

**Consumption Patterns of
Indebted Households:
Unravelling the Relevance of
Fiscal Policy**

António Afonso, Eduardo de Sá Fortes Leitão Rodrigues

Impressum:

CESifo Working Papers

ISSN 2364-1428 (electronic version)

Publisher and distributor: Munich Society for the Promotion of Economic Research - CESifo GmbH

The international platform of Ludwigs-Maximilians University's Center for Economic Studies and the ifo Institute

Poschingerstr. 5, 81679 Munich, Germany

Telephone +49 (0)89 2180-2740, Telefax +49 (0)89 2180-17845, email office@cesifo.de

Editor: Clemens Fuest

<https://www.cesifo.org/en/wp>

An electronic version of the paper may be downloaded

- from the SSRN website: www.SSRN.com
- from the RePEc website: www.RePEc.org
- from the CESifo website: <https://www.cesifo.org/en/wp>

Consumption Patterns of Indebted Households: Unravelling the Relevance of Fiscal Policy

Abstract

We have investigated the influence of fiscal instruments, notably taxes on income and government spending, on household consumption in two different samples and two measures of household debt to provide a comprehensive analysis of the topic. We used dynamic panel models and the GMM approach for 32 advanced and emerging countries from 1995 to 2019. Our findings suggest that fiscal impulses increase private consumption, but when households are highly indebted, patterns change, and increased government spending or reduced taxes, in the presence of high indebtedness, actually discourage household consumption compared to the baseline (lower debt) group.

JEL-Codes: C320, E580, E620, E630.

Keywords: household consumption, household debt, fiscal policy, panel data.

António Afonso
ISEG – School of Economics and Management
University of Lisbon / Portugal
aafonso@iseg.lisboa.pt

Eduardo de Sá Fortes Leitão Rodrigues
Federal Rural University of
Rio de Janeiro / Brazil
edsafortes@ufrj.br

July 2023

The authors acknowledge financial support from FCT – Fundação para a Ciência e Tecnologia (Portugal), national funding through research grant UIDB/05069/2020. The opinions expressed herein are those of the authors and do not necessarily reflect those of the authors' employers. Any remaining errors are the authors' sole responsibility.

1. Introduction

In the last 40 years, consumption and household debt have been indicated as crucial factors lying behind aggregate fluctuations in economies (Sahin, 2021). Indeed, other authors also suggest that the larger the increase in household leverage before a recession, the more severe the recession is in the future (Mian and Sufi, 2018). In order to tame these periods and promote growth, fiscal policy has gained prominence, especially after the global financial crisis (2007 - 2009) and the economic downturn caused by the COVID-19 pandemic (2020 - 2022). However, it is not obvious to what extent the fiscal stimulus is able to stimulate household consumption, especially in the case of already highly indebted households. Thus, the intricate relationship between fiscal policies, household consumption, and the financial well-being of indebted households has garnered significant attention from researchers and policymakers.

As many economies grapple with the challenge of a rising trend of household debt¹, understanding the multifaceted dynamics and implications of fiscal measures on consumption patterns of indebted households becomes crucial.

In this context, this paper investigates the fiscal effects on consumption while emphasising the role of household indebtedness. Household consumption is a critical driver of economic growth, constituting a significant share of aggregate demand (Röhn, 2010). Simultaneously, the financial health of households, particularly their levels of indebtedness, profoundly influences consumer behaviour. Therefore, we highlight two hypotheses to be tested: i) increased public spending or reduced taxes stimulate household consumption; ii) a fiscal stimulus stimulates household consumption, even in periods of high household indebtedness.

Through dynamic panel models, and considering policy implications, this paper contributes to the ongoing discussion on fostering economic stability and prosperity amidst the challenges posed by rising household indebtedness.

Our findings suggest significant implications for policymakers, financial institutions, and individuals. Using dynamic panel models and the GMM approach for two samples of advanced and emerging countries from 1995 to 2019. Our findings suggest that fiscal impulses increase private consumption, but when households are highly indebted, patterns change.

¹ Debt is equal to the sum of the loans (primarily mortgage loans and consumer credit) and other accounts payable. The index is measured as a percentage of net household disposable income.

Thus, general models indicate that fiscal stimuli encourage household consumption. However, when we control for the degree of household indebtedness, consumption patterns change, particularly through the lens of the precautionary effect.

Therefore, our findings are in line with different papers (Shapiro & Slemrod, 2003; Baiardi et al., 2020) that point out that indebtedness accentuates an uncertain economic future and, therefore, private agents reduce consumption due to precaution. This effect can inform the design of public policies aimed at responsible borrowing, encouraging adequate savings, and promoting sustainable economic growth.

The article is organised as follows. Section 2 is a review of the literature, exploring prior research on the influence of fiscal policies on consumption choices among indebted households. Section 3 presents the data and estimation strategy. Section 4 covers the data and the estimation strategy. Section 5 discusses the results. The last section is the conclusion.

2. Literature Review

This section provides a review of relevant studies that shed light on the role of fiscal policy in shaping consumption patterns, especially among highly indebted households.

There is extensive literature on fiscal incentives for household consumption (Blinder & Solow, 1973; Blanchard & Perotti 2002; Zagler & Dürnecker, 2003; Galí et al., 2007; Feldstein, 2009). These studies emphasise two economic strands of the literature for the effects of fiscal stimulus. For the New Classical view, the households behave in a Ricardian fashion, and a fiscal stimulus decreases the present value of disposable income and reduces consumption owing to a negative wealth effect and the expectation of future higher tax burdens to finance the current fiscal expansion (Burda & Wyplosz; 2013, Röhn, 2010).

On the other hand, from the Keynesian perspective, a fiscal impulse fosters household consumption because consumption depends on current disposable income and not on resources throughout their lifetime. Along the same line, expansionary fiscal policies, such as government spending on infrastructure projects or tax cuts, have the potential to stimulate economic growth and create job opportunities (Alesina & Ardagna, 1998; Fatas & Mihov 2001).

