INCOME INEQUALITY, WORLD UNCERTAINTY AND DEVELOPING COUNTRIES' SELF-FINANCING CAPACITY[*]

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This paper examines the effect of uncertainty on income inequality on a dataset of 66 developing countries over the period 2000-2020. The generalized method of moments is used to address the problems of simultaneity and endogeneity. Our robust results show that uncertainty, approximated by the World Uncertainty Index, increases income inequality. However, this effect is not robust and depends on the capacity of a country to finance public spending with its own resources. Indeed, world uncertainty exacerbates income inequality in developing countries during periods when they need financing. However, during periods when countries are in a situation of self-financing capacity, the amplifying effect of uncertainty on income inequality is mitigated. Indeed, the improvement in the capacity of a country to finance public spending with its own resources contributes to reducing income inequalities. These results confirm the socio-economic stabilizing role that fiscal policy management could play during periods of uncertainty.

Keywords: Uncertainty, Income Inequality, Fiscal Policy Management, Developing Countries
JEL Classification: O11, E62, P36

1. INTRODUCTION

Since the recession of 2009, the literature on uncertainty has been growing and providing many lessons to public and private decision-makers on how they can handle its worse effects. This last decade, the Brexit, the COVID-19 pandemic, trade wars and conflicts between countries raised uncertainty to a higher level never recorded before

and there is no more doubt about its damaging effects on economies. Indeed, according to Bloom (2014), uncertainty can affect economic activity through three main channels: real-options effects, risk-premium effects, and precautionary-savings effects. Regarding the real-options effects, firms or companies become more cautious when decisions are costly to revert, delaying hiring and investments while they wait for more information (Bernanke, 1983; Dixit et al., 1994). Regarding risk-premium effects, an increase in uncertainty raises the probability of default and, consequently, the risk in the financial market (Christiano et al., 2014). Like firms, households that are unsure about future income, postpone consumption particularly of durable goods, as a precautionary measure (Romer, 1990).

Therefore, in times of high uncertainty, investment and spending become less attractive to the average economic agents, leading them to postpone their consumption and investment decisions (Bernanke, 1984; Bloom, 2009, 2014; Christiano et al., 2014; Pástor and Veronesi, 2012). Furthermore, the negative effects of uncertainty can be a reason to suspend reforms and development programs in a country or a region. Indeed, according to Fernandez and Rodrick (1991) and Alesina and Drazen (1991), uncertainty can be a brake on the progress of economic reforms and programs in countries that do not have budget surpluses and effective economic instruments to deal with its perverse effects. During periods of high uncertainty, some countries, especially developing countries, without budget surpluses and in a situation of indebtedness, are often forced to suspend momently their economic development programs. Many developing countries, especially in Africa, have suspended their economic and development programs between 2020 and 2023 because of the negative economic repercussions of the COVID-19 pandemic and the war between Russia and Ukraine, to be more focused on resilience and economic recovery. Overall, uncertainty can affect negatively the whole economy by slowing economic growth (Bernanke, 1983; Bloom, 2009). It is why the factor "uncertainty" is and should be seriously considered by economic agents in their decisions.

If the effect of uncertainty on economic activity is carefully analyzed within the literature, it can be noticed that its distributional effects, especially in developing countries, have received little attention. Despite the growing attention of both economists and policymakers on the issue, little effort has been devoted to studying the effect of uncertainty on public choices, especially on income inequalities in developing countries. Such an omission is unfortunate, particularly for developing countries, where the analysis of the effects of uncertainty could enable private and public decision-makers to carry out reforms to reduce or avoid the economic and social losses caused by uncertainty (Bonfiglioli et al., 2022).

Uncertainty can affect income inequality. Indeed, as uncertainty affects asset prices, its impact on wealthy and poor households is not homogenous. Wealthy households are often more resilient to uncertainty shocks than poor households. This reality contributes to increasing income inequality if measures are not carried out by policymakers to support poor households. Despite the weak literature on the topic, it has been proved in the literature that this effect can depend on factors such as education for instance

(Brueckner and Vespignani, 2017). Indeed, for Brueckner and Vespignani (2017), the effect of uncertainty on income inequality depends on the ability of the population to anticipate events that can affect economic activity. For them, in a country where only a small share of the population is educated, an increase in uncertainty is associated with a significant increase in income inequality. Wealthy households (the small share of the population), which are most of the time more educated, are often more resilient than poor and vulnerable households to uncertainty shocks because they can anticipate events that could affect negatively economic activity. But for the large share of the population composed of poor, vulnerable, and middle-income households, and without a high level of education, it would be difficult to anticipate uncertain events that could affect them economically and socially. Then, during periods of uncertainty, the consequence will be the accentuation of income inequalities, especially when economic and social measures such as cash transfers, subsidies for necessities, tax breaks and banking facilities for instance, are not taken by policymakers in favor of the large share of the population.

