



How susceptible is the European financial stability to economic policy uncertainty?

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Abstract

This study examines the interdependence and asymmetries in the relationships between the economic policy uncertainty and the selected financial stability variables in Europe. Specifically, the impact of uncertainty on inflation, equity returns, the euro in US dollar exchange rate and interest rates is analyzed. The results show a significant negative impact of shocks in economic policy uncertainty on equity returns in Europe during the examined January 1987 – January 2023 period. Uncertainty shocks affect inflation asymmetrically at different time intervals. Asymmetric responses of interest rates and the exchange rate to uncertainty shocks are also found. The results suggest that economic policies in Europe should encompass efforts to mitigate economic uncertainty.

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1. Introduction

The main objective of this paper is an assessment of interactions between the economic policy uncertainty (EPU) and the selected variables of financial stability in Europe, particularly in the euro area. The main tested variable is the EPU index for Europe that is based on the

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model originally developed by Bloom (2009) and expanded by Baker et al. (2016). The index is reported by www.policyuncertainty.com.

A logical conceptual explanation suggesting the link between EPU and financial stability may be found in “Minsky-Kindleberger Theory of Financial Instability” (Kindleberger, 1978; Minsky, 1982). The theory argues that borrowers tend to accumulate debt and lenders relax credit criteria at periods of economic prosperity. Their behavior results in excessive debt accumulation and in asset price bubbles that later burst. Such boom-bust cycle can be smoothed if there is less uncertainty and better predictability of future economic conditions. One may therefore argue that financial instability is directly related to various aspects of economic uncertainty. There are occasional outbreaks of financial instability that correspond with increases in economic uncertainty. As suggested by Minsky (1982), the triggers for such outbreaks are not uniform and not entirely predictable. In essence, better information about EPU and its trends is likely to assuage the boom-bust cycles and to prevent sudden shocks to financial stability.

The analytical focus of this study is on the interdependence and asymmetries between the EPU for Europe and several financial stability variables including inflation, equity returns, the euro in US dollar exchange rate and interest rates. The empirical tests are based on monthly data for the January 1987 – January 2023 sample period (433 observations).

The emerging literature examines the relationships between EPU and macroeconomic and financial variables. Several studies have examined the impact of uncertainty on inflation. Their main findings and conclusions are mixed. Among others, Leduc and Liu (2016) as well as Haque and Magnusson (2021) find that US inflation responds inversely to EPU shocks for the long sample period starting from the end of World War II. Moreover, Leduc and Liu (2016) argue that uncertainty shocks during the post-WWII period are mainly deflationary. Taking into consideration financial cycle developments, Alessandri and Mumtaz (2019) show that EPU shocks tend to be inflationary at normal times and deflationary during financial crises. Somewhat opposite conclusions are presented by Meinen and Röhe (2018) who find ambiguous inflation responses to uncertainty shocks at all times, regardless of business cycle conditions. Investigating long-term effects of EPU, Istrefi and Piloiu (2014) argue that concerns about economic policy lead only to long-term, not to short-term inflation expectations. A somewhat different argument is presented by Caggiano et al. (2022) who note that uncertainty shocks trigger a temporary disinflation only during recessions.

There is a consensus in the literature that changes in EPU have significant effects on stock market returns and on volatility of stock prices, although their causal effects are asymmetric and time dependent across countries. Pastor and Veronesi (2012) and more recently Jahaveri et al., (2022) find a significant, non-linear impact of EPU on equity market returns in the U.S. Similar effects are found for a broader group of countries. Nusair and Al-Khasawneh (2022) show a significant short-run impact of EPU on stock prices in the G7 countries. The opposite causal effects are examined by Degiannakis and Filis (2019) who find a pronounced inverse relationship between EPU and stock price volatility in European equity markets.

Several studies address the impact of EPU on the term structure of nominal interest rates. Leippold and Matthys (2022) note a significant decline in yields and increases in bond volatilities at times of elevated EPU. Confirming this result, Shang (2022) also finds increasing yield curve sensitivity to monetary policy surprises when EPU is high.

The relationship between EPU and exchange rate volatility is investigated in the literature as well. Among others, Krol (2014) notes strong susceptibility of foreign exchange markets mainly to U.S. induced EPU shocks, and less to country-specific shocks. Orlowski (2012 and 2021) shows that the transmission of uncertainty shocks to exchange rates becomes particularly

pronounced in the European economies at times of financial crises. EPU is also believed to be an important driver of exchange rate movements in the global economy. [Abid \(2020\)](#) argues that predictability of exchanges in emerging market economies is substantially improved when EPU is included in exchange rate forecasting models.

