

3. THE SPENDING BEHAVIOR OF GOVERNMENT THROUGH THE LENSES OF GLOBAL UNCERTAINTY AND ECONOMIC INTEGRATION

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Abstract

This article contributes to the literature dealing with fiscal policy's drivers and the effects of the globalization on public sectors. By using the level and the volatility of the global economic policy uncertainty (EPU) and the US economic policy uncertainty, we examine the total government expenditures for a sample of 113 countries over the period 1997-2014. We observe that higher global uncertainty levels significantly increased the public spending at global level while the volatility of the global uncertainty has an insignificantly positive effect. Notably, these results are stronger for the low and middle-income economies. We also observe that the influence of the global uncertainty on public spending in the low and middle-income economies are exacerbated by the economic integration (provided through trade openness) while in high income economies, it is an opposite trend. These findings show that what the existing literature labels as 'efficiency hypothesis' and 'compensation hypothesis' can actually be combined and that this combination depends on the global uncertainty, at least of low, middle- and upper-income economies. This observation also shows that economic integration can act as a diversifying factor for high-income economies rejecting the current growing protectionism observed in some of these countries. Beyond these findings, our study paves a way for future research study on the impacts of global uncertainty on fiscal policy, the public expenditure and tax revenue.

Keywords: government spending, economic policy uncertainty, cyclicity

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1. Introduction

Even though the existing literature broadly acknowledges that the differences in public spending behaviors are usually related to the differences in the institutional settings (e.g.,

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political stability and control of corruption), there are still non conclusive empirical features on the drivers of public spending. Meanwhile, the recent debt crisis (in Europe, especially in Greece) led to harmful impacts on the role of public spending (Overbeek, 2012). This crisis also questioned the benefit of the globalization in a situation of large economic fluctuations. In this context, a comprehensive study analyzing the drivers of governments' expenditures in a globalized world would provide a significant contribution to both macroeconomic literature and fiscal policy practices.

These recent years, a huge attention among scholars is paid to the macro-impacts of economic policy uncertainty (Nguyen *et al.*, 2020). The literature shows that an increase in the policy uncertainty leads to the fall in output, investment and employment (Canh *et al.*, 2019). The impact of the global economic policy uncertainty on the domestic economies is likely to be stronger than the impact of the domestic economic policy uncertainty (Carrière-Swallow and Céspedes, 2013). Although the effect of an increase in the domestic EPU on aggregated variables within a country is quite well documented (Canh *et al.*, 2019), few studies have been done on the impacts of global uncertainty on government behaviors. With the norm that a rise in the global economic policy uncertainty leading to the fall in domestic economic growth (Carrière-Swallow and Céspedes, 2013), government may expand their fiscal policy to counter the downfall as common wisdom in fiscal policy conducting. However, the increase in global uncertainty may lead to the down of investment and the foreign capital flows implying a lower tax bases and revenues for the government (Canh *et al.*, 2019). In this context, the governments might face with a dilemma to make their decision. This study investigates further this issue by assuming that global economic policy uncertainty (EPU) has an influence on the fiscal policy through the public spending.

The paper is structured as follows. The next section reviews the literature dealing with our topic while Section 3 presents our methodology and data. The empirical results are then presented and discussed in Section 4. The last section concludes this analysis with some recommendations.

2. Literature Review

2.1) Fiscal Policy

The Keynesian perspective has established a well-known distinction between automatic and discretionary aspects of the fiscal policy (Bashar *et al.*, 2017, Dinh Thanh and Canh, 2019). The counter-cyclical fiscal policy (by tax policies and public spending) is suggested to be used by government as an 'automatic stabilizer' during recessions (Chari *et al.*, 1994). In addition to the common drivers of public spending (economic growth, unemployment, old population), Hemming *et al.* (2002) noticed that the government is often limited in fiscal capability due to debt; especially, in developing countries that have to tackle more constraints due to the availability and cost of domestic and external borrowings (Phuc Canh, 2018).

Despite the large literature devoted to fiscal policy, the influence of uncertainty on the government's behavior in public spending is quite under-investigated. One can mention some studies (*e.g.*, Alexopoulos and Cohen, 2009; Davis *et al.*, 2013; Leduc and Liu, 2016; Forni *et al.*, 2017) but all of them used heterogeneous proxies to capture the economic uncertainty. Grobar (1993), for instance, found that some categories of manufactured exports in Argentina, Brazil, Colombia, Greece, Malaysia, Mexico, Philippines, South Africa, Thailand, and Yugoslavia are negatively affected by the real exchange rate

uncertainty in the period 1963-1985. Asamoah et al. (2016) studied that the macroeconomic uncertainty through the dynamics of FDI in the sample of 40 Sub-Saharan African countries over the period 1996 to 2011. Dimic et al. (2016) examined the impact of the global financial market uncertainty and domestic macroeconomic factors through the stock-bond correlation in emerging markets. These authors found that stock-bond correlation patterns vary significantly with the time horizon (the variation in the short-term characterizing the uncertain period). Bogdanov (2010) identified different patterns for countries facing with economic recession: counter-cyclical behavior in developed countries but acyclical properties in developing countries. Interestingly, Schalck (2014) noticed a particular dynamics fiscal policy in emerging European responding to external shocks: most of the countries pursued a counter-cyclical policy after 2008 while the post-crisis period is characterized by an acyclical or pro-cyclical policy.

By using the new measure of Economic Policy Uncertainty, Chi and Li (2017) studies data about Chinese commercial banks from 2000 to 2014 to examine the effect of the economic policy uncertainty on banks' credit risks and lending decisions – their analysis documented that a positive link between the EPU and non-performing loan ratio, loan concentrations and the normal loan migration rate. Colombo (2013) documented that a one standard deviation shock in the US economic policy uncertainty leads to a statistically significant fall in the European industrial production and prices of -0.12% and -0.06%, respectively, in the period 1999M1-2008M6. The impact of the US uncertainty shock on the European aggregates is shown to be quantitatively larger than the one exerted by a Euro area-specific uncertainty shock. In addition, Creal and Wu (2017) investigated the relationship between uncertainty about monetary policy and its transmission mechanism leading to potential economic fluctuations, as expected. These authors found that uncertainty contributes negatively to economic activity. In the same vein, Forni et al. (2017) emphasized that the Volcker recession and the Great Recession were exacerbated by the uncertainty effects of news.

In line with this heterogeneous collection of articles, this paper studies proposes the influence of global uncertainty (proxied by Global Economic Policy Uncertainty and US Economic Policy Uncertainty) on the public spending at a global level by assuming that the government behavior in public spending is no longer an exogenous variable. Our contributions on this aspect are: 1) to use a systematic measure of EPU; and 2) to combine this aspect with economic openness in our study. The next section provides an overview of the literature dealing with economic openness.