In this analysis, we assume that uncertainty can affect income inequality in developing countries, however, this effect in a country could vary depending on its capacity or not, to finance public spending with its own resources. We also assume that during periods when countries can self-finance public spending, the effect of world uncertainty on income inequality could be different from that during periods when countries require financing. Indeed, According to Bénassy-Quéré et al. (2016) and Kebalo and Zouri (2024), when a developing country presents a fiscal surplus or can self-finance its public spending, it is more reactive in the adoption of measures and precisely countercyclical policies to mitigate the adverse effects of uncertainty. It is not the case for a country which presents fiscal deficits during periods when negative effects of uncertainty occur. Most of the time, in this situation, the country becomes less reactive and then adopts cyclical policies which can amplify the negative effects of uncertainty.

In this paper, we examine four different effects. Firstly, we examine the effect of world uncertainty on income inequality in developing countries. Secondly, the effect on income inequality of countries' capacity to finance public spending with their own resources is analyzed. Finally, we examine the effects (two) of world uncertainty during periods when developing countries are able or not to self-finance their public spending.

The contribution of this paper is threefold. First, we use an innovative measure of uncertainty which is a subjective feeling about the economy and is therefore not directly observable. We use the innovative measure of uncertainty developed by Ahir et al. (2022): the World Uncertainty Index. This index is superior in quality to other measures of uncertainty because it is the first comparable uncertainty index across developing, developed, and emerging countries, and it includes both political and economic uncertainties. Second, comparatively to the literature, we focus our analysis on the effect on income inequality of countries' ability to self-finance, not with external resources, public expenditures which have three objectives: allocation, distribution and stabilization. Third, we perform a robustness analysis to be sure that our results are consistent.

Given data availability, our analysis is performed on a panel set of 66 developing countries and covers the period 2000-2020. To obtain reliable results, the generalized method of moments (GMM) is used to address the problems of simultaneity and endogeneity.

After estimations, our results show that uncertainty increases income inequality. However, the effect is not robust and depends on the capacity of a country to finance public spending with its own resources. For a developing country, a deterioration in its capacity to self-finance public spending (an improvement in its capacity to self-finance public spending) contributes to exacerbating (respectively reducing) income inequality in developing countries. Our analysis shows that during periods of uncertainty, having primary fiscal surpluses helps countries to mitigate the negative effects of uncertainty on wealth distribution, and therefore, contributes to reducing income inequality. However, for countries with primary fiscal deficits, and less fiscally disciplined, uncertainty contributes to increasing income inequality. Moreover, results show that an improvement in the capacity of a country to self-finance public spending contributes to reducing income inequalities.

The remainder of the paper is organized as follows. Section 2 describes the data and discusses the estimation strategy. Section 3 presents and discusses our results. Finally, Section 4 concludes the research.

2.   DATA AND METHODOLOGY

This section highlights the data used and describes the methodology mobilized. It also introduces specific stylized facts to provide deeper insights into the behavior of our variables and their relationship.

2.1.   Data and Source

The data used have been compiled from different sources that have been merged into an original and unique dataset. Due to data availability, we consider 66 developing countries, and the econometric analysis focuses on the period 2000-2020. A summary of all data can be found in Table 1. While the uncertainty data, originally recorded quarterly, have been converted to an annual frequency, the rest of the data were initially collected on an annual basis.
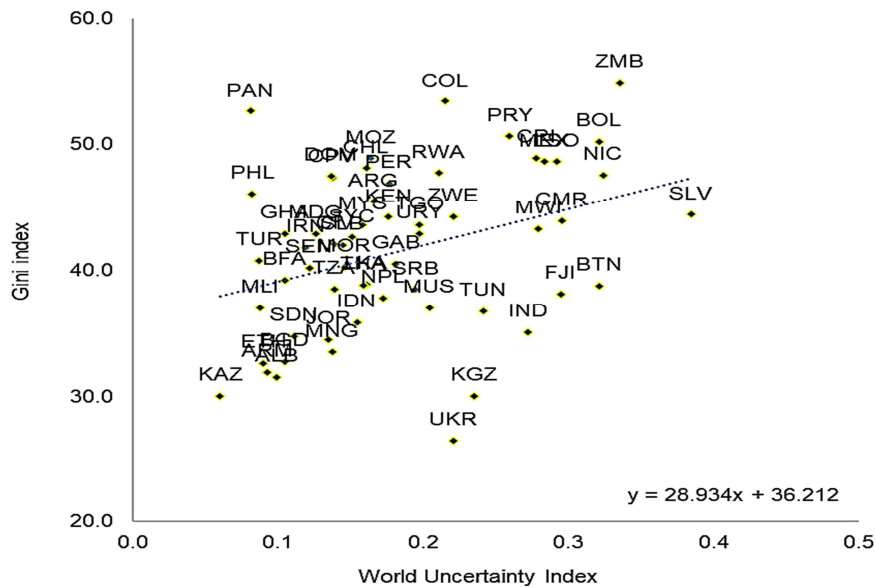
2.1.1.   Measure of Income Inequality