Considering the adverse effects of EPU on financial stability indicators addressed in the literature, this paper provides new insights on the interactions between the uncertainty and the European financial variables. It takes into consideration the impact of U.S. shocks on Europe's EPU. It also evaluates the destabilizing effects of the most recent episodes of the pandemic and the geopolitical risks on the financial stability in Europe.

Interactions between the U.S. and Europe's EPU trends are discussed in Section II. The relationship between EPU and inflation in the European economies is analyzed in Section III. Interactions between EPU and equity returns are examined in Section IV. EPU effects on long-term interest rates are analyzed in Section V and its repercussions for exchange rate stability in Section VI. The concluding section VII summarizes the key findings.

2. Interactions between trends in economic policy uncertainty for Europe and the U.S

Transmission and contagion effects of economic uncertainty shocks among countries is found to be significant, particularly at crises periods ([Londono et al., 2021](#)). Recognizing such global effects, my analytical exercise begins with the examination of interactions between EPU trends in the U.S. and in the European economy. These trends are shown in [Fig. 1](#). I have opted out from the graphical presentation of the actual EPU indexes as they are very unstable. The actual EPU series for Europe are shown in [Fig. 3](#) below. Volatility of EPU indexes at their levels is heavily influenced by significant cyclical variations that are removed in this exercise with the estimated Hodrick-Prescott filter trends shown in [Fig. 1](#).

The EPU trend patterns for Europe and the U.S. are synchronous with varying time lags until 2015. Since then, these trends have become considerably asynchronous. More importantly from

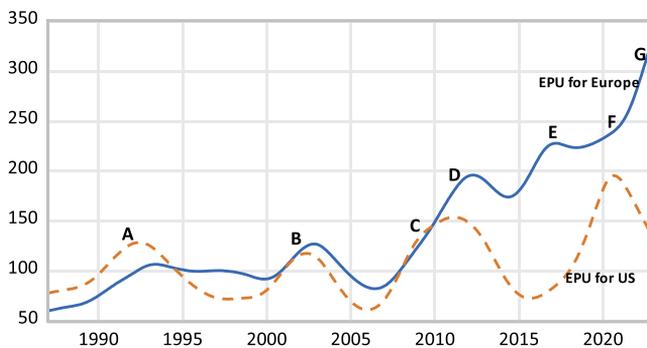


Figure 1. Trends in Economic Policy Uncertainty for Europe and the United States. Notes: January 1987 – January 2023 sample period (433 monthly observations); Hodrick-Prescott filter trends of Economic Policy Uncertainty indexes for the largest 5 European economies (continuous line) and for the United States (pattern line); letters indicate the timing of: A - the Bosnian war outbreak in April 1992, B - the Gulf War (March-May 2003), C - the peak of the global financial crisis in October-November 2008, D - the outbreak of the euro area sovereign debt crisis in October 2011, E - Brexit referendum in June 2016, F - the peak of the Covid19 pandemic crisis in March-April 2020, G - Russia's invasion of Ukraine in February 2022.

Source: Author's estimation of trends based on EPU indexes data obtained from www.policyuncertainty.com and [Baker et al. \(2016\)](#).

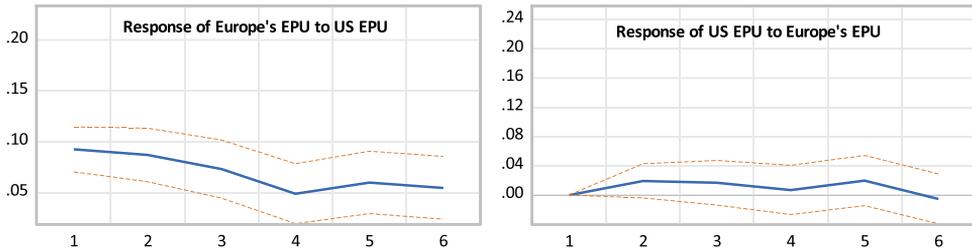


Figure 2. Impulse responses between EPU for Europe and for U.S. Notes: Accumulated impulse responses to (Cholesky) one-standard deviation shocks, generated from standard vector autoregression VAR(6) between log changes in Europe's EPU and log changes in U.S. EPU. The order of VAR is obtained by minimizing the Akaike Information Criterion. January 1987 – January 2023 sample period.

Source: as in Fig. 1.

the standpoint of this analysis, Europe's EPU has been considerably higher and rising faster than the EPU in the U.S., particularly since the global financial crisis of 2008–2010. In recent years, Europe's EPU has been strongly affected by the euro area sovereign debt crisis of 2011–2012. It has been also amplified by the Brexit referendum in June 2016 and intensified by the Covid-19 pandemic. Most recently, it has been escalated by Russia's invasion of Ukraine.

