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The Impact of European Economic Policy Uncertainty on the Tunisian Economy

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1.Motivation

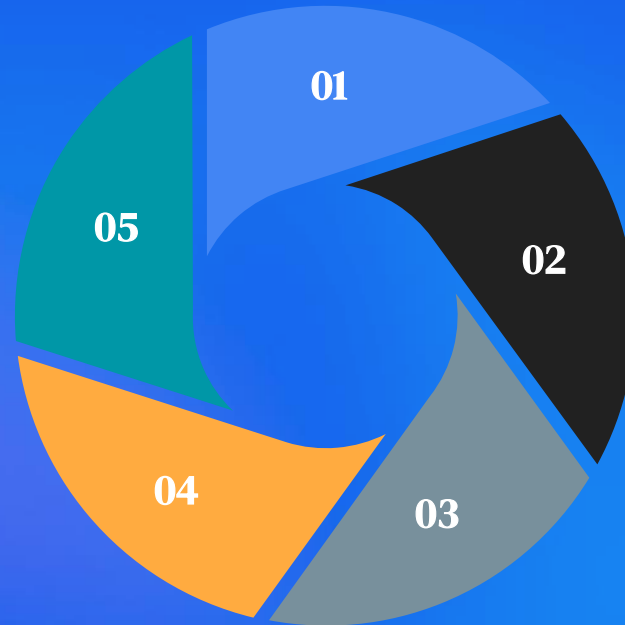
No previous studies on this topic

The strong interconnection between the EU and Tunisian economies

Quantify the extent and nature of the impact of EU policy uncertainty on Tunisia

Importance of examining the impact of EU economic policy uncertainty on Tunisia

Using new European policy uncertainty index by Baker and al (2023)



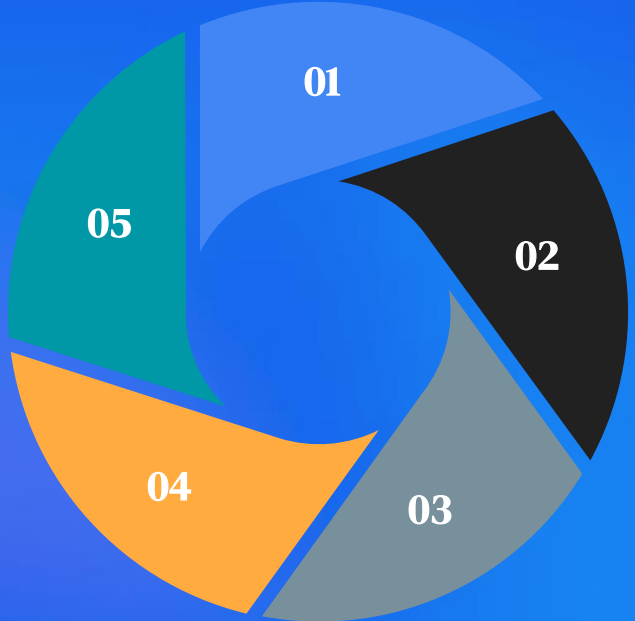
2.Factors Contributing to Economic Policy Uncertainty

- **Free trade agreements**
- **Trade restrictions**
- **New immigration policies**
- **BCE's stance on monetary policy**
- **Euro area sovereign debt crisis**
- **Sanctions imposed on Russia by the EU**
- **Brexit vote**

3.EU-Tunisia Relations and Economic Integration

EU-Tunisia Association Agreement signed in 1995

Tunisian economy closely linked to EU countries



Trade agreements between EU and Tunisia since 1969

Free Trade Area with EU for industrial products since 2008

Privileged Partnership approved in 2012 aims for deeper economic integration

3.EU-Tunisia Relations and Economic Integration

- (i) **Trade of goods channels:** geographical distribution of Tunisia's external trade reveals the dominance of the European Union countries as Tunisia's largest trading partner, with a share of about 70% of total exports and almost half of total imports.
- (ii) **Trade of services:** tourist activity shows the preponderance of tourist receipts from Europe, which accounted for more than half of total receipts. The French market was the main provider of European tourists in 2021.