For income inequality, we use the Gini index (Obiakor et al., 2022; Thye et al., 2021). The index takes values between 0 (perfect equality) and 1 (perfect inequality). To

deal with the missing values, we assume a five-year invariance of the Gini index according to Ametoglo et al. (2018) and Kebalo et al. (2022).

2.1.2. Measure of Uncertainty

Uncertainty, as defined by Knight (1921), refers to the inability to determine the probability of events, implying a total lack of knowledge regarding future occurrences. Consequently, economic uncertainty manifests as the incapacity to predict future economic conditions, often illustrated by discrepancies in expert forecasts for economic variables. In this research, we use the World Uncertainty Index (WUI) to measure this uncertainty. It assesses the level of uncertainty in countries across the World. This suitable index is proposed by Ahir et al. (2022) who constructed quarterly indices of economic uncertainty for 143 developing, developed and emerging countries from 1996 onwards using frequency counts of "uncertainty" and its variants in the quarterly Economist Intelligence Unit (EIU) country reports. The EIU quarterly reports discuss key political and economic developments in each country, as well as analyses and forecasts of political, policy, and economic conditions.

Source: Author with data from World Bank and https://worlduncertaintyindex.com/.

Figure 1.   Correlation between World Uncertainty and Income Inequality in
Developing Countries (Average 2000-2020)

According to Ahir et al. (2022), the WUI is superior to other uncertainty measures (Economic Policy Uncertainty index, the Trade Policy Uncertainty index) since it is the first uncertainty index constructed for a panel dataset of developed, emerging, and developing countries. In short, the novelty of the WUI is that it is the first uncertainty index, which is comparable across countries. To make the WUI comparable across countries, the raw counts are scaled by the total number of words in each EIU report.

Figure 1 shows a positive relationship between the world uncertainty index and the Gini index, therefore a positive relationship between global uncertainty and income inequality in developing countries. As seen in the Figure, in general, income inequalities increase as uncertainty increases. Uncertainty appears therefore like a potential factor that can contribute to the increase of income inequality in countries and the World.

2.1.3.   Primary Fiscal Balance

The primary fiscal balance of a country measures its capacity to finance public spending with its own resources, i.e. without donations or grants. This variable reflects the short-term sustainability of public finances, as it demonstrates to what extent a country can meet its financial obligations optimally without causing fiscal stress (Daniel, 2006). We think that countries with a positive primary fiscal balance have greater flexibility to respond to economic shocks. They can increase public spending or reduce taxes during recessions without exacerbating public debt, thereby stabilizing the economy and reducing income inequality.

Two different primary fiscal balances can be calculated. The first one is the basic primary fiscal balance (PFB^{basic}) which is obtained as follows:

$$PFB^{basic} = Revenue\ without\ grants - spending\ (without\ debt\ charges). \qquad (1)$$

The second one is the global primary fiscal balance (PFB^{global}) which is obtained as follows:

$$PFB^{global} = Revenue\ without\ grants - (spending\ +\ debt\ charges). \qquad (2)$$

PFB^{global} expresses the capacity of a country to finance all spending, including debt charges (interests on public debt) with its own resources. However, PFB^{basic} reflects the real fiscal space, i.e. the capacity of a country to finance only its current and capital spending. Indeed, by not considering the public debt burden, the indicator shows the real capacity of a country to respond to its internal commitments. Indeed, interest on public debt is an additional charge that countries have to pay with their resources.

Figure 2 presents three scatters, illustrating respectively the relationships between income inequality (Gini index) and the three fiscal aggregates such as PFB^{basic}, PFB^{global}, and debt burden. It shows that the improvement in PFB^{basic} and PFB^{global} in developing countries considered in our sample is followed by a decrease