EPU for Europe is also susceptible to shocks from uncertainty in the U.S. Transmission patterns of EPU shocks between Europe and U.S. are reflected by impulse response functions shown in Fig. 2. The accumulated impulse responses are derived from standard vector autoregression (VAR) of the log changes in the EPU series for Europe and for the U.S. The 6th order of autoregressive terms in VAR is obtained by finding a minimum Akaike information criterion (AIC).

As shown in Fig. 2, there is a conspicuous transmission of U.S. uncertainty shocks onto Europe's EPU accumulated for a four-month time horizon. The reverse transmission of Europe's EPU shocks to the U.S. uncertainty is considerably weaker and slower, with the accumulated impact effects for a two- to three-months period. Arguably, U.S. policy uncertainty has a considerably stronger impact on the uncertainty in Europe than the reversed absorption of Europe's EPU shocks by the U.S. It might be therefore argued that the policy-makers in Europe ought to take into consideration the scale of the uncertainty shocks generated in the U.S. in their efforts to stabilize their economies.

3. Economic policy uncertainty impact on inflation

Most of the studies analyzing the impact of EPU on macroeconomic stability focus on its impact on inflation. From the standpoint of my analysis, the findings of Alessandri and Mumtaz (2019) are particularly useful. They argue that EPU shocks are inflationary during normal financial stability periods and deflationary during financial crises episodes. These outcomes are broadly confirmed by the graphical presentation of the EU-wide annualized inflation (based on harmonized index of consumer prices (HICP)) and the EPU index for Europe shown in Fig. 3.

There are several worth noting interactions between EPU and inflation shown in Fig. 2. First, inflation is increasing faster than EPU on the eve of the global financial crisis. Second, at the

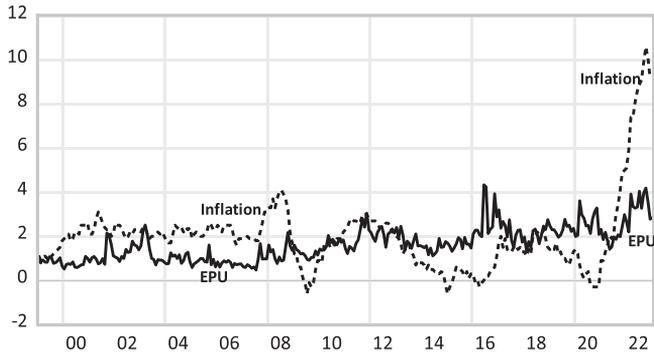


Figure 3. Economic Policy Uncertainty Index for Europe and HICP Inflation for EU. Notes: The actual EPU Index for Europe is divided by 100.

Source: as in Fig. 1 and Eurostat.

peak and the immediate aftermath of the 2008 crisis, inflation declines faster than the EPU. Third, as the sovereign debt crisis in the euro area escalates in 2011 and 2012, both inflation and EPU are increasing. Fourth, EPU increases faster than inflation at times of mounting concerns about the Brexit outcomes in 2016. In addition, significant disparities between inflation and EPU are observed during the Covid 19 pandemic and the outbreak of the war in Ukraine. The economic slowdown during the pandemic crisis is associated with disinflation and rising EPU. In contrast, inflation increases disproportionately more than the EPU does during the 2022 war. In essence, it remains to be seen how Europe's future economic growth will be affected by the recent inflation and EPU dynamics. Regardless of the future outcomes, it can be argued that policies devised to mitigate the risks associated with economic policy uncertainty should be given equal importance to those aimed at restoring price stability.

Further insights into interactions between EPU and inflation are provided by the accumulated impulse responses between Europe's EPU and changes in HICP inflation rates for the EU shown in Fig. 4. Shocks in inflation entail a significant direct reaction of EPU for a prolonged period. In contrast, the reverse response of inflation to shocks in EPU is considerably milder, lasting for up to three months. This weaker causal reaction of inflation to EPU appears to be consistent with the findings of Meinen and Röhe (2018). In essence, the impulse responses in

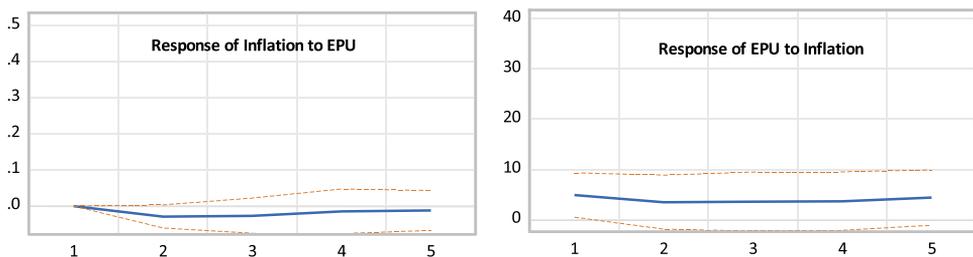


Figure 4. Impulse responses between changes in EPU and in inflation rate in Europe. Notes: Accumulated impulse responses between monthly changes in Europe's EPU and HICP annualized inflation for the January 1997 – January 2023 sample period, generated from standard VAR(3).