2.2 Economic Openness

In the existing literature, the effects of trade openness are normally divided into two categories: positive influence (associated with the 'efficiency hypothesis') and negative influence (associated with the idea of 'compensation'). The latter refers to the situation in which economic openness leads government to expand public sectors and social expenditures whereas the former (efficiency hypothesis) rather describes a situation in which a higher economic trade leads to lower taxes and reduce public sectors (Gemmell et al., 2008). Regarding this issue, Avelino et al. (2005) found that trade openness has a positive association with education and social security expenditures in Latin America area over the period 1980–1999. Interestingly, Busemeyer (2009) found little evidence for compensation effects of trade openness on taxation or spending in the OECD countries. In the same vein, Gemmell et al. (2008) used both the inward FDI and openness as measures of globalization but they also found no effect on the size of government excepting the significant effects of FDI in shifting the expenditure composition towards social spending in OECD in the period

1980-1997. Related to this, Liberati (2007) found that the compensation hypothesis is not in general supported by data in European countries, US, Canada, Australia, New Zealand, and Japan in the period of 1975-2005. Adsera and Boix (2002) explained that the positive effect of a high level of trade integration on the public sector, results from the fact that states with a higher trade openness act as a social planner in adopting a salient role to minimize the risks of economic integration and secure social peace. Nations may therefore embrace protectionist policies to shore up the welfare for key domestic sectors without engaging substantial public spending. To maintain trade openness in democracies, policymakers develop compensation policies to muster a support for the losers of openness. Benarroch and Pandey (2012) used both aggregate and disaggregated government expenditure data of 119 countries for the period from 1972 to 2000, including data on social security, to examine the relationships between trade openness and government size. They found little or no support for a causal relationship between openness and aggregate or disaggregated government expenditure, while only evidence of a statistically significant positive relationship was found between openness and education expenditures in low income countries.

Epifani and Gancia (2009) added that openness can increase the size of governments through two channels: (1) a terms-of-trade externality, whereby trade lowers the domestic cost of taxation, and (2) the demand for insurance, whereby trade raises risk and public transfers. This study suggests that the effects of economic integration on public spending should be investigated under the dynamics of the influences of global uncertainty (*i.e.* kind of risk) on fiscal policy. This aspect has not really been investigated in the literature and that is the purpose of this article aiming at studying the extent to which trade openness could play a catalyst role and could increase the effects of the global uncertainty (an exogenous risk factor) on the public sector. Precisely, a higher trade openness could lead to a higher exposure of a country to external shocks and therefore the effects of global shocks on the public sector could be exaggerated. The next section will present our methodology and we deal with our data in our empirical analysis of this issue.

3. Methodology and Data

With the purpose to study the gap identified in the previous section, our study focuses on the influence of the global uncertainty on the public spending at a global level by taking into consideration the dynamics of economic integration, income level, and economic cycles. With this purpose, we collect the annual data for 113 countries³ following three income levels for the period 1997-2014 (due to the availability of data). The fundamental equation capturing the common determinants of the government expenditures including economic growth, unemployment, aging population, trade openness is directly inspired from existing studies (e.g., Yu et al., 2011; Gemmell et al., 2008).

$$Govexp_{it} = \alpha_j X_{it-1} + \beta_1 EPU_{it} + \varepsilon_{it} \quad (1)$$

where: i and t denote country i at year t , $Govex$ is the public spending, which is measured by ratio of general final government consumption to GDP ($Govex1$), and ratio of total government consumption to GDP ($Govex2$), respectively. For robustness purposes, we use two different proxies for the public spending. X is the vector of economic drivers for the public spending including real GDP growth rate ($GDPg$), unemployment rate ($Unem$), old

³ See Table A1 in Appendix (available online) for the list of countries.

population to total (*Old*), and trade openness (*Trade*). All these control variables are then regressed with 1 year lag to avoid the potential endogeneity between dependent variables with independent variables (for instance the public spending may have impacts on economic growth through crowding-in or crowding-out effects (Shen et al., 2018), or public spending can have casual effects with trade openness (Benarroch and Pandey, 2012). Our main explanatory variable is the global uncertainty (*EPU*) proxied by the Global Economic Policy Uncertainty (*GEPU*) and the US Economic Policy Uncertainty (*USEPU*). The data related to this aspect are collected from www.PolicyUncertainty.com that proposes two different indicators of the Global EPU (one in nominal price and one in real price), and the US EPU (one is baseline overall index and one is news based index), we use these alternative measures for robustness purpose. Finally, δ , α and β are the coefficients whereas ε is residual term. All sources, definitions and calculations of our data are presented in Table A1 in the Appendix.

In this study, the values of the Global and the US EPU in the January are used to proxy the level global uncertainty for each year. In addition, the means of each EPU are used for robustness checks, while the standard deviation of each EPU is used to estimate the effect of the volatility of economic policy uncertainty on the public spending. All data were collected from the World Development Databases version 2017 of World Bank, while the ratio of total government consumption is recruited from the Penn World Table 9.0.

In the second step, the interaction terms between the economic policy uncertainty and the trade openness are used to examine the influence of the global uncertainty on the public spending in a dynamic economic integration following eq. 2 hereafter,

$$Govexp_{it} = \alpha_j X_{it-1} + \beta_1 EPU_{it} + \beta_2 EPU_{it} * Trade_{it-1} + \varepsilon_{it} \quad (2)$$

Afterwards, our sample has been divided into three sub-samples ranked by income level⁴: 48 low and lower-middle income economies, 28 upper-middle income economies, and 37 high-income economies for which we applied the same aforementioned process to examine the effects of the global uncertainty on public spending for different level of economic development (see Table A2 in the Appendix for the list of countries). Finally, we separated with the data into two periods: 1997 to 2007 and 2008 to 2014 in order to investigate the impacts of the global uncertainty on the public spending in difference economic cycles.

The data in Table A3 in the Appendix show that, on average, the total government consumption to GDP is 17.3%, while the general government consumption is 15.2% on average. However, there are some differences in the composition of public spending among countries since the standard deviation and the maximum value are larger for the ratio of total government consumption to GDP. The economic integration is quite high since the average of trade openness to GDP is 86.2%, implying a high exposure of economies to the global risk in the period of study. Interestingly, the average of the economic policy uncertainty is much higher for the US EPU in comparison with the global EPU. In fact, the global EPU is calculated basing on the US EPU and the other major economies EPU (see on www.PolicyUncertainty.com). Table A4 in the Appendix reports the correlation matrix between our major variables.

⁴ The World Bank's new country classifications by income level: 2018-2019 is available at: <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>.

The two proxies for the public spending have a significant negative correlation with the real GDP growth rate. This suggests that the government expenditures may follow counter-cyclical properties with a decrease in the context of higher economic growth and vice versa. As expected, the unemployment rate and an aging population have both a significant positive correlation with government expenditures. The trade openness does not have a consistent correlation with the two proxies of public spending. The global uncertainty value in January and yearly mean have a significant positive correlation while the volatility of the global uncertainty has a positive (but insignificant) correlation with public spending. Moreover, the study takes a further step by examining the Granger causality of economic policy uncertainty on government expenditures. The panel Granger causality proposed by Dumitrescu and Hurlin (2012) is used. The results that are reported in Table A5 (in the Appendix) show strong statistical evidence of a Granger causality between the global economic policy uncertainty and the two proxies capturing public expenditures (*Govexp1*) and (*Govexp2*).