3.EU-Tunisia Relations and Economic Integration

- (i) **Workers' remittances:** Remittances flow from some 600,000–700,000 Tunisians working across the globe, principally in the EU (60% in France, 15% in Italy, and 7% in Germany). Related labor income in 2021 amounted to 7.493 MD
- (ii) **Foreign direct investment:** the geographical distribution of FDI in 2021 continues to show the predominance of FDI from EU countries, with a share exceeding two-thirds of total inward FDI. France, Italy, and Austria are the main providers of direct investment in Tunisia.

4. Research Objectives

Given the strong interconnection between the EU and Tunisian economies, it is important to examine the spillover impact of European economic policy uncertainty on the main macroeconomic aggregates of the Tunisian economy.

the positive and negative EU uncertainty shocks on Tunisian macroeconomic aggregates are symmetric ?

4. Research Objectives

In the same wake, we investigate the degree of responsiveness of the Tunisian economic variables to a positive EU EPU shock by different shock size by using nonlinear SVAR methodology.

In fact, according to Kilian and Vigfusson (2011), the linear SVAR approach can be misleading in that the effect of a given shock in asymmetric models depends on the recent history of the series in question and on the magnitude of the shock.

5. Related Empirical Literature

Benignoi et al (2012): This study focuses on the impact of economic shocks on G7 indicators, with a specific emphasis on time uncertainty. It explores how shocks affect the volatility of monetary policy and key nominal and real indicators in the G7 countries.

Carrière-sallow and Cespedes (2013): This research delves into the effects of US uncertainty shocks on investment and consumption in both developed and developing countries. Notably, it finds that developing nations tend to be more affected by uncertainty in US economic policies.

5. Related Empirical Literature

Colombo (2013): Colombo's study explores the consequences of increased economic policy uncertainty in the United States on major euro area macroeconomic aggregates. It reveals that a 1% positive shock to US economic policy uncertainty leads to statistically significant decreases in European industrial production and price levels.

IMF (2013): This analysis examines the impact of the Economic Policy Uncertainty (EPU) index on investment and production in different world regions. It concludes that rising EPU temporarily reduces potential growth in other regions, with Sub-Saharan Africa and Commonwealth of Independent States countries being the most affected.

6. Related Empirical Literature

- **Baker et al. (2016):** This study suggests that shocks in US Economic Policy Uncertainty have a more significant effect on the euro area and Canada than political uncertainty shocks in those regions. It highlights the international spillover of US economic uncertainty.
- **Alam and Istiak (2020):** Alam and Istiak examine the impact of US economic policy uncertainty on Mexican economic aggregates. They use a nonlinear autoregressive vector structural model and find that higher US EPU leads to lower Mexican production, lower price levels, and lower key interest rates.
- **Azad et al. (2022):** This research investigates the impact of US monetary policy uncertainty on inflation rates in seven emerging economies. Using a multivariate GARCH-in-Mean VAR methodology, it finds that an increase in US monetary policy uncertainty has a negative impact on the macroeconomic and financial fundamentals of these economies.

7.Data

- For Tunisian economy, we use data for the index industrial production, the effective real exchange rate index, the policy interest rate, the consumer price index, current account balance, trade balance (net exports), the amount of worker remittances and tourism receipt.
- Data on the Tunisian economy are extracted from the Central Bank of Tunisia, National institutes of Statistics and The International Financial Statistics database.

7.Data : measure of Uncertainty

- we use an index based on newspaper articles about the political uncertainty proposed by Baker et al (2016). The authors rely on two newspapers per country for the European indices: Le Monde and Le Figaro for France, Handelsblatt and Frankfurter Allgemeine Zeitung for Germany, Corriere Della Sera and La Stampa for Italy, El Mundo and El Pais for Spain, the Times of London, and the United Kingdom Financial Times.
- Baker and al (2016) counts the number of newspaper articles containing the terms uncertainty or economic uncertainty, and one or more terms relevant to the policy.
- The data used are monthly from 2000:1 to 2023:03. The choice of study period is dictated by the availability of data from the Tunisian Economy.