Source: as in Fig. 3.

Table 1

The relationship between log changes in HICP inflation rate for EU countries and changes in EPU for Europe - multiple breakpoint regression estimation of Eq.1. *Dependent variable* $\Delta\pi_t^{EU}$.

	Period I	Period II	Period III	Period IV
Time interval → (no. of observations)	January 1997 – January 2003 (72)	February 2003 – December 2011 (107)	January 2012 – October 2017 (70)	November 2017 – January 2023 (63)
β_0 (constant term)	0.001 (0.02)	0.005 (0.19)	-0.020 (-0.70)	0.123 ** (2.34)
β_1 (EPU term)	-0.141 (-1.54)	0.206 ** (1.97)	-0.169 (-1.37)	0.743 *** (2.81)
Diagnostic statistics: F-stat.= 4.93; log likelihood = -46.97; AIC = 0.353				

Notes: Bai-Perron multiple breakpoint regression with 3 fixed sequential breaks; error distributions are heterogeneous across breaks; January 1997 – January 2023 sample period (312 monthly observations); t-statistics are in parentheses; AIC is Akaike information criterion; *** denotes significance at 1%, ** at 5% and * at 10%.

Source: as in Fig. 1 and Eurostat.

Fig. 4 suggest that higher inflation is a significant source of economic uncertainty in Europe. One may therefore argue that the efforts of policy makers to contain inflation are also likely to mitigate EPU in Europe.

Prior studies examining EPU and inflation clearly imply that their interactions are not stable over time (Alessandri & Mumtaz, 2019; Caggiano et al., 2022; Meinen & Röhe, 2018;). Their functional relationship is subject to structural breaks and varying parameters over time. To determine structural breaks in a bivariate model of association between inflation and EPU in Europe, I employ the structural multiple breakpoint test devised by Bai and Perron (2002) on the functional relationship prescribed by Eq. 1.¹

$$\Delta\pi_t^{EU} = \beta_0 + \beta_1 * \Delta\log(EPU_t^{EU}) + \mu_t \quad (1)$$

where π_t^{EU} is the annualized European inflation rate (based on HICP for EU), and EPU_t^{EU} is the economic policy uncertainty index for Europe.

The multiple breakpoint estimation of Eq. 1 assumes 3 fixed sequential breaks and allows error distributions to differ across breaks. It identifies four distinctive subperiods in the examined linear relationship. The estimation output shown in Table 1 indicates no association between changes in Europe's EPU and in HICP inflation during the sub-periods I (January 1997-January 2003) and III (January 2012 – October 2017). Evidently, changes in EPU are disassociated with the inflation dynamics during these subperiods. There is a significant direct relationship between EPU and inflation in subperiod II that ranges from February 2003 to December 2011. This time frame covers the duration of the 2008 – 2010 financial crisis and its aftermath. It reflects the initial increase in inflation coupled with rising EPU prior to the crisis' outbreak in 2008, followed by disinflation and gradually decreasing EPU during the post-crisis period. There is also a strong, positive relationship between the tested variables in the sub-period IV, between November 2017 and January 2023. This conspicuous, statistically significant association reflects a positive relationship between rising inflation and increasing EPU.

¹ To ensure comparability of the obtained results, the multiple breakpoint tests employed in this study assume uniformly a fixed number of 3 sequential breaks and heterogeneous error distributions across breaks.

As evidenced in Fig. 3, their co-movement is particularly pronounced in 2022 when rising inflation and worsening uncertainty are strongly affected by increasing geopolitical risk, higher energy prices and lingering global supply chain problems.

In sum, the association between Europe's EPU and inflation becomes amplified at times of financial crises and elevated economic risks. Their relationship becomes weaker at times of economic and financial stability.

4. Uncertainty impact on equity returns

Prior studies have shown that the interactions between changes in EPU and in equity returns in the larger developed economies are non-linear, state-dependent and predominantly short-term (Javaheri et al., 2022; Nusair & Al-Khasawneh, 2022). To examine their intricate interactions in the European economies, I employ the VAR analysis of changes in the EPU for Europe and log changes in the OECD-estimated all shares/broad total equity index for the euro area 19 countries. Their un-accumulated impulse responses shown in Fig. 5 are derived from a bivariate standard VAR(3) test.

