

Economic Policy Uncertainty and the Structure of Household Consumption: Evidence from Chinese Province Panel Data(2015-2023)

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Abstract: This paper investigates the impact of Economic Policy Uncertainty (EPU) on the structure of household consumption in China. Using provincial panel data from 2015 to 2023 and a two-way fixed effects model, we analyze the heterogeneous effects of EPU on three consumption categories: food, education & culture, and healthcare. Results show that rising EPU significantly reduces the share of food expenditure while increasing the share of healthcare expenditure, with no statistically significant effect on education & culture spending. These findings, robust to alternative specifications, suggest that heightened policy uncertainty drives households to prioritize precautionary health spending over basic consumption upgrading. This study highlights the critical need for policy stability and a strengthened social safety net to mitigate uncertainty-driven distortions in household consumption patterns.

Keywords: Economic Policy Uncertainty (EPU); Consumption Structure; Panel Data; Precautionary Saving; China

1. Introduction

Economic policy uncertainty (EPU) has emerged as a pivotal determinant of global macroeconomic performance and microeconomic decision-making [1]. A well-established literature documents its contractionary effects on aggregate investment and consumption [2-3]. However, its influence on the internal composition of household consumption-how uncertainty reshapes the allocation of spending across necessity, developmental, and precautionary goods-remains a significant gap in our understanding. This gap is theoretically and politically important. Household consumption structure is not monolithic; different expenditure categories exhibit systematically different sensitivities to

economic shocks [4]. Understanding whether and how EPU induces a structural reallocation is crucial for designing policies that aim to stabilize expectations, safeguard welfare, and foster balanced growth of domestic demand.

China provides an ideal setting for this investigation. Its economy has experienced rapid transformation alongside notable fluctuations in measurable policy uncertainty [1]. Using a comprehensive provincial panel dataset from 2015-2023, this study examines how the China EPU index affects the budgetary shares of three pivotal consumption categories: food (a basic necessity), education & culture (a human capital investment), and healthcare (a quintessential precautionary good).

This paper makes three primary contributions. First, it moves beyond the analysis of aggregate consumption to rigorously examine structural shifts, thereby bridging the literature on EPU with the established framework of heterogeneous consumption dynamics [4]. Second, it provides timely and robust empirical evidence from the world's largest consumer market. Third, by identifying a strong reallocation toward healthcare spending, it links macro-level policy uncertainty to micro-level precautionary behavior rooted in health security concerns, a channel supported by related literature on insurance and saving [5,8].

2. Literature Review

2.1 Economic Policy Uncertainty and Aggregate Economic Activity

The seminal contribution of Baker et al. [1] in constructing a quantitative EPU index catalyzed empirical research into its real economic effects. A consensus has since formed that elevated EPU depresses business investment in the U.S. [2] and other economies, including China [6]. At the macroeconomic level, uncertainty shocks akin to EPU have been shown to reduce aggregate output and consumption [3]. While these studies

firmly establish EPU's aggregate dampening effect, they do not address its potential to alter the composition of economic activity, particularly at the household level.

2.2 The Microfoundations: Precautionary Saving under Uncertainty

The theoretical bedrock for analyzing household responses to uncertainty is the theory of precautionary saving. Carroll and Kimball [5] formally demonstrated that under convex marginal utility (prudence), future income uncertainty induces households to increase savings and depress current consumption. This theoretical prediction has been widely used to explain aggregate consumption cyclicality [7]. It implies that households facing uninsurable risks will not only save more but may also reallocate their remaining consumption toward goods that provide security against those specific risks.

2.3 Heterogeneity in Consumption Responses to Shocks

A separate but critical strand of literature emphasizes that consumption is not a single composite good. Different categories respond heterogeneously to aggregate shocks. For instance, Berger and Vavra [4] show that durable goods consumption is far more volatile and procyclical than non-durable consumption. This highlights the necessity of a disaggregated, structural analysis to fully understand how households adjust their budgets under stress. Our study applies this fundamental insight to a new type of shock-economic policy uncertainty.

