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Uncertainty and household consumption in developing countries

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ABSTRACT

This study analyses the effect of global economic uncertainty on household consumption growth in a sample of 87 developing countries over the period 2000–2019. Using the two-step system generalized method of moments, we show that an increase in economic uncertainty is, on average, associated with lower household consumption. This result is robust to the use of an alternative measure of uncertainty, outliers' exclusion, an alternative estimations approach, and use of an alternative data structure. However, the results show that the effect of uncertainty appears to be driven by sub-Saharan Africa and Latin America. Similarly, countries that have received debt relief under the Heavily Indebted Poor Countries initiative are more vulnerable to the effect of uncertainty on private consumption. This study also finds that remittances, foreign aid, and social protection moderate the adverse effect of economic uncertainty on household consumption. These results highlight the need to implement tax breaks to facilitate remittances from sending to receiving countries to support household consumption during uncertainty shocks and to identify reliable partners to enable aid in recipient countries to reach private and public consumers.

1. Introduction

Recent international developments, including the war in Ukraine, the COVID-19 pandemic, and the trade war between US and China, have revived the debate on the role of uncertainty in firms' and households' economic decision-making. Uncertainty through lower consumption affects the welfare of risk-adverse households, threatens long-term growth, and could jeopardize the achievement of poverty reduction goals.

As regards household consumption behaviour, the standard theory, founded on the lifecycle/permanent income hypothesis, suggests that individuals choose a consumption path determined by their permanent income level (Friedman, 1957; Modigliani & Brumberg, 1954; Ando & Modigliani, 1963; Campbell & Mankiw, 1989). However, in response to an increase in uncertainty about their future income stream, economic agents tend to increase precautionary saving, thus lowering consumption (Drèze & Modigliani, 1972; Leland, 1978). As these traditional models fail to explain the relationship between expected future income and current consumption, a modern theory (the buffer-stock theory) initiated by Carroll (1994, 1997) and Deaton (1991) suggests that prudent consumers might consume more than their current income if they know their future income, whereas income uncertainty in the future results in 'buffer-stock' saving behaviours (Tran, 2022). Complementary behavioral approaches, such as Prospect Theory (Kahneman & Tversky, 1979), emphasize that consumption decisions are often influenced by cognitive biases and strong risk aversion. In times of uncertainty, they tend to make conservative decisions, reducing their consumption disproportionately to their actual financial situation. This leads to higher savings and a postponement of discretionary spending.

Several recent empirical studies have tested the relationship between uncertainty and household consumption, including through validation or not of the precautionary saving motive (Bahmani-Oskooee & Nayeri, 2020; Chen et al., 2022; Coibion et al., 2024; Harmenberg & Öberg, 2021; Nam et al., 2021; Tran, 2022; Wu & Zhao, 2022). Using a sample of G7 countries, Bahmani-Oskooee and Nayeri (2020) show that economic policy uncertainty has asymmetric effects on consumer expenditure. In a different setting (a calibrated heterogeneous agent model), Harmenberg and Öberg (2021) find that in response to an adverse labour market shock, households' spending on durable goods falls. Likewise, using a Vietnamese household survey, Tran (2022) finds strong evidence to support the importance of the permanent income hypothesis, the lifecycle factor hypothesis, and the precautionary savings hypothesis.

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Finally, Coibion et al. (2024) use a randomized treatment and find that higher macroeconomic uncertainty induces households to significantly and persistently reduce their total monthly spending in subsequent months.

The above-mentioned studies all provide empirical evidence of the negative impact of economic uncertainty on household consumption. However, they are limited in a number of ways. Firstly, most are country-specific and they use different measures of uncertainty, making it difficult to generalize the findings or to assess cross-country variability and changes across regions and levels of income. Secondly, the studies tend to focus on a sample of advanced countries, while developing countries are most vulnerable to uncertainty, considering their low level of economic diversification, limited access to finance to smooth consumption in case of shocks, and low and ineffective social safety net coverage. Thirdly, policy options to mitigate the impact of uncertainty on consumption are almost never tested in the literature.

Against this backdrop, this paper investigates the impact of overall policy uncertainty on household consumption growth in a sample of 87 developing countries over the period 2000–2019. The contribution to the literature is fourfold. Firstly, unlike the existing literature, we test the impact of economic uncertainty on household consumption in a comprehensive sample of developing countries, which are more likely to be highly vulnerable to external political and economic shocks. Secondly, we use a now widely accepted measure of uncertainty that allows cross-country variability and comparison. We use the World Uncertainty Index (WUI) constructed by Ahir et al. (2022). The WUI is constructed using frequency counts of the word "uncertainty" (and its variants) in the Economist Intelligence Unit (EIU) quarterly country reports. Then, the raw counts are scaled by the total number of words in each report to make the economic uncertainty index comparable across countries. Thirdly, we check the heterogeneity of the effect of uncertainty, depending on the region and level of income, lending status, and whether the country benefited from the Heavily Indebted Poor Countries (HIPC) initiative. Fourthly, we test the effectiveness of remittances, foreign development assistance, and social protection (measured by inverse effects of out-of-pocket health expenditure) to mitigate the negative impact of uncertainty on household consumption growth. The stabilizing role of remittances and foreign development assistance is well documented in the literature (Combes & Ebeke, 2011; Combes et al., 2014), while increasing the social protection coverage in developing countries is widely seen as an effective means to strengthen resilience to shocks for the poor and vulnerable. In addition, we use a system GMM-IV to address endogeneity issues and infer a causal effect of uncertainty on consumption growth. This contribution is key from the policy perspective as it can inform the policymaker on the type of policy that could be considered to dampen the effect of uncertainty on household consumption.

The paper proceeds as follows. Section 2 presents the literature review, while Section 3 describes the data and methodology used in this paper. Section 4 presents the results of our empirical investigation and Section 5 concludes.

2. Literature review

2.1. Economic uncertainty and household consumption: theoretical consideration

Uncertainty has been identified as a powerful driver of economic fluctuations (Di Maggio et al., 2022). Indeed, both investors and consumers can become more anxious and cautious in the presence of elevated uncertainty. For instance, uncertainty can constrain investors to delay their investment decisions, leading to the postponement of production increases and hiring decisions. This argument derives from the intuition that, faced with an uncertain world and in the presence of large irreversible costs, wait-and-see becomes the best option for investors (Cerda et al., 2018).

Economic theory posits that household consumption expenditure is primarily influenced by income and wealth. On one hand, the lifecycle hypothesis (Modigliani & Brumberg, 1954) stipulates that income varies systematically over a household's lifecycle, prompting households to save during their working years to maximize lifetime utility. In contrast, the permanent income hypothesis (Friedman, 1957) asserts that consumption is determined by lifetime income rather than current income, incorporating past income and future income expectations in the consumption decision process. This framework helps explain how unexpected income variations and economic shocks affect households' saving and consumption decisions. For instance, households facing income uncertainty or risk aversion tend to lower their current consumption in anticipation of reduced future income.

More recently, Carroll (1997) and Deaton (1991) developed the buffer-stock model in which consumers face high income uncertainty but are also very impatient but prudent. Consumers with buffer-stock behaviour have a target wealth to permanent income ratio such that if wealth is below the target, the precautionary saving motive will dominate impatience and the consumer will save, while if wealth is above the target, impatience will dominate prudence and the consumer will dissave (Carroll, 1997). Tran (2022) provides empirical evidence in support of the importance of the lifecycle hypothesis, the permanent income hypothesis, and the buffer-stock hypothesis. Additionally, different occupations, which come with varying degrees of earnings risk, influence household consumption and saving behaviours, riskier occupations leading to higher savings and lower consumption (Fuchs-Schündeln & Schündeln, 2005; Tran, 2022).

The validity of the precautionary saving motive and, more broadly, of the above-mentioned theories/hypotheses lies in the approaches used to analyse the effects of uncertainty on consumers' behaviour and the impact channels at play. Two main approaches are often used. In the first, the macroeconomic effects of uncertainty shocks assume autarkic economies—i.e. economies where domestic shocks are the sole drivers of the business cycle (Castelnuovo, 2023). Thus, this approach deals with uncertainty spillovers—i.e. the effects on a given country of an increase in uncertainty originating from another. The second approach focuses on the effects of external shocks, namely global uncertainty. This concept concerns uncertainty-generating events occurring worldwide. The first approach deals with the uncertainty spillover that is considered domestic, while the second deals with global uncertainty that is foreign.