If the literature points to mixed results regarding the fiscal influence on aggregate consumption, the effects on the consumption of highly indebted households are even more uncertain.

Therefore, it is necessary to investigate the potential implications of fiscal stimulus on consumption patterns during periods of high indebtedness. The existing literature sheds some light on the possible responses of households in such situations.

In this sense, Hamilton et al. (2019) draw insights from different papers that have examined financial constraints from different perspectives and help us understand consumer behaviour with financial constraints, which can sometimes be counterintuitive. Therefore, the findings can be significantly different, and consumer reactions to the fiscal impulse can vary depending on various factors.

One potential outcome is the growth of consumer confidence, leading to increased consumption. In this case, when the fiscal impulse stimulates the economy, private agents may perceive positive changes and become more optimistic about their financial condition. This newfound confidence can encourage them to spend more on goods and services, even if they have high levels of debt. Despite their indebtedness, they may be inclined to participate in the growing economy.

Thus, some papers highlight that fiscal actions that improve overall economic conditions, such as infrastructure investments or business incentives, can positively influence consumer sentiment, leading to increased spending among highly indebted households. Hence, if such households perceive a more favourable economic outlook, they may feel more secure about their financial situation and be more willing to engage in consumption, thereby potentially boosting their spending levels. Consumers' confidence is affected by economic and non-economic factors, such as social problems and violence. However, among economic factors, consumer sentiment can be affected notably by inflation and unemployment.

In this vein, Sahin (2020) indicates that the government can use countercyclical fiscal or countercyclical transfer policies to control fluctuations in these variables and influence the economic agent's confidence.

A second possibility for the fiscal impulse is related to the consumer profile, i.e., individuals with high levels of debt may exhibit an impatient profile. Frigerio et al. (2020) argue that in the last decade, the number of studies on the relationship between impatience and over-indebtedness has grown. The concept of impatience can be understood as the preference for anticipating the time of a future satisfaction (Böhm-Bawerk, 1912).

In this same line, Bleichrodt et al. (2009), Sutter et al. (2013) and Cruz Rambaud & Muñoz Torrecillas (2016) point out that impatience is directly related to the concepts of hyperbolic

discounting and present bias, i.e., the tendency to value immediate gains in comparison with benefits futures. According to Loewenstein (1988), consumer impatience (focus on the short term) is a significant factor in the predisposition to indebtedness, especially when combined with present bias. In this sense, agents with this profile can increase their indebtedness because of an increase in current income, or even a temporary benefit.

In such cases, fiscal impulses can potentially influence consumer spending positively, particularly among those with higher debt levels. Thus, some authors, through theoretical models, relate credit restriction, indebtedness, and impatience with the effects of fiscal policy (Brinca et al., 2016; Gabaix, 2020).

Lastly, it is also necessary to consider the possibility that the fiscal impulse does not promote a positive effect on the consumption of highly indebted households because due to prudence, spending is reduced. In this sense, some authors analyse the relationship between periods of high debt, uncertainty, and consumer behaviour. In other words, agents reassess their consumption patterns due to future uncertainty generated by high debt. For Kimball (1990), a crucial point behind this household decision-making is prudence. This sentiment, associated with uncertainty, encourages precautionary savings. Dreze & Modigliani (1975) and Leland (1978) initially studied this issue, and recently Baiardi et al. (2020) provide an overview of the latest developments in precautionary saving. In such scenarios, fiscal stimulus may not necessarily lead to increased consumption but rather encourage precautionary saving. This implies that households may choose to save more in response to uncertain economic conditions rather than immediately increase their spending (Baiardi et al., 2020). Hence, the precautionary effect captures households' inclination to increase savings as a precautionary measure against uncertain future events or financial shocks.

Among highly indebted households, this effect becomes particularly salient, as they often exhibit heightened precautionary saving behaviour to address concerns regarding debt servicing and maintaining financial resilience. In this vein and based on a survey of a representative sample of households, Shapiro & Slemrod (2003) find that only 22 percent of U.S. households receiving the income tax rebates in 2001 would spend it. In fact, they would either save it or use it to pay off debt.

