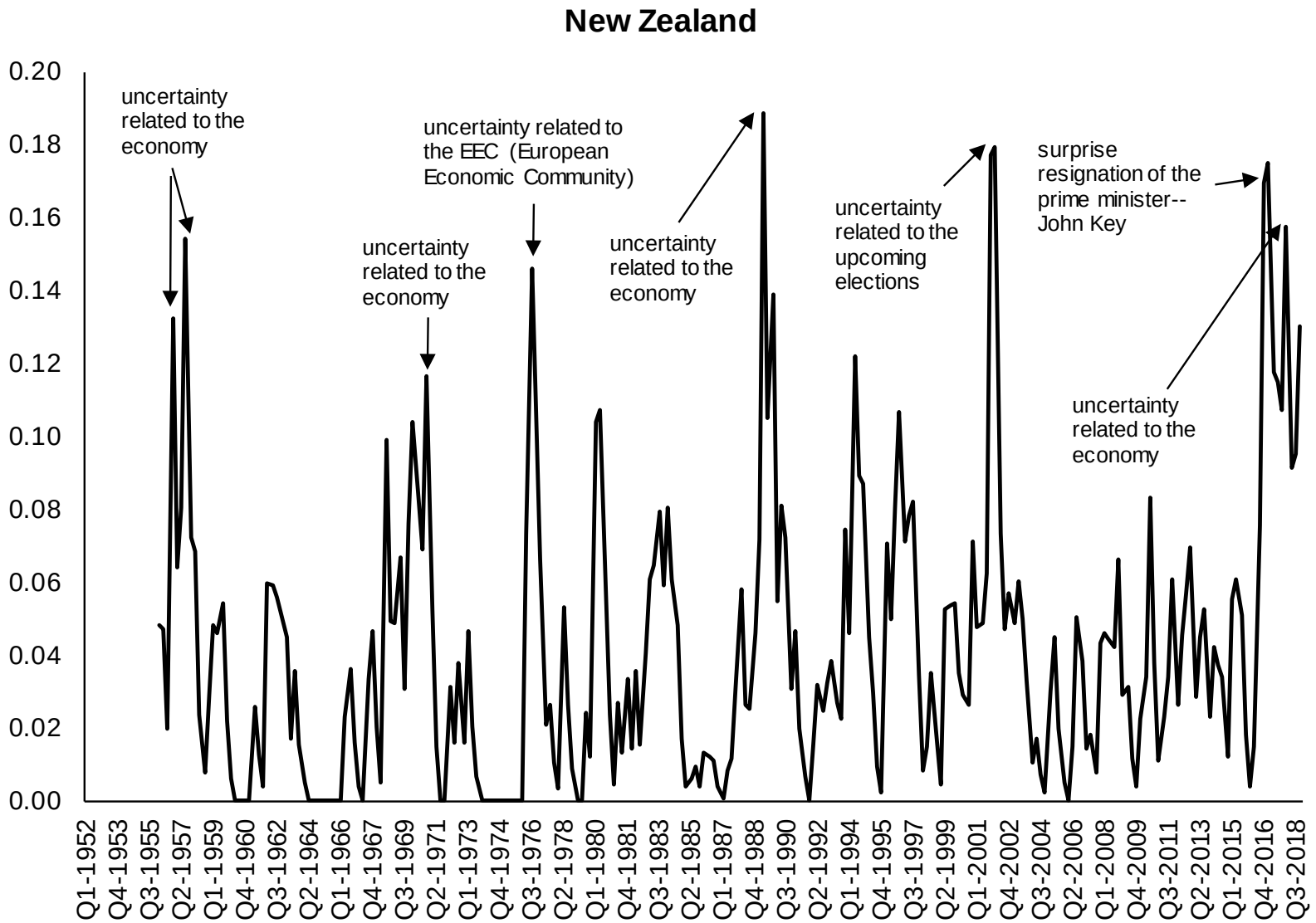

Netherlands
0.25
0.20
0.15
0.10
0.05
0.00
uncertainty related to upcoming elections, Brexit, and presidential elections in the U.S.
uncertainty related to inconclusive general elections
uncertainty related to upcoming elections
uncertainty related to the economy
euro zone crisis
Q1-1952
Q4-1953
Q3-1955
Q2-1957
Q1-1959
Q4-1960
Q3-1962
Q2-1964
Q1-1966
Q4-1967
Q3-1969
Q2-1971
Q1-1973
Q4-1974
Q3-1976
Q2-1978
Q1-1980
Q4-1981
Q3-1983
Q2-1985
Q1-1987
Q4-1988
Q3-1990
Q2-1992
Q1-1994
Q4-1995
Q3-1997
Q2-1999
Q1-2001
Q4-2002
Q3-2004
Q2-2006
Q1-2008
Q4-2009
Q3-2011
Q2-2013
Q1-2015
Q4-2016
Q3-2018