Econometrically speaking, our sample has a relatively large number of cross sections (N=113 economies) but a relatively shorter time horizon (1997-2014, *i.e.* T=18 years). Therefore, we use the Pesaran's CD test (Pesaran, 2004) to examine the existence of a potential cross-sectional dependence in the sample. The result is provided in Table A6 (Appendix) and it shows the existence of cross-sectional dependence between the real GDP growth rate, unemployment rate, old population, and trade openness. In this context, the Pesaran's (2007) CIPS ($Z(t\text{-bar})$) unit root tests are employed to test the stationarity of these variables. Except for the real GDP growth rate and the unemployment rate (which are stationary at 1% and 10%, respectively), our variables are non-stationary. In this case, the Panel Corrected Standard Errors model (PCSE) estimation is usually presented as an appropriate estimator for small panel data with short T and large N in the existence of cross-sectional dependence (Marques and Fuinhas, 2012; Bailey and Katz, 2011). Therefore, PCSE estimator is used as our main technique. Moreover, we proceed with some robustness checks by applying a series of different estimations including Pool OLS, Fixed Effects Model, Random Effects Model, and Feasible Generalized Least Squares (FGLS) (Liao and Cao, 2013; Zhang and Nian, 2013). The results obtained with the other estimators are consistent and confirm our main econometric analysis – they can be provided upon requests.

4. Results and Discussion

4.1. The Global Uncertainty and Public Spending: A Global Perspective

Table A7 in the Appendix shows an influence of both EPU and US EPU (in terms of levels and volatility) on the public spending (total government consumption and general final government consumption to GDP). Results are consistent for all estimations.

The real GDP growth has a significant negative effect on the general final government consumption, but an insignificant negative effect on the total government consumption. This implies that the government has likely done a counter-cyclical fiscal policy by reducing their general consumption in the period of higher economic growth and vice versa (Chari et al., 1994). However, this observation is not significant for the total government consumption due to an expansionary fiscal policy implemented in many countries and the pro-cyclical properties of such fiscal policy (Ilizetzi and Végh, 2008). Indeed, some governments do not necessarily reduce their total consumption in a period of high economic growth. In addition, some governments may have their priority depending on specific public spending

explaining that the dynamics in the total government consumption can move in a different way than the general government consumption (Facchini and Seghezza, 2018).

The unemployment and the aging population variables have a significant positive effect on the two proxies capturing the government expenditures while the trade openness has a negative effect. The former effects confirm the important role played by public spending as a stabilizing factor of the social security and welfare (Gray, 2009). These results are consistent with the theory and empirical evidences.

More interestingly, the negative effect of the trade openness (significant in the case of general government consumption (*Govex1*) - but insignificant in the case of total government consumption (*Govex2*)) - supports the idea that globalization might favor an efficient context in which governments tend to spend less money (Gemmell et al., 2008). Such results may shed an important light to support the positive influence of globalization that would help in reducing the government size.

Our major variables (the global EPU and the US EPU) capturing the economic policy uncertainty have a significant positive effect on the two indicators of the government expenditures. This observation is consistent with our expectations according to which a higher global uncertainty implies a higher risk while inducing lower output and higher unemployment, therefore governments react by spending more. This finding also shows that, globally, governments are more endogenous actors by taking action against the global uncertainty and these governments face more challenges in managing their fiscal policies (Rodden, 2002). This result extended the literature on fiscal policy according to which the latter should not be seen as an exogenous variable in macroeconomic models (Lavertu and Clair, 2018). Governments respond to global (exogenous) uncertainty by raising their public spending in social security of the domestic economy. In such context, a higher economic integration, propagating a higher global uncertainty, would cancel the efficient effect of globalization. Such results also contribute to the literature devoted to uncertainty and its effects on macroeconomic factors (e.g., stock market, credit market monetary policy (Asamoah et al., 2016; Chi and Li, 2017).

The volatility of the global EPU and the US EPU have a positive (but insignificant) effect on the two proxies of governments' spending. This means that governments react actively to a higher global uncertainty, but they may not respond significantly to the fluctuations of this global uncertainty. Precisely, when the global uncertainty increases, governments response by increasing the public spending to handle the global risk; however, when the global uncertainty changes too much (more volatile) government do not react actively. Table 1 shows the influence of the global uncertainty on the public spending in combination with the economic integration.

Table 1

Economic Policy Uncertainty and Fiscal policy: the interaction with trade openness (Global sample)

Dep. Var: Govexp1	Global Economic Policy Uncertainty						US Economic Policy Uncertainty					
	GEPU1	GEPU2	GEPUmean1	GEPUmean2	GEPUvol1	GEPUvol2	USEPU1	USEPU2	USEPUmean1	USEPUmean2	USEPUvol1	USEPUvol2
L.GDPg	-0.054** [0.023]	-0.055** [0.024]	-0.056** [0.024]	-0.057** [0.024]	-0.060** [0.024]	-0.060** [0.024]	-0.055** [0.024]	-0.054** [0.024]	-0.056** [0.024]	-0.056** [0.024]	-0.060** [0.024]	-0.060** [0.024]
L.Unem	0.160*** [0.015]	0.160*** [0.015]	0.159*** [0.015]	0.159*** [0.015]	0.159*** [0.015]	0.159*** [0.015]	0.160*** [0.015]	0.160*** [0.015]	0.160*** [0.015]	0.159*** [0.015]	0.159*** [0.015]	0.159*** [0.015]
L.Oldpop	0.468*** [0.013]	0.468*** [0.013]	0.468*** [0.013]	0.468*** [0.013]	0.468*** [0.013]	0.468*** [0.013]	0.468*** [0.013]	0.469*** [0.013]	0.468*** [0.013]	0.468*** [0.013]	0.468*** [0.013]	0.468*** [0.013]
L.Trade	-0.023* [0.013]	-0.017 [0.013]	-0.023 [0.016]	-0.018 [0.016]	-0.004** [0.002]	-0.005** [0.002]	-0.006 [0.013]	-0.019 [0.012]	-0.004 [0.014]	-0.016 [0.016]	-0.004 [0.002]	-0.004* [0.002]
EPU	0.322 [0.279]	0.429 [0.280]	0.263 [0.356]	0.321 [0.348]	0.007 [0.008]	0.006 [0.008]	0.627** [0.299]	0.374 [0.263]	0.539* [0.315]	0.350 [0.341]	0.012 [0.011]	0.006 [0.006]
L.Trade*EPU	0.004 [0.003]	0.003 [0.003]	0.004 [0.003]	0.003 [0.003]	-0.000002 [0.0001]	0.00002 [0.00008]	0.0004 [0.003]	0.003 [0.002]	-0.0001 [0.003]	0.002 [0.003]	-0.00005 [0.0001]	-0.00001 [0.00006]
Cons	9.132*** [1.347]	8.643*** [1.351]	9.424*** [1.696]	9.162*** [1.654]	10.49*** [0.296]	10.50*** [0.296]	7.650*** [1.479]	8.817*** [1.319]	8.111*** [1.533]	8.971*** [1.670]	10.41*** [0.315]	10.45*** [0.312]
Wald ch2	2244 (0.000)	2238 (0.000)	2238 (0.000)	2234 (0.000)	2268 (0.000)	2272 (0.000)	2263 (0.000)	2282 (0.000)	2255 (0.000)	2268 (0.000)	2259 (0.000)	2264 (0.000)
RMSE	4.357	4.358	4.360	4.360	4.363	4.362	4.359	4.358	4.361	4.360	4.363	4.362
Dep. Var: Govexp2	Global Economic Policy Uncertainty						US Economic Policy Uncertainty					
L.GDPg	-0.011 [0.049]	-0.014 [0.049]	-0.012 [0.049]	-0.015 [0.049]	-0.023 [0.049]	-0.023 [0.049]	-0.014 [0.050]	-0.011 [0.049]	-0.015 [0.049]	-0.012 [0.049]	-0.022 [0.049]	-0.022 [0.049]
L.Unem	0.157***	0.157***	0.156***	0.156***	0.155***	0.155***	0.157***	0.157***	0.157***	0.156***	0.155***	0.155***