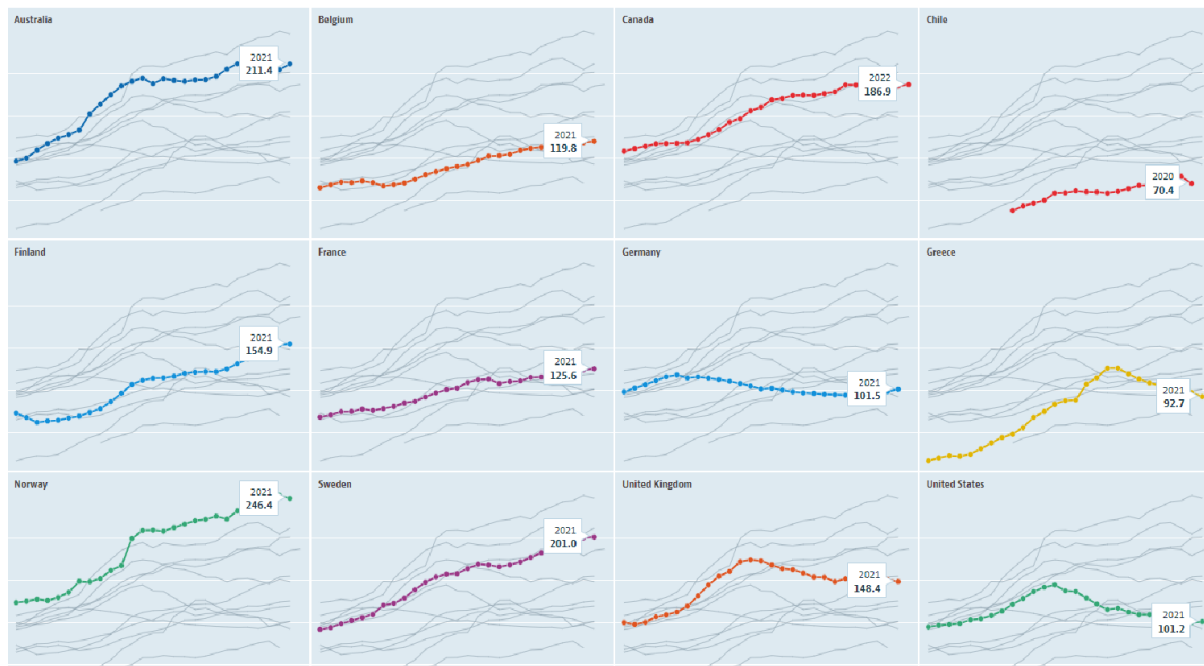
3. Data and Estimation Strategy

3.1. Data

Our dataset is built based on data available from the World Bank (WB), the International Monetary Fund (IMF) and the Organisation for Economic Cooperation and Development (OECD). We examined two samples of countries² (24 and 32 economies) from 1995 to 2019, and the economic variables are household consumption (HC), GDP (Y) and government consumption (GC), total taxes revenue (T) as fiscal instruments³ (see Table A1 - Appendix).

Sample 1 variables are originally in billions of constant 2017 international dollars. They were converted into per capita terms (pc) and, later, into diff log series. The second sample was already in percentage change (percentage of GDP). In order to get an overview of the developments in household debt, Figure 1 fulfils such objective.

Figure 1. Household Debt (% of net disposable income - 1995 – 2022)



Source: OECD database - <https://data.oecd.org>.

² Sample 1 - Austria, Belgium, Brazil, Canada, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Luxembourg, Netherlands, Norway, Sweden, Switzerland Türkiye, United Kingdom, United States.

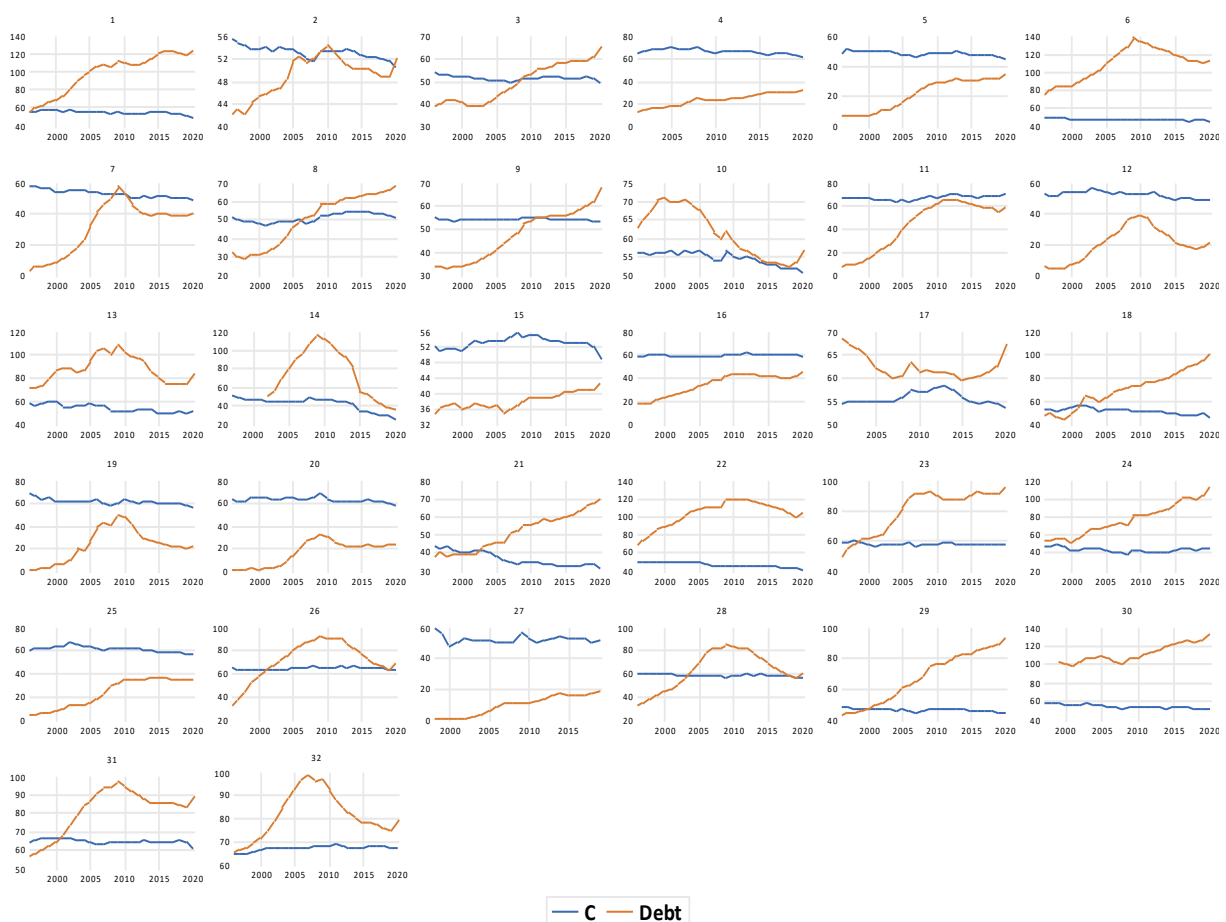
Sample 2 - Australia, Austria, Belgium, Costa Rica, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Netherlands, New Zealand, Norway, Poland, Portugal, Russia, Spain, Sweden, Switzerland, United Kingdom, United States.