As shown in Fig. 5, there is a very strong response of EPU to shocks in equity returns, although this inverse reaction is relatively ephemeral, lasting only one month. The opposite causal interaction is indiscernible, i.e., equity returns do not respond to shocks in EPU. The impulse responses also suggest that there is a strong adverse reaction of Europe's EPU to shocks in equity returns. Deteriorating returns result in increasing economic uncertainty and, adversely, increasing returns lead to an improved economic policy climate.

Structural breaks in the interactions between the examined EPU and equity returns can be determined by employing the Bai-Perron multiple breakpoint regression on their monthly series for the January 1987- January 2023 sample period. The tested relationship is prescribed by Eq.2.

$$\Delta \log(E_t^{EA}) = \beta_0 + \beta_1 * \Delta(EPU_t^{EU}) + \mu_t \quad (2)$$

where E_t^{EA} is the broad equity index for the euro area 19 countries.

The results of multiple breakpoint regression estimation of Eq. 2 are shown in Table 2. There is a significant inverse relationship between changes in Europe's EPU and equity returns during the entire sample period, except for sub-period II (September 1992 – March 2000). The results

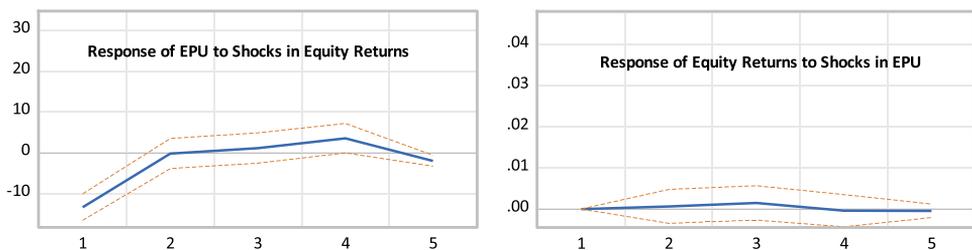


Figure 5. Impulse responses between changes in EPU for Europe and in equity returns in the euro area. Notes: Un-accumulated impulse responses between changes in EPU for Europe and log changes in the all shares/broad total equity index for the euro area 19 countries; January 1987 – January 2023 sample period (432 observations); generated from standard VAR(3).

Source: as in Fig. 3 and OECD Main Economic Indicators.

Table 2

The relationship between log changes in the all shares/broad equity index for the euro area countries and changes in EPU for Europe - multiple breakpoint regression estimation of Eq.2. *Dependent variable* $\Delta \log E_t^{EU}$.

	Period I	Period II	Period III	Period IV
Time interval → (no. of observations)	January 1987 – August 1992 (67)	September 1992 – March 2000 (91)	April 2000 – August 2012 (149)	September 2012 – January 2023 (125)
β_0 (constant term)	-0.001	0.017 ***	-0.004	0.005
β_1 (EPU term)	(-0.04)	(4.17)	(-1.05)	(1.51)
	-0.052 ** (-2.18)	-0.012 (-0.94)	-0.078 *** (-6.63)	-0.031 *** (-4.92)
Diagnostic statistics: F-stat.= 12.97; log likelihood = 757.08; AIC = -3.468				

Notes: Bai-Perron multiple breakpoint regression with 3 fixed sequential breaks; EPU index is divided by 100; error distributions are heterogeneous across breaks; January 1987 – January 2023 sample period (432 monthly observations); t-statistics are in parentheses; AIC is Akaike information criterion; *** denotes significance at 1%, ** at 5% and * at 10%.

Source: as in Fig. 1 and OECD Main Economic Indicators.

shown in Table 2 broadly confirm the earlier findings by Degiannakis and Filis (2019) suggesting that there is a persistent time invariant inverse relationship between the economic uncertainty and equity returns in Europe. The most pronounced inverse interactions are observed for sub-period III, ranging from April 2000 to August 2012, which covers the destabilizing episodes of the 2003 Gulf War, the 2008–2010 financial crisis and the euro-periphery sovereign debt crisis in 2011 and 2012. These crises episodes have contributed to increasing EPU and declining returns in European equities.

In hindsight, there is a significant inverse relationship between Europe's EPU and the equity returns in the euro area. During most of the examined time period, higher equity returns are accompanied by decreasing economic uncertainty and, vice versa, increasing EPU corresponds with the declining returns.

