An Empirical Analysis of Fiscal Illusion Using Subjective Well-being Data[*]

Kohei Kiya[1]

Abstract

Most developed countries experienced increased public debt even before the COVID-19 pandemic. One of the theories that explain the increase in public debt is the theory of "fiscal illusion." The idea of the fiscal illusion is that people prefer higher government spending than optimal because of people's systematic misperception of the cost of public goods. Sources of the misperceptions are, for example, the complexity of the revenue structure and debt financing.

There is a wide variety of existing literature that empirically examines the illusion. Most of the literature uses a measure of fiscal illusion, such as the Herfindahl index for revenue complexity, and explores how the index is related to actual government spending. Although the discussion is ongoing, clear evidence of fiscal illusion has yet to be established. Additionally, even though some studies support the relationship between government spending and illusion indices, it is still unsure if the fiscal illusion mediates the observed relationship. The "illusion" is a matter of perception and preference. The existing studies skip the process of how illusion affects people's preferences. To identify the existence of the illusion, we need to examine people's preferences for government spending directly. This paper directly examines the fiscal illusion, using data on government expenditures and life satisfaction from OECD countries. I regress individual life satisfaction on explanatory variables, including an interaction term between government expenditure and a measure of the illusion. Then, I derive the marginal effects of government expenditures on life satisfaction and examine how they differ by the degrees of the illusion index. If the illusion exists, the higher the illusion index is, the greater the marginal effects are. This paper provides new empirical evidence on fiscal illusion.

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[1] Department of Industrial Information, Junior College Division, University of Aizu, Fukushima, Japan. kiya@jc.u-aizu.ac.jp

1. Introduction

Public debt has risen in most developed countries over the last four decades. Certain countries, such as Japan, have accumulated debts to a level that is considered "unsustainable" (IMF 2020). To understand why certain countries accumulate public debt, we need to adopt political economy approaches (Alesina and Perotti 1995), which provide a range of models to explain the persistent budget deficit. One such model is "fiscal illusion." It assumes that revenue structure makes people underestimate the costs of public goods and services through misperceptions and prefer greater government size (Wagner 1976). There are five sources of misperception: a complex revenue structure, renter illusion on property taxes, income elasticity of the tax structure, debt illusion, and the flypaper effect (Oates 1988).

The complex revenue structure hypothesis has received significant attention in empirical research. However, to the best of my knowledge, no prior empirical study has found clear evidence of the illusion yet. Most previous studies examine the relationship between revenue complexity measures, such as the Herfindahl index of the revenue structure and the size of government expenditure. This approach, which Wagner (1976) first proposed and has been followed by many researchers, has been criticized for not being able to exclude possibilities of other hypotheses. For example, on "revenue diversification," Oates (1988) argues that governments that intend to increase state spending create another revenue source rather than raise revenue from existing sources. This behavior is because greater reliance on specific sources causes consumers or businesses with a higher tax burden to avoid shopping or investment in the jurisdiction. Another criticism of the revenue complexity approach concerns "fiscal stress." Misiolek and Elder (1988) suggest that a government with greater expenditure diversifies its revenue sources to stabilize revenue. Their empirical study in the U.S. supports the fiscal stress hypothesis rather than the fiscal illusion. Since fiscal illusion is a matter of people's preferences, we cannot exclude these alternative hypotheses without directly examining the preferences. Because of the fundamental difficulty of such an empirical analysis, even though the concept of fiscal illusion is widely recognized and mentioned in academic research and policy papers, new empirical evidence on this topic has been limited in recent years.

To test the fiscal illusion hypothesis, this study proposes a different approach, which employs subjective well-being (SWB) data to examine people's preferences about government spending directly. Many empirical studies have used SWB data, such as self-reported happiness and life satisfaction, to explore people's preferences. For example, Frey and Stutzer (1999) suggest that SWB helps capture individual preferences. Di Tella, MacCulloch, and Oswald (2001) use happiness data to examine people's preferences about inflation and unemployment. Kotakorpi and Laamanen (2010) use SWB to examine people's preferences about public healthcare expenditure. Kiya (2012) examines how government revenue and expenditure structures are related to SWB

by using U.S. microdata and discusses people's preferences about the structures.