in income inequality. In other words, an improvement in the capacity of a country to finance its public spending (including or not debt burden) with its own resources is followed by a reduction of income inequality in developing countries. However, the intensity of the relationship between the two primary fiscal balances and income
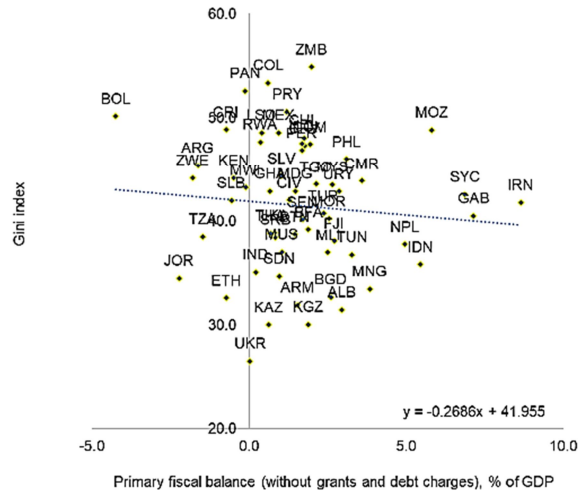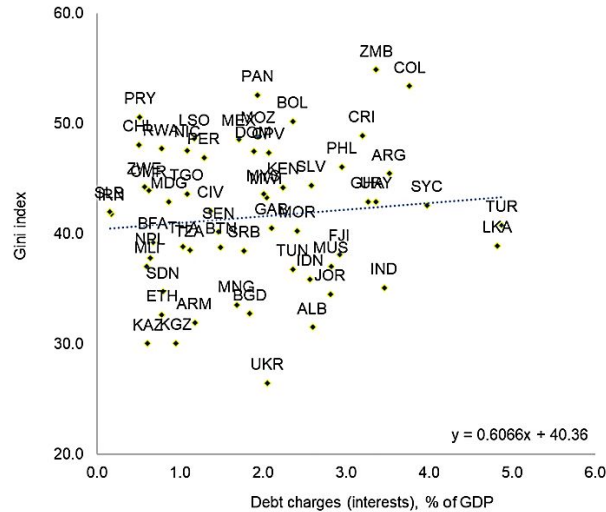

a) Primary fiscal balance (without grants and debt charges) and Gini index
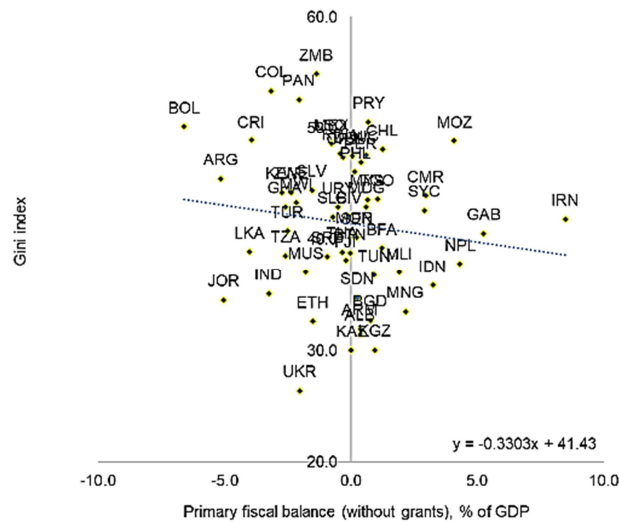
b) Primary fiscal balance (without grants, including debt charges) and Gini index

Figure 2. Fiscal Position and Income Inequality in Developing Countries
(Average 2000-2020)

c) Debt charge (interests) and Gini index

Figure 2. Fiscal Position and Income Inequality in Developing Countries
(Average 2000-2020) (cont')

inequality varies according to the consideration of the debt burden or not. Indeed, as illustrated in Figure 2, without any surprise, the rise in the debt burden of developing countries is accompanied by an increase in income inequalities. Overall, from Figures 1 and 2, it can be concluded that the world uncertainty and the capacity of a developing country to finance or not its public spending from its own resources, could affect income inequality. However, it is more judicious to verify this conclusion by using an empirical approach.

2.1.4.   Other Variables

The first variable considered is the income per capita. According to the literature, this variable can have a significant impact on income inequality, but the nature of the impact is mixed. For instance, Anyanwu et al. (2016) and Kebalo et al. (2022) find that rising per capita income tends to reduce income inequality in developing countries. Conversely, Thye et al. (2021) argue that an increase in per capita income can exacerbate income inequality. This is not surprising: if the increase in per capita income is equitably distributed across all population segments, it can help mitigate income inequality. However, if the increase primarily benefits high-income groups, inequalities may either persist or intensify.

The second variable is the official development assistance (ODA) received by countries, as highlighted by Batuo et al. (2022). ODA is typically aimed at fostering the

economic, social, and human development of developing nations. By enhancing essential social services, ODA can play a crucial role in reducing income inequality. It achieves this by alleviating poverty and improving the living conditions of low-income and vulnerable populations.