5. Interest rate effects

EPU is also believed to be an important driver of government bond yields and a contributing factor to volatility of bond prices. As argued by Leippold and Matthys (2022), higher economic uncertainty results in declining yields and increasing price volatility of bonds. Using standard VAR(3) estimation and the related impulse responses, I examine the transmission of shocks between Europe's EPU and the OECD estimated yield on the 10-year government bonds in the euro area. The accumulated impulse responses between changes in EPU and changes in bond yields are shown in Fig 6.

There is a distinctive accumulated positive EPU response to shocks in the long-term government bond yields within a two months' period. The reverse response of government bond yields to shocks in EPU is negative and marginal. Its accumulated effects are extended over a longer period. The estimated impulse responses indicate a gradual impact of positive shocks in

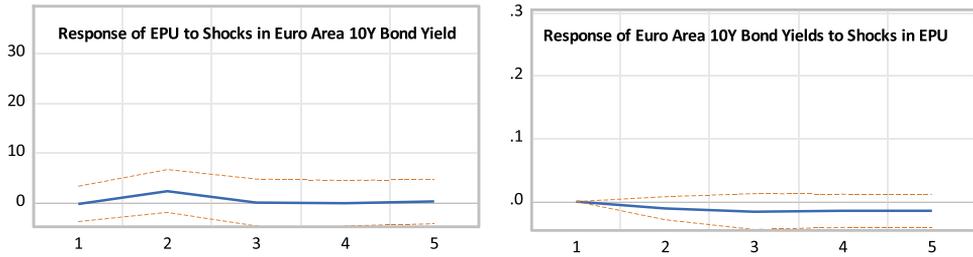


Figure 6. Impulse responses between changes in EPU for Europe and in OECD estimated 10Y government bond yields for the euro area 19 countries. Notes: Accumulated impulse responses between changes in EPU for Europe and changes in OECD-estimated 10Y government bond yields for the euro area 19 countries; January 1987 – January 2023 sample period (432 observations); generated from standard VAR(3). Source: as in Fig. 5.

the euro area government bond on EPU. However, the effects of shocks in bond yields on EPU are less pronounced than the repercussions of shocks in equity returns.

I further examine time dependency of changes between EPU and bond yields using the multiple breakpoint regression on their relationship reflected by Eq. 3.

$$\Delta B_t^{EA} = \beta_0 + \beta_1 * \Delta(EPU_t^{EU}) + \mu_t \quad (3)$$

where B_t^{EA} is the OECD-estimated yield on the 10-year government bonds for the euro area 19 countries.

The estimation results of Eq. 3 are shown in Table 3. There is an inverse relationship between changes in EPU and changes in government bond yields that is significant only during sub-period III spanning between February 1992 and October 2011. This sub-period encompasses several structural changes and shocks in the EU economy related to the euro inception in January 1999, the extensive EU enlargement in May 2004, and the global financial crisis of 2008. The negative value of the coefficient implies an inverse relationship between

Table 3

The relationship between changes in the OECD-estimated 10-year government bond yields for the euro area countries and changes in EPU for Europe - multiple breakpoint regression estimation of Eq.3. *Dependent variable* ΔB_t^{EA} .

	Period I	Period II	Period III	Period IV
Time interval →	January 1987 –	September 1992 –	February 1992 –	November 2011 –
(no. of observations)	August 1992 (67)	January 1999 (77)	October 2011 (153)	January 2023 (135)
β_0 (constant term)	0.024	-0.082 ***	0.002	-0.008
β_1 (EPU term)	(1.10)	(-3.18)	(0.17)	(-0.44)
	0.119 (1.30)	-0.004 (-0.06)	-0.083 ** (-1.72)	0.042 (1.24)
Diagnostic statistics: F-stat.=2.62; log likelihood = 93.90; AIC = -0.398				

Notes: Bai-Perron multiple breakpoint regression with 3 fixed sequential breaks; EPU index is divided by 100; error distributions are heterogeneous across breaks; January 1987 – January 2023 sample period (432 monthly observations); t-statistics are in parentheses; AIC is Akaike information criterion; *** denotes significance at 1%, ** at 5% and * at 10%.

Source: as in Fig. 2.

bond yields and the EPU for Europe. Specifically, these structural changes are associated with capital inflows to government bonds resulting in their higher prices and lower yields. There is no significant association between changes in EPU and in bond yields during the remaining three sub-periods.

6. Exchange rate effects

Containment of EPU is also important for exchange rate stability. Interactions between changes in EPU and in the euro in U.S. dollar exchange rate are shown in Fig. 7. They reflect bivariate accumulated impulse responses generated from standard VAR(3). There is a very strong, negative response of EPU to shocks in the exchange rate, which suggests that the euro appreciation shocks result in a short-term decrease (improvement) in economic uncertainty. This also implies that the euro depreciation shocks have a prompt negative impact on EPU. On the other side, the transmission of shocks in EPU to the exchange rate is considerably weaker and slower, showing a discernible negative impact within a two-month period.