This study examines how the impact of government spending on individual life satisfaction differs by the degree of a fiscal illusion variable. The effect is estimated by a model that includes an interaction term between government spending and a measure of fiscal illusion. This empirical strategy enables us to address the criticisms by Oates (1988) and Misiolek and Elder (1988). Neither revenue stabilization nor revenue stress is a matter of people's perceptions. For example, even when a government diversifies its revenue sources for revenue stabilization, as long as people's perceptions of public service costs are precise, they do not prefer greater government spending.

The hypothesis of this paper is as follows:

H: Where the country's fiscal illusion is greater, there is a positive relationship between government spending and subjective well-being.

Suppose life satisfaction is higher with greater government expenditure under a more complex revenue structure. That means people prefer greater government expenditure under a higher degree of illusion, which would be clear evidence of fiscal illusion.

2. Data and Estimation Strategy

This study uses life satisfaction data from the "Integrated Values Surveys (IVS) dataset 1981-2022" to examine how people's preferences about government spending differ by revenue complexity. The life satisfaction data is given as an answer to the question, "All things considered, how satisfied are you with your life as a whole these days?" The answer takes an integer value between 1 and 10, where one is "dissatisfied" and ten is "satisfied." While the IVS data covers 120 countries/ territories from 1981 to 2022, this study limits the samples to OECD countries because our interest is in debt accumulation in developed countries. The sample period for the analysis is 1995–2018 due to the availability of control variable data.

Using the SWB data, this study estimates a model with an interaction term between revenue complexity and government expenditures to examine how people's preferences about government expenditures differ by complexity. The model is

$$SWB_{ict} = \beta_0 + \beta_1 GovtExp_{ct} + \beta_2 Illusion_{ct} + \beta_3 GovtExp_{ct} * Illusion_{ct} + \beta_4 Macro_{ct} + \beta_5 Individual_{ict} + \beta_3 Country_c + \beta_4 Year_t + \varepsilon_{ict}$$

where *SWB* is the life satisfaction of individual *i* at county *c* in year *t*. *GovtExp* is government expenditure as a percentage of GDP. *Illusion* is a measure of revenue complexity, the Herfindahl index, as explained below. $GovtExp_{it} * Illusion_{it}$ is an interaction term between government

size and the measure of revenue complexity. *Macro* contains variables to control a country's socio-economic characteristics. They are the log of GDP per capita, GDP growth, inflation rate, and unemployment rate by following prior research on the relationship between SWB and government spending. Individual level control variables, *Individual*, are gender, age, marital status, occupation, number of children, education level, and household income level. This choice of individual-level control variables also follows the existing literature. *Country* is a country fixed effect. It is expected to control for unobservable country characteristics. *Year* contains year dummies. ε_it is a usual error term. Although the dependent variable is ordinal, this study estimates the model by OLS for simplicity of interpretation.

The variables of interest are government spending, revenue complexity, and their interaction term. Using coefficients on the variables, I calculate the marginal effects of government spending given various levels of revenue complexity. If the fiscal illusion hypothesis is true, the marginal effects should be greater and statistically significant with a more complex revenue structure.

This paper employs various government expenditures from two datasets provided by OECD: the Social Expenditure (SOXC) Database and the Public Finance Dataset. The former dataset includes only "social" expenditure, which satisfies two criteria: (i) "the benefits aim to address one or more social purposes," and (ii) "programmes regulating the provision of benefits have to involve either (a) inter-personal redistribution, or (b) compulsory participation." The latter datasets are based on national accounts data and classify categories using a mixture of functions and transactions.

The revenue complexity is measured by the Herfindahl index. The index is the most popular measure of revenue complexity in prior research. The index is calculated by squaring each revenue category's share of total revenue and summing the numbers. The revenue categories are taxes on individuals, taxes on corporations and other enterprises, taxes on payroll and workforce, taxes on property, taxes on goods and services, taxes on international trade and transactions, other taxes, nontax revenue, and social contributions. A lower value of the index means a more complex revenue structure.