The third variable considered is the education level. The literature consistently demonstrates that improving educational attainment or implementing effective educational policies is a significant factor in reducing income inequality (Dout and Kebalo, 2021; Kebalo et al., 2022). Individuals with higher education levels generally have better prospects for securing stable and well-paying jobs. Education enhances their skills and employability, thereby lowering the risk of unemployment and precarious employment. Table 1 provides a summary of the variables, along with detailed definitions, measurement methods, and data sources.

Table 1. Definition of Variables

Variable	Definition	Unit	Source
Income inequality	Gini index	Index	World Bank
World Uncertainty	World Uncertainty Index	Index	Ahir et al. (2022)[1]
Basic primary fiscal balance	Revenues (without grants) minus expenditures without interest on public debt	Percent of GDP	IMF
Global primary fiscal balance	Revenues (without grants) minus expenditures including interest on public debt	Percent of GDP	IMF
Income (log)	GDP per capita	USD	World Bank
Assistance (log)	Net official development assistance and official aid received	USD	World Bank
Education	School enrolment, tertiary (% gross).	Ratio	World Bank

Note: USD constant prices. IMF for The International Monetary Fund.

2.2. Methodology

To estimate the effects on income inequality of uncertainty and the capacity of states to finance their expenditures from their own resources, we consider the following equation:

$$Gini_{i,t} = \begin{cases} \alpha + \beta WUI_{i,t} + \varphi PFB_{i,t}^{basic} + \Gamma X_{i,t} + \varepsilon_{i,t} \\ \psi + \gamma WUI_{i,t} + \delta PFB_{i,t}^{global} + \Psi X_{i,t} + \varepsilon_{i,t} \end{cases}, \tag{3}$$

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[1] https://worlduncertaintyindex.com/.

where $Gini$, WUI, X, and ε represent respectively the income inequality, the world uncertainty index, the vector of other control variables and the error term. $\alpha, \beta, \varphi, \psi, \delta, \Psi$ and Γ are the parameters. i refers to countries and t to time. However, to consider the persistence of income inequality which is mainly observed in developing countries (Kebalo et al., 2022), we integrate into Equation (3) the income inequality variable delayed by one period. The estimated equation becomes:

$$Gini_{i,t} = \begin{cases} \alpha + \omega Gini_{i,t-1} + \beta WUI_{i,t} + \varphi PFB_{i,t}^{basic} + \Gamma X_{i,t} + \varepsilon_{i,t} \\ \psi + \rho Gini_{i,t-1} + \gamma WUI_{i,t} + \delta PFB_{i,t}^{global} + \Psi X_{i,t} + \varepsilon_{i,t} \end{cases}. \qquad (4)$$

In Equations (3) and (4), β and γ are expected to be positive. Thus, we can conclude that the rise in uncertainty in developing countries contributes to increasing income inequality. Equation (4) is estimated by the generalized method of moments (GMM). Indeed, the GMM is suitable when the individual dimension is superior to the temporal dimension ($N > T$). Our study includes 66 developing countries and covers the period 2000-2020. Therefore, $N = 66 > T = 21$. Furthermore, the GMM addresses issues such as simultaneity bias, reverse causality, and omitted variable bias. We use a dynamic model, as it includes the lagged dependent variable of order 1 among the explanatory variables. Indeed, the literature indicates that income inequality tends to persist in developing countries (Dout and Kebalo, 2021; Kebalo et al., 2022). In contrast to dynamic panel GMM, traditional econometric methods such as ordinary least squares (OLS) are inadequate for obtaining efficient estimates of such models due to the inclusion of the lagged dependent variable on the right-hand side of the equation (Kinda and Thiombiano, 2021).

To estimate the effects of world uncertainty during periods when developing countries can self-finance or not their public spending, we consider the following equation:

$$Gini_{i,t} = \begin{cases} \alpha_0 + \alpha_1 Gini_{i,t-1} + \alpha_2 WUI_{i,t} + \alpha_3 Deficit_{i,t} + \alpha_4 Deficit_{i,t} \times WUI_{i,t} \\ + \varphi_1 PFB_{i,t}^z + \Gamma X_{i,t} + \varepsilon_{i,t} \\ \\ \beta_0 + \beta_1 Gini_{i,t-1} + \beta_2 WUI_{i,t} + \beta_3 Surplus_{it} + \beta_4 Surplus_{i,t} \times WUI_{i,t} \\ + \varphi_2 PFB_{i,t}^z + \Psi X_{i,t} + \varepsilon_{i,t}, \end{cases} \qquad (5)$$

where $Deficit$ and $Surplus$ are binary variables. $Deficit$ takes the value 1 at t when PFB^z (with z for $basic$ or $global$) of a country i records a fiscal deficit, otherwise, 0. $Surplus$ takes the value 1 at t when PFB^z of a country i records a fiscal surplus, otherwise, 0.