2.4 Research Gap and This Study's Position

Despite the maturity of the three aforementioned literatures, they intersect only minimally. Specifically, whether and how EPU differentially affects the shares of necessity, developmental, and precautionary consumption

remains an open empirical question. This study fills this gap. We hypothesize, based on precautionary saving theory [5] and evidence linking health insurance to saving behavior [8], that EPU will particularly stimulate the share of healthcare expenditure—a direct form of self-insurance—while potentially suppressing more discretionary or upgradable consumption like food.

3. Data and Methodology

3.1 Data Sources

We construct a balanced panel dataset for 31 Chinese provinces from 2015 to 2023. Data on household consumption expenditure (by category), regional GDP, and population are sourced from the China Statistical Yearbooks. The provincial Consumer Price Index (CPI) is used to deflate nominal values. Our core explanatory variable, the China Economic Policy Uncertainty Index, is obtained from the database developed by Baker et al. [1] and aggregated to an annual frequency.

3.2 Variable Construction

- 1) Dependent Variables: Three expenditure shares:
 - a) Food Share (food_ratio): Percentage of total consumption spent on food, tobacco, and alcohol.
 - b) Education & Culture Share (edu_culture_ratio): Percentage spent on education, cultural, and recreational services.
 - c) Healthcare Share (medical_ratio): Percentage spent on healthcare products and services.
- d) Core Explanatory Variable: Annual Economic Policy Uncertainty Index (epu).
- e) Control Variables: Log of per capita GDP (ln_gdp_pc) to control for income levels and the Consumer Price Index (cpi). Province and year fixed effects are included in all specifications.

Table 1. Variable Definition and Data Sources

Variable Type	Variable Name	Variable Symbol	Definition	Data Source
Dependent Variables	Food Consumption Share	food_ratio	Ratio of food, tobacco, and alcohol expenditure to total household consumption expenditure (<100%)	"China Statistical Yearbooks" (2015–2023); Provincial Bureau of Statistics
Dependent Variables	Education & Culture Consumption Share	edu_culture_ratio	Ratio of education, culture, and recreation expenditure to total household consumption expenditure (<100%)	"China Statistical Yearbooks" (2015–2023); Provincial Bureau of Statistics
Dependent Variables	Healthcare Consumption Share	medical_ratio	Ratio of healthcare products and services expenditure to total household consumption expenditure	"China Statistical Yearbooks" (2015–2023); Provincial Bureau of Statistics

			(<100%)	
Core Explanatory Variable	Economic Policy Uncertainty	epu	Annual average of monthly China Economic Policy Uncertainty Index, constructed based on newspaper coverage frequency	Policy Uncertainty Website (Baker et al. 2016) [http://www.policyuncertainty.com]
Control Variable	Per Capita Gross Regional Product	gdp_per_capita	Gross regional product (10,000 RMB) divided by year-end permanent population (10,000 people), reflecting regional economic development level	“China Statistical Yearbooks” (2015–2023); National Bureau of Statistics
Lagged Variable (Robustness)	One-period Lagged EPU	l_epu	One-period lag value of the core explanatory variable “epu”	Policy Uncertainty Website (Baker et al. 2016) [http://www.policyuncertainty.com]

Notes: 1. All data are balanced panel data covering 31 provincial administrative regions in China from 2015 to 2023. 2. Missing data for individual provinces in specific years are supplemented by linear interpolation to ensure data integrity. 3. The EPU index is constructed by Baker et al. (2016) and has been widely used in studies on economic policy uncertainty in China.

3.3 Empirical Model

We employ the following two-way fixed effects model:

$$Share_{it} = \beta_0 + \beta_1 EPU_{it} + \beta_2 \ln(GDPpc)_{it} + \beta_3 CPI_{it} + \mu_i + \lambda_t + \epsilon_{it} \quad (1)$$

where $Share_{it}$ is the consumption share for province i in year t . μ_i and λ_t are province and year fixed effects. Standard errors are clustered at the province level.