2.2. Economic uncertainty and household consumption: main findings from the empirical literature

The effect of uncertainty has been analysed in relation to several macroeconomic factors, namely, foreign direct investment, the financial market, employment, investments, or even growth (Baker et al., 2016; Bloom et al., 2018; Caggiano et al., 2017; Caglayan & Xu, 2019; Castelnuovo, 2023; Dietrich et al., 2022; Jardet et al., 2022; Kang et al., 2014; Phan et al., 2021). Other studies highlight the adverse effects of economic uncertainty on gender equality (Nguyen, 2022), suicide rates (Abdou et al., 2022; Claveria, 2022), subjective health (Tao & Cheng, 2023), tourism (Nguyen et al., 2022), commodity prices (Yuan et al., 2022), financial inclusion (Lee et al., 2022), renewable energy consumption (Borozan, 2022), foreign direct investment attraction (Avom et al., 2020; Gao et al., 2024), and environmental quality (Wen & Zhang, 2022; Yu et al., 2021). The more recent study by Andrikopoulos et al. (2023) highlights that global economic policy uncertainty has a negative impact on gross capital inflows. However, tighter macroprudential policies may moderate this effect. Koirala et al. (2024) find that a rise in economic uncertainty has insignificant but expansionary effects on tertiary education enrolment, but the effect changes according to the income status of countries. Specifically, we find that economic uncertainties expand enrolments in developed countries and contract them in developing economies. However, this review focuses on the effects on consumption.

Empirically, various measures of uncertainty have been considered to assess the impact of economic uncertainties on private consumption. In this regard, several authors have studied how economic uncertainty can affect consumption and savings decisions in various economies over different periods (Menegatti, 2010; Pericoli & Ventura, 2012; Bahmani-Oskooee & Nayeri, 2020; Di Maggio et al., 2022). The estimated results suggest that income uncertainty could affect consumption and saving due to precautionary saving incentives.

Using the probability of marital separation as an uncertainty variable, Pericoli and Ventura (2012) studied how the risk of family breakdown affected household consumption and the decision to save in Italy over the period 1995–1999. The estimated results suggest that the risk of family breakdown leads to additional positive savings that reduce the level of household consumption. Other authors have examined the relationship between exchange rate uncertainty and consumption for various country samples. Empirical results show that exchange rate uncertainty affects both short-term and long-term consumption (Bahmani-Oskooee et al., 2015).

The importance of the precautionary savings motive for consumption decisions has been tested in different contexts by a large literature considering either aggregate consumption data or data from household surveys (see Lugilde et al., 2019). For example, Benito (2006) studied the existence of a precautionary saving motive in relation to consumption. He used the risk of unemployment as an indicator of uncertainty, finding that any positive shock to the risk of unemployment can reduce consumer spending. More recently, Harmenberg and Öberg (2021) found that overall household spending on durable goods mainly declines due to the ex-ante increase in income uncertainty caused by a higher risk of unemployment.

Many other arguments have been advanced to explain consumption puzzles (general equilibrium considerations, myopia, liquidity constraints, and different assumptions about the labour income process), but none of these arguments seem to provide sufficient explanations alongside the influence of uncertainty. Several authors have provided empirical evidence that the precautionary savings motive can explain these empirical puzzles (Deaton, 1991; Yin, 2021). In general, this work tests whether abandoning the equivalence of certainty assumption can help account for excessive regularity of consumption in relation to unexpected changes in income and excessive sensitivity to anticipated income changes. Subsequently, several analyses based on the uncertainty of credit explain the variations in the level of consumption. Zeldes (1989) showed that there exists a greater sensitivity of consumption to transitory income in the context of uncertainty than under certain equivalence, since the result of excessive sensitivity depends on the utility function.

The empirical literature has also shown that the standard model based on the lifecycle or permanent income hypothesis does not adequately account for consumption behaviour through either excessive sensitivity (Flavin, 1981) or excessive consumption regularity (Deaton, 1987). Indeed, on the one hand, Flavin (1981) described the significant lagged income coefficients as excessive sensitivity of consumption to income. She found a strong reaction of consumption to current income. On the other hand, changes in aggregate income are associated with relatively small changes in aggregate consumption, and the deviations of consumption from its trend are smaller than those of income from its trend. Wu and Zhao (2022) found that households in China reduce consumption in response to greater economic policy uncertainty. Moreover, the effect of uncertainty is more pronounced among older, wealthier, more educated, and urban households. The authors also identified holding more liquid assets and commercial insurance as important channels for mitigating the negative effect of uncertainty on household consumption. Similarly, using a newly developed provincial uncertainty index in China, Chen et al. (2022) showed that uncertainty shock reduces household income and that households mainly respond by reducing nondurable expenditure. The impacts of uncertainty shock are more pronounced among older, male-headed, and urban households. In the same vein, while high levels of economic uncertainty led to a shift in households' consumption from services to non-durable goods, widespread adoption of FinTech overcomes this negative effect and prevents the reduction in service spending (Huang et al., 2023). A recent study by Di Maggio et al. (2022) found that increased firm-level uncertainty reduces total compensation and workers reduce their durable goods consumption in response. This result is also in line with the recent findings of Coibion et al. (2024), wherein greater macroeconomic uncertainty prompts households to significantly and persistently reduce their total monthly expenditure in subsequent months. Changes in spending are generalized across all expenditure items and apply, too, to purchases of larger durable goods. In contrast to this previous research, Bahmani-Oskooee and Nayeri (2020) showed that political uncertainty has asymmetric effects on consumer spending in all G7 countries. Specifically, they found significant short-run effects of political uncertainty on consumption in Canada, Italy, Japan, and the United States. However, only in Italy and the United States did the short-run effects turn into significant long-run effects.

Three main gaps emerge from the above-mentioned empirical literature. Firstly, despite the growing literature on the effect of economic uncertainty on households' consumption, it is clear that few studies have examined the effects of overall economic uncertainty using data from a large sample of developing countries. The majority of previous studies focused on a small sample of developed countries or case studies. Secondly, very few studies have analysed the heterogeneous effects of uncertainty on household consumption in different regions, according to income level, loan category and the HIPC initiative. Finally, this study aims to fill another knowledge gap in the above-mentioned literature by exploring the moderating role of various policy options to mitigate the impact of overall economic uncertainty on household consumption. To our knowledge, no study has empirically examined the role of remittances, foreign aid and social protection spending in the relationship between economic uncertainty and household consumption.

3. Estimating the effect of overall economic uncertainty on household consumption

3.1. Data on household consumption and economic uncertainty

This study uses unbalanced panel data from 87 developing countries during the period 2000–2019. The data collected come from four main sources: Ahir et al. (2022),[1] the World Development Indicator (World Bank, 2022),[2] Chinn and Ito (2006)[3] and La Porta et al. (1999). The choice of study period and sample size reflects data availability.

Our dependent variable is households' final consumption expenditure (annual percentage growth). Households' final consumption expenditure (formerly private consumption) is the market value of all goods and services, including durable goods (such as cars, washing machines, and home computers), purchased by households. It excludes purchases of dwellings but includes imputed rents for owner-occupied housing. It also includes payments and fees paid to governments to obtain permits and licences. Data on household consumption are drawn from the World Development Indicator (World Bank, 2022). Fig. 1 shows the volatile trend in household consumption expenditure in the different regions. This volatility is less pronounced in North America (NA), where household consumption remained stable over the considered period. In contrast, household consumption was more volatile in developing regions such as North Africa and the Middle East (MEA) and sub-Saharan Africa (SSF). However, household consumption fell continuously in Europe and Central Asia (ECS) and in East Asia and the Pacific (EAS).

[1] www.policyuncertainty.com.
[2] https://databank.worldbank.org/source/world-development-indicators.
[3] https://web.pdx.edu/~ito/Chinn-Ito_website.htm.