³ In the first sample, it was possible to use taxes on income (TI), but due to the scarcity of data for sample 2, we did not incorporate this fiscal instrument. For the same reason, the fiscal variable TG (sales, production, transfer taxes) was incorporated into the initial models (Tables 7 and 8) but is not included in the other models.

These numbers are in line with other measures of debt (Figure 1) that point to an overall increase in the level of indebtedness. In our analysis, we use another metric of household debt, that is, debt of households and NPISHs, as a percentage of their total assets (debt as percentage of total assets). However, to confirm the results and deepen the analysis, we examine a second indebtedness measure: the household debt loans and debt securities (percent of GDP) as it allowed us to maximise the sample size.

Figure 2 emphasises that of the 32 countries analysed, only three did not present an increase in the level of household debt in recent years.

Figure 2. Household Consumption (C) and Debt (Percent of GDP: 1995 – 2019)

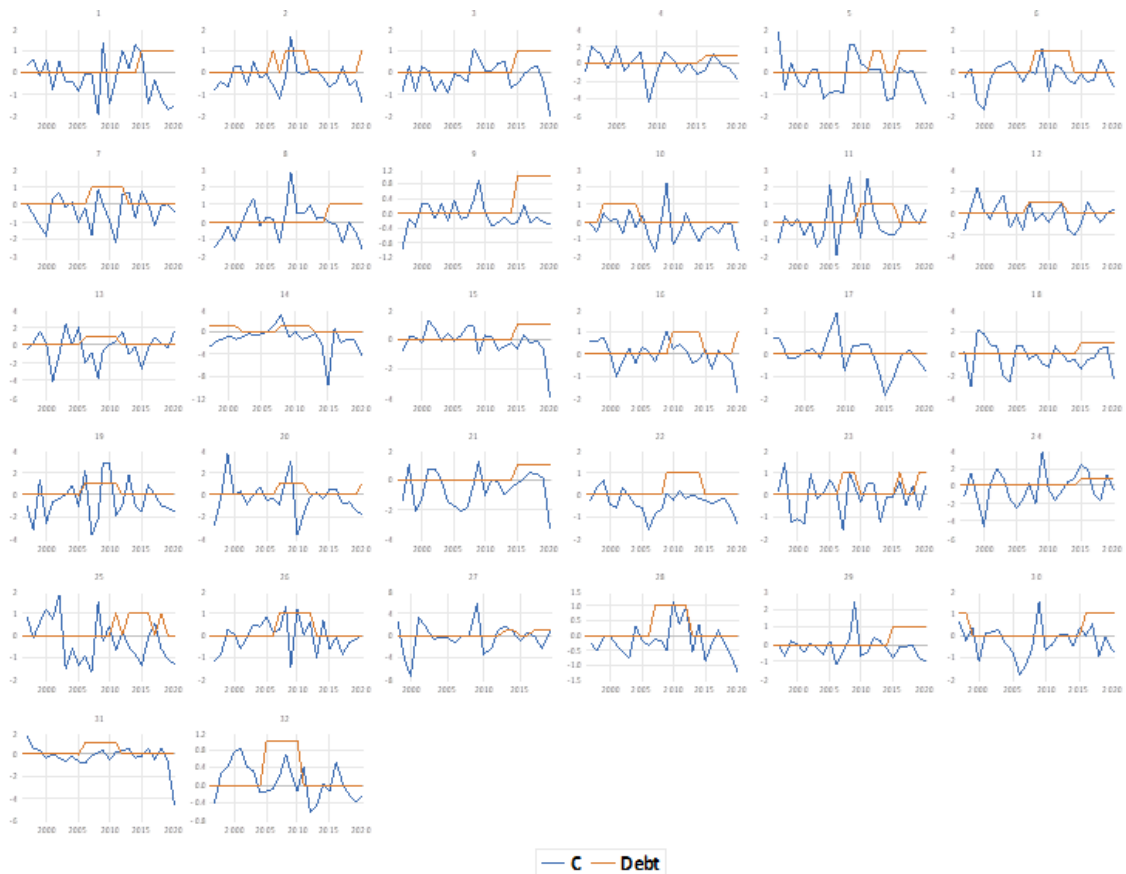


Source: IMF.

In this paper, we assume that a country has reached a high level of household debt when the index reaches the third quartile. Figure 3 depicts the household consumption growth and periods of high debt. As we can note, there are indications that high indebtedness can cause a reversal or attenuate agents' consumption.

In order to investigate the aforementioned effects, our empirical analysis is based on three sets of models. First, we examine the impact of fiscal stimuli on household consumption in a panel with two samples (24 and 32 countries), by using dynamic panel models, but we do not control for the degree of indebtedness.

Figure 2. Household Consumption Growth (C) and High Debt Level (Debt) - Percent of GDP: 1995 – 2019)



Source: authors' calculations.

Second, we split the sample into two groups and evaluated the influence of high household indebtedness through multiplicative dummy variables. They are associated with taxes (DM.T) and government consumption (DM.GC). The periods where the index is above the third quartile of the sample (for each country) are considered periods of high indebtedness and, therefore, activate the dummy variable. In other words, we are interested in the effect of expansionary fiscal policy on the consumption pattern when households have a high level of indebtedness. Finally, to confirm the findings and increase the robustness of the results, we use a second indebtedness measure.

3.2. Methodology and Results

To develop the panel models, we used the Generalised Method of Moments (GMM) approach⁴, as it offers several advantages. This approach addresses the endogeneity issue associated with lagged dependent variables (instrumental variables - IV⁵), especially when there is a correlation between explanatory variables and the error term. Additionally, GMM controls for omitted variable bias and unobserved panel heterogeneity. To this end, we perform two techniques for transformation: forward orthogonal deviations (FOD), as indicated by Arellano & Bover (1995), and first differences transformation (FD), as highlighted by Arellano & Bond (1991).