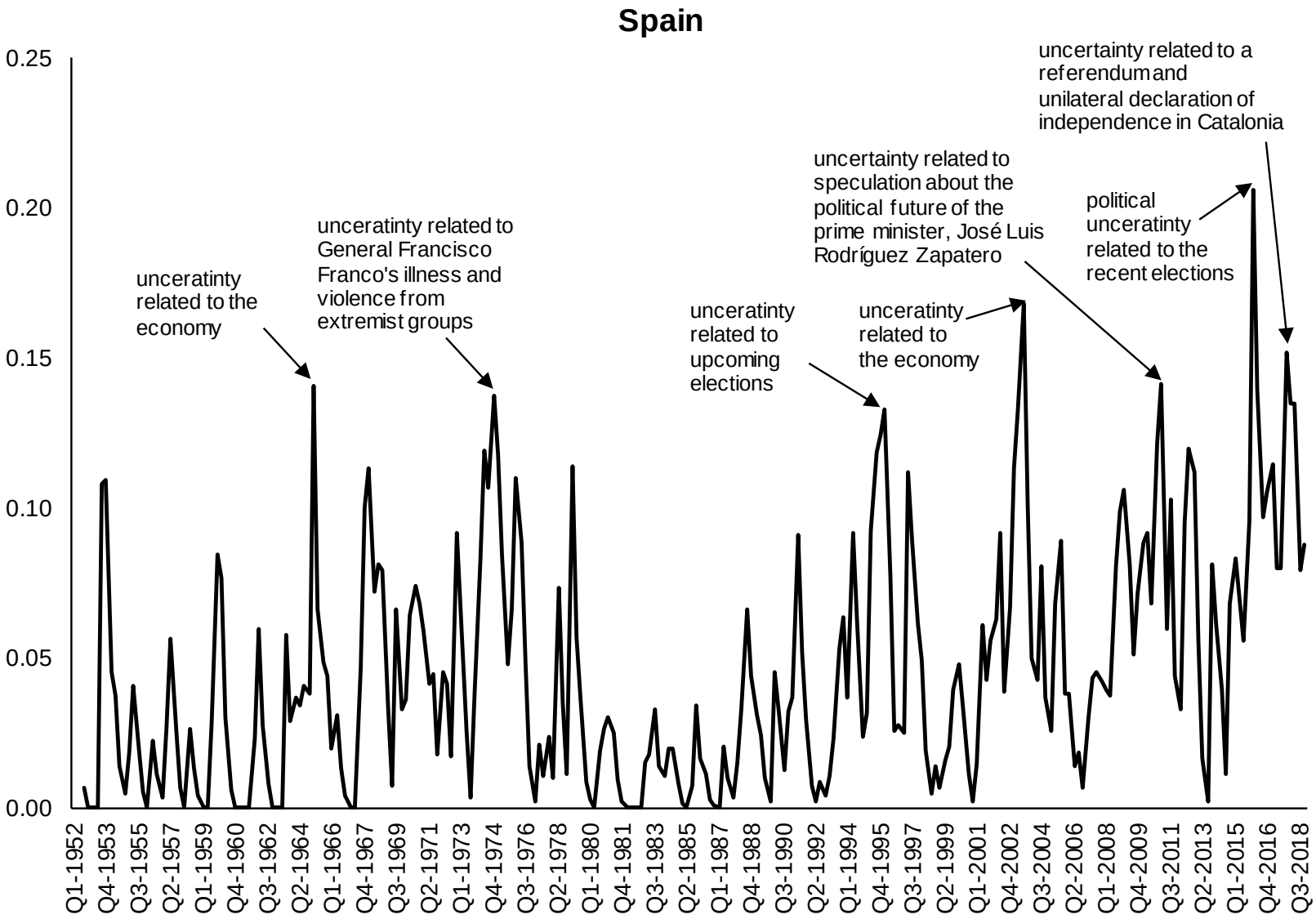

Norway
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
uncertainty to the shut dow n of Suez canal and the cut in w orking w eek
uncertainty trelated to the economy
political uncertainty related to the forthcoming elections
eurozone crisis
Brexit
Q1-1952
Q4-1953
Q3-1955
Q2-1957
Q1-1959
Q4-1960
Q3-1962
Q2-1964
Q1-1966
Q4-1967
Q3-1969
Q2-1971
Q1-1973
Q4-1974
Q3-1976
Q2-1978
Q1-1980
Q4-1981
Q3-1983
Q2-1985
Q1-1987
Q4-1988
Q3-1990
Q2-1992
Q1-1994
Q4-1995
Q3-1997
Q2-1999
Q1-2001
Q4-2002
Q3-2004
Q2-2006
Q1-2008
Q4-2009
Q3-2011
Q2-2013
Q1-2015
Q4-2016
Q3-2018