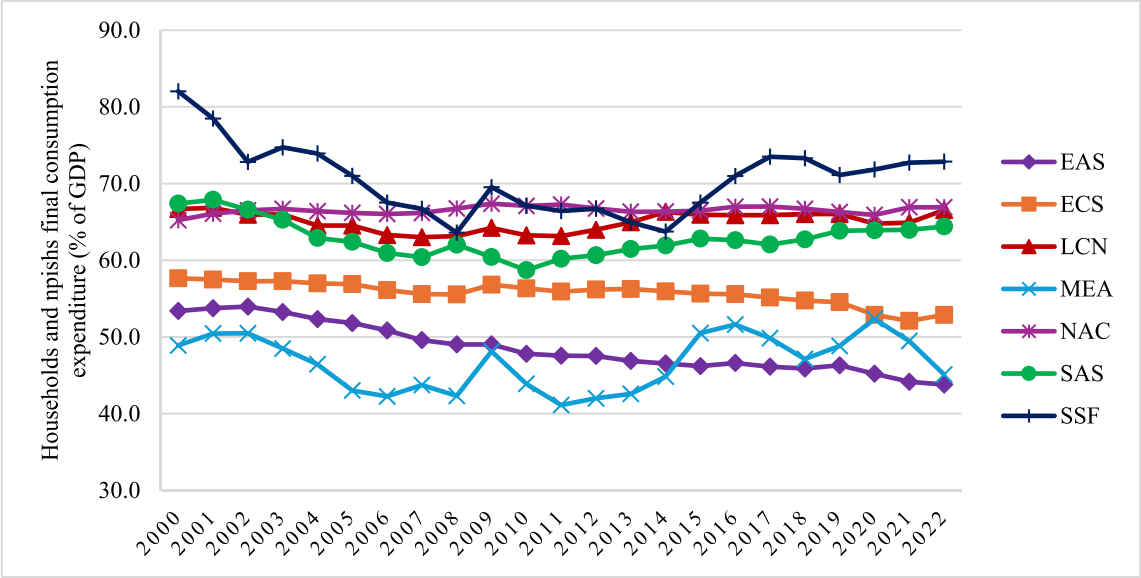

Fig. 1. Trends in household consumption by region according to World Bank classification (2000–2022)[4].
Source: Authors' construction based on World Bank data.

As the variable of interest, we use overall economic uncertainty from the World Uncertainty Index (WUI) database of Ahir et al. (2022). Ahir et al. (2022) construct quarterly economic uncertainty indices for 143 countries from 1952 to 2022 using frequency counts of the word "uncertainty" (and its variants) in the EIU quarterly country reports. They then use raw counts scaled by the total number of words in each report to make the economic uncertainty index comparable across countries. The choice of this measure is motivated by the availability of data on a larger sample of countries in contrast to other uncertainty indices, such as the well-known Economic Policy Uncertainty (EPU) index from Baker et al. (2016), which is available for 22 countries.

This index has three key advantages over the other measures of uncertainty used in the literature (volatility of key economic and financial variables, disagreement among professional forecasters, etc.). Firstly, it covers a wide range of developing economies and offers a wide time coverage. Secondly, the measure is constructed by building on a single data source with a standardized reporting process that allows comparability across countries and time. Thirdly, it is correlated with the standard measures of uncertainty often used in the literature and is associated with large global spikes such as the "9/11 attacks, the SARS outbreak, the second Gulf War, the Euro debt crisis, El Niño, the border control crisis in Europe, the UK referendum vote for Brexit, and the 2016 US presidential election" (Ahir et al., 2022, p. 10). Since the WUI is quarterly, we convert the quarterly data to annual data using the quarterly average to represent the level of uncertainty in each country. Fig. 2 shows a continuous increase in the overall uncertainty index between 2000 and 2016 in the different groups of countries according to their income levels. This was followed by two years of generalized decline in uncertainty. Then, between 2019 and 2020, overall uncertainty increased in all country groups except the upper-middle income countries (UMIC).

Fig. 3 shows, on average, a negative correlation between economic uncertainty and household consumption expenditure in developing countries. In other words, countries that have experienced an economic uncertainty shock saw a decline in household consumption expenditure growth, consistent with this study's hypothesis.

3.2. Control variables description

Following the recent literature on the macroeconomic determinants of household consumption, we consider four control variables for the estimation of our benchmark model: inflation, per capita income measured by GDP per capita, government final consumption, and trade openness (Bahmani-Oskooee & Nayeri, 2020; Combes & Ebeke, 2011).

Inflation, as measured by the Consumer Price Index, reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly (World Bank, 2022). A higher level of inflation reduces people's purchasing power, all other things being equal, leading to a reduction in household consumption expenditure.

GDP per capita growth is expected to affect consumption growth positively (Campbell & Mankiw, 1989; Nam et al., 2021). In a context where markets are imperfect and households face significant liquidity constraints and cannot reallocate consumption over time, a change in income is a strong predictor of consumption growth.

In terms of government spending, the study uses general government final consumption expenditure (percentage of GDP) as its proxy, collected from the World Development Indicators (World Bank, 2022). A positive effect on private consumption can occur through an income effect because of either higher wages or higher subsidies (Blanchard & Perotti, 2002). However, a negative wealth effect of higher fiscal spending could imply lower private consumption through higher taxation.

Trade openness is measured as the ratio of imports and exports of goods and services to GDP. Trade openness is expected to show a positive coefficient, reflecting increased competition and lower prices of goods and services.

For robustness, we use several additional control variables that also represent determinants of household consumption, notably the share of the urban population in the total population, financial development measured by domestic credit to the private sector, oil rent, broad money, and financial openness. We expect a negative effect from our measure of urbanization, oil rent and financial openness. Indeed, we assume that a larger share of the urban population in the total population due to urban-rural migration in developing countries is negatively associated with household consumption due to its negative effects on employment (Chaudhuri, 2000). Following the abundant literature on the resource curse (see Badeeb et al., 2017), we assume that oil rents are associated

[4] EAS, ECS, LNC, MEA, NAC, SAS and SSF denote East Asia and the Pacific, Europe and Central Asia, Latin America and the Caribbean, Middle East and North Africa, North America, South Asia, and sub-Saharan Africa, respectively.

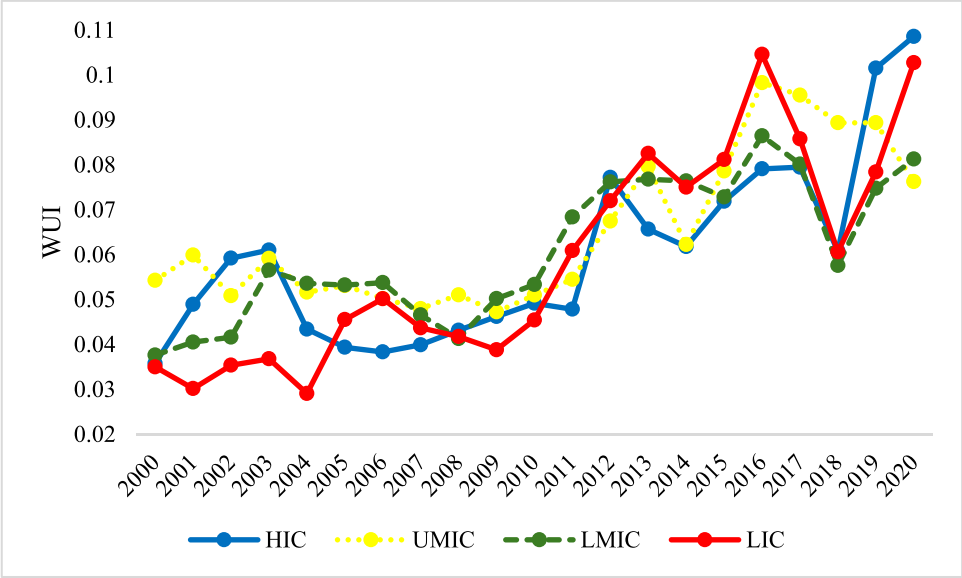

Fig. 2. Trend in the overall economic uncertainty index[5].
Source: Authors' construction based on Ahir et al.'s (2022) data.