Thus, we employ different configurations of the GMM model for panel data and not only investigate the isolated effect of fiscal impulse on consumption, but we also control the level of household indebtedness. Our standard specification for the dynamic model is as follows:

$$Y_{it} = \alpha Y_{i,t-1} + X'_{it}\beta + e_t + u_{it} \quad (1)$$

Here, α is a scalar and β is a coefficient vector ($k \times 1$). Y_{it} represents the dependent variable (GDP per capita), while X_{it} denotes the vector of explanatory variables ($1 \times k$). The subscript i refers to countries across time periods (t). The terms u_{it} and e_t represent a composite error, where the random component of the variation in our independent variable stems from the idiosyncratic error (u_{it}) and the time-invariant error (e_t). Finally, we incorporate the lagged dependent variable $Y_{i,t-1}$ as a determinant for the dynamic panel and take advantage of the time series dimension. Hence, the AR(1) coefficient α reflects the persistence or memory of the process affecting household consumption growth (Y_{it}).

For the general models (full samples), i.e., without differentiating the level of household indebtedness, the fiscal impulses analysed have positive impacts on the growth of household consumption (samples 1 and 2). Whether due to orthogonal deviations or first differences, the results show statistically significant parameters, especially for GC and TI (Table 1).

⁴ Considering the significance level of 5%, the estimated models did not indicate a second-order correlation problem (AR2), nor problems related to over-identifying restrictions (validity of the instruments).

⁵ We use lagged variables as instruments for endogenous variables and estimation parameters by GMM, in line with Anderson & Hsiao (1982) and Arellano & Bond (1991).

Table 1: Dynamic Models. Household Consumption (Full Sample 1)

Dependent Variable	GMM FOD (1)	GMM FD (2)
	Household Consumption – HC ($\Delta\%$)	
HC (-1) ($\Delta\%$)	0.133197*** (0.014584)	0.13161*** (0.022165)
Y($\Delta\%$)	0.590590*** (0.068651)	0.653397*** (0.031983)
TI($\Delta\%$)	-0.006072* (0.0003059)	-0.012174* (0.007175)
GC($\Delta\%$)	0.129941*** (0.014309)	0.11802*** (0.022102)
T($\Delta\%$)	0.004467 (0.012504)	-0.002181 (0.007198)
Prob(J-statistic)	0.351603	0.57291
AR(2)		0.3160
Countries	24	24
Observations	528	528

*** - significant at 1%; ** - significant at 5%; * - significant at 10%.
Standard deviations in brackets.

FOD - Forward orthogonal deviations; FD - first differences transformation.

For sample 2 (Table 2), GC and T have the same signs as for sample 1, but the GC and T coefficients are statistically significant for both transformations (FOD and FD). These results are in line with different studies (Blanchard & Perotti 2002; Afonso & Leal, 2019) that advocate that fiscal policy matters and plays a relevant role in boosting aggregate demand.

In order to examine the relationship between the level of indebtedness and household consumption, we included the level of debt, as shown in models 3 and 4 (Table 2). Therefore, in addition to confirming the signs of a fiscal impulse, we find indications that an increase in the level of indebtedness reduces household consumption. These findings suggest that hypothesis 1 of this paper cannot be rejected. However, it remains to deepen the examination of household consumption when there is high indebtedness.

Table 2. Dynamic models. Household Consumption (Full Sample 2).

Dependent Variable	GMM FOD (1)	GMM FD (2)	GMM FOD (3)	GMM FD (4)
	Household Consumption - HC ($\Delta\%$)		Household Consumption - HC ($\Delta\%$)	
HC (-1) ($\Delta\%$)	0.016754*** (0.005671)	-0.001964 (0.006191)	0.018850 (0.015071)	-0.005996 (0.006153)
GC($\Delta\%$)	0.034603*** (0.004857)	0.029822*** (0.007268)	0.031767*** (0.011027)	0.032976*** (0.008957)
T($\Delta\%$)	-0.049427*** (0.011796)	-0.045538*** (0.009763)	-0.012434 (0.082160)	-0.063204*** (0.013190)
Debt			0.002857 (0.002155)	-0.000855* (0.000442)
Prob(J-statistic)	0.447327	0.396249	0.473096	0.351591
AR(2)		0.1226		0.1375
Countries	32	32	32	32
Observations	657	657	620	620

*** - significant at 1%; ** - significant at 5%; * - significant at 10%.

Standard deviations in brackets.

FOD - Forward orthogonal deviations; FD - first differences transformation

To fulfil this objective, we run different sets of models and two different debt metrics. The first set incorporates the dummy variable on taxes (Table 3), and the second one includes the dummy variable on government consumption (Table 4).

In our models, dummy variables are introduced to adequately capture the differential effects produced by agents' behaviour due to different qualitative changes in the level of indebtedness. In other words, High-Debt dummy variables were used to capture the interaction of fiscal stimulus and high debt on household consumption.

For an initial examination, we use the data from sample 1 and have included a new tax, namely, tax on sales and production (TG). In addition, we use household debt (percentage of total assets) as a measure of indebtedness.

Table 3. Dynamic models. Household Consumption (Sample 1 *dummy* T – High Debt).

Dependent Variable	GMM FOD (1)	GMM FD (2)
	Household Consumption – HC ($\Delta\%$)	
HC (-1) ($\Delta\%$)	0.159713*** (0.015844)	0.163240*** (0.008798)
Y($\Delta\%$)	0.684871*** (0.049586)	0.671296*** (0.048442)
T($\Delta\%$)	-0.000694 (0.019129)	-0.005890 (0.013331)
DM.T	-0.217139* (0.124608)	-0.055520 (0.118767)
TG($\Delta\%$)	0.021103 (0.016790)	0.023053** (0.010620)
Prob(J-statistic)	0.628164	0.199345
AR(2)		0.4235
Countries	20	20
Observations	420	420

*** - significant at 1%; ** - significant at 5%; * - significant at 10%.

Standard deviations in brackets.