Interactions between changes in the exchange rate and in Europe's EPU are further tested with the multiple breakpoint regression estimation of Eq. 4. As in the previous cases, I choose 3 fixed sequential breaks and four distinctive interaction periods for comparability of the results.

$$\Delta e_t^{EA} = \beta_0 + \beta_1 * \Delta(EPU_t^{EU}) + \mu_t \quad (4)$$

where e_t^{EA} is the euro in U.S. dollars exchange rate.

The multiple breakpoint regression estimation results are shown in Table 4. The main effect is an increasing sensitivity of the exchange rate to changes in EPU during the most recent two sub-periods spanning from April 2008 to January 2023. There is no significant relationship between the two tested variables during the first two sub-periods (from January 1999 to March 2008). The end of sub-period II coincides with the collapse of The Bear Stearns investment bank in March 2008, i.e., the first trigger of the global financial crisis. The strengthening inverse relationship between changes in EPU and in the exchange rate during the two recent sub-periods

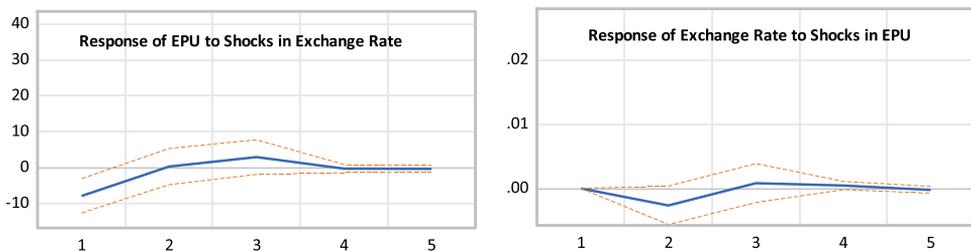


Figure 7. Impulse responses between changes in EPU for Europe and in the euro in U.S. dollar exchange rate. Notes: Un-accumulated impulse responses between changes in EPU for Europe and changes in the euro in U.S. dollar exchange rate; January 1999 – January 2023 sample period (288 observations); generated from standard VAR(3). Source: as in Fig. 5.

Table 4

The relationship between changes in the euro in U.S. dollar exchange rate and in EPU for Europe - multiple breakpoint regression estimation of Eq.4. *Dependent variable* Δe_t^{EA} .

	Period I	Period II	Period III	Period IV
Time interval → (no. of observations)	January 1999 – October 2002 (45)	November 2002 – March 2008 (65)	April 2008 – November 2011 (44)	December 2011 – January 2023 (134)
β_0 (constant term)	-0.004	0.009 ***	-0.003	-0.002
β_1 (EPU term)	(-1.10)	(2.65)	(-0.50)	(-1.17)
	-0.212 (-0.18)	-0.405 (-0.37)	-3.726 * (-1.80)	-0.739 ** (-2.21)
Diagnostic statistics: F-stat.= 3.00; log likelihood = 641.90; AIC = -4.402				

Notes: Bai-Perron multiple breakpoint regression with 3 fixed sequential breaks; EPU index is divided by 10,000; error distributions are heterogeneous across breaks; January 1999 – January 2023 sample period (288 monthly observations); t-statistics are in parentheses; AIC is Akaike information criterion; *** denotes significance at 1%, ** at 5% and * at 10%.

Source: as in Figure 2.

indicate an increasing association between rising EPU and the euro depreciation against the U.S. dollar. These effects are also highlighted in Figs. 1 and 3.

In sum, the obtained results suggest that the exchange rate stability has recently become increasingly dependent on changes in EPU. In addition, the impulse responses show also a reverse causal impact; they indicate an increasing impact of the euro depreciation on the EPU in Europe.

7. Conclusions

A general conclusion of this study is that EPU plays an important role in maintaining financial stability in Europe. I argue that better information and understanding of EPU, including its trends and repercussions, may reduce shocks to financial stability and improve predictability of financial conditions in the long run. This stabilizing role of EPU has been particularly pivotal during the recent several years covering the pandemic risk and the geopolitical risk, as highlighted by the increasingly significant association between EPU and the financial stability indicators examined in this paper.