4. Empirical Results

4.1 Descriptive Statistics

Table 2 presents summary statistics. The average food share is 29.97%, education & culture share is 10.74%, and healthcare share is 8.82%. The EPU index shows substantial variation (mean=260.60, sd=94.73), confirming significant policy uncertainty fluctuations during

the sample period.

4.2 Baseline Regression Results

1) Table 3 reports the baseline two-way fixed effects estimates. The results reveal a clear and significant structural reallocation:

a) Food Share: A one-unit increase in the EPU index is associated with a 0.0053 percentage point decrease in the food expenditure share (significant at the 1% level). This suggests households compress basic, potentially upgradable consumption when policy uncertainty rises.

b) Healthcare Share: Conversely, the same increase in EPU leads to a 0.0038 percentage point increase in the healthcare share (significant at the 1% level). This provides strong support for the precautionary motive, indicating households actively allocate more resources to health security.

Table 2. Descriptive Statistics

Variable Name	Variable Symbol	Observations	Mean	Std. Dev.	Minimum	Maximum
Food Consumption Share	food ratio	278	29.97	4.02	19.72	48.62
Education & Culture Share	edu culture ratio	278	10.74	1.86	3.81	16.35
Healthcare Consumption Share	medical ratio	278	8.82	2.02	2.63	13.57
Economic Policy Uncertainty	epu	279	260.60	94.73	92.11	390.39
Per Capita GDP (10k-RMB)	gdp_per_capita	279	6.97	3.28	2.86	20.02
One-period Lagged EPU	l_epu	279	238.92	106.97	92.11	390.39

Table 3. Baseline Regression Results: The Impact of EPU on Consumption Structure

Explanatory Variable	(1) Food Share	(2) Education & Culture Share	(3) Healthcare Share
Economic Policy Uncertainty(epu)	-0.0053*** (0.0017).	-0.0010(0.0006).	0.0038*** (0.0006).
Per Capita GDP (gdp_per_capita)	0.1171** (0.0675).	-0.2177*** (0.0629).	0.1875*** (0.0331).
Constant.	30.5466*** (0.6782).	12.5189*** (0.4255).	6.5084*** (0.2356).
Province Fixed Effects	Controlled.	Controlled.	Controlled.
Year Fixed Effects	Controlled.	Controlled.	Controlled.
Observations.	278.	278.	278.
Within R ² .	0.0801.	0.1512.	0.5076.

Notes: Robust standard errors clustered at the provincial level are reported in parentheses. ***p<0.01, **p<0.05, *p<0.1.

Table 4. Robustness Check Results

Test Method	Dependent Variable	Core Explanatory Variable	Coefficient (Robust Std. Err.)	P-value	Observations	Within R ²
Lagged Explanatory Variable	Food Share	One-period Lagged EPU (1 epu)	-0.0018 (0.0019)	0.37 8	278	0.0725
Lagged Explanatory Variable	Healthcare Share	One-period Lagged EPU (1 epu)	0.0032***(0.0007)	0.00 0	278	0.4981
1% Winsorization of EPU	Food Share	Winsorized EPU	-0.0053***(0.0017)	0.00 4	278	0.0801
1% Winsorization of EPU	Healthcare Share	Winsorized EPU	0.0038***(0.0006)	0.00 0	278	0.5076

Notes: All regressions control for per capita GDP, province fixed effects, and year fixed effects. Robust standard errors clustered at the provincial level are reported in parentheses. ***p<0.01, **p<0.05, *p<0.1. Winsorization is applied to the EPU index to mitigate the impact of outliers.

c) Education & Culture Share: The coefficient is negative but statistically insignificant, likely reflecting the long-term, planned nature of such investments, which are less sensitive to short-term policy fluctuations.

4.3 Robustness Checks

1) To ensure our baseline findings are not driven by model specification or extreme values, we conduct two robustness checks:

a) Employing a one-period lag of the EPU index to address potential reverse causality.

b) Winsorizing the EPU index at the 1% level to mitigate the influence of outliers. The results are summarized in Table 4.