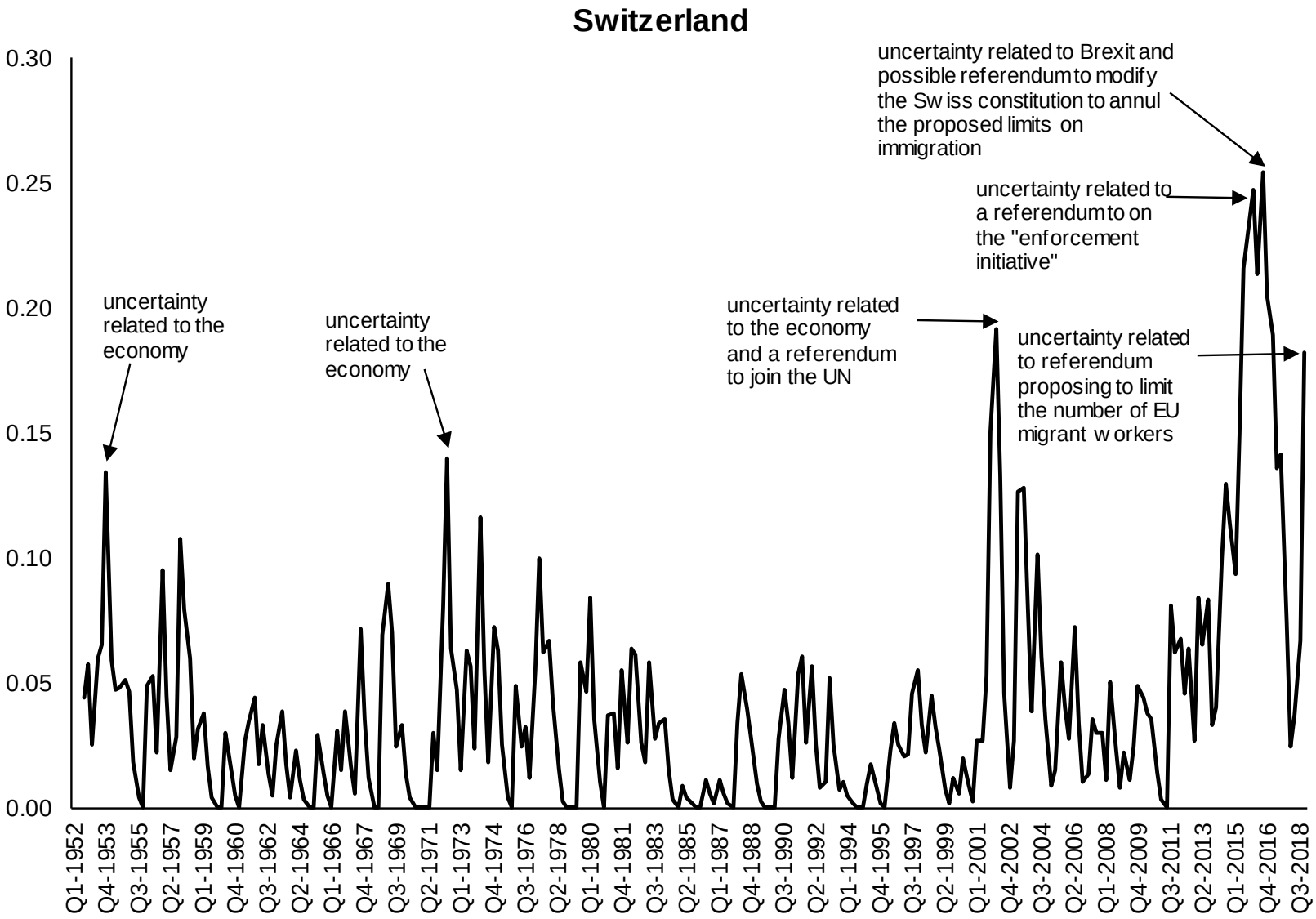

Poland
0.30
0.25
0.20
0.15
0.10
0.05
0.00
uncertainty related to the economy
uncertainty related to the economy
uncertainty following the resignation of prime minister Leszek Miller
political uncertainty related to upcoming referendums put forward by the president, Bronislaw Komorowski
Brexit and the elections in the U.S.
Q1-1952
Q4-1953
Q3-1955
Q2-1957
Q1-1959
Q4-1960
Q3-1962
Q2-1964
Q1-1966
Q4-1967
Q3-1969
Q2-1971
Q1-1973
Q4-1974
Q3-1976
Q2-1978
Q1-1980
Q4-1981
Q3-1983
Q2-1985
Q1-1987
Q4-1988
Q3-1990
Q2-1992
Q1-1994
Q4-1995
Q3-1997
Q2-1999
Q1-2001
Q4-2002
Q3-2004
Q2-2006
Q1-2008
Q4-2009
Q3-2011
Q2-2013
Q1-2015
Q4-2016
Q3-2018