Dep. Var: Govexp1	Global Economic Policy Uncertainty						US Economic Policy Uncertainty					
	GEPU1	GEPU2	GEPUmean1	GEPUmean2	GEPUvol1	GEPUvol2	USEPU1	USEPU2	USEPUmean1	USEPUmean2	USEPUvol1	USEPUvol2
	[0.014]	[0.014]	[0.014]	[0.014]	[0.014]	[0.014]	[0.014]	[0.014]	[0.014]	[0.014]	[0.014]	[0.014]
L.Oldpop	0.272*** [0.016]	0.272*** [0.016]	0.272*** [0.016]	0.271*** [0.016]	0.272*** [0.016]	0.272*** [0.016]	0.273*** [0.016]	0.274*** [0.016]	0.272*** [0.016]	0.273*** [0.016]	0.272*** [0.016]	0.272*** [0.016]
L.Trade	0.003 [0.026]	0.015 [0.027]	0.009 [0.032]	0.018 [0.031]	-0.001 [0.005]	-0.001 [0.005]	0.029 [0.029]	-0.011 [0.027]	0.031 [0.030]	-0.003 [0.033]	0.0004 [0.005]	-0.001 [0.005]
EPU	1.617*** [0.624]	1.744*** [0.657]	1.940*** [0.749]	1.947*** [0.755]	0.008 [0.023]	0.012 [0.023]	1.908** [0.756]	1.154* [0.665]	1.778** [0.776]	1.459* [0.785]	0.018 [0.029]	0.010 [0.016]
L.Trade*EPU	-0.001 [0.006]	-0.003 [0.006]	-0.002 [0.007]	-0.004 [0.007]	0.0001 [0.0002]	0.0001 [0.0002]	-0.006 [0.006]	0.002 [0.006]	-0.007 [0.006]	0.001 [0.007]	-0.00002 [0.0002]	0.00003 [0.0001]
Cons	6.190** [2.864]	5.605* [3.003]	4.784 [3.418]	4.775 [3.430]	13.53*** [0.604]	13.43*** [0.599]	4.631 [3.542]	8.105** [3.195]	5.379 [3.596]	6.781* [3.709]	13.35*** [0.640]	13.37*** [0.631]
Wald ch2	643 (0.000)	618 (0.000)	631 (0.000)	613 (0.000)	628 (0.000)	631 (0.000)	586 (0.000)	666 (0.000)	578 (0.000)	638 (0.000)	601 (0.000)	624 (0.000)
RMSE	7.006	7.009	7.007	7.010	7.022	7.020	7.012	7.009	7.014	7.011	7.022	7.021
N	1,921	1,921	1,921	1,921	1,921	1,921	1,921	1,921	1,921	1,921	1,921	1,921
Countries	113	113	113	113	113	113	113	113	113	113	113	113

Note: EPU is Economic Policy Uncertainty. Standard errors are in []. *, **, *** are significant levels at 10%, 5%, 1%, respectively. All results are estimated by Panel Corrected Standard Errors model (PCSE).

Interestingly, the interaction variables between global uncertainty (both global EPU and US EPU) and the trade openness have an insignificant positive effect (for the levels and means of uncertainty) and an insignificant negative effect (for the volatility of uncertainty) on the general final government consumption. While, they have insignificant negative effects on total government consumption to GDP. These results mean that the effect of the global uncertainty on public spending may not be significantly limited by the economic integration as evoked earlier. However, our sample includes 113 economies with very different stage of economic development and trade openness. Some measures might need to be considered in relation to the income-level of countries. Therefore, we investigate further the impact of these differences by studying the influence of global uncertainty on the different group of economies.

4.2. The Global Uncertainty and Public Spending: Income Groups¹

In this section, we discuss the results of three sub-samples following the income levels: 48 low and lower-middle income economies (LMEs), 28 upper-middle income economies (UMEs), and 37 high income economies (HIEs).

4.2.a) Low and Lower-middle Income Economies

Our findings (Table A8 in the Appendix) show that, for the 48 LMIEs, there is a significant negative effect of the real GDP growth rate on the public spending for general final government consumption combined with the insignificant negative effect of total government consumption suggest that governments in these countries tend to reduce their public consumption when the economic growth is high in line with counter-cyclical fiscal policy (Jha et al., 2014). The insignificant negative effect of the real GDP growth rate on the total government consumption implies that the government are not always truly effective in cutting their total consumption (Papageorgiou et al., 2016). This may explain for the pro-cyclical properties of fiscal policy evidenced in many developing countries (Abad et al., 2013).

The significant positive effect of unemployment and aging population on government expenditure proxies implies that these parameters are still the major drivers of public spending for all economies independently of their income level. This finding is consistent with previous empirical studies on the topic (Fan et al., 2008). The trade openness also has a significant positive effect on the public spending supporting the idea of a compensation effect of globalization on the public sector – in other words, a higher economic integration leads the governments, in low and lower-middle income economies, to spend more for social security (Gray, 2009).