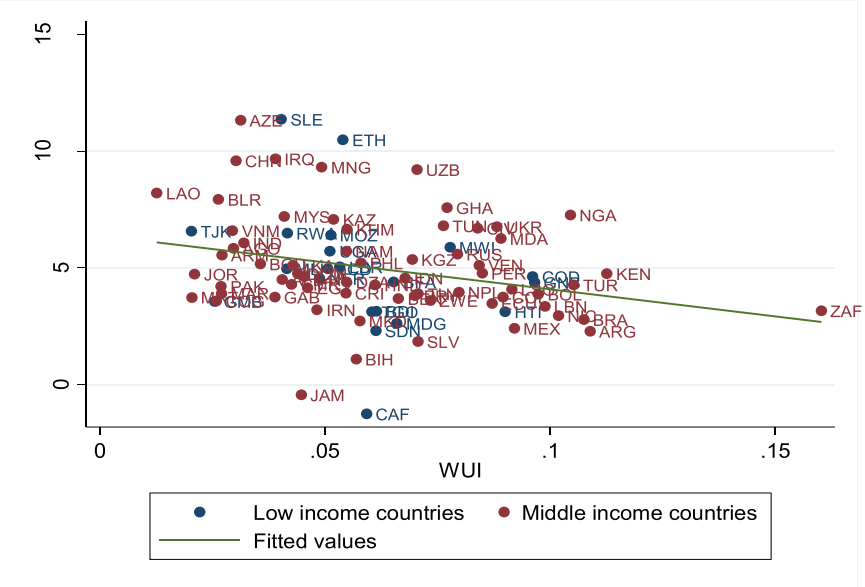

Fig. 3. Relationship between WUI and household consumption growth (2000–2019).
Source: Authors' construction

with a lower institutional quality, leading to a decline in economic growth and therefore in household consumption. Financial openness is measured by the KAOPEN index proposed by Chinn and Ito (2006), which measures a country's degree of capital account openness. This index takes on higher values for countries more open to cross-border capital transactions. Combes and Ebeke (2011) show that financial openness is linked to consumption instability; the benefits of financial integration only appear beyond a given threshold. In this perspective, we also expect a negative effect of financial openness on households' consumption.

We expect a positive effect from other additional control variables such as financial development and broad money due to their positive contributions to economic growth (see Valickova et al., 2015). In addition, better access to credit and greater broad money allows for greater income provision by households, which can result in a higher level of consumption. Descriptive statistics of all the variables are provided in Table 1.

[5] HIC, UMIC, LMIC and LIC denote High income countries, Upper middle-income countries, lower middle-income countries and low-income countries, respectively.

Table 1
Descriptive statistics and data sources.

Variables	Obs.	Mean	Std. Dev.	Min.	Max.	Sources
Household consumption (% annual growth)	1,459	4.848	6.425	-35.875	71.878	WDI
WUI	1,459	0.061	0.055	0	0.418	Ahir et al. (2022)
WUI max	1,459	0.325	0.252	0	2.038	Authors' construction
WUI_vol	1,459	0.024	0.019	0	0.180	Authors' construction
Inflation (annual %)	1,459	7.587	18.564	-3.749	513.907	WDI
GDP per cap growth (log)	1,459	2.711	3.966	-31.333	32.997	WDI
Government consumption (% GDP)	1,459	13.625	5.099	.952	41.888	WDI
Trade (% GDP)	1,459	72.601	35.527	16.669	311.354	WDI
Domestic credit to private sector (% GDP)	1,263	34.883	32.09	0	165.39	WDI
Urban population (% total population)	1,459	48.7	20.134	8.246	91.203	WDI
Oil (% GDP)	1,392	4.009	9.085	0	56.269	WDI
Broad money (% GDP)	1,424	46.691	35.603	2.857	260.064	WDI
Ka_open	1,445	-0.288	1.306	-1.927	2.311	Chinn and Ito (2006)
Remittances (% GDP)	1,423	5.589	7.051	0	44.126	WDI
Aid (% GNI)	1,428	4.869	7.076	-0.643	92.141	WDI
OPHE (% current health expenditure)	1,374	-41.977	17.045	-83.348	-4.555	Authors' construction
Legor uk	1,459	0.262	0.440	0	1	La Porta et al. (1999)
Legor fr	1,459	0.546	0.498	0	1	La Porta et al. (1999)

Notes: OPHE, Aid, WUI and Ka_open denote out-of-pocket expenditure, foreign aid, World Uncertainty Index, and financial openness, respectively. Time period 2000–2019. WDI denotes World Development Indicators.

3.3. Methodological strategy

3.3.1. Benchmark model specification

Theoretical models of precautionary saving suggest that larger income uncertainty increases saving, depressing current consumption and raising expected future consumption (Leland, 1978; Menegatti, 2001). This implies that consumption growth is influenced not only by income growth through the lifecycle, but also by the uncertainty affecting future income. This paper tests this latter prediction of the precautionary saving theory on a sample of developing countries. In line with Combes and Ebeke (2011), we estimate the following dynamic panel data model:

$$\boldsymbol{HC}_{i,t} = \boldsymbol{\alpha} + \beta_0 \boldsymbol{HC}_{i,t-1} + \beta_1 \boldsymbol{WUI}_{i,t} + \beta_2 \boldsymbol{X}_{i,t} + \boldsymbol{\mu}_i + \boldsymbol{\nu}_t + \boldsymbol{\xi}_{i,t} \quad (1)$$

where $HC_{i,t}$ is the household final consumption expenditure per capita growth (annual percentage) of country i in year t, $WUI_{i,t}$ is the index of uncertainty, and $HC_{i,t-1}$ is the lagged variable of household final consumption expenditure per capita growth, which captures the inertia that often characterizes the dynamics of consumption. $X_{i,t}$ is the vector of control variables, including inflation, GDP per capita growth, government final consumption, and trade openness. μ_i and ν_t are the country- and time-specific effects, respectively. They are included in the specification to capture time-invariant heterogeneity and common shocks at each period among countries in the sample. $\xi_{i,t}$ denotes the error term. We hypothesize that household consumption growth is inversely related to policy uncertainty in the sample of developing countries under scrutiny. Higher uncertainty depresses consumption because households have concern about their future income and delay consumption to build some buffer stocks.

3.3.2. Estimation technique and identification strategy

Estimating Eq. (1) with the Driscoll-Kraay standard error approach is not without challenges. Introducing lagged consumption as an explanatory variable invalidates standard static panel regression due to dynamic panel bias (Nickell, 1981). This raises the endogeneity problem, and static estimation will generate biased and inconsistent results. Also, standard sources of endogeneity, including reverse causality, omitted variable bias, and unobserved heterogeneity, fail to be addressed in this setting. We assume the existence of a potential reverse causality bias in the event that an increase in private consumption affects the level of overall economic uncertainty. Although this hypothesis is quite implausible, we can assume that a decrease in household consumption will stimulate economic growth and consequently reduce uncertainty. Specifically, while increased uncertainty reduces households' consumption through greater household precautionary savings, increased savings may in turn lead to investment growth, which can stimulate economic growth and reduce economic policy uncertainty (Xu, 2023). To address this concern, we used a two-step system GMM estimator that allows the use of lagged differences and lagged levels of the explanatory variables as instruments (Blundell & Bond, 1998).

There are several factors motivating the choice of the two-step system GMM estimator. Firstly, this estimation strategy has the advantage of dealing with the endogeneity previously highlighted by controlling for time-invariant omitted variables and simultaneity (with the instrumentation process) (Tchamyou et al., 2019). Also, it allows additional efficiency gains compared to the difference GMM estimator (Bond, 2002). Secondly, the number of cross-sections (N = 87) is higher than the number of time series in each cross-section (T = 20), therefore N > T. Thirdly, our panel data structure is consistent with the GMM method, which implies that cross-country differences are taken into account in the analysis.

Due to the large temporal dimension of our panel, as well as the additional moments imposed by the system GMM estimator, the problem of creating too many instruments relative to N could arise, resulting in poor small sample properties (Stojanovikj & Petrevski, 2021). In this regard, it is advised that the number of instruments be less than the number of cross-sectional units (Roodman, 2009a, 2009b). To reduce the number of instruments, we proceeded in two steps: firstly, we restricted the number of lags used as instruments for the endogenous variables ;[6] secondly, we collapsed the set of instruments by stacking the columns of the instrument matrix (Roodman, 2009a, 2009b; Wooldridge, 2002). Specifically, we use the collapse option to keep the overall number of instruments at a reasonable level (following the rule of thumb that the number of instruments should be lower than the number of panel data units).

We ensure that the implementation of the GMM estimation approach is consistent with best practice (see Roodman, 2009a). Firstly, the identification approach is in line with the works of Tchamyou and Asongu (2017) and Tchamyou (2019). We consider all independent variables to be predetermined or assumed to be endogenous, while only

[6] We take lags of orders 2 to 4 because lagged values of the dependent variable and of the regressors which are assumed to be weakly exogenous are used as GMM style instruments. We performed the estimations using the Stata module xtabond2 in Stata 16 following Roodman (2009b).

time-invariant omitted variables are considered strictly exogenous.[7] Therefore, the procedure for dealing with *ivstyle* (time) is *iv (time, eq (diff))*, while the process for the predetermined variables is *gmmstyle*. In light of the aforementioned insights, the time-invariant omitted variables (time) influence the dependent variable (households' consumption) only through the suspected endogenous variables. Secondly, the simultaneity problem is solved in our framework by using lagged explanatory variables as instruments. Given that fixed effects are correlated with the error term, Helmet conversions are used to remove these fixed effects in order to avoid obtaining biased estimates (Arellano & Bover, 1995; Tchamyou et al., 2019).[8] Thirdly, with regard to exclusion restriction, following Tchamyou and Asongu (2017), we argue that the years (also used as instruments) that are treated as strictly exogenous influence the outcome indicator only through the endogenous explaining variables. The statistical relevance underlying this exclusion restriction is investigated with the difference in Hansen test for instrument exogeneity. Accordingly, the alternative hypothesis of the test should be rejected for the instruments to elucidate the dependent variable exclusively via the endogenous explaining variables.