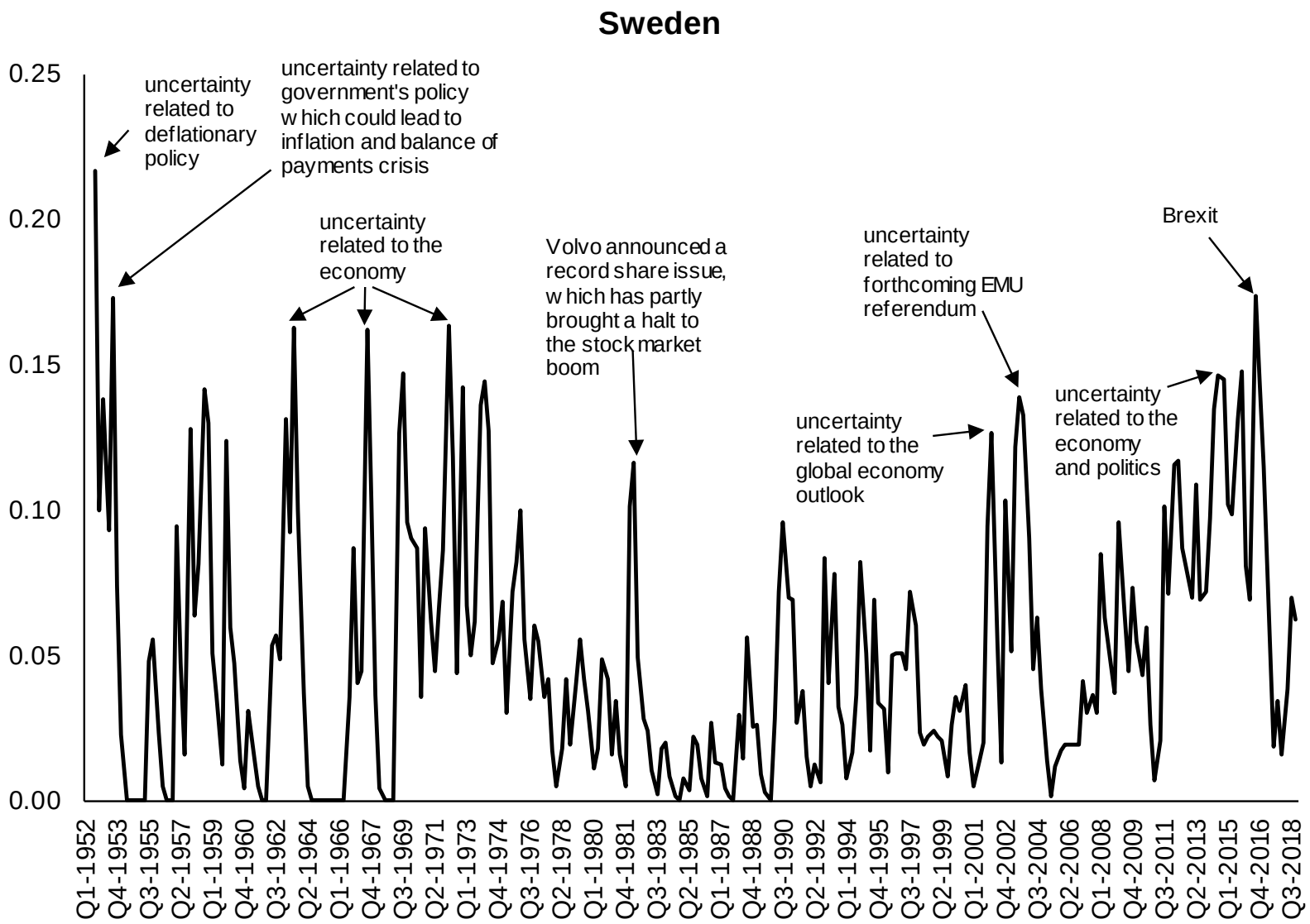

Portugal
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
uncertainty related to membership to the European Common Market
uncertainty related to the economy
uncertainty related to the effective or pontential demotion of prime minister--Vasco Gonçalves
uncertainty related the elections and the coalition betw een Social Democratic Party (PSD) and People's Party (CDS)
uncertainty related to the economy
Brexit and the elections in the US
euro zone crisis
uncertainty related to the economy
Q1-1952
Q4-1953
Q3-1955
Q2-1957
Q1-1959
Q4-1960
Q3-1962
Q2-1964
Q1-1966
Q4-1967
Q3-1969
Q2-1971
Q1-1973
Q4-1974
Q3-1976
Q2-1978
Q1-1980
Q4-1981
Q3-1983
Q2-1985
Q1-1987
Q4-1988
Q3-1990
Q2-1992
Q1-1994
Q4-1995
Q3-1997
Q2-1999
Q1-2001
Q4-2002
Q3-2004
Q2-2006
Q1-2008
Q4-2009
Q3-2011
Q2-2013
Q1-2015
Q4-2016
Q3-2018