Our major variables, the level and mean of global uncertainty have a significant positive effect on the public spending while their volatilities have an insignificant positive effect. These results confirm our previous findings that a higher global uncertainty lead to higher risk for the low and lower-middle income economies, leading their governments to re-act by

¹ *It is worth mentioning that we also analyzed our sample by dividing it into two sub-samples in terms of time: the pre financial crisis (1997-2007) and post financial crisis (2007-2014). We observe that effect of global uncertainty on public spending is more significant and stronger in the period of good economic conditions (1997-2007) showing that governments with more capability (higher tax revenues in good economic conditions) tend to be more sensible to global risk. This points out an important fact that the excessive public spending in the good economic condition (creating a debt crisis) may have contributed in the global uncertainty and the overconfidence of government in tackling with these risks. All results related to this analysis can be provided on request.*

increasing public spending to protect domestic social security. Meanwhile, the insignificant effect of global uncertainty volatilities may be explained by the weak ability of governments in these countries to follow the global uncertainty fluctuations due to their weak access to the borrowing markets (Boiciuc, 2015) and/or their low institutional quality (Bjørnskov, 2011). Table 2 shows the results for the combined effect between the global uncertainty and the trade openness on public spending in the low and lower-middle income economies.

In opposition with our previous observation for the global sample, the effect of trade openness is now negative while the effect of the global uncertainty is negative. However, the combination has a significant positive influence on the government's expenditures. This means that a higher economic integration (proxied by trade openness) has an efficient effect other than a compensation one. However, a higher trade openness combined with a higher global uncertainty increase the public spending and transform the effect of economic integration from an efficient hypothesis to a compensation one. This situation shows that global uncertainty can actually switch the advantage of trade openness into a disadvantage by exposing further the national economy.

By explaining the effects of globalization on the public sectors through the lens of global uncertainty, our article contributes to both theory and practice. Precisely, previous mixed results on the effect of economic integration on public sectors in low and lower economies (Epifani and Gancia, 2009) can now be explained by taking into account of the global risk (i.e. global uncertainty). In this perspective, the weak ability of governments in these countries to access international credit markets combined with their relatively poor lead governments to conduct a fiscal policy appear to be more problematic in a context of high uncertainty especially when these countries have a higher economic openness.

4.2.b) Upper-middle Income Economies

Our results for the 28 UMEs are reported in Table A 9 in the Appendix and they show that the real GDP growth has an insignificant negative effect on public spending implying that governments, in these countries, reduce their expenditures but not significantly when the economic growth is high. This findings supports many previous studies documenting pro-cyclical fiscal policies in developing countries (Camous and Gimber, 2018). Since these countries are almost emerging economies with high economic growth, they have quite large tax revenues (Mahdavi, 2008) and they are transforming their economic structures with a huge need of infrastructure investment (Zhen-Wei Qiang, 2010) explaining why these countries do not follow a cyclical fiscal policy. The significant positive effect of the unemployment and aging population confirm the important roles of fiscal policy in social security in the upper-middle income economies. This issue has a growing importance in these countries where population is aging (Feng et al., 2012). The results of the combined influence between trade openness and global uncertainty on the public spending are given in Table 3.

Table 2. Economic Policy Uncertainty and Fiscal policy: the interaction with trade openness (Low and lower-middle income economies)

Dep. Var: Govexp1	Global Economic Policy Uncertainty						US Economic Policy Uncertainty					
	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.029
L.GDPg	-0.067**	-0.068**	-0.068**	-0.069**	-0.075**	-0.075**	-0.068**	-0.07**	-0.069**	-0.07**	-0.075**	-0.075**
	[0.029]	[0.029]	[0.029]	[0.029]	[0.029]	[0.029]	[0.029]	[0.029]	[0.029]	[0.03]	[0.029]	[0.029]
L.Unem	0.126***	0.126***	0.125***	0.125***	0.123***	0.123***	0.125***	0.125***	0.125***	0.124***	0.123***	0.123***
	[0.015]	[0.015]	[0.015]	[0.015]	[0.015]	[0.015]	[0.015]	[0.015]	[0.015]	[0.015]	[0.015]	[0.015]
L.Oldpop	0.186***	0.185***	0.185***	0.185***	0.185***	0.185***	0.184***	0.185***	0.184***	0.185***	0.185***	0.185***
	[0.022]	[0.022]	[0.022]	[0.022]	[0.023]	[0.023]	[0.022]	[0.022]	[0.022]	[0.023]	[0.023]	[0.023]
L.Trade	-0.098**	-0.106**	-0.100**	-0.104**	0.014**	0.013**	-0.088*	-0.044	-0.073	-0.033	0.012	0.013*
	[0.043]	[0.045]	[0.050]	[0.05]	[0.007]	[0.007]	[0.051]	[0.043]	[0.049]	[0.05]	[0.008]	[0.007]
EPU	-1.236*	-1.319*	-1.205	-1.262*	0.017	0.014	-1.003	-0.430	-0.821	-0.237	0.013	0.008
	[0.681]	[0.709]	[0.766]	[0.761]	[0.018]	[0.017]	[0.764]	[0.635]	[0.726]	[0.722]	[0.023]	[0.013]
L.Trade*EPU	0.023**	0.025**	0.024**	0.025**	-0.0002	-0.0001	0.021*	0.011	0.018*	0.009	-0.0001	-0.0001
	[0.009]	[0.01]	[0.011]	[0.011]	[0.0003]	[0.0003]	[0.011]	[0.009]	[0.011]	[0.011]	[0.0004]	[0.0002]
Cons	16.02***	16.42***	15.84***	16.10***	10.02***	10.07***	15.07***	12.40***	14.16***	11.46***	10.14***	10.13***
	[3.178]	[3.304]	[3.548]	[3.521]	[0.517]	[0.514]	[3.657]	[3.092]	[3.43]	[3.454]	[0.572]	[0.559]
Wald ch2	191 (0.000)	196 (0.000)	181 (0.000)	186 (0.000)	139 (0.000)	139 (0.000)	176 (0.000)	155 (0.000)	170 (0.000)	150 (0.000)	139 (0.000)	139 (0.000)
RMSE	4.386	4.386	4.389	4.388	4.396	4.396	4.390	4.392	4.391	4.394	4.396	4.396