By including these binary variables in our model, we examine the behaviour of income inequality when developing countries are in a situation of self-financing or not of their public spending. Then, by crossing them with the world uncertainty index, we examine the effects of world uncertainty on income inequality during periods when

developing countries can self-finance or not, their public spending.

Equation (5) is also estimated by the GMM. As a reminder, there are two types of GMM estimators: (i) the first-difference GMM estimator and (ii) the system GMM estimator, with the latter being preferred. Blundell and Bond (1998) demonstrate through Monte Carlo simulations that the system GMM estimator outperforms the first-difference GMM estimator. The first-difference GMM estimator tends to produce biased results in finite samples, particularly when the instruments are weak. Additionally, we opted for the two-step GMM estimator, which is considered more efficient than the one-step GMM estimator (Roodman, 2009). Furthermore, in formulating the commands for our estimations, we followed the guidelines provided by Roodman (2009) and Newey and Windmeijer (2009), incorporating Windmeijer's (2005) correction. This approach ensures that we obtain robust asymptotic standard errors and effectively mitigate potential biases that could arise from the two-step estimation process.

3.   RESULTS

In this section, first, we present and discuss results from the estimations of Equation (4). Then, we perform a sensitivity analysis (Equation 5) by considering the capacity of a country to self-finance or not its public spending, in the relationship between the world uncertainty and the income inequality.

3.1.   Effects of uncertainty and self-financing capacity on income inequality

Table 2 presents the results of Equation (4). Arellano-Bond tests for serial correlation of disturbances indicate that our GMM estimators are consistent. In addition, Sargan and Hansen's tests for overidentifying restrictions do not reject the hypothesis that our instruments are valid.

Moreover, the results presented in Table 2 show that no matter the estimate (1 or 2), an improvement in the lagged dependent variable of order 1 is associated, at the 1% threshold, with an increase in the level of income inequality. This result attests to the relevance of the use of a dynamic model in our study and confirms the persistent problem of income inequality often noted in developing countries (Kebalo et al., 2022). In addition, the results show that uncertainty increases income inequality in developing countries. Thus, a 1-point improvement in World Uncertainty is associated, at the 1% threshold, with an increase in the Gini index (income inequality) by 4.30-points (column 1) and 4.10-points (column 2). Indeed, households are not uniformly impacted by uncertainty. Wealthier households generally exhibit greater resilience to uncertainty shocks compared to poor and vulnerable households. During periods of uncertainty, when negative effects arise, poor, vulnerable, and middle-income households often

struggle to mobilize the necessary resources to mitigate the adverse impacts on their welfare. This is not necessarily the case for wealthier households. As a direct consequence, income inequality tends to increase, particularly when policymakers do not implement social measures such as cash transfers, subsidies for essential goods, tax breaks, and banking facilities to support poor and vulnerable households.

Table 2. Baseline Results

	Estimates	
	(1)	(2)
Intercept	-17.67***	-19.79**
	(3.07)	(3.36)
Income inequality (one lag)	0.91***	0.92***
	(0.04)	(0.04)
World Uncertainty	4.30***	4.10***
	(0.63)	(0.60)
Basic primary fiscal balance (PFB^{basic})	-0.06***	
	(0.02)	
Global Primary fiscal balance (PFB^{global})		-0.05***
		(0.02)
Income (log)	7.54***	8.03***
	(1.07)	(1.08)
Assistance (log)	-0.10**	-0.09**
	(0.04)	(0.05)
Education (%)	-0.14***	-0.15***
	(0.01)	(0.02)
Observations	466	466
Number of instruments	47	47
Diagnostic tests		
Sargan test (p-value)	0.48	0.52
Hansen test (p-value)	0.40	0.41
Arellano-Bond: AR(1) in first difference	-3.77	-3.81
	[0.00]	[0.00]
Arellano-Bond: AR(2) in first difference	-0.33	-0.32
	[0.51]	[0.75]

Note: p-value are in [.] and t-statistic in parentheses (.). ***, ** and * indicate statistical significance at the 1%, 5%, and 10% thresholds, respectively. Instrumental variables are the one-period lags of the dependent variables. Intercept reported. Hansen test: overidentifying restrictions are valid.