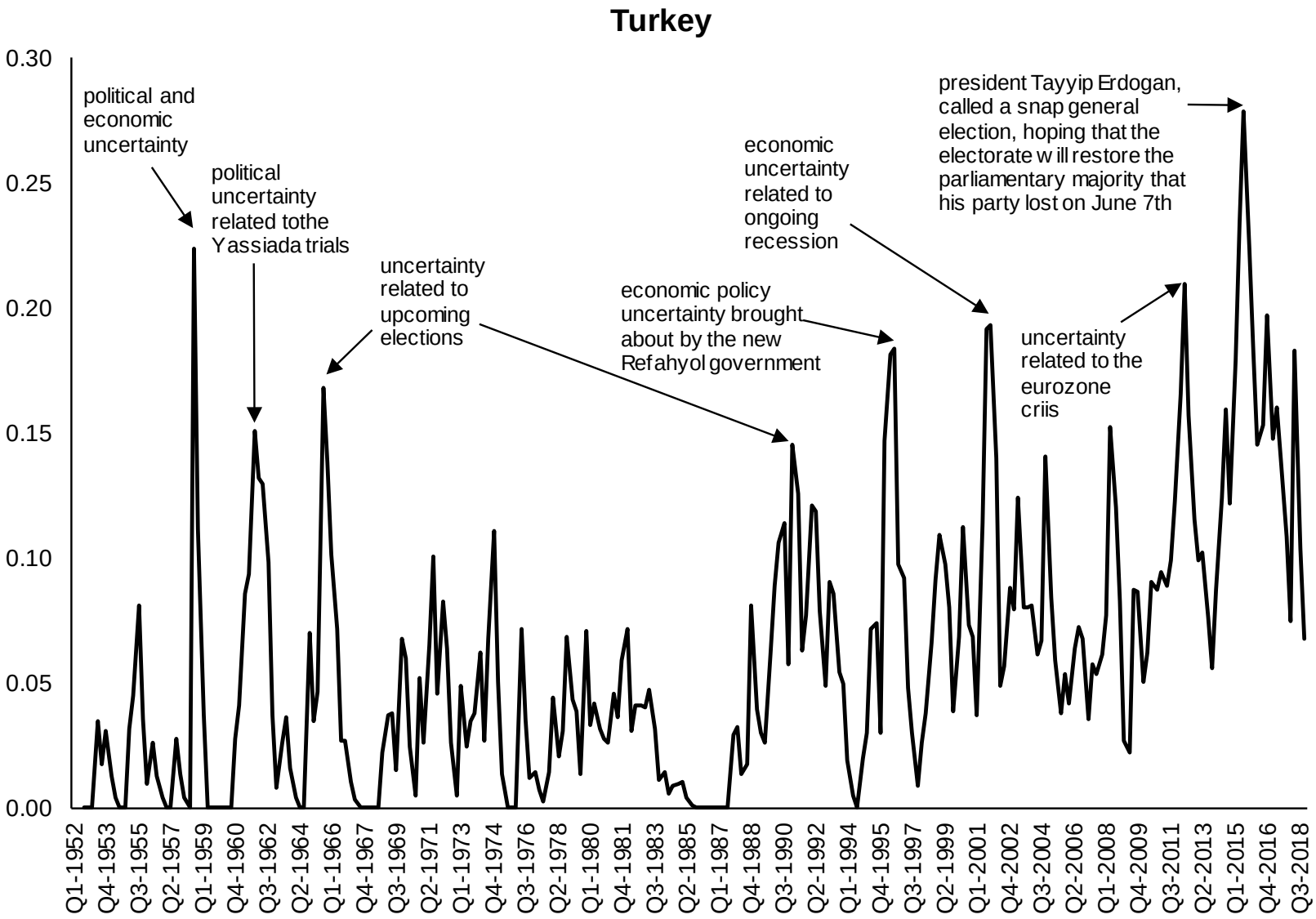

Russia
0.25
0.20
0.15
0.10
0.05
0.00
economic uncertainty
uncertainty related to Soviet-US relations pending US Senate ratification of Salt II
uncertainty over President Boris Yeltsin's health
Russian financial crisis
uncertainty in the business environment and uncertainty related to Russia's foreign policy
uncertainty related to the treatment of Yukos and its founder, Mikhail Khodorkovsky
uncertainty related to Yukos case and Gazprom - Rosneft
uncertainty related to upcoming elections
uncertainty related to the economy and Gazprom
Q1-1952
Q4-1953
Q3-1955
Q2-1957
Q1-1959
Q4-1960
Q3-1962
Q2-1964
Q1-1966
Q4-1967
Q3-1969
Q2-1971
Q1-1973
Q4-1974
Q3-1976
Q2-1978
Q1-1980
Q4-1981
Q3-1983
Q2-1985
Q1-1987
Q4-1988
Q3-1990
Q2-1992
Q1-1994
Q4-1995
Q3-1997
Q2-1999
Q1-2001
Q4-2002
Q3-2004
Q2-2006
Q1-2008
Q4-2009
Q3-2011
Q2-2013
Q1-2015
Q4-2016
Q3-2018