Dep. Var: Govexp2	Global Economic Policy Uncertainty						US Economic Policy Uncertainty					
	L.GDPg	-0.100	-0.104	-0.100	-0.103	-0.113	-0.112	-0.106	-0.101	-0.107	-0.101	-0.112
	[0.092]	[0.092]	[0.091]	[0.091]	[0.091]	[0.091]	[0.092]	[0.092]	[0.092]	[0.092]	[0.092]	[0.091]
L.Unem	0.080***	0.080***	0.080***	0.079***	0.077***	0.077***	0.078***	0.080***	0.078***	0.078***	0.077***	0.077***
	[0.021]	[0.021]	[0.021]	[0.021]	[0.021]	[0.021]	[0.021]	[0.021]	[0.021]	[0.021]	[0.021]	[0.021]
L.Oldpop	0.353***	0.352***	0.352***	0.351***	0.353***	0.353***	0.351***	0.354***	0.351***	0.353***	0.353***	0.353***
	[0.102]	[0.102]	[0.102]	[0.102]	[0.102]	[0.102]	[0.102]	[0.102]	[0.102]	[0.102]	[0.102]	[0.102]
L.Trade	-0.098	-0.055	-0.148	-0.103	0.020	0.018	-0.031	-0.116	-0.038	-0.159	0.022	0.017
	[0.091]	[0.094]	[0.107]	[0.105]	[0.014]	[0.014]	[0.107]	[0.094]	[0.102]	[0.11]	[0.016]	[0.015]
EPU	-1.095	-0.495	-1.699	-1.143	-0.042	-0.045	-0.362	-1.561	-0.571	-2.111*	-0.045	-0.034
	[1.05]	[1.070]	[1.233]	[1.192]	[0.037]	[0.035]	[1.176]	[1.069]	[1.111]	[1.256]	[0.044]	[0.026]
L.Trade*EPU	0.028	0.019	0.040*	0.030	0.001	0.001	0.014	0.031	0.015	0.041*	0.001	0.001
	[0.020]	[0.020]	[0.023]	[0.023]	[0.001]	[0.001]	[0.022]	[0.02]	[0.022]	[0.023]	[0.001]	[0.0005]
Cons	17.07***	14.35***	19.784***	17.27***	12.97***	13.05***	13.77**	19.50***	14.72***	21.95***	12.93***	13.16***
	[4.781]	[4.908]	[5.585]	[5.415]	[0.982]	[0.981]	[5.512]	[4.993]	[5.166]	[5.803]	[1.046]	[1.029]
Wald ch2	91.03 (0.000)	88.32 (0.000)	84.02 (0.000)	82.07 (0.000)	68.90 (0.000)	69.05 (0.000)	80.89 (0.000)	85.53 (0.000)	74.26 (0.000)	75.88 (0.000)	69.76 (0.000)	68.94 (0.000)
RMSE	8.863	8.867	8.861	8.866	8.871	8.869	8.871	8.864	8.872	8.863	8.873	8.870
N	816	816	816	816	816	816	816	816	816	816	816	816
Countries	48	48	48	48	48	48	48	48	48	48	48	48

Note: *EPU* is Economic Policy Uncertainty. Standard errors are in []. *, **, *** are significant levels at 10%, 5%, 1%, respectively. All results are estimated by Panel Corrected Standard Errors model (PCSE).

Table 3. Economic Policy Uncertainty and Fiscal policy: the interaction with trade openness (Upper-middle income economies)

Dep. Var: Govexp1	Global Economic Policy Uncertainty						US Economic Policy Uncertainty					
	GEPU 1	GEPU 2	GEPU mean1	GEPU mean2	GEPU vol1	GEPU vol2	USEP U1	USEP U2	USEP Umea r1	USEP Umea r2	USEP Uvol1	USEP Uvol2
L.GDPg	-0.004	-0.003	-0.008	-0.008	-0.009	-0.009	-0.001	-0.004	-0.004	-0.007	-0.008	-0.009
	[0.033]	[0.033]	[0.033]	[0.022]	[0.034]	[0.034]	[0.034]	[0.034]	[0.034]	[0.034]	[0.034]	[0.034]
L.Unem	0.331***	0.331***	0.330***	0.33***	0.327***	0.327***	0.331***	0.330***	0.330***	0.329***	0.328***	0.328***
	[0.024]	[0.025]	[0.025]	[0.031]	[0.026]	[0.026]	[0.025]	[0.025]	[0.025]	[0.026]	[0.026]	[0.026]
L.Oldpop	0.351***	0.35***	0.349***	0.349***	0.355***	0.355***	0.352***	0.355***	0.352***	0.353***	0.355***	0.355***
	[0.037]	[0.037]	[0.037]	[0.042]	[0.037]	[0.037]	[0.037]	[0.037]	[0.037]	[0.037]	[0.037]	[0.037]
L.Trade	-0.050	-0.044	-0.075	-0.075	0.002	0.001	-0.046	-0.019	-0.054	-0.038	0.003	0.003
	[0.051]	[0.056]	[0.061]	[0.058]	[0.007]	[0.007]	[0.069]	[0.045]	[0.065]	[0.055]	[0.008]	[0.008]
EPU	0.265	0.343	-0.337	-0.337	-0.007	-0.007	0.237	0.715	-0.200	0.164	0.003	0.003
	[1.011]	[1.104]	[1.222]	[1.254]	[0.026]	[0.026]	[1.343]	[0.877]	[1.275]	[1.075]	[0.035]	[0.019]
L.Trade*EPU	0.012	0.011	0.018	0.018	0.0001	0.0002	0.011	0.005	0.013	0.009	0.0001	0.00004
	[0.011]	[0.012]	[0.014]	[0.013]	[0.0003]	[0.0003]	[0.015]	[0.010]	[0.014]	[0.012]	[0.0004]	[0.0002]
Cons	7.192	6.822	9.916*	9.916*	8.595***	8.586***	7.266	5.006	9.293	7.642	8.397***	8.369***
	[4.432]	[4.858]	[5.307]	[5.762]	[0.823]	[0.837]	[6.058]	[4.070]	[5.649]	[4.865]	[0.837]	[0.829]
Wald ch2	505 (0.000)	508 (0.000)	537 (0.000)	540 (0.000)	451 (0.000)	448 (0.000)	509 (0.000)	488 (0.000)	514 (0.000)	510 (0.000)	469 (0.000)	464 (0.000)
RMSE	3.591	3.600	3.599	3.601	3.619	3.618	3.603	3.599	3.608	3.608	3.619	3.619

Dep. Var: Govexp2	Global Economic Policy Uncertainty						US Economic Policy Uncertainty					
	L.GDPg	-0.004	-0.004	-0.009	-0.008	-0.007	-0.008	-0.003	-0.003	-0.004	-0.004	-0.006
	[0.060]	[0.061]	[0.060]	[0.060]	[0.060]	[0.060]	[0.061]	[0.060]	[0.061]	[0.031]	[0.060]	[0.060]
L.Unem	0.238***	0.237***	0.237***	0.236***	0.237***	0.237***	0.237***	0.239***	0.237***	0.237***	0.237***	0.237***
	[0.044]	[0.044]	[0.044]	[0.044]	[0.045]	[0.045]	[0.044]	[0.045]	[0.044]	[0.043]	[0.045]	[0.045]
L.Oldpop	0.869***	0.870***	0.867***	0.867***	0.873***	0.873***	0.871***	0.873***	0.871***	0.871***	0.873***	0.873***
	[0.047]	[0.047]	[0.047]	[0.047]	[0.047]	[0.047]	[0.047]	[0.047]	[0.047]	[0.058]	[0.047]	[0.047]
L.Trade	-0.044	-0.035	-0.098	-0.093	0.011	0.011	-0.033	-0.007	-0.062	-0.062	0.012	0.012
	[0.076]	[0.081]	[0.093]	[0.093]	[0.012]	[0.012]	[0.092]	[0.07]	[0.093]	[0.081]	[0.013]	[0.012]
EPU	-0.346	-0.536	-1.519	-1.823	-0.021	-0.015	-0.683	0.623	-1.419	-1.419	-0.024	-0.007
	[1.47]	[1.585]	[1.826]	[1.85]	[0.041]	[0.041]	[1.776]	[1.308]	[1.819]	[1.686]	[0.054]	[0.030]
L.Trade*EPU	0.013	0.011	0.025	0.024	0.0003	0.0003	0.011	0.005	0.017	0.017	0.0003	0.0002
	[0.017]	[0.018]	[0.020]	[0.020]	[0.0004]	[0.0004]	[0.020]	[0.015]	[0.020]	[0.018]	[0.001]	[0.0003]
Cons	8.940	9.830	14.24*	15.63*	7.759***	7.646***	10.56	4.362	13.90*	13.90*	7.789***	7.562***
	[6.777]	[7.293]	[8.326]	[8.407]	[1.331]	[1.336]	[8.342]	[6.304]	[8.426]	[7.854]	[1.416]	[1.388]
Wald ch2	532 (0.000)	531 (0.000)	573 (0.000)	574 (0.000)	519 (0.000)	520 (0.000)	532 (0.000)	527 (0.000)	548 (0.000)	539 (0.000)	521 (0.000)	521 (0.000)
RMSE	4.988	4.994	4.984	4.988	4.995	4.994	4.996	4.985	4.993	4.987	4.996	4.995
N	476	476	476	476	476	476	476	476	476	476	476	476
Countries	28	28	28	28	28	28	28	28	28	28	28	28