8. Econometric methodology

- We propose to estimate a nonlinear SVAR, proposed by Kilian and Vigfusson (2011) to test the impact of positive and negative variations of EU EPU on the Tunisian economy.

Either V one of the variables of the Tunisian economy and E designates EU EPU. Therefore :

$$Y_t = \ln(V_t) - \ln(V_{t-1}) ; X_t = \ln(E_t) - \ln(E_{t-1}) .$$

- The SVAR model proposed by Kilian and Figfusson (2011) reads as follows:

$$X_t = b_{10} + \sum_{i=1}^p b_{11,i} X_{t-i} + \sum_{i=1}^p b_{12,i} Y_{t-i} + \varepsilon_{1,t}$$
$$Y_t = b_{20} + \sum_{i=1}^p b_{21,i} X_{t-i} + \sum_{i=1}^p b_{22,i} Y_{t-i} + \sum_{i=1}^p g_{21,i} X_{t-i}^- + \varepsilon_{2,t}$$

8. Econometric methodology

For testing symmetry in the changes of EU EPU, the null hypothesis can be defined as follows

$$H_0: g_{21,0} = \dots = g_{21,p} = 0$$

If the null hypothesis is rejected, then the impulse responses are asymmetric. However, the rejection of this hypothesis provides no idea of the direction of deviation of symmetry and the level of asymmetry. As the impulse responses in this model are nonlinear, the degree of asymmetry and the presence of a deviation from symmetry are statistically significant.

Because of nonlinear VAR model, the impulse responses are obtained from generalized impulse responses (Gallant, et al., 1993 and Koop, et al., 1996) which based on past histories.

Finally, the null hypothesis is given as follows

$$H_0: I_y(h, \sigma) = -I_y(h, -\sigma); h = 0, 1, \dots, H$$

where $I_y(h, \delta)$ and $I_y(h, -\delta)$ are responses of EU EPU at horizon $h=0,1,2, \dots, H$ to a shock of positive or negative EU EPU shocks. Wald test of this hypothesis has an asymptotic χ^2_{H+1} distribution.

8. Empirical result : linear SVAR

Table : error variance decomposition of main Tunisian macroeconomic aggregates due to the 1% shock to EU EPU index

Horizon	IPI	CA	CPI	TB	REER	INT	RT	RW
6	4.80	4.51	1.38	4.24	0.05	1.48	1.94	11.32
12	14.80	5.75	0.78	5.76	0.25	3.55	4.99	16.93
18	17.50	6.11	0.55	6.15	0.36	4.73	7.67	21.67
24	19.49	5.97	0.51	6.25	0.36	4.16	7.61	25.70
30	20.39	6.16	0.36	6.12	0.35	3.73	7.05	28.01
36	20.74	8.79	0.33	5.89	0.33	4.78	7.06	27.80

8. Empirical result : Empirical symmetry tests the modified slope-based test

Table 5. Empirical symmetry tests: the modified slope-based test

	Modified Test of Symmetric Slope Coefficients	Significance Level	Mork's Test of Symmetric Slope Coefficients	Significance Level
Industrial production index	1.44	0.99	16.66	0.54
Consumer price index	669.48	0.00	118.44	0.00
Real effective exchange rate	22.92	0.24	13.24	0.76
Current account	318.23	0.00	119.37	0.00
Trade balance	1.01	0.99	16.26	0.57
Tourism revenue	0.02	0.99	9.76	0.93
Worker remittance	0.0209	0.99	14.31	0.28
Interest rate	2.84	0.99	15.70	0.60