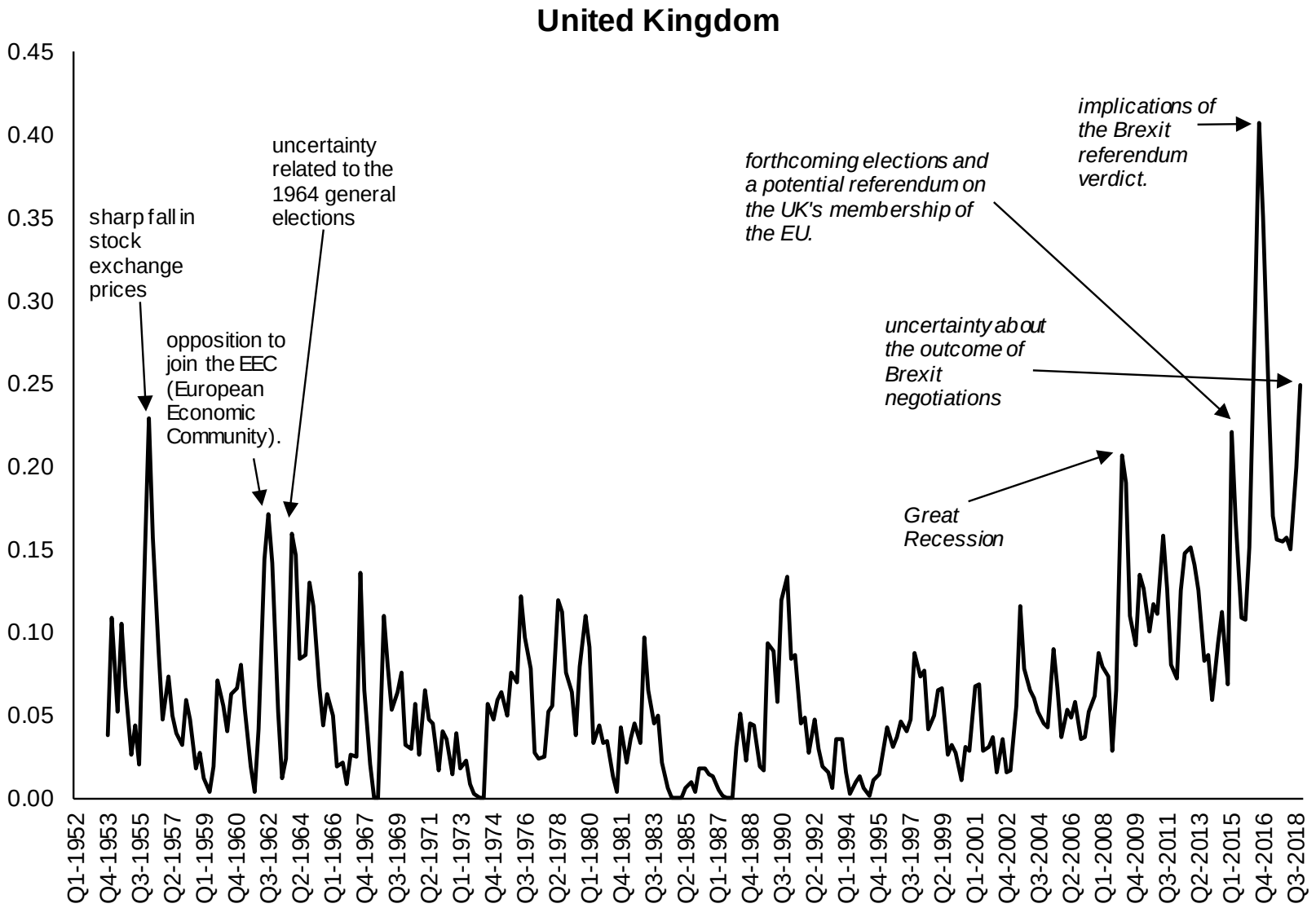

New Zealand
0.20
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
uncertainty related to the economy
uncertainty related to the economy
uncertainty related to the EEC (European Economic Community)
uncertainty related to the economy
uncertainty related to the upcoming elections
surprise resignation of the prime minister-- John Key
uncertainty related to the economy
Q1-1952
Q4-1953
Q3-1955
Q2-1957
Q1-1959
Q4-1960
Q3-1962
Q2-1964
Q1-1966
Q4-1967
Q3-1969
Q2-1971
Q1-1973
Q4-1974
Q3-1976
Q2-1978
Q1-1980
Q4-1981
Q3-1983
Q2-1985
Q1-1987
Q4-1988
Q3-1990
Q2-1992
Q1-1994
Q4-1995
Q3-1997
Q2-1999
Q1-2001
Q4-2002
Q3-2004
Q2-2006
Q1-2008
Q4-2009
Q3-2011
Q2-2013
Q1-2015
Q4-2016
Q3-2018