Note: EPU is Economic Policy Uncertainty. Standard errors are in []. *, **, *** are significant levels at 10%, 5%, 1%, respectively. All results are estimated by Panel Corrected Standard Errors model (PCSE).

Our findings also indicate that the effect of trade openness on public spending in the upper-middle income economies is positive (as expected by the compensation hypothesis, see Avelino et al., 2005), but when the global uncertainty and its combination with trade openness are taken into account, the effect of trade openness became negative (in line with the efficiency hypothesis). This means that the globalization can help in reducing the public sector in the upper-middle income economies, but this effect might be reversed if the country is facing a too high uncertainty (risk). In such context, governments have to take actions to response to the global risk, expanding their spending is one of these possible actions (Avelino et al., 2005).

4.3.c) High Income Economies

Our last sub-sample deals with 37 HIEs whose results are showed in Tables A8 and A10 in the Appendix. The real GDP growth rate has a significant negative effect on public spending suggesting that governments in high income economies reduce their spending for both kinds of general consumption and total consumption when the economic growth is higher. This suggests the existence of counter-cyclical fiscal policies in these countries in accordance with several previous studies (Combes et al., 2017). While, the unemployment has a negative effect on the general government consumption (insignificant) and the total government consumption (significant). This observation means that governments in high income economies focus more on the total measure (through total government consumption) to fight with the unemployment. These findings interestingly show a difference in the spending compositions between high income economies with low and middle-income ones. Meanwhile, the old population has a significant positive effect on both kinds of public spending, this is consistent with theory and many empirical studies according to which aging of population requires more public spending from government in high income economies (Gray, 2009).

Trade openness has a significant negative effect on public spending in HIEs suggesting that the efficiency hypothesis of globalization is quite effective for these countries since the higher levels of globalization through trade activities will reduce the size of public sector (Gemmell et al., 2008). This result contributes new evidences to the literature of globalization as the effects of economic integration on public sector or government's behavior should be seen under the light of the economic development stages of a country. Interestingly, the global uncertainty has a significant positive effect on public spending in the high-income economies confirming our previous results observed for the low and middle-income economies. This also confirms the important role played by the global uncertainty in the government's behavior whatever the level of income. The results of the combined influence between trade openness and global uncertainty on the public spending are given in Table 4.

Table 4. Economic Policy Uncertainty and Fiscal policy: the interaction with trade openness (High income economies)

Dep. Var: Govexp1	Global Economic Policy Uncertainty						US Economic Policy Uncertainty					
	GEPU1	GEPU2	GEPUmean1	GEPUmean2	GEPUvol1	GEPUvol2	USEPU1	USEPU2	USEPUmean1	USEPUmean2	USEPUvol1	USEPUvol2
L.GDPg	-0.139***	-0.139***	-0.144***	-0.145***	-0.170***	-0.170***	-0.133***	-0.145***	-0.138***	-0.148***	-0.166***	-0.168***
	[0.042]	[0.042]	[0.042]	[0.042]	[0.043]	[0.043]	[0.044]	[0.043]	[0.043]	[0.043]	[0.042]	[0.042]
L.Unem	0.028	0.028	0.026	0.025	0.029	0.028	0.031	0.031	0.029	0.029	0.03	0.029
	[0.022]	[0.022]	[0.022]	[0.022]	[0.022]	[0.022]	[0.022]	[0.022]	[0.022]	[0.022]	[0.022]	[0.022]
L.Oldpop	0.112***	0.111***	0.111***	0.11***	0.113***	0.113***	0.113***	0.115***	0.113***	0.114***	0.113***	0.113***
	[0.034]	[0.034]	[0.034]	[0.034]	[0.034]	[0.034]	[0.034]	[0.034]	[0.034]	[0.034]	[0.034]	[0.034]
L.Trade	-0.021**	-0.021**	-0.022*	-0.023*	-0.021***	-0.021***	-0.017	-0.021**	-0.017	-0.022*	-0.020***	-0.021***
	[0.01]	[0.01]	[0.012]	[0.012]	[0.002]	[0.002]	[0.011]	[0.01]	[0.012]	[0.012]	[0.002]	[0.002]
EPU	0.964***	1.053***	1.043**	1.058**	0.009	0.011	1.177***	0.728**	1.089**	0.803*	0.014	0.008
	[0.325]	[0.341]	[0.438]	[0.437]	[0.011]	[0.011]	[0.411]	[0.324]	[0.433]	[0.428]	[0.014]	[0.008]
L.Trade*EPU	0.0002	0.0002	0.0005	0.0006	0.0001	0.0001	-0.001	0.0004	-0.001	0.001	0.0001	0.00004
	[0.002]	[0.002]	[0.003]	[0.003]	[0.0001]	[0.0001]	[0.002]	[0.002]	[0.003]	[0.003]	[0.0001]	[0.00005]
Cons	15.06***	14.66***	14.79***	14.73***	19.34***	19.307***	13.90***	15.96***	14.41***	15.71***	19.26***	19.29***
	[1.56]	[1.619]	[2.035]	[2.024]	[0.579]	[0.576]	[2.011]	[1.643]	[2.081]	[2.084]	[0.593]	[0.587]
Wald ch2	1616 (0.000)	1654 (0.000)	1584 (0.000)	1609 (0.000)	1450 (0.000)	1444 (0.000)	1689 (0.000)	1512 (0.000)	1636 (0.000)	1496 (0.000)	1439 (0.000)	1443 (0.000)
RMSE	3.839	3.838	3.841	3.840	3.847	3.847	3.840	3.843	3.841	3.844	3.848	3.847