8. Empirical result : Empirical symmetry tests

the impulse response functions based test

Table . Empirical symmetry tests: the impulse response functions based test

h	Industrial production index	Consumer price index	Real effective exchange rate	Current account	Trade balance	Tourism revenue	Worker remittance	Interest rate
1	0.041	0.010	0.556	0.018	0.007	0.04	0.051	0.45
2	0.144	0.013	0.734	0.018	0.021	0.030	0.002	0.361
3	0.216	0.095	0.813	0.034	0.040	0.096	0.001	0.467
4	0.346	0.043	0.660	0.005	0.077	0.014	0.094	0.292
5	0.484	0.076	0.727	0.009	0.121	0.026	0.337	0.123
6	0.604	0.528	0.696	0.007	0.119	0.045	0.319	0.157
7	0.716	0.640	0.225	0.005	0.142	0.034	0.426	0.109
8	0.344	0.649	0.303	0.008	0.207	0.055	0.526	0.165
9	0.258	0.742	0.385	0.010	0.253	0.053	0.575	0.293
10	0.292	0.119	0.473	0.017	0.273	0.082	0.495	0.010
11	0.367	0.191	0.009	0.026	0.323	0.104	0.584	0.034
12	0.434	0.102	0.041	0.040	0.315	0.135	0.608	0.081
13	0.493	0.133	0.075	0.055	0.375	0.157	0.668	0.227
14	0.522	0.133	0.338	0.076	0.302	0.203	0.485	0.267
15	0.562	0.150	0.361	0.104	0.368	0.231	0.545	0.289
16	0.628	0.190	0.425	0.193	0.410	0.158	0.616	0.332
17	0.669	0.240	0.483	0.111	0.480	0.195	0.617	0.377
18	0.730	0.294	0.552	0.130	0.504	0.208	0.610	0.045

8. Empirical result : Response of Tunisian's macroeconomic aggregates to positive EU EPU index by shock size

Fig.2: The Response of Tunisian industrial production index to a Positive euro area economic policy uncertainty Shock by Shock Size

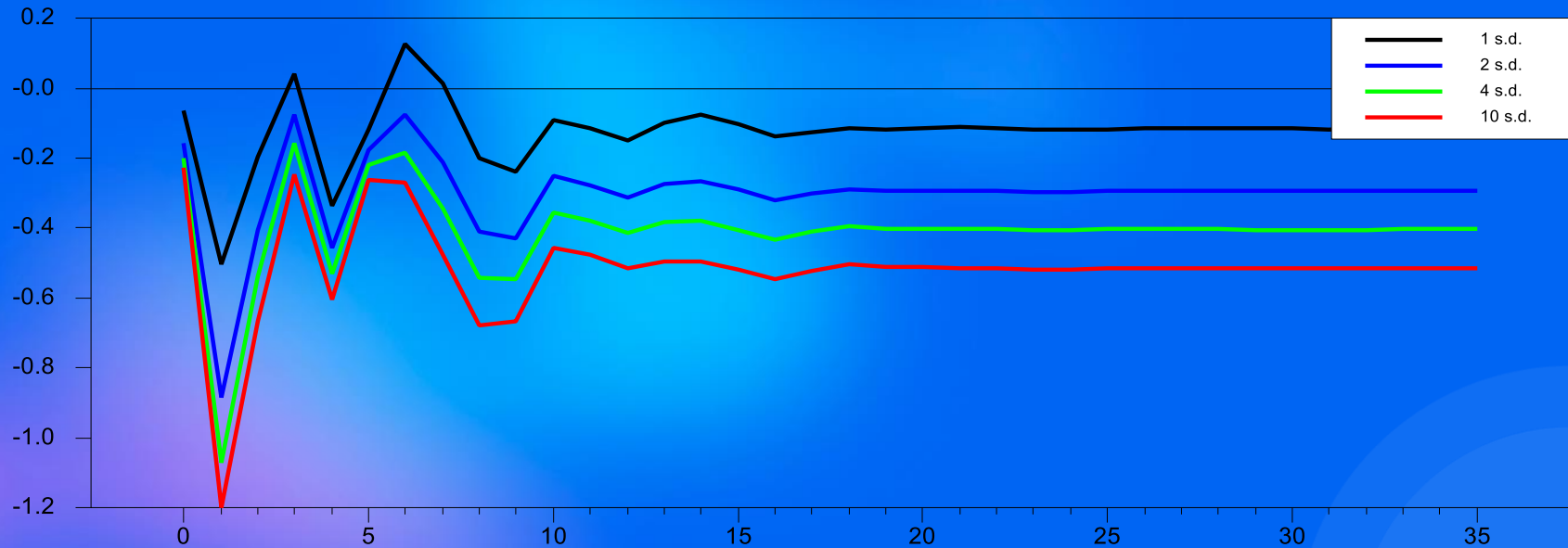


Figure : The Response of Tunisian industrial production index to a Positive euro area economic policy uncertainty Shock by Shock Size