The results in Table 4 confirm the robustness of our core findings. First, when confirm the robustness of our core findings. First, when using the one-period lagged EPU, its positive effect on the healthcare share remains statistically significant at the 1% level (coeff. = 0.0032), closely mirroring the baseline estimate. This indicates that the stimulative effect of policy uncertainty on precautionary health spending is persistent and not merely a contemporaneous correlation.

Second, the effect of lagged EPU on the food share becomes statistically insignificant. This pattern suggests that the compression of basic food expenditure is a more immediate and short-lived adjustment to a current uncertainty shock. In contrast, the increase in healthcare spending represents a more deliberate and sustained behavioral response that continues into the subsequent period.

Finally, winsorizing the EPU index at the 1% level to trim extreme values yields coefficients for both food (-0.0053) and healthcare (0.0038) shares that are virtually identical to our baseline results in both magnitude and statistical significance. This confirms that our core conclusions are not driven by outliers in the

policy uncertainty measure.

In summary, these robustness checks solidify our main inference: economic policy uncertainty reliably triggers a significant reallocation of household budgets, consistently stimulating healthcare expenditure while exerting a more immediate negative effect on food spending that may attenuate over time.

5. Conclusion and Policy Implications

This study provides robust empirical evidence that economic policy uncertainty (EPU) systematically reshapes the structure of household consumption in China. Utilizing provincial panel data from 2014 to 2023 and a two-way fixed effects model, we find that rising EPU triggers a strategic reallocation of the household budget: it significantly suppresses the share of food expenditure while stimulating the share of healthcare spending, with no statistically significant effect on education and culture expenditure. Robustness checks confirm that the positive effect on healthcare is persistent (surviving a one-period lag), while the negative effect on food is more immediate, and neither finding is driven by outliers.

Our research makes a distinct contribution by bridging three strands of literature: the study of EPU's macroeconomic impacts [1-3], the established framework of heterogeneous consumption dynamics [4], and the micro-founded theory of precautionary saving under uncertainty [5,7]. We demonstrate that EPU is not merely an aggregate demand shock but a force that distorts consumption composition, specifically by strengthening the precautionary motive for health security—a behavioral channel supported by related research on health insurance.

1) The findings carry direct and important implications for policymakers:

a) *Policy Stability as a Foundational Public*

Good: The documented sensitivity of consumption structure to EPU underscores that clear, consistent, and predictable economic governance is a direct contributor to household welfare. Governments should prioritize transparent communication and forward guidance to manage expectations and reduce the uncertainty tax on household consumption upgrading.

b) *Strengthening the Social Safety Net, Particularly in Health:* The robust, persistent rise in healthcare spending under uncertainty reveals a strong latent demand for security. This highlights the critical role of a reliable and comprehensive public health system. Enhancing social health insurance coverage and depth, as evidenced in other contexts [8], can reduce households' perceived need for costly self-insurance through precautionary saving, thereby freeing up income for other welfare-enhancing consumption and reducing vulnerability to policy shocks.

c) *Differentiated Macro-Stabilization and Consumption Promotion Policies:* Stimulus measures should account for the heterogeneous sensitivity of consumption categories. Policies could be designed to simultaneously support quality upgrading in more discretionary sectors (e.g., green and digital consumption, quality food products) while ensuring the healthcare system has the capacity to meet rising, uncertainty-driven demand without imposing excessive out-of-pocket burdens.

A primary limitation of this study is its reliance on aggregate provincial data, which masks heterogeneity across income groups, age cohorts, and the urban-rural divide. Future research using household-level microdata could fruitfully explore these distributional effects and better disentangle the precise mechanisms—such as changes in risk perception versus liquidity constraints—linking policy uncertainty to specific consumption choices. Extending this structural analysis to other economies would also help

establish the generalizability of the patterns identified here.

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