Furthermore, the results show that the improvement in basic and global primary fiscal balances is closely associated with a decrease in income inequality. Indeed, a 1-point improvement in the basic primary fiscal balance and the global primary fiscal balance is associated, at the 1% threshold, with a decrease in the Gini index by

0.0006-point and 0.0005-point, respectively. This result is not surprising. Indeed, according to Daniel (2006), countries with a positive primary balance have greater flexibility to respond to economic shocks. They can increase public spending or reduce taxes during recessions without exacerbating public debt, thereby stabilizing the economy. Additionally, primary fiscal surpluses enable the financing of redistributive policies without increasing public debt. Examples include social transfers such as allowances for low-income families, housing assistance, subsidies for education and healthcare, and support programs for the elderly and disabled. These measures directly improve the living conditions of the most vulnerable populations and contribute to reducing wealth inequality. Moreover, the results suggest that the burden of debt limits the effectiveness of fiscal policy in reducing income inequality (0.0005 < 0.0006). Indeed, countries must allocate a portion of their resources to debt repayment, rather than using them for programs that support vulnerable populations.

Other results reveal that no matter the estimate (1 or 2), an improvement in the income per capita (respectively education level, official development assistance) contributes to increasing the level of income inequality (respectively to reduce the level of income inequality). More precisely, a 1% improvement in per capita income is associated, at the 1% threshold, with an increase in the Gini index by 0.0754-point (column 1) and 0.0803-point (column 2). A 1-point improvement in the official development assistance (ODA) is associated, at the 5% threshold, with a decrease in the Gini index by 0.001-point (column 1) and 0.0009-point (column 2). Also, a 1-point improvement in tertiary education is associated, at the 1% threshold, with a decrease in the Gini index by 0.0014-point (column 1) and 0.0015-point (column 2).

These findings are consistent with the existing literature. Thye et al. (2021) demonstrate that an increase in income per capita exacerbates income inequality when the benefits primarily accrue to high-income groups. Batuo et al. (2022) illustrate that official development assistance, by enhancing essential social services, can help reduce poverty and improve the living conditions of low-income individuals. Dout and Kebalo (2021) point out that improving educational attainment or implementing effective educational policies is a crucial factor in reducing income inequality.

3.2. Sensitivity Analysis

Tables 3 and 4 present the effects of world uncertainty on income inequality during periods when developing countries are able to finance or not, their public spending with their own resources. Table 3 considers the basic primary fiscal balance PFB^{basic} while Table 4 considers the global primary fiscal balance PFB^{global}.

Results in Table 3 indicate that uncertainty exacerbates income inequality during periods when developing countries require financing, in other words, when countries are not able to self-finance their fiscal spending. Conversely, during periods when countries can self-finance their public spending, income inequalities decrease amid uncertainty.

Table 3. Sensitivity Analysis Considering the Basic Primary Fiscal Balance

	Estimates	
	(1)	(2)
Intercept	-19.31***	-16.36***
	(2.15)	(1.61)
Income inequality (one lag)	0.87***	0.93***
	(0.02)	(0.02)
World Uncertainty	3.61***	4.41***
	(0.34)	(0.70)
Basic primary fiscal balance (PFB^{basic})	-0.06***	-0.05**
	(0.02)	(0.02)
$Deficit$ (binary variable)	0.17	
	(0.17)	
World Uncertainty $\times Deficit$	0.73*	
	(0.5)	
$Surplus$ (binary variable)		-0.52***
		(0.19)
World Uncertainty $\times Surplus$		-0.89**
		(0.5)
Income (log)	8.53***	6.90***
	(0.79)	(0.72)
Assistance (log)	-0.09***	-0.07***
	(0.02)	(0.02)
Education (%)	-0.15***	-0.13***
	(0.01)	(0.01)
Observations	454	454
Number of instruments	57	57
Diagnostic tests		
Sargan test (p-value)	0.64	0.72
Hansen test (p-value)	0.44	0.51
Arellano-Bond: AR(1) in first difference	-3.64	-3.70
	[0.000]	[0.00]
Arellano-Bond: AR(2) in first difference	-0.33	-0.40
	[0.74]	[0.69]

Note: p-value are in [.] and t-statistic in parentheses (.). ∗∗∗, ∗∗ and ∗ indicate statistical significance at the 1%, 5%, and 10% thresholds, respectively. Instrumental variables are the one-period lags of the dependent variables. Intercept reported. Hansen test: overidentifying restrictions are valid.

Table 4. Sensitivity Analysis Considering the Global Primary Fiscal Balance

	Estimates	
	(1)	(2)
Intercept	-14.05***	-20.34***
	(1.68)	(2.47)
Income inequality (one lag)	0.93***	0.91***
	(0.01)	(0.02)
World Uncertainty	3.11***	4.70***
	(0.28)	(0.60)
Global Primary fiscal balance (PFB^{global})	-0.08***	-0.10***
	(0.02)	(0.02)
$Deficit$ (binary variable)	-0.46	
	(0.44)	
World Uncertainty $\times$ $Deficit$	2.51***	
	(0.40)	
$Surplus$ (binary variable)		-0.43***
		(0.08)
World Uncertainty $\times$ $Surplus$		-0.53***
		(0.1)
Income (log)	5.94***	8.34***
	(0.53)	(0.82)
Assistance (log)	-0.07***	-0.08*
	(0.01)	(0.04)
Education (%)	-0.11***	-0.15***
	(0.006)	(0.01)
Observations	452	452
Number of instruments	57	57
Diagnostic tests		
Sargan test (p-value)	0.80	0.86
Hansen test (p-value)	0.51	0.41
Arellano-Bond: AR(1) in first difference	-3.67	-3.69
	[0.00]	[0.00]
Arellano-Bond: AR(2) in first difference	-0.34	-0.24
	[0.73]	[0.81]