8. Empirical result : Response of Tunisian's macroeconomic aggregates to positive EU EPU index by shock size

Fig.4: The Response of Tunisian consumer price index to a Positive euro area economic policy uncertainty Shock by Shock Size

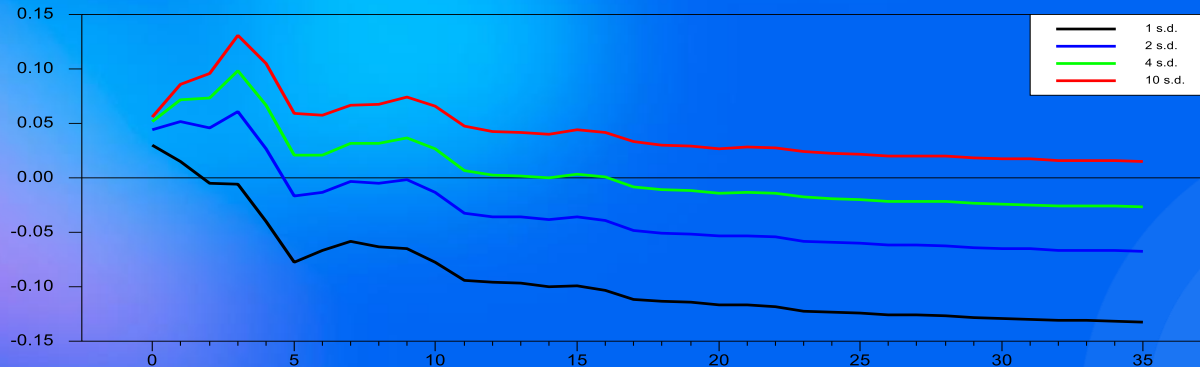


Figure 6: The Response of inflation to a Positive euro area economic policy uncertainty Shock by Shock Size

8. Empirical result : Response of Tunisian's macroeconomic aggregates to positive EU EPU index by shock size

Fig.3: The Response of Tunisian policy interest rate to a Positive euro area economic policy uncertainty Shock by Shock Size

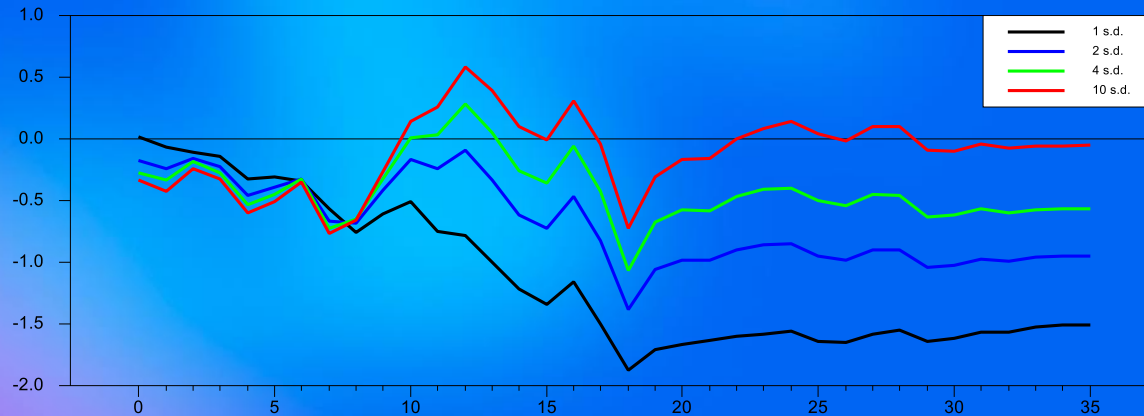


Figure 6: The Response of interest rate to a Positive euro area economic policy uncertainty Shock by Shock Size