Dep. Var: Govexp2	Global Economic Policy Uncertainty						US Economic Policy Uncertainty					
L.GDPg	-0.115*	-0.115*	-0.117*	-0.119*	-0.176***	-0.176***	-0.098	-0.123*	-0.107	-0.124*	-0.168***	-0.172***
	[0.063]	[0.063]	[0.062]	[0.062]	[0.065]	[0.064]	[0.066]	[0.064]	[0.065]	[0.064]	[0.064]	[0.064]
L.Unem	0.241***	0.241***	0.235***	0.235***	0.245***	0.243***	0.248***	0.248***	0.246***	0.243***	0.247***	0.245***
	[0.027]	[0.026]	[0.026]	[0.026]	[0.027]	[0.027]	[0.025]	[0.027]	[0.025]	[0.026]	[0.026]	[0.027]
L.Oldpop	0.06*	0.058	0.058	0.056	0.062*	0.062*	0.062*	0.065*	0.061*	0.063*	0.062*	0.062*
	[0.035]	[0.035]	[0.035]	[0.035]	[0.035]	[0.035]	[0.035]	[0.035]	[0.035]	[0.035]	[0.035]	[0.035]
L.Trade	0.03*	0.033*	0.049**	0.05**	-0.008***	-0.008**	0.043**	0.017	0.048**	0.036*	-0.006*	-0.007**
	[0.017]	[0.018]	[0.021]	[0.021]	[0.003]	[0.003]	[0.021]	[0.018]	[0.021]	[0.022]	[0.003]	[0.003]
EPU	3.100***	3.274***	3.973***	4.006***	0.039	0.043*	3.649***	2.406***	3.611***	3.211***	0.064**	0.034*
	[0.624]	[0.659]	[0.733]	[0.731]	[0.025]	[0.024]	[0.772]	[0.691]	[0.787]	[0.816]	[0.031]	[0.018]
L.Trade*EPU	-0.009**	-0.009**	-0.013***	-0.013***	-0.00003	-0.00005	-0.011**	-0.005	-0.012***	-0.01**	-0.0001	-0.0001
	[0.004]	[0.004]	[0.004]	[0.004]	[0.0001]	[0.0001]	[0.004]	[0.004]	[0.004]	[0.005]	[0.0002]	[0.0001]
Cons	1.998	1.195	-1.807	-1.909	15.49***	15.41***	-1.081	4.637	-0.620	1.125	15.10***	15.22***
	[2.927]	[3.088]	[3.388]	[3.375]	[0.775]	[0.763]	[3.698]	[3.353]	[3.712]	[3.875]	[0.815]	[0.799]
Wald ch2	284 (0.000)	291 (0.000)	305 (0.000)	314 (0.000)	224 (0.000)	225 (0.000)	327 (0.000)	255 (0.000)	325 (0.000)	272 (0.000)	235 (0.000)	230 (0.000)
RMSE	4.519	4.518	4.515	4.514	4.560	4.557	4.521	4.534	4.525	4.531	4.556	4.556
N	629	629	629	629	629	629	629	629	629	629	629	629
Countries	37	37	37	37	37	37	37	37	37	37	37	37

Note: EPU is Economic Policy Uncertainty. Standard errors are in []. *, **, *** are significant levels at 10%, 5%, 1%, respectively. All results are estimated by Panel Corrected Standard Errors model (PCSE).

Notably, the interaction term between the global uncertainty and the trade openness has a significant negative effect on public spending, especially in the case of total government spending. The sign of the trade openness' effect on public spending did not change when this combination is integrated in the estimation of the final government consumption. This observation means that the efficiency effect of the economic integration on public spending in the case of higher global risk is not changed implying that governments in high income economies are more active by taking actions for their general final consumption as a response to the global uncertainty. This can also be explained by the fact that the institutional quality of these countries is good and their capability in assessing to international credit market is stronger. Moreover, in the case of total government consumption (*govex2*), the association between the global uncertainty and the trade openness has a significant effect, while these two coefficients now have positive effect. It suggests that a higher global uncertainty combined with a higher economic integration put more pressure and on governments in high income countries (to control their public spending).

5. Conclusion and Implication

The study extends empirical literature dealing with fiscal policy by investigating the effect of the global uncertainty on public spending in a global sample of 113 economies during the period from 1997 to 2014. By analyzing three sub-samples including 48 low and lower-middle income economies, 28 upper-middle income economies, and 37 high income economies. By using sophisticated statistical estimations for panel data in the existence of cross-dependence problem, results from PCSE models are reported and discussed. There are some significant contributions. First, the public spending is directly impacted by the global uncertainty. These results mean that the fiscal policy is not an exogenous variable suggesting that modern macroeconomic models have to take into consideration the uncertainty factors, especially the global uncertainty. Our findings also show that even though governments react to global uncertainty by increasing public spending, they usually do not react actively to the uncertainty's indicators volatility.

Second, by associating the combined influence of global uncertainty with trade openness on the public spending, this article contributes to the existing literature by clarifying the effects of the globalization on public sectors. Precisely, this study shows that the global uncertainty can be considered as a good proxy to explain the influence of the economic integration on the public sector. This finding highlights the utility of GEPU and it has a policy implication since it shows how this indicator can be used by policy makers for their macroeconomic projection.

The results for the different sub-samples show different level of influence of global uncertainty on public spending. Depending on the countries' level income, governments have different response to the global risk due to their ability to access the international credit market and their institutional setting. The influence of the global uncertainty on public spending in the low and middle-income economies are exacerbated by the economic integration (proxied here with trade openness) while in high income economies, it is an opposite trend. This observation shows that economic integration act as a diversifying factor only in the high-income economies. Our results imply strong implications for researches dealing with cyclicity of the fiscal policy since our findings suggest that global uncertainty is a key variable explaining the counter- or pro-cyclical fiscal policy.

From a theoretical point of view, our study shows that what the existing literature labels as 'efficiency hypothesis' and 'compensation hypothesis' can actually be combined and that this combination depends on the global uncertainty, at least of the LMEs and UMEs. Indeed, in these countries, we observe that trade openness on public spending in the upper-middle income economies is positive (as expected by the compensation hypothesis), but when the global uncertainty and its combination with trade openness are taken into account, the effect of trade openness became negative (in line with the efficiency hypothesis).

In term of practices, our results show that government spending and trade openness have associated links with the global uncertainty. These effects can be different depending on the countries' income level. The governments in LMEs and UMEs should be more cautious by implementing an appropriate policy combining public spending since it should actually be estimated in relation to their respective level of globalization since the trade openness can exacerbated the impacts of global uncertainty; meanwhile the globalization is a good tool to limit the impacts of global uncertainty in case of HIEs. Based on these results, the current growing protectionism observed in some HIEs (such as US or UK) does not seem to be appropriate!

Beyond these findings, our study paves a way for future research study on the impacts of global uncertainty on fiscal policy, the public expenditure and tax revenue. Our empirical study indicates global uncertainty indicator should be considered as an influent parameter for countries' long-term fiscal policy.

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