FOD - Forward orthogonal deviations; FD - first differences transformation

Table 4. Dynamic models. Household Consumption (Sample 1 *dummy* GC – High Debt).

Dependent Variable	GMM FOD (1)	GMM FD (2)
	Household Consumption – HC ($\Delta\%$)	
HC (-1) ($\Delta\%$)	0.106023*** (0.11250)	0.102877*** (0.013432)
Y($\Delta\%$)	0.677817*** (0.047547)	0.697963*** (0.058141)
GC($\Delta\%$)	0.108258*** (0.028293)	0.1288861*** (0.026114)
DM.GC	-0.094163 (0.154631)	-0.020740 (0.166267)
TG($\Delta\%$)	0.008875 (0.011483)	-0.003730 (0.014873)
Prob(J-statistic)	0.274054	0.257009
AR(2)		
Countries	20	20
Observations	420	420

*** - significant at 1%; ** - significant at 5%; * - significant at 10%.

Standard deviations in brackets.

FOD - Forward orthogonal deviations; FD - first differences transformation

Probably due to the unavailability of data from this indebtedness metric and the limitations of a smaller sample⁶ (20 countries), not all coefficients are statistically significant. However, model 1 (Table 3) sheds light on the issue of changing consumption patterns and confirms that tax reduction has a reverse effect when there is high indebtedness. In addition, the models (Table 4) confirm the (statistically significant) positive impact of the fiscal stimulus on consumption but suggest a reduction in household spending when agents are highly indebted. Therefore, the models confirm the signs of previously estimated coefficients, and the fiscal expansion enhances household consumption, but in periods of high indebtedness, these effects are attenuated or reversed due to a more cautious pattern of consumption.

To further check whether high debt affects consumption patterns and increases the robustness of the results, the next models examine a larger sample (32 countries) and use another measure of household debt, i.e., debt (% of GDP).

An inspection of the coefficients (Tables 5 and 6) indicates that both a reduction in taxes and an increase in public spending have a (statistically significant) positive effect on consumption, confirming the previous findings.

Considering that fiscal impulses boost private consumption, the results point to a "prudence effect" when we analyse the differential effects generated by the coefficients of the variables T and GC and DM.T and DM.GC, respectively. As noted in Table 5, the negative effect of tax increases on consumption is accentuated when the debt level is high. In the case of increased public spending (Table 6), the joint effect of the GC and of the DM.GC coefficient reduces (model 1) or considerably inhibits (model 2) household consumption. These results are in line with the literature that emphasises the precautionary saving effect and a more prudent behaviour of households during periods of high indebtedness.

⁶ Four countries were excluded.

Table 5. Dynamic models. Household Consumption (Sample 2 *dummy* T - High Debt).

Dependent Variable	GMM FOD (1)	GMM FD (2)
	Household Consumption - HC ($\Delta\%$)	
HC (-1) ($\Delta\%$)	0.012020* (0.006478)	-0.001617 (0.006572)
T($\Delta\%$)	-0.06001* (0.032538)	-0.044668*** (0.015625)
DM.T	-0.267122* (0.144283)	-0.231160** (0.087827)
T(-1)	0.021366 (0.024923)	-0.105290*** (0.037198)
GC($\Delta\%$)	0.026579*** (0.008011)	0.028819** (0.014093)
Prob(J-statistic)	0.419156	0.320112
AR(2)		0.1037
Countries	32	32
Observations	655	655

*** - significant at 1%; ** - significant at 5%; * - significant at 10%.

Standard deviations in brackets.

FOD - Forward orthogonal deviations; FD - first differences transformation

Table 6. Dynamic models. Household Consumption (Sample 2 *dummy* GC- High Debt).

Dependent Variable	GMM FOD (1)	GMM FD (2)
	Household Consumption - HC ($\Delta\%$)	
HC (-1) ($\Delta\%$)	0.027231** (0.0010684)	0.018529** (0.007509)
GC($\Delta\%$)	0.056823*** (0.010157)	0.066721*** (0.012407)
DM.GC	-0.084166* (0.047001)	-0.065802*** (0.015529)
GC(-1)	-0.009990 (0.009846)	-0.031811*** (0.010107)
T($\Delta\%$)	-0.057098 (0.045918)	-0.051178 (0.037059)
Prob(J-statistic)	0.358062	0.412899
AR(2)		0.1242
Countries	30	30
Observations	629	629

*** - significant at 1%; ** - significant at 5%; * - significant at 10%.

Standard deviations in brackets.

FOD - Forward orthogonal deviations; FD - first differences transformation

4. Conclusion

In the last twenty years, notably after the 2007-2009 crisis and recently with the COVID-19 pandemic (2020 - 2022), there has been a renewed interest in the role of fiscal instruments to neutralize adverse shocks and stimulate growth. However, there is no consensus among scholars and policymakers on this topic or the effectiveness of the fiscal instruments. Thus, our paper contributes to this debate by highlighting not only the role of fiscal instruments on private consumption, but also because it deepens the investigation by analysing the fiscal influence on consumption when households have high debt.

For this purpose, we have investigated the influence of fiscal instruments, notably taxes on income and government spending, on household consumption in two different samples and two different measures of household debt. We used dynamic panel models and the GMM approach for 32 advanced and emerging countries from 1995 to 2019, and we perform two techniques for transformation: forward orthogonal deviations (as indicated by Arellano & Bover, 1995), and first differences transformation (as highlighted by Arellano & Bond, 1991).