To ensure the relevance of the instrumentation method, the Hansen's test statistics for overidentifying restrictions is used, helping to evaluate the quality of the instruments. It is complemented by Arellano and Bond's (1991) error autocorrelation test. The instrumentation technique is validated if the null hypothesis of residual autocorrelation is rejected at first order and not at second order, and if Hansen's J test is not rejected. In addition, we ensure that the number of instruments remains lower than the number of countries in all specifications.

Although the S-GMM estimator is robust and widely used in the literature, this method has been criticized for low robustness against the instrument choice—in particular, large models' weak instruments may cause the estimates to be biased.[9] While this is true, and as pointed out by Njangang et al. (2024), addressing simultaneity bias by using lagged values of explanatory variables as instruments is somewhat misleading. We also recognize that since no identification strategy is infallible, it is necessary to adopt an alternative estimation approach to mitigate possible concerns about causal inference. Therefore, for robustness, we employ the two-stage instrumental variables (IV-2SLS) approach by considering the exogeneous elections as the external source of variation for economic policy uncertainty. Details of these alternative empirical approaches are discussed in Section 4.2.5.

4. Empirical results

4.1. Baseline findings

As a preliminary step in our investigation, Table 2 reports the ordinary least squares (OLS) fixed effect estimates of the effect of overall economic uncertainty on household consumption growth (assuming no inertia of consumption growth). The estimated coefficients are corrected for heteroscedasticity, autocorrelation, and cross-sectional dependence using the Driscoll-Kraay estimator (Driscoll & Kraay, 1998).

Column (1) presents the results of a simple model without a control and shows that uncertainty is negatively and significantly correlated with household consumption. This implies that household consumption growth declines with a positive uncertainty shock. In columns (2) to (5), we gradually augment the model with a set of controls to mitigate omitted variable bias that may arise because factors simultaneously affecting the variable of interest and the dependent variable are not included in the regression. The estimated coefficients have a magnitude suggesting that a 1 per cent increase in economic uncertainty is on average associated with a decrease in household consumption of 0.037–0.103 per cent of the standard deviation.[10] Thus, consistent with the existing literature, we add to the specification inflation GDP per capita growth, government consumption, and trade. In addition, controlling for these variables allows us to separate standard macroeconomic effects to identify specific uncertainty effects. The results are robust to the introduction of these variables, although the magnitude of the coefficients decreases on average.

Table 3 reports the results of the dynamic panel data estimations. The results of the main tests pertaining to the hypotheses attached to the dynamic panel show that the model is well specified and the technique well implemented. Firstly, the Sargan/Hansen overidentification test indicates that the instruments are not correlated with the error term and their validity is therefore not rejected. Secondly, the null hypothesis of no second-order serial correlation of the error term is not rejected. This ensures that the hypothesis of serial independence in the error term is not invalidated. Lastly, the number of instruments does not exceed the number of countries, which ensures that the problem of instrument proliferation is avoided (Roodman, 2009a). The findings reported in Table 3 are qualitatively consistent with what was observed using the Driscoll-Kraay estimator. However, the magnitude of the effect of the uncertainty index is higher. This may suggest that falling to control for the endogeneity of explanatory variables leads to a downward bias in the coefficient of the variable of interest. Moreover, we find a negative and significant sign of the lagged dependent variable, reflecting some income rigidity. This result means that higher household consumption at time t induces lower household consumption at t+1. Thus, if we assume that income changes are rigid, an unexpected increase or an increase above the standard level allowed by the permanent income assumption will lead to lower consumption the next day.

There are several channels through which this result can be explained. Firstly, economic uncertainty can make investors and consumers more cautious and anxious. For example, uncertainty may force investors to defer investment decisions, leading to the postponement of production increases and hiring decisions. This reduction in employment leads to lower incomes and, consequently, lower household consumption. Secondly, the negative impact of uncertainty on consumption can also be explained by the theory of precautionary savings (Lugilde et al., 2019). When consumption decisions are made in a context of economic uncertainty and households are risk-averse, uncertainty will have a significant negative impact on current consumption. Uncertainty therefore generates additional positive savings, known as precautionary savings. Our result is in line with recent work by Chen et al. (2022) and Wu and Zhao (2022), who found that Chinese households reduce consumption in response to greater economic uncertainty. These results also corroborate the recent findings of Coibion et al. (2024), who found that greater macroeconomic uncertainty induces households to significantly and persistently reduce their total monthly expenditure in subsequent months. However, these results are antagonistic to the findings of Bahmani-Oskooee and Nayeri (2020), who showed that uncertainty has asymmetric effects on consumer spending in all G7 countries.

4.2. Robustness checks

We perform several robustness checks to test the quality of our

[7] According to Roodman (2009b), it is not possible for years (or time-invariant variables) to be endogenous in first difference.

[8] These transformations embody forward mean-differencing of the indicators: "the mean of future observations is subtracted from the variables instead of subtracting the previous observations for the contemporaneous one" (Roodman, 2009b, p. 104).

[9] For comprehensive critique of GMM estimators, refer to Bazzi and Clemens (2013).

[10] The standardized coefficients are calculated according to the formula $\beta_x = \alpha_x \frac{\lambda_x}{\lambda_y}$. β_x, α_x , λ_x, λ_y correspond to the standardized coefficient, the initial estimated coefficient, the standard deviation of the WUI, and the standard deviation of the household's consumption, respectively.

Table 2
Baseline results, Driscoll-Kraay.

	Dependent variable: House_consumption				
	(1)	(2)	(3)	(4)	(5)
WUI	-11.894***	-11.991***	-5.563***	-5.170***	-4.331***
	(4.095)	(4.067)	(1.879)	(1.718)	(1.440)
Inflation		-0.009*	-0.005*	-0.004	-0.004*
		(0.004)	(0.003)	(0.003)	(0.002)
GDP per cap growth			0.648***	0.643***	0.630***
			(0.027)	(0.025)	(0.031)
Gov_consumption				-0.039	-0.058**
				(0.027)	(0.025)
Trade					0.012**
					(0.005)
Constant	5.578***	5.650***	3.394***	3.922***	3.332***
	(0.415)	(0.393)	(0.209)	(0.325)	(0.348)
Observations	1,459	1,459	1,459	1,459	1,459
R-squared	0.010	0.011	0.166	0.167	0.171
Number of countries	82	82	82	82	82

Notes: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Driscoll-Kraay standard errors are reported in parentheses. Time period: 2000–2019.

Table 3
Baseline results, two-step system GMM.

	Dependent variable: House_consumption				
	(1)	(2)	(3)	(4)	(5)
Lagged House_consumption	-0.242***	-0.237***	-0.294***	-0.339***	-0.282***
	(0.060)	(0.060)	(0.063)	(0.072)	(0.066)
WUI	-9.951***	-8.818***	-6.554***	-7.493**	-7.624***
	(3.364)	(3.180)	(2.481)	(2.927)	(2.840)
Inflation		-0.024	-0.001	-0.005	-0.007
		(0.016)	(0.014)	(0.015)	(0.014)
GDP per cap growth			0.770***	0.634***	0.445***
			(0.075)	(0.085)	(0.086)
Gov_consumption				-0.058	-0.091
				(0.050)	(0.063)
Trade					0.012*
					(0.006)
Constant	8.015***	8.366***	6.505***	5.983***	5.771***
	(0.632)	(0.780)	(1.817)	(0.845)	(1.082)
Observations	1,376	1,376	1,376	1,376	1,376
Year FE	Yes	Yes	Yes	Yes	Yes
Number of countries	82	82	82	82	82
Number of instruments	64	64	60	64	61
Fisher	281.84***	358.65***	459.81***	427.71***	448.22***
AR(1)	0.006	0.004	0.006	0.010	0.007
AR(2)	0.381	0.415	0.427	0.307	0.401
Hansen OIR	0.349	0.210	0.165	0.260	0.336

Notes: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Robust standard errors are reported in parentheses. The coefficients are based on the two-step GMM system estimation using the finite sample correction of Windmeijer (2005). All explanatory variables are treated as potentially endogenous. The lags of the explanatory variables are taken as an instrument for the difference equation, while the first differences of the explanatory variables are taken as an instrument for the level equation. Time period: 2000–2019.

previous conclusions. Firstly, we estimate our benchmark model by introducing several additional control variables representing determinants of household consumption. Secondly, we use several alternative measures of economic uncertainty. Thirdly, we test the robustness of our results by excluding outliers, and then proceed to change the data structure to rule out the effect of the business cycle. Finally, we test the robustness by using an alternative estimation approach to address causal inference concerns.