8. Empirical result : Response of Tunisian's macroeconomic aggregates to positive EU EPU index by shock size

Fig.: The Response of Tunisian Real effective exchange rate to a Positive euro area economic policy uncertainty Shock by Shock Size

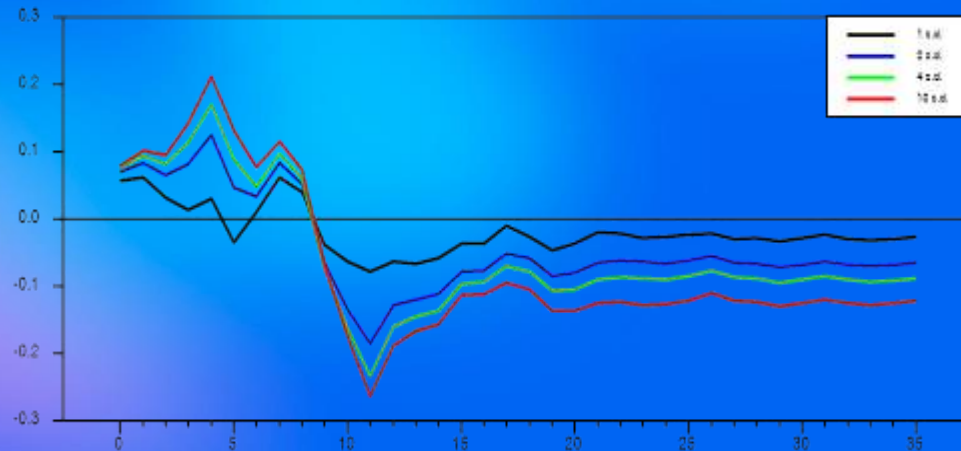


Figure : The Response of Tunisian real effective exchange rate to a Positive euro area economic policy uncertainty Shock by Shock Size

8. Empirical result : Response of Tunisian's macroeconomic aggregates to positive EU EPU index by shock size

Fig: The Response of Tunisian current account balance to a Positive euro area economic policy uncertainty Shock by Shock Size