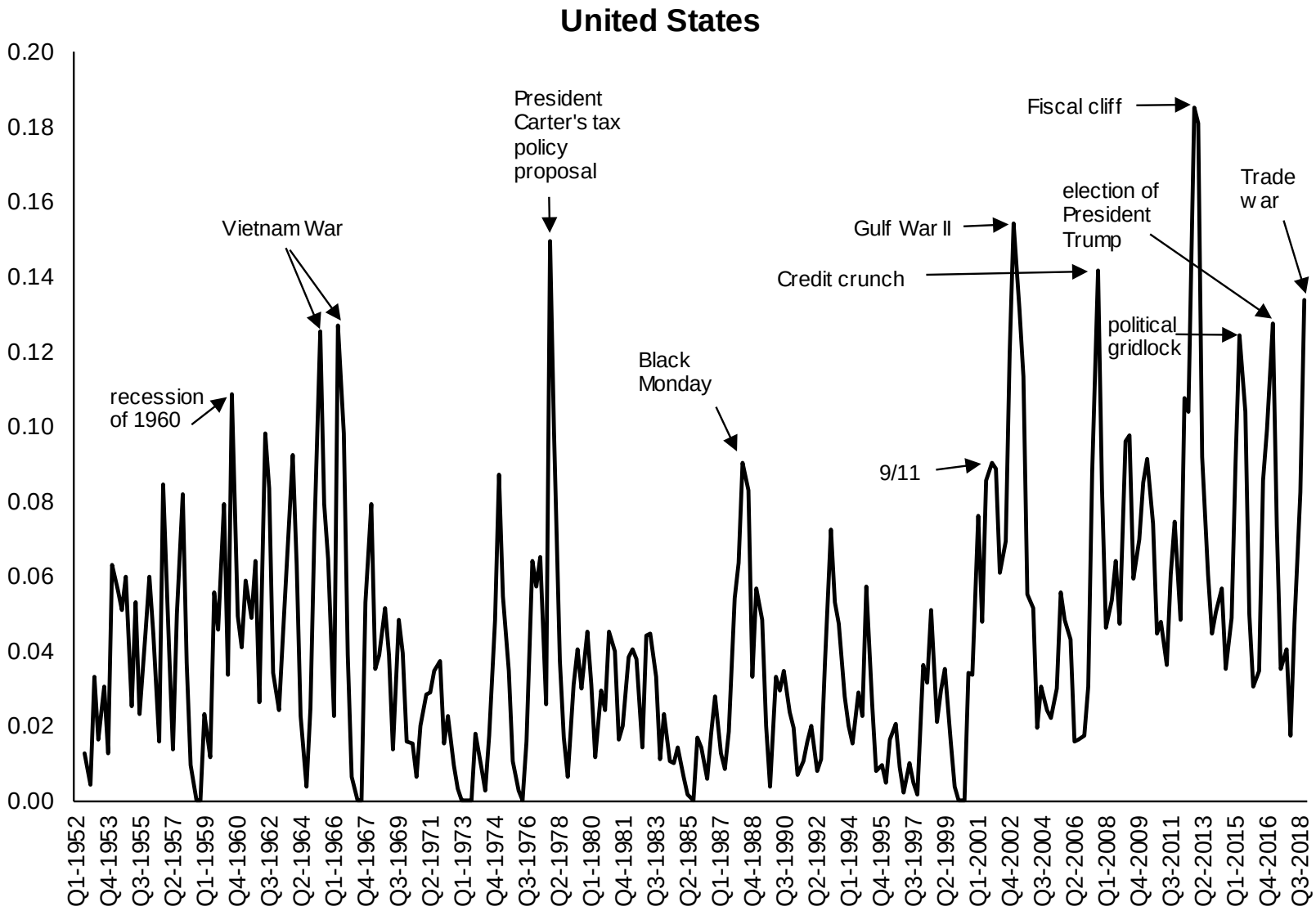

Spain
0.25
0.20
0.15
0.10
0.05
0.00
uncertainty related to the economy
unceratinty related to General Francisco Franco's illness and violence from extremist groups
unceratinty related to upcoming elections
uncertainty related to speculation about the political future of the prime minister, José Luis Rodríguez Zapatero
unceratinty related to the economy
political unceratinty related to the recent elections
uncertainty related to a referendum and unilateral declaration of independence in Catalonia
Q1-1952
Q4-1953
Q3-1955
Q2-1957
Q1-1959
Q4-1960
Q3-1962
Q2-1964
Q1-1966
Q4-1967
Q3-1969
Q2-1971
Q1-1973
Q4-1974
Q3-1976
Q2-1978
Q1-1980
Q4-1981
Q3-1983
Q2-1985
Q1-1987
Q4-1988
Q3-1990
Q2-1992
Q1-1994
Q4-1995
Q3-1997
Q2-1999
Q1-2001
Q4-2002
Q3-2004
Q2-2006
Q1-2008
Q4-2009
Q3-2011
Q2-2013
Q1-2015
Q4-2016
Q3-2018