4.2.1. *Including additional control variables*

To minimize further any bias that could arise from the omission of potential drivers of household consumption growth, we added to the baseline model five variables: urban population as a percentage of the total population, credit to the private sector in percentage GDP, oil revenues in percentage GDP, broad money in percentage GDP, and the financial openness measure developed by Chinn and Ito (2006).

Urban population as a percentage of the total population is included in the specification to capture the impact of market potential on consumption. Financial deepening captures the fact that the depth and efficiency of the financial system eases the ability of households to smooth consumption in case of high uncertainty (Combes & Ebeke, 2011). Financial deepening is measured by two indicators: credit to the private sector in percentage GDP and the broad money (M2) to GDP ratio. In column (2), when we include domestic credit to the private sector, we find that domestic credit has a positive and significant effect on households' consumption. In column (3), the coefficient associated with broad money is negative and statistically significant at the 10 per cent level. The variable oil revenues in percentage GDP is included in the regression to capture the effect of oil dependency on consumption. As shown by De Michelis et al. (2019), over-reliance on oil could imply frequent changes in household consumption. Finally, as seen in the results in column (5), the estimated coefficient on financial openness is negative and

statistically significant, suggesting that financial openness is on average associated with lower household consumption. This result can be justified by the fact that financial openness increases the degree of exposure to global financial crises, which may lead to lower household consumption. The results of this new estimation are reported in Table 4 and show that the impact of uncertainty on household consumption growth remains robust.

4.2.2. Alternative measure of WUI

Our main measure of WUI is available quarterly, and in line with the previous studies we generate and use annual averages of the quarterly data. For robustness checks, we construct an alternative measure of WUI by considering the maximum quarterly value of the index—i.e. the highest level of uncertainty each year. In addition, we follow Nguyen and Lee (2022) and calculate the uncertainty index's yearly standard deviation to proxy for the volatility of domestic uncertainty that can represent an alternate uncertainty measure (WUI_vol). The results using these two alternative measures are reported in columns (1) and (2) of Table 5. We find that the coefficient associated with each of these two measures is positive and statistically significant. We note in particular that the coefficient associated with the variable measuring maximum uncertainty is larger (11.946), with an amplitude suggesting that, on average, a 1 per cent increase in maximum uncertainty is associated with a reduction in household consumption of the order of 0.468 per cent standard deviation. These results confirm the negative effects of uncertainty on household consumption, which can be explained by risk aversion on the part of households, the slowdown in the supply of employment for entrepreneurs, and the decrease in wages for companies, among other factors.

4.2.3. Excluding outliers

The previous results are based on the overall sample. While interesting, they may suffer from the presence of outliers that could potentially bias our conclusions. More specifically, careful observation of Fig. 3 shows that Azerbaijan (AZE), Ethiopia (ETH) and Sierra Leone (SLE) are outliers in our sample. For further robustness, we exclude these countries and estimate our model. The results summarized in column (3) of Table 5 show that the coefficient associated with WUI remains negative and statistically significant.

Table 5
Further robustness checks.

	Alternative measure of uncertainty		No outliers	Alternative data structure
	Dependent variable: House_consumption			
	(1)	(2)	(3)	(4)
Lagged House_consumption	-0.371***	-0.289***	-0.273***	-0.067**
	(0.084)	(0.007)	(0.067)	(0.027)
WUI_max	-11.946***			
	(4.070)			
WUI_vol		-10.724***		
		(3.653)		
WUI			-9.015***	-7.878***
			(3.130)	(2.634)
Baseline control	Yes	Yes	Yes	Yes
Constant	34.822**	27.187***	5.885***	6.337***
	(15.178)	(1.027)	(1.125)	(0.733)
Observations	1,376	1,376	1,346	299
Year FE	Yes	Yes	Yes	Yes
Number of countries	82	82	79	82
Number of instruments	20	65	54	35
Fisher	47.22***	6865.56***	416.59***	1278.14***
AR(1)	0.002	0.003	0.007	0.003
AR(2)	0.492	0.612	0.391	0.459
Hansen OIR	0.934	0.530	0.262	0.113

Notes: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Robust standard errors are reported in parentheses. The coefficients are based on the two-step GMM system estimation using the finite sample correction of Windmeijer (2005). In columns (1) and (2), we have used alternative measures of uncertainty. In column (3), we exclude outliers; in column (4), we use data averaged over five years.

4.2.4. Ruling out the effect of the business cycle

While the introduction of time effects helps control for the common time trend in household consumption across countries, it cannot

Table 4
Robustness with additional control.

	Dependent variable: House_consumption				
	(1)	(2)	(3)	(4)	(5)
Lagged House_consumption	-0.292***	-0.257***	-0.277***	-0.287***	-0.187**
	(0.068)	(0.066)	(0.059)	(0.073)	(0.075)
WUI	-11.600**	-10.431***	-10.665***	-10.835**	6.731***
	(4.992)	(3.965)	(4.033)	(4.539)	(2.587)
Baseline control	Yes	Yes	Yes	Yes	Yes
Urban_pop.	0.015				
	(0.015)				
Domestic_credit to private sector		0.433**			
		(0.206)			
Broad_ money			-0.062*		
			(0.032)		
Oil				0.073	
				(0.114)	
Ka_open					-0.390*
					(0.217)
Constant	8.621***	6.948***	9.249***	7.710***	0.364
	(2.055)	(2.119)	(1.936)	(2.035)	(1.497)
Observations	1,204	1,376	1,344	1,309	1,362
Year FE	Yes	Yes	Yes	Yes	Yes
Number of countries	80	83	82	83	82
Number of instruments	71	72	79	69	57
Fisher	259.20***	491.11***	568.93***	270.85***	495.01***
AR(1)	0.011	0.001	0.001	0.001	0.001
AR(2)	0.243	0.382	0.625	0.637	0.622
Hansen OIR	0.161	0.192	0.247	0.317	0.295

Notes: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Robust standard errors are reported in parentheses. The coefficients are based on the two-step GMM system estimation using the finite sample correction of Windmeijer (2005).

completely rule out the business cycle effect. To ensure that effects identified in the estimation do not simply reflect business cycle effects, we rerun the estimations, averaging data over non-overlapping three-year periods. This reduces the time dimension of the panel to four periods. The results are reported in column (4) of Table 5 and are consistent with the previous findings.

4.2.5. Alternative method: IV-2SLS

Previous results show that, on average, uncertainty is negatively associated with household consumption. In a system GMM framework, we attempted to deal with endogeneity issues by using lags of explanatory variables as instruments. Although this approach is robust, it is not a panacea for reverse causality problems. The use of external instruments via an instrumental variable approach is said to be the best option for dealing with potential reverse causality problems, provided a sufficiently exogenous instrument can be identified.

Theoretically, we need an instrument that is strongly correlated with economic uncertainty but not with private consumption, except through uncertainty. We follow Agoraki et al. (2024) and assume that a decline in the quality of governance will increase uncertainty. Consequently, we do not need a direct measure of institutional quality such as the governance indices provided by the International Country Risk Guide (ICRG) and World Governance Indicators (WGI), but rather a relatively more exogenous measure representing a notably historical determinant of institutional quality. We assume, in line with the work of La Porta et al. (1999), that legal origin is an important factor in the quality of contemporary institutions, and consequently in the level of economic uncertainty. Indeed, it is argued that the British system (common law) and, to a lesser extent, the German and Scandinavian systems are based on greater recognition of economic freedom, which limits state intervention in the economy. In contrast, the legal system of French origin (civil law), and even more so the Soviet system, was designed to determine the state's capacity to organize economic and social life, leading to weaker recognition of property rights and individual freedom (Alonso & Garcimartín, 2013). Consequently, although not unanimously agreed, it is accepted that British and Nordic legal traditions are associated with better institutional quality (La Porta et al., 1999, 2008). We consider two dummy variables for French and British legal origins. The identification in this framework stems from the fact that British and French legal origin contribute to better institutions, which may reduce the magnitude of economic uncertainty. However, we find no evidence of a direct relationship between legal origin and household consumption other than through its impact on the quality of institutions and hence the level of economic uncertainty.