3. Results and Discussion

Table 1 reports the estimation results for total government expenditure and its components, which use data from the Public Finance dataset. Column 1 uses the total expenditure of the general government, and Columns 2-12 use each category of the spending. The last column adds all the categories in the estimation equation. In the last column, the interaction terms for health, as well as sickness and disability, have a negative and significant coefficient, which means that the effect (i.e., slope) of the spending on life satisfaction decreases with higher values of the Herfindahl index.

Table 1: Estimation Results Using Public Finance Dataset

Dependent Variable: Avg. Life Evaluation	(1) Total Government	(2) Education	(3) Health	(4) Other Wages	(5) Old-age &Survivors	(6) Sickness & Disability	(7) Unemployed Benefits	(8) Family & Children	(9) Subsidies	(10) Investment	(11) Other Primary	(12) Property Income Paid	(13) All categories
Herfindahl Index	-23.62*	-20.15	-7.942	-22.30	-8.026	5.582	-11.21***	-12.44*	-8.918	-23.49**	-12.81*	-7.720	-1.385
	(13.52)	(18.71)	(12.77)	(14.37)	(9.989)	(4.285)	(3.859)	(6.818)	(5.458)	(11.31)	(6.733)	(6.095)	(16.92)
Total Expenditure (% of GDP)	-0.0399												
	(0.0602)												
Total Expenditure*Herfindahl Index	0.309												
	(0.275)												
Education (% of GDP)		-0.332											-1.525
		(0.828)											(1.171)
Education*Herfindahl Index		1.682											6.891
		(3.572)											(4.936)
Health (% of GDP)			0.249										1.050**
			(0.389)										(0.411)
Health*Herfindahl Index			-0.703										-4.483**
			(1.689)										(1.761)
Other Wages & Intermediate Consumption (% of GDP)				-0.240									-0.503
				(0.295)									(0.435)
Other Wages & Intermediate Consumption*Herfindahl Index				1.011									2.035
				(1.252)									(1.898)
Old-age &Survivors (% of GDP)					0.126								0.250
					(0.230)								(0.265)
Old-age &Survivors*Herfindahl Index					-0.472								-0.983
					(1.014)								(1.152)
Sickness & Disability (% of GDP)						1.865***							1.550***
						(0.393)							(0.504)
Sickness & Disability*Herfindahl Index						-7.624***							-6.033***
						(1.599)							(2.187)
Unemployment (% of GDP)							0.394						-0.391
							(0.494)						(0.592)
Unemployment*Herfindahl Index							-0.891						2.703
							(1.741)						(2.674)
Family & Children (% of GDP)								0.316					0.614
								(0.665)					(0.727)
Family & Children*Herfindahl Index								-0.859					-3.047
								(2.802)					(2.931)
Subsidies (% of GDP)									-0.785**				0.964
									(0.297)				(1.044)
Subsidies*Herfindahl Index									3.726***				-4.402
									(1.130)				(4.606)
Investment (% of GDP)										-1.067*			-0.812*
										(0.566)			(0.469)
Investment*Herfindahl Index										4.868*			3.309
										(2.515)			(2.060)
Other Primary Expenditure (% of GDP)											0.0217		0.636
											(0.249)		(0.514)
Other Primary Expenditure*Herfindahl Index											0.228		-2.640
											(1.165)		(2.275)
Property Income Paid (inc. interest payments, % of GDP)												-0.0762	0.210
												(0.212)	(0.305)
Property Income Paid*Herfindahl Index												0.343	-1.571
												(0.923)	(1.428)
Log GDP per capita	0.630	0.997**	1.087**	0.846**	0.717	0.645*	0.576	0.379	1.018***	0.730*	0.396	0.972**	0.153
	(0.393)	(0.396)	(0.405)	(0.393)	(0.429)	(0.367)	(0.386)	(0.401)	(0.325)	(0.401)	(0.412)	(0.374)	(0.418)
Real GDP Growth	0.0153**	0.0109*	0.0141*	0.0111*	0.00892	0.0154**	0.0155**	0.00881	0.0127*	0.0143*	0.0141**	0.0171**	0.0177**
	(0.00729)	(0.00629)	(0.00701)	(0.00604)	(0.00641)	(0.00672)	(0.00710)	(0.00618)	(0.00658)	(0.00780)	(0.00687)	(0.00719)	(0.00759)
Unemployment rate	-0.0332**	-0.0317**	-0.0272**	-0.0313**	-0.0347**	-0.0343**	-0.0385**	-0.0364**	-0.0270**	-0.0187	-0.0334**	-0.0254**	-0.0474***
	(0.0146)	(0.0130)	(0.0111)	(0.0127)	(0.0139)	(0.0114)	(0.0163)	(0.0133)	(0.0109)	(0.0146)	(0.0150)	(0.00974)	(0.0117)
Inflation rate	-0.0881***	-0.0851***	-0.0834***	-0.0848***	-0.0870***	-0.0937***	-0.0665***	-0.0997***	-0.0699***	-0.0731***	-0.0935***	-0.0737***	-0.102***
	(0.0154)	(0.0210)	(0.0203)	(0.0194)	(0.0224)	(0.0195)	(0.0150)	(0.0242)	(0.0197)	(0.0179)	(0.0208)	(0.0175)	(0.0110)
Constant	5.108	1.302	-2.689	3.669	1.641	-1.140	3.699	5.773	-0.904	5.373	6.149	-0.611	6.473
	(5.302)	(6.980)	(6.137)	(6.314)	(4.850)	(4.153)	(4.456)	(6.637)	(4.071)	(5.811)	(5.126)	(4.293)	(4.893)
Observations	123,040	128,877	128,877	128,877	129,118	129,118	126,164	127,065	140,818	140,818	123,040	140,818	123,040
Adjusted R-squared	0.139	0.153	0.153	0.153	0.152	0.153	0.150	0.142	0.153	0.153	0.139	0.152	0.141