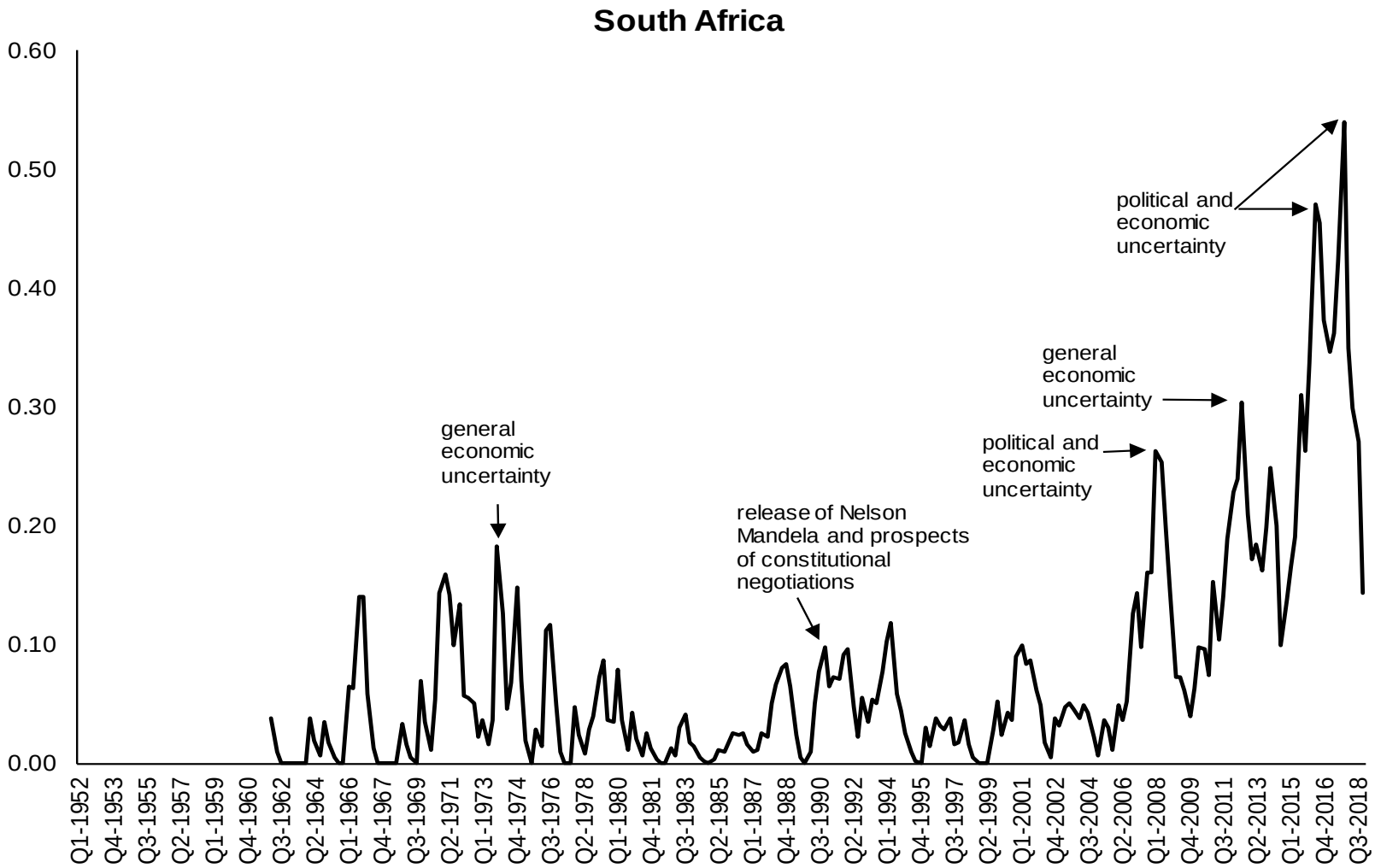

Switzerland
uncertainty related to Brexit and possible referendum to modify the Swiss constitution to annul the proposed limits on immigration
uncertainty related to a referendum to on the "enforcement initiative"
uncertainty related to the economy
uncertainty related to the economy
uncertainty related to the economy and a referendum to join the UN
uncertainty related to referendum proposing to limit the number of EU migrant workers
0.30
0.25
0.20
0.15
0.10
0.05
0.00
Q1-1952
Q4-1953
Q3-1955
Q2-1957
Q1-1959
Q4-1960
Q3-1962
Q2-1964
Q1-1966
Q4-1967
Q3-1969
Q2-1971
Q1-1973
Q4-1974
Q3-1976
Q2-1978
Q1-1980
Q4-1981
Q3-1983
Q2-1985
Q1-1987
Q4-1988
Q3-1990
Q2-1992
Q1-1994
Q4-1995
Q3-1997
Q2-1999
Q1-2001
Q4-2002
Q3-2004
Q2-2006
Q1-2008
Q4-2009
Q3-2011
Q2-2013
Q1-2015
Q4-2016
Q3-2018


Sweden
0.25
0.20
0.15
0.10
0.05
0.00
uncertainty related to deflationary policy
uncertainty related to government's policy which could lead to inflation and balance of payments crisis
uncertainty related to the economy
Volvo announced a record share issue, which has partly brought a halt to the stock market boom
uncertainty related to the global economy outlook
uncertainty related to forthcoming EMU referendum
uncertainty related to the economy and politics
Brexit
Q1-1952
Q4-1953
Q3-1955
Q2-1957
Q1-1959
Q4-1960
Q3-1962
Q2-1964
Q1-1966
Q4-1967
Q3-1969
Q2-1971
Q1-1973
Q4-1974
Q3-1976
Q2-1978
Q1-1980
Q4-1981
Q3-1983
Q2-1985
Q1-1987
Q4-1988
Q3-1990
Q2-1992
Q1-1994
Q4-1995
Q3-1997
Q2-1999
Q1-2001
Q4-2002
Q3-2004
Q2-2006
Q1-2008
Q4-2009
Q3-2011
Q2-2013
Q1-2015
Q4-2016
Q3-2018


Turkey
0.30
0.25
0.20
0.15
0.10
0.05
0.00
political and economic uncertainty
political uncertainty related tothe Yassiada trials
uncertainty related to upcoming elections
economic policy uncertainty brought about by the new Refahyol government
economic uncertainty related to ongoing recession
president Tayyip Erdogan, called a snap general election, hoping that the electorate will restore the parliamentary majority that his party lost on June 7th
uncertainty related to the eurozone criis
Q1-1952
Q4-1953
Q3-1955
Q2-1957
Q1-1959
Q4-1960
Q3-1962
Q2-1964
Q1-1966
Q4-1967
Q3-1969
Q2-1971
Q1-1973
Q4-1974
Q3-1976
Q2-1978
Q1-1980
Q4-1981
Q3-1983
Q2-1985
Q1-1987
Q4-1988
Q3-1990
Q2-1992
Q1-1994
Q4-1995
Q3-1997
Q2-1999
Q1-2001
Q4-2002
Q3-2004
Q2-2006
Q1-2008
Q4-2009
Q3-2011
Q2-2013
Q1-2015
Q4-2016
Q3-2018


United Kingdom
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
sharp fall in stock exchange prices
opposition to join the EEC (European Economic Community).
uncertainty related to the 1964 general elections
forthcoming elections and a potential referendum on the UK's membership of the EU.
implications of the Brexit referendum verdict.
uncertainty about the outcome of Brexit negotiations
Great Recession
Q1-1952
Q4-1953
Q3-1955
Q2-1957
Q1-1959
Q4-1960
Q3-1962
Q2-1964
Q1-1966
Q4-1967
Q3-1969
Q2-1971
Q1-1973
Q4-1974
Q3-1976
Q2-1978
Q1-1980
Q4-1981
Q3-1983
Q2-1985
Q1-1987
Q4-1988
Q3-1990
Q2-1992
Q1-1994
Q4-1995
Q3-1997
Q2-1999
Q1-2001
Q4-2002
Q3-2004
Q2-2006
Q1-2008
Q4-2009
Q3-2011
Q2-2013
Q1-2015
Q4-2016
Q3-2018


United States
0.20
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
recession of 1960
Vietnam War
President Carter's tax policy proposal
Black Monday
9/11
Credit crunch
Gulf War II
election of President Trump
Fiscal cliff
political gridlock
Trade w ar
Q1-1952
Q4-1953
Q3-1955
Q2-1957
Q1-1959
Q4-1960
Q3-1962
Q2-1964
Q1-1966
Q4-1967
Q3-1969
Q2-1971
Q1-1973
Q4-1974
Q3-1976
Q2-1978
Q1-1980
Q4-1981
Q3-1983
Q2-1985
Q1-1987
Q4-1988
Q3-1990
Q2-1992
Q1-1994
Q4-1995
Q3-1997
Q2-1999
Q1-2001
Q4-2002
Q3-2004
Q2-2006
Q1-2008
Q4-2009
Q3-2011
Q2-2013
Q1-2015
Q4-2016
Q3-2018



Note: The historical WUI is computed using the 3-quarter weighted moving averages, computed as follows: 1996Q4= (1996Q4*0.6 + 1996Q3*0.3 + 1996Q2*0.1)/3