In addition, using the IV-2SLS approach requires an assessment of the validity of our instruments.[11] Hence, we utilize the Hansen test, which is a test of overidentifying restrictions. Notably, failure to reject the null hypothesis can serve as an indication of the employment of an appropriate instrumental variable (Agoraki et al., 2024). Additionally, we employ the weak instrument test to determine whether our instruments have strong correlations with the endogenous variables.

Table A2 presents the results of the IV-2SLS estimations. The second stage is presented in Panel A and the first stage in Panel B. The first stage suggests a highly negative significant relationship between the British and French legal origin and economic uncertainty, supporting the validity of our instrument. Regarding the instrument relevance, the Kleibergen-Paap Wald rk F statistic is used to test for weak instruments. This statistic is above 10, indicating no problem of weak identification. In addition, the high p-values of the Hansen test suggest that we are consistently unable to reject the null hypothesis pertaining to overidentifying restrictions. Hence, there is no evidence of overidentifying restrictions within our framework, and the results indicate that our IV-2SLS remain valid. To sum up, we do not encounter issues of weak instrument variables, strengthening the validity of our instrumental variables identification strategy. Concerning the results of the estimated coefficients, we find that economic uncertainty remains negatively and statistically associated with household consumption. Our results therefore remain robust to the use of an alternative estimation technique to address endogeneity issues.

[11] The estimation of our Model IV is performed with cross-sectional data due to the time-invariant nature of our external instrument (the legal origin).

4.3. Economic uncertainty and households' consumption: further analysis

4.3.1. Testing the heterogeneity of the impact across region by income level, lending category, and HIPC initiative

This section questions whether the impact of overall policy uncertainty on consumption growth varies across developing regions depending on income level, lending category, and participation in the HIPC. The following specification was estimated:

$$\boldsymbol{HC}_{i,t} = \boldsymbol{\alpha} + \boldsymbol{\delta}_0 \boldsymbol{HC}_{i,t-1} + \boldsymbol{\delta}_1 \boldsymbol{WUI}_{i,t} + \boldsymbol{\delta}_2 \boldsymbol{WUI}_{i,t} \times \boldsymbol{RILH} + \boldsymbol{\delta}_3 \boldsymbol{X}_{i,t} + \boldsymbol{\mu}_i + \boldsymbol{\nu}_t + \epsilon_{i,t} \quad (2)$$

where *RILH* refers to the dummy variable, taking the value 1 for a specific region/income level group/lending category group where the country benefitted from the HIPC initiative and 0 otherwise. In the specification, we do not control additively to avoid perfect correlation between the interacted dummies and the country fixed effects. The analysis covers the main sub-regions and income groups[12] from the World Bank's (2022) country classification by income level. The lending categories are IDA, IBRD, and Blend.[13] The results of the estimation of Eq. (2) are reported in Table 6. The main effect of uncertainty on consumption growth remains robust to the inclusion of interactions terms, although the magnitude decreases significantly. Also, this overall impact seems to be driven by two regions, sub-Saharan Africa and Latin America, the magnitude being higher in the latter. This is partly due to the weak institutional framework and limited capacity of governments in these countries to mitigate the negative effects of economic uncertainty on household consumption. Governments in SSA and LAC are characterized by their weak capacity in terms of social protection mechanisms for vulnerable households operating predominantly in the informal sector, and their weak capacity to support entrepreneurs in the event of economic uncertainty. By level of income, the most affected group is the upper middle-income group.

The results by lending category (see Table 7) show that the negative effect of uncertainty is significantly higher in IDA eligible countries. Accordingly, the impact of uncertainty is 40 per cent higher on average compared to what is observed for other lending categories. Similarly, countries that benefited from debt relief under the HIPC initiative are more vulnerable to the effect of uncertainty on private consumption. More generally, this finding confirms the intuition that poor countries with limited fiscal space are more vulnerable to overall policy uncertainty.

4.3.2. Testing the effectiveness of potential mitigating factors of the negative impact of uncertainty

The following equation is estimated to test the hypothesis that the

[12] Regions: East Asia and the Pacific (EAP), South Asia, Middle East and North Africa (MENA), Latin America and the Caribbean (LAC), Europe and Central Asia (ECA), and sub-Saharan Africa (SSA). Income groups: lower middle-income countries (LMIC), upper middle-income countries (UMIC), and low income countries (LIC).

[13] IDA countries are countries from the International Development Association having a GNI per capita below $1,255 in the fiscal year 2022. Blend countries are countries eligible for both IDA and International Bank for Reconstruction and Development (IBRD) financing.

Table 6
Analysis by sub-regions and income levels.

	Dependent variable: House_consumption								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Lagged dependent variable	-0.258***	-0.275***	-0.267***	-0.269***	-0.291***	-0.237***	-0.116***	-0.282***	-0.117***
	(0.069)	(0.069)	(0.010)	(0.015)	(0.067)	(0.072)	(0.009)	(0.072)	(0.009)
WUI	**-11.595****	**-9.932****	**-4.665*****	**-10.033*****	**-13.685*****	**-11.713****	**-2.431****	**-10.915****	**-4.215*****
	(5.740)	**(4.140)**	**(1.491)**	**(2.664)**	**(5.231)**	**(4.902)**	**(1.178)**	**(5.474)**	**(0.842)**
WUI × ECA	9.314								
	(12.291)								
WUI × MENA		6.013							
		(11.539)							
WUI × SSA			**-5.565****						
			(2.179)						
WUI × LAC				**-10.847****					
				(4.302)					
WUI × South Asia					-11.456				
					(15.236)				
WUI × EAP						0.938			
						(16.940)			
WUI × UMIC							**-5.317****		
							(2.141)		
WUI × LMIC								1.758	
								(11.281)	
WUI × LIC									1.105
									(1.688)
Baseline control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	10.151***	9.607***	5.646***	12.891***	9.814***	8.952**	4.201***	9.962***	4.325***
	(2.544)	(2.418)	(0.257)	(0.935)	(2.464)	(3.602)	(0.366)	(3.528)	(0.324)
Observations	1,376	1,376	1,376	1,376	1,376	1,376	1,376	1,376	1,376
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of instruments	82	82	82	82	82	82	82	82	82
Number of countries	56	58	62	48	58	56	62	66	62
Fisher	787.1***	1,296.4***	6,279.1***	1,249.5***	1,904.9***	9,154.4***	764.12***	708.41***	818.1***
AR(1)	0.004	0.005	0.001	0.002	0.007	0.006	0.001	0.005	0.001
AR(2)	0.631	0.551	0.419	0.468	0.422	0.302	0.855	0.544	0.858
Hansen OIR	0.135	0.254	0.284	0.116	0.174	0.781	0.170	0.399	0.148

Notes: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Robust standard errors are reported in parentheses. The coefficients are based on the two-step GMM system estimation using the finite sample correction of Windmeijer (2005).

Table 7
Analysis according to lending category and HIPC initiative.