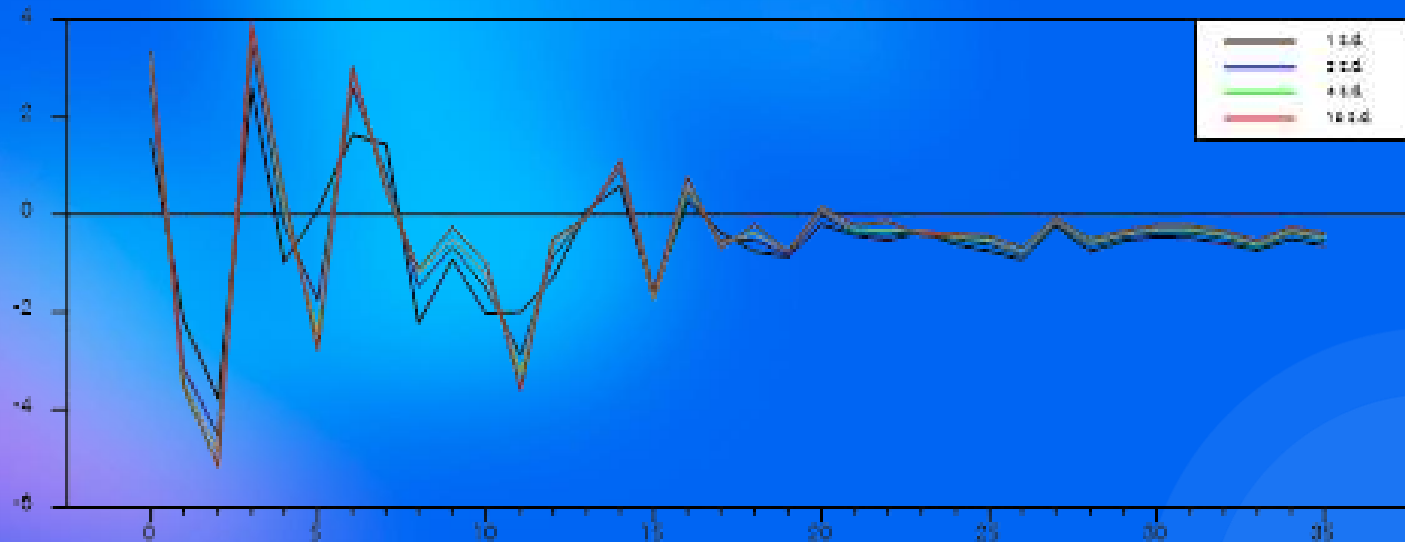


Figure : The Response of Tunisian current account to a Positive euro area economic policy uncertainty Shock by Shock Size

8. Empirical result : Response of Tunisian's macroeconomic aggregates to positive EU EPU index by shock size

Fig: The Response of Tunisian workers remittance to a Positive euro area economic policy uncertainty Shock by Shock Size

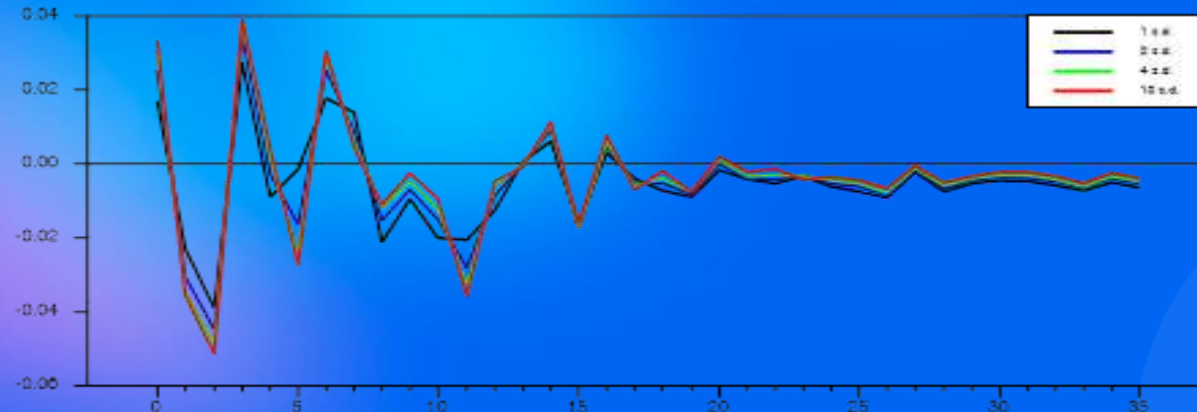


Figure : The Response of worker remittances to a Positive euro area economic policy uncertainty Shock by Shock Size

8. Empirical result : Response of Tunisian's macroeconomic aggregates to positive EU EPU index by shock size

Fig.: The Response of Tunisian trade balance to a Positive euro area economic policy uncertainty Shock by Shock Size