More specially, I find that trends in uncertainty about economic policy in Europe have been elevated by the episodes of economic crises and financial distress during the entire January 1987 – January 2023 sample period. I further find that the EPU for Europe is highly susceptible to uncertainty shocks in the U.S. There is a pronounced impact of inflation shocks on Europe's EPU. The direct relationship between inflation and EPU is considerably intensified at crises' times. Shocks in equity returns in the euro area have a strong, short-term deteriorating impact on EPU. The opposite transmission of shocks in EPU to equity returns is indiscernible. Transmission of shocks in the euro area bond yields to EPU is milder and more gradual than the EPU effects of changes in equity returns. Prior to April 2008, the link between changes in the euro in U.S. dollar exchange rate were unrelated to changes in EPU. Since then, the inverse relationship between these two variables has become increasingly significant. Most recently, increases in EPU are strongly associated with the euro depreciation.

The interaction between EPU and selected financial stability variables examined in this paper may be useful for understanding the underlying factors and for predictability of economic uncertainty in Europe. Policies aimed at mitigating such uncertainty should consider possible future effects of these contributing factors.

References

- Abid, A. (2020). Economic policy uncertainty and exchange rates in emerging markets: Short and long runs evidence. *Finance Research Letters*, 37, Article 101378.
- Alessandri, P., & Mumtaz, H. (2019). Financial regimes and uncertainty shocks. *Journal of Monetary Economics*, 101(1), 31–46.
- Bai, J., & Perron, P. (2002). Computation and analysis of multiple structural change models. *Journal of Applied Econometrics*, 18(1), 1–22.
- Baker, S. R., Bloom, N., & Davis, S. J. (2016). Measuring economic policy uncertainty. *Quarterly Journal of Economics*, 131(4), 1593–1636.
- Bloom, N. (2009). The impact of uncertainty shocks. *Econometrica*, 77(3), 623–685.
- Caggiano, G., Castelnuovo, E., & Nodari, G. (2022). Uncertainty and monetary policy in good and bad times: A replication of the vector autoregressive investigation by Bloom (2009). *Journal of Applied Econometrics*, 37(1), 210–217.
- Degiannakis, S., & Filis, G. (2019). Forecasting European economic policy uncertainty. *Scottish Journal of Political Economy*, 66(1), 94–114.
- Haque, Q., & Magnusson, L. M. (2021). Uncertainty shocks and inflation dynamics in the US. *Economics Letters*, 202, Article 109825.
- Istrefi, K., & Piloju, A. (2014). Economic policy uncertainty and inflation expectations. *Banque Déelott France Working Paper*, no. 511.
- Javaheiri, B., Habibi, F., & Amani, R. (2022). Economic policy uncertainty and stock market trading: Non-ARDL Evidence. *Future Business Journal*, 8(36).
- Kindleberger, C. P. (1978). *Maniacs, Panics and Crashes: A History of Financial Crisis*. New York: Basic Books.
- Krol, R. (2014). Economic policy uncertainty and exchange rate volatility. *International Finance*, 17(2), 241–256.
- Leduc, S., & Liu, Z. (2016). Uncertainty shocks are aggregate demand shocks. *Journal of Monetary Economics*, 82(1), 20–35.
- Leippold, M., & Matthys, F. (2022). Economic policy uncertainty and the yield curve. *Review of Finance*, 26(4), 751–797.
- Londono, J. M., Ma, S., & Wilson, B. A. (2021). The global transmission of real economic uncertainty. *The Board of Governors of the Federal Reserve System – International Finance Discussion Paper*, no. 1317.
- Meinen, P., & Röhe, O. (2018). To sign or not to sign? On the response of prices to financial and uncertainty shocks. *Deutsche Bundesbank Discussion Paper*, No. 33/, 2018.
- Minsky, H. P. (1982). The financial instability hypothesis: capitalist processes and the behavior of the economy. In C. P. Kindleberger, & J.-P. Laffargue (Eds.), *“Financial Crises: Theory, History and Policy”* (pp. 13–39). Cambridge University Press.
- Nusair, S. A., & Al-Khasawneh, J. A. (2022). Impact of economic policy uncertainty on the stock markets of the G7 countries: A non-linear ARDL approach. *The Journal of Economic Asymmetries*, 26(C), Article e00251.
- Orlowski, L. T. (2012). Financial crisis and extreme market risks: Evidence from Europe. *Review of Financial Economics*, 21(3), 120–130.
- Orlowski, L. T. (2021). The 2020 pandemic: Economic repercussions and policy responses. *Review of Financial Economics*, 39(1), 20–26.
- Pastor, L., & Veronesi, P. (2012). Uncertainty about government policy and stock prices. *Journal of Finance*, 67(4), 1219–1264.
- Shang, F. (2022). The effect of uncertainty on the sensitivity of the yield curve to monetary policy surprises. *Journal of Economic Dynamics and Control*, 137, 14355.