	Dependent variable: House_consumption			
	(1)	(2)	(3)	(4)
Lagged House_consumption	-0.048***	-0.279***	-0.271***	-0.064***
	(0.008)	(0.013)	(0.071)	(0.014)
WUI	**-3.198*****	**-8.455*****	**-10.638****	**-3.633****
	(1.237)	**(1.529)**	**(4.544)**	**(1.578)**
WUI × IDA	**-2.712***			
	(1.627)			
WUI × IBRD		**-3.559**		
		(2.463)		
WUI × BLEND			**-7.394**	
			(8.191)	
WUI × HIPC				**-6.015****
				(3.044)
Baseline control variables	Yes	Yes	Yes	Yes
Constant	4.920***	9.643***	10.283***	3.203***
	(0.271)	(0.649)	(2.848)	(0.704)
Observations	1,376	1,376	1,376	1,376
Year FE	Yes	Yes	Yes	Yes
Number of countries	82	82	82	82
Number of instruments	71	64	63	59
Fisher	127.31***	763.38***	1063.72***	2302.0***
AR(1)	0.001	0.002	0.005	0.001
AR(2)	0.541	0.499	0.574	0.602
Hansen OIR	0.576	0.132	0.210	0.203

Notes: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Robust standard errors are reported in parentheses. The coefficients are based on the two-step GMM system estimation using the finite sample correction of Windmeijer (2005).

impact of overall uncertainty on households' consumption can be mitigated by some specific variables, including remittance, foreign development assistance, and social protection.

$$\boldsymbol{HC}_{i,t} = \boldsymbol{\tau} + \boldsymbol{\gamma}_0 \boldsymbol{HC}_{i,t-1} + \boldsymbol{\gamma}_1 \boldsymbol{WUI}_{i,t} + \boldsymbol{\gamma}_2 \boldsymbol{WUI}_{i,t} \times \boldsymbol{MIT}_{i,t} + \boldsymbol{\gamma}_4 \boldsymbol{MIT}_{i,t} + \boldsymbol{\gamma}_5 \boldsymbol{X}_{i,t} + \boldsymbol{\mu}_i + \boldsymbol{\nu}_t + \boldsymbol{\sigma}_{i,t} \quad (3)$$

where $MIT_{i,t}$ refers to either remittances in percentage of GDP, official development assistance in percentage of Gross National Income (GNI), or the inverse of out-of-pocket expenditure as a percentage of total health expenditure (OPHE). The latter captures the level of coverage of the existing social safety net. The smoothing effect of $MIT_{i,t}$ is obtained as follows and defines the threshold above which the mitigation effect occurs:

$$\frac{\boldsymbol{\Delta HC}_{i,t}}{\boldsymbol{\Delta WUI}_{i,t}} = \boldsymbol{\gamma}_1 + \boldsymbol{\gamma}_2 \boldsymbol{MIT}_{i,t} = 0 \Rightarrow \boldsymbol{MIT}^{*}_{i,t} = \frac{-\boldsymbol{\gamma}_1}{\boldsymbol{\gamma}_2} \quad (4)$$

The results of the estimation of Eq. (3) are provided in Table 8. The coefficient of the interaction term ($WUI_{i,t} \times MIT_{i,t}$) for each mitigation variable (remittances, foreign aid, and inverse of out-of-pocket expenditure) is positive and significant. Also, the coefficients of the uncertainty measure and those of specific mitigation variables are jointly significant at 1 per cent and 5 per cent. Overall, the results suggest that remittances, foreign aid, and higher health insurance coverage can mitigate the effect of uncertainty on households' consumption growth. Using the formula provided in Eq. (4), we calculate that a minimum of 8.6 per cent of GDP in remittances is needed to absorb fully the decline in households' consumption induced by the rise in overall policy uncertainty (Column 1, Table 8). Within our sample, 20 countries are

Table 8
Role of foreign aid, remittances, and social protection expenditure.

	Dependent variable: Household_consumption		
	(1)	(2)	(3)
Lagged Household_consumption	-0.256***	-0.149**	-0.116***
	(0.016)	(0.072)	(0.009)
WUI	**-7.208****	**-8.540****	**-2.733***
	(3.490)	**(4.347)**	**(1.650)**
Remittances	**0.182*****		
	(0.046)		
WUI × Remittances	**0.834*****		
	(0.241)		
Aid		**0.058****	
		(0.025)	
WUI × Aid		**0.777***	
		(0.434)	
OPHE			**0.026*****
			(0.005)
WUI × OPHE			**0.157*****
			(0.052)
Baseline control variables	Yes	Yes	Yes
Constant	34.757***	5.928***	7.801***
	(2.228)	(1.723)	(0.831)
Observations	1,342	1,346	1,292
Year FE	Yes	Yes	Yes
Number of countries	81	81	81
Number of instruments	62	69	71
Fisher	1176.81***	668.13***	5438.03***
AR(1)	0.001	0.003	0.001
AR(2)	0.941	0.967	0.856
Hansen OIR	0.182	0.115	0.473
Thresholds	8.643	10.991	-17.458
Chi2 joint test of significance, p value	0.001	0.105	0.000
Number of countries above the threshold	20	9	7

Notes: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Robust standard errors are reported in parentheses. The coefficients are based on the two-step GMM system estimation using the finite sample correction of Windmeijer (2005). OPHE denotes out-of-pocket expenditure. The estimated coefficients of the baseline control variables are not reported due to space constraints.

above that threshold. However, the majority of these countries belong to regions other than SSA and LAC. The corresponding thresholds for foreign aid and inverse of out-of-pocket expenditure are 10.9 per cent of GNI and 17.4 per cent of GDP, respectively. As shown at the bottom of Table 8, nine countries are above the threshold of foreign aid, while seven countries are above the threshold for the inverse of out-of-pocket expenditure. These results suggest that in our sample only twenty, eight and seven countries respectively receive remittances, foreign aid, and allocate sufficient funds to health insurance or social protection to mitigate the negative effects of economic uncertainty on households' consumption.

5. Conclusion and policy implications

International macroeconomic shocks such as the COVID-19 pandemic and the trade war between the United States and China, and more recently the Ukraine-Russia conflict, have rekindled the debate on the effects of uncertainty in the economic decision-making of firms and households. Through lower consumption, uncertainty affects the welfare of risk-averse households, threatens long-term growth, and could undermine the achievement of sustainable development goals, particularly in developing countries. This study contributes to the growing and non-consensus literature on the effects of economic uncertainty by examining its effects on household consumption growth in developing countries. We show that an increase in aggregate economic uncertainty reduces household consumption growth. Analyses using different samples suggest that the negative effect of overall economic uncertainty is borne by sub-Saharan Africa, Latin America, and upper middle-income countries. In addition, countries that have received debt relief under the Heavily Indebted Poor Countries initiative are more vulnerable to the effect of uncertainty on private consumption. This study also shows that remittances, foreign aid, and social protection moderate the negative effect of economic uncertainty on household consumption.

The results allow us to formulate some policy recommendations for the leaders of developing countries, particularly in sub-Saharan Africa and Latin America, that are suffering the deleterious effects of economic uncertainty due to COVID-19 and the Ukrainian crisis. We encourage the establishment of social protection mechanisms to enable households to meet their needs and make investments. The decline in household consumption due to uncertainty may have a negative impact on the achievement of the SDGs, particularly education, population health, food security and poverty. Social protection mechanisms should be more focused on protecting the most vulnerable households, with particular attention to those living in rural areas. This study also shows that there are thresholds for foreign aid (10.9% GNI) and remittances (8.6% GDP) that mitigate the negative effect of uncertainty on household consumption. Specifically, we also show that only 20 countries receive the amounts of remittances and nine countries the amount of foreign aid needed to mitigate the effects of uncertainty. The results highlight the need to implement tax breaks to facilitate remittances from sending to receiving countries to support households' consumption during uncertainty shocks. This measure should be particularly focused on SSA countries, which receive a smaller share of remittances and foreign aid than other developing regions. In addition, it is important to identify reliable partners to enable aid in recipient countries to reach private and public consumers. Improving governance is also a prerequisite for improving the effectiveness of foreign aid in recipient countries.

Although this study leads to relevant results and policy implications, it is not without limitations. The main shortcoming lies in the fact that official development assistance is an aggregate measure and does not specifically indicate the type of aid (sectoral aid) likely to be most effective in moderating the deleterious effect of uncertainty.

This study suggests a number of avenues for future research. One of the first avenues would be to examine the potential role of institutional quality, using the Fraser Institute's Index of Economic Freedom or the Heritage Foundation's Index of Economic Freedom. Continuing with this study, we could hypothesize a heterogeneous effect of economic uncertainty on household consumption. This would lead to use of the quantile-of-moments approach, which would take into account the heterogeneity of the distribution of household consumption in a large sample of countries. Research could also be undertaken to enrich the literature on the effects of economic uncertainty. Specifically, further studies may assume that economic uncertainty could affect capital flight in developing countries. The analysis of the effect of economic uncertainty on energy poverty would also be of interest in order to understand the implications of uncertainty shocks for the achievement of SDG 7. In the same vein, other studies could consider the effect of economic uncertainty on food security by examining the role of remittances or food aid.

CRediT authorship contribution statement

Joseph Keneck Massil: Visualization, Validation, Project administration. **Sosson Tadadjeu:** Writing – original draft, Investigation, Formal analysis, Data curation. **Urbain Thierry Yogo:** Writing – original draft, Validation, Methodology, Data curation, Conceptualization.

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Supplementary materials

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Data availability

Data will be made available on request.

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