*** p<0.01, ** p<0.05, * p<0.1
Cluster robust standard errors at country level in parentheses.
All estimations include individual level control variables, year dummies and country dummies.

Using the coefficients in the last column, I calculate the marginal effects of health expenditure on life satisfaction for given values of the index. Figure 1 presents the marginal effects with 95% confidence intervals. It shows a positive and statistically significant impact of the expenditure when the Herfindahl index is low. I obtain similar results for sickness and

Figure 1: Marginal Effects of Health

disability expenditure. The results indicate that life satisfaction is higher with greater government spending when the revenue structure is complex. This result supports the fiscal illusion hypothesis.
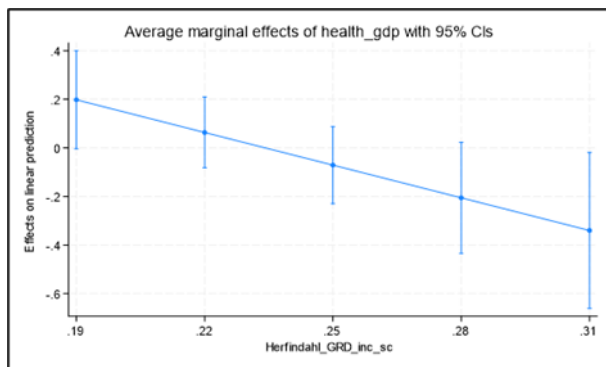
I also estimate the model with the Social Expenditure dataset, although I do not present the results due to space constraints in this preliminary draft. The results also show that the marginal

effects of some categories of government spending are greater when the Herfindahl Index is low, supporting the fiscal illusion hypothesis.

4. Conclusion

This study aimed to empirically examine fiscal illusion by using SWB data. Although the concept of fiscal illusion has a long history, to the best of my knowledge, no clear evidence has been provided because it is difficult to directly analyze people's preferences about government spending. The results of this study suggest that people prefer greater government spending when the revenue structure is complex. This supports the existence of fiscal illusion.

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