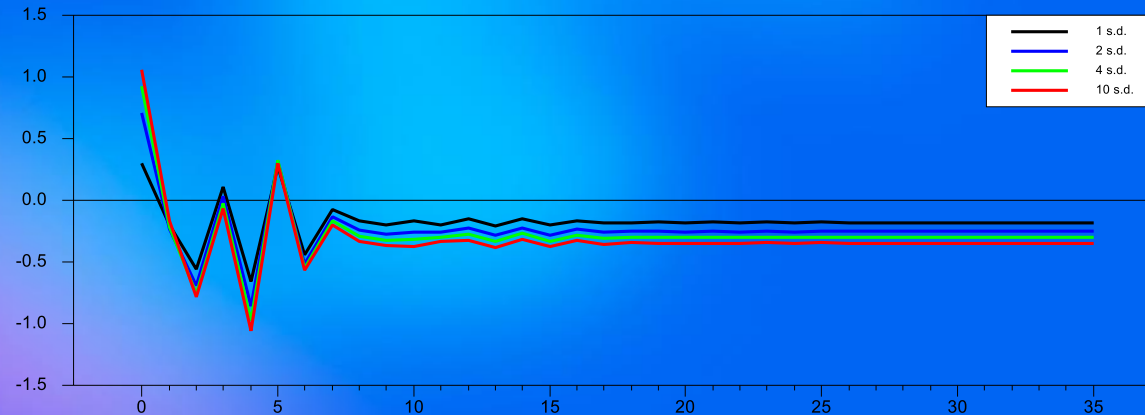


Figure : The Response of trade balance to a Positive euro area economic policy uncertainty Shock by Shock Size

8. Empirical result : Response of Tunisian's macroeconomic aggregates to positive EU EPU index by shock size

Fig.: The Response of Tunisian Tourism receipt to a Positive euro area economic policy uncertainty Shock by Shock Size

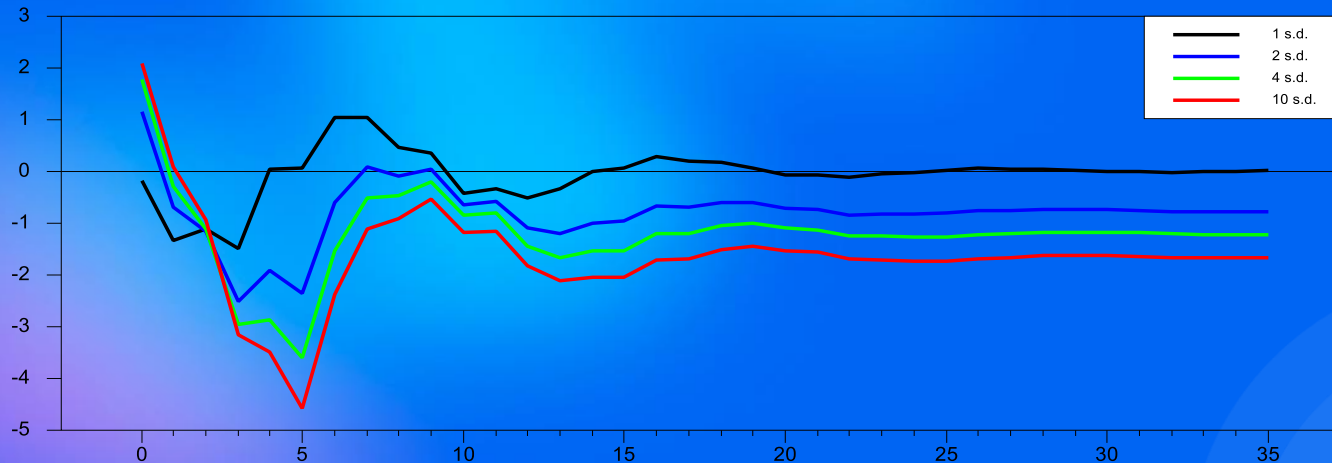


Figure : The Response of Tunisian tourism revenues to a Positive euro area economic policy uncertainty Shock by Shock Size

Summary

1. We also find interesting evidence that fluctuations in Tunisian industrial production and policy, current account balance, worker's remittances and tourism receipts are explained strongly by the EU uncertainty.

2. Our results also show that the responses of all macroeconomics variables are asymmetric to positive and negative shocks to EU policy uncertainties.

3. The results also showed that the response of the various macroeconomic aggregates was statistically negative and asymmetric to the various positive shocks of 1%, 2%, 4% and 10% to EU policy uncertainties, except for the consumer price index.

Recommendations

The results of this research could be used as policy recommendations for Tunisian policy makers. First, the sources of Tunisian economic growth (Export, import, tourism receipt, production, and worker's remittance) appear to be affected by the increase in EU EPU. Consequently, Tunisian policymakers will have to diversify the Tunisian economy and open to different markets to limit dependence on EU policy uncertainties.

Thank you. Please feel free to ask any questions.