Note: *p*-value are in [.] and *t*-statistic in parentheses (.). ∗∗∗, ∗∗ and ∗ indicate statistical significance at the 1%, 5%, and 10% thresholds, respectively. Instrumental variables are the one-period lags of the dependent variables. Intercept reported. Hansen test: overidentifying restrictions are valid.

Indeed, when world uncertainty increases by 1-point, developing countries presenting a fiscal surplus see, at the 5% threshold, their income inequalities reduced by 0.9-point than countries not having a fiscal surplus (column 2). Finally, our results show that during periods when a developing country records a primary fiscal surplus, at the 1%

threshold, income inequality decreases by 0.52-point than countries not recording a primary fiscal surplus (column 2).

Our results are not surprising insofar as a country's primary fiscal position reflects its ability to self-finance, as soon as possible, targeted expenditures to mitigate the negative socio-economic effects of uncertainty or crises. With a primary fiscal surplus, a government has additional financial resources to implement stabilization measures without increasing debt. This can include income support programs, subsidies, and infrastructure investments. These programs, funded by the primary surplus, can provide direct support to low-income households, thereby reducing wealth inequality.

Additionally, by mitigating the effects of economic shocks, primary fiscal surpluses can decrease income and asset volatility, thus protecting vulnerable households. However, developing countries with primary fiscal deficits are less likely to implement the aforementioned socio-economic policies to support poor and vulnerable households. Consequently, they may be inclined to adopt pro-cyclical fiscal policies, which often involve reducing public expenditures and/or increasing tax rates during periods of uncertainty and crisis (Alesina et al., 2008; Bénassy-Quéré et al., 2016). This difficulty in financing important and necessary policies reduces the resilience of poor and vulnerable households compared to wealthy households, thereby increasing income inequality. For the rest, the signs of the control variables align with the literature.

Results presented in Table 4 indicate that when considering the interests on public debt, an improvement in the global primary fiscal balance contributes to reducing income inequality and mitigating the impact of uncertainty on income inequality. However, the magnitude of this effect is relatively smaller compared to the impact of the basic primary fiscal balance on income inequality in developing countries. Indeed, a 1-point improvement in global primary fiscal balance is associated, at the 1% threshold, with a decrease in the Gini index by 0.0008-point (column 1) and 0.001-point (column 2). Moreover, our results show that developing countries with a global primary fiscal surplus, have at the 1% threshold, a low level of income inequality (-0.43-point) than countries without a fiscal surplus (column 2). Furthermore, when the uncertainty increases by 1-point, the countries presenting a global primary fiscal surplus have, at the 1% threshold, a low level of income inequality (-0.53 point) (column 2).

These results are not surprising. Indeed, interest payments on debt constitute a significant portion of public expenditures. When the government must allocate a substantial part of its revenues to servicing debt interest, it has fewer resources available to fund social programs and support initiatives. For instance, funds that could be used to finance family allowances, housing assistance, education subsidies, and healthcare are instead directed towards debt service. This diversion of resources directly limits the government's ability to invest in programs that could reduce income inequality.

4.   CONCLUSION

In this paper, we examine how world uncertainty impacts income inequality in developing countries, taking into account their capacity to self-finance public spending. To ensure reliable results, the generalized method of moments has been used. Our findings indicate that uncertainty exacerbates income inequality. Additionally, the results suggest that, in the presence of uncertainty, primary fiscal deficits contribute to increasing income inequality, while primary fiscal surpluses help mitigate the positive effects of uncertainty on income inequality. Moreover, the results show that when considering the interest on public debt, an improvement in the fiscal balance contributes to reducing income inequality and mitigating the impact of uncertainty on income inequality. However, the magnitude of this effect is relatively smaller compared to the impact of the basic primary balance on income inequality. These results indicate that the debt burden restricts the effectiveness of fiscal policy in reducing income inequality. Furthermore, the results underscore the crucial socio-economic stabilizing role that primary fiscal policy management plays during periods of uncertainty. Furthermore, we find that improvements in education level and official development assistance contribute to reducing the level of income inequality.

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