Our findings suggest that fiscal impulses increase private consumption, but when households are highly indebted, patterns change. Thus, the models do not reject our first hypothesis, emphasising that fiscal impulses foster household consumption. However, an important distinction arises when considering households with significant levels of debt. Contrary to our second hypothesis (where fiscal stimulus could foster household consumption, even in periods of high household indebtedness), we found that consumers with higher debt do not increase their consumption in response to fiscal instruments. Instead, our findings suggest that increased government spending or reduced taxes, in the presence of high indebtedness, actually discourage household consumption compared to the baseline group. These results align with studies that highlight the cautious behaviour of agents facing uncertain future income due to debt, leading to reduced private spending and an increase in precautionary savings.

The implications of our findings are twofold. Firstly, policymakers should consider the cautious behaviour of indebted households when formulating fiscal and monetary strategies to boost economic activity. Lastly, another crucial issue that needs to be addressed is the relationship between fiscal impulses and fiscal sustainability. Therefore, an avenue to be explored in future work could be the effect of fiscal stimulus on household consumption, controlling not only the level of household indebtedness but also the degree of fiscal sustainability of countries.

References

- Afonso, A., & Leal, F. S. (2019). Fiscal multipliers in the Eurozone: an SVAR analysis. *Applied Economics*, 51(51), 5577-5593.
- Alesina, A., & Ardagna, S. (1998). Tales of fiscal adjustment. *Economic policy*, 13(27), 488-545.
- Anderson, T. W., & Hsiao, C. (1982). Formulation and estimation of dynamic models using panel data. *Journal of econometrics* 18(1), 47-82.
- Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The review of economic studies* 58(2), 277-297.
- Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of econometrics* 68(1), 29-51.
- Baiardi, D., Magnani, M., & Menegatti, M. (2020). The theory of precautionary saving: an overview of recent developments. *Review of Economics of the Household* 18(2), 513-542.
- Blanchard, O., & Perotti, R. (2002). An empirical characterization of the dynamic effects of changes in government spending and taxes on output. *The Quarterly Journal of economics*, 117(4), 1329-1368.
- Bleichrodt, H., Rohde, K. I., & Wakker, P. P. (2009). Non-hyperbolic time inconsistency. *Games and Economic Behavior*, 66(1), 27-38.
- Blinder, A. S., & Solow, R. M. (1973). Does fiscal policy matter?. *Journal of public economics*, 2(4), 319-337.
- Böhm-Bawerk, E. V. (1912). *VON: Positive Theorie des Kapitals, Dritte Auflage*, 1912, especially Buch IV. Abschnitt I, Gegenwart und Zukunft in der Wirtschaft, 426-486.
- Brinca, P., Holter, H. A., Krusell, P., & Malafry, L. (2016). Fiscal multipliers in the 21st century. *Journal of Monetary Economics* 77, 53-69.
- Burda, M., & Wyplosz, C. (2013). *Macroeconomics: A European text*. Oxford university press.
- Cruz Rambaud, S., & Muñoz Torrecillas, M. J. (2016). Measuring impatience in intertemporal choice. *PLoS One*, 11(2), e0149256.
- Dreze, J. H., & Modigliani, F. (1975). Consumption decisions under uncertainty. In *Stochastic optimization models in finance* (pp. 459-486). Academic Press.
- Fatás, A., & Mihov, I. (2001). The effects of fiscal policy on consumption and employment: theory and evidence. Available at SSRN 267281.

- Feldstein, M. (2009). Rethinking the role of fiscal policy. *American Economic review*, 99(2), 556-559.
- Frigerio, M., Ottaviani, C., & Vandone, D. (2020). A meta-analytic investigation of consumer over-indebtedness: The role of impulsivity. *International Journal of Consumer Studies*, 44(4), 328-342.
- Gabaix, X. (2020). A behavioral New Keynesian model. *American Economic Review*, 110(8), 2271-2327.
- Galí, J., López-Salido, J. D., & Vallés, J. (2007). Understanding the effects of government spending on consumption. *Journal of the european economic association* 5(1), 227-270.
- Hamilton, R. W., Mittal, C., Shah, A., Thompson, D. V., & Griskevicius, V. (2019). How financial constraints influence consumer behavior: An integrative framework. *Journal of Consumer Psychology*, 29(2), 285-305.
- Kimball, M. S. (1990). Precautionary saving and the marginal propensity to consume. National Bureau of Economic Research. *Working Paper* 3403.
- Leland, H. E. (1978). Saving and uncertainty: The precautionary demand for saving. In *Uncertainty in economics* (pp. 127-139). Academic Press.
- O'Donoghue, T., & Rabin, M. (1999). Doing it now or later. *American economic review*, 89(1), 103-124.
- Röhn, O. (2010). New Evidence on the Private Saving Offset and Ricardian Equivalence. *OECD Economics Department Working Papers*, No. 762, OECD.
- Sahin, S. (2021). Consumer confidence, consumption, and macroeconomic fluctuations: A systemic stock-flow consistent model. *Metroeconomica*, 72(4), 868-904.
- Shapiro, Matthew, D., and Joel Slemrod. (2003). Consumer Response to Tax Rebates. *American Economic Review*, 93 (1): 381-396.
- Sutter, M., Kocher, M. G., Glätzle-Rützler, D., & Trautmann, S. T. (2013). Impatience and uncertainty: Experimental decisions predict adolescents' field behavior. *American Economic Review*, 103(1), 510-531.
- Zagler, M., & Dürnecker, G. (2003). Fiscal policy and economic growth. *Journal of economic surveys*, 17(3), 397-418.

Appendix

Table A1: Data Sources

Data Source	Code	Original Series
International Monetary Fund	GDP	Gross domestic product, in billions of constant 2011 international dollars
World Bank and OECD	GC	General government final consumption expenditure (current LCU)
World Bank	HC	Households and NPISHs Final consumption expenditure, PPP (constant 2017 international \$)
OECD	T	Total tax revenue
OECD	TI	Taxes on income and profits of individuals
OECD	TG	Taxes on sale, production, transfer, etc
OECD	Debt (% of total assets)	Debt of households and NPISHs, as a percentage of their total assets
OECD	HC (% of GDP)	Household final consumption expenditure, percentage of GDP
OECD	GC (% of GDP)	General government expenditure by function, total expenditure, percentage of GDP
OECD	T (% of GDP)	Current taxes on income, wealth, etc. (Percentage of GDP)
World Bank	Pop	Population, total
International Monetary Fund	Debt (% of GDP)	Household debt, loans and debt securities (Percent of GDP)

Table A2: Summary Statistics Sample 1 - Panel (billions of constant 2017 international dollars)

	Gov. Consumption	Household Consumption	Total Taxes Revenue	Taxes on Income
Mean	244.1488	851.7060	389.9189	94.01743
Median	88.48494	271.7088	132.5197	24.46782
Maximum	2886.700	13890.58	5217.633	1899.807
Minimum	1.866223	4.203961	0.000000	0.000000
Std. Dev.	413.5277	1768.546	714.1770	240.8143
Skewness	4.054197	4.951014	4.091954	5.213054
Kurtosis	22.39134	29.99307	22.59591	32.45729
Countries	24.00000	24.00000	24.00000	24.00000

Table A3: Summary Statistics Sample 2 - Panel (percent of GDP)

	Gov. Consumption	Household Consumption	Total Taxes Revenue	Taxes on Income
Mean	44.32267	54.81418	24.15902	12.53276
Median	44.30196	54.16041	23.42862	11.89900
Maximum	63.03288	70.21750	41.36764	33.15292
Minimum	20.99603	30.42583	13.49592	4.339728
Std. Dev.	7.357199	7.496564	7.614485	5.011611
Skewness	-0.157332	-0.238438	0.526370	1.398994
Kurtosis	2.687324	3.056626	2.451142	5.729626
Countries	32.00000	32.00000	32.00000	32.00000

Table A4: Summary Statistics Sample 1 - Countries (growth rate)

Country	Statistics	Gov. Consumption	Household Consumption	Total Tax Revenue	Tax on Income	Tax on Sales and Production
Austria	Mean	0.0134	0.0093	0.0150	0.0185	0.0119
	St. Dev.	0.0155	0.0101	0.0234	0.0494	0.0199
Belgium	Mean	0.0166	0.0106	0.0130	0.0043	0.0142
	St. Dev.	0.0155	0.0081	0.0194	0.0280	0.0255
Brazil	Mean	0.0098	0.0145	0.0198	0.1083	0.0137
	St. Dev.	0.0256	0.0277	0.0384	0.3804	0.0569
Canada	Mean	0.0117	0.0190	0.0120	0.0103	0.0074
	St. Dev.	0.0200	0.0110	0.0226	0.0361	0.0299
Denmark	Mean	0.0119	0.0104	0.0120	0.0100	0.0074
	St. Dev.	0.0166	0.0165	0.0314	0.0288	0.0332
Finland	Mean	0.0204	0.0188	0.0159	0.0130	0.0190
	St. Dev.	0.0169	0.0176	0.0354	0.0421	0.0329
France	Mean	0.0109	0.0116	0.0135	0.0387	0.0128
	St. Dev.	0.0102	0.0105	0.0214	0.0796	0.0226
Germany	Mean	0.0150	0.0098	0.0158	0.0157	0.0129
	St. Dev.	0.0119	0.0096	0.0240	0.0601	0.0249
Greece	Mean	0.0172	0.0092	0.0260	0.0376	0.0207
	St. Dev.	0.0578	0.0381	0.0490	0.1118	0.0518
Hungary	Mean	0.0227	0.0255	0.0234	0.0180	0.0265
	St. Dev.	0.0407	0.0351	0.0354	0.0823	0.0381
Iceland	Mean	0.0288	0.0192	0.0282	0.0397	0.0109
	St. Dev.	0.0366	0.0524	0.1253	0.0623	0.0836
Ireland	Mean	0.0260	0.0228	0.0255	0.0237	0.0131
	St. Dev.	0.0406	0.0338	0.0529	0.0400	0.0610
Israel	Mean	0.0084	0.0198	0.0096	-0.0018	0.0086
	St. Dev.	0.0159	0.0175	0.0414	0.0724	0.0309
Italy	Mean	0.0067	0.0052	0.0079	0.0080	0.0074
	St. Dev.	0.0225	0.0190	0.0268	0.0351	0.0367
Japan	Mean	0.0195	0.0066	0.0164	0.0092	0.0283
	St. Dev.	0.0122	0.0110	0.0367	0.0699	0.0536
Korea	Mean	0.0580	0.0255	0.0514	0.0472	0.0322
	St. Dev.	0.0237	0.0443	0.0475	0.0690	0.0735
Luxembourg	Mean	0.0211	0.0110	0.0212	0.0245	0.0175
	St. Dev.	0.0271	0.0157	0.0343	0.0439	0.0653
Netherlands	Mean	0.0190	0.0101	0.0173	0.0222	0.0206
	St. Dev.	0.0235	0.0196	0.0290	0.0732	0.0319
Norway	Mean	0.0174	0.0216	0.0118	0.0113	0.0017
	St. Dev.	0.0488	0.0159	0.0261	0.0477	0.0460
Sweden	Mean	0.0185	0.0182	0.0159	0.0050	0.0153
	St. Dev.	0.0137	0.0141	0.0353	0.0472	0.0223
Switzerland	Mean	0.0091	0.0080	0.0152	0.0114	0.0104

	St. Dev.	0.0111	0.0070	0.0222	0.0154	0.0280
Turkiye	Mean	0.0586	0.0263	0.0447	0.0331	0.0451
	St. Dev.	0.0492	0.0431	0.0598	0.0997	0.0895
United Kingdom	Mean	0.0196	0.0177	0.0193	0.0160	0.0168
	St. Dev.	0.0276	0.0192	0.0343	0.0481	0.0386
United States	Mean	0.0131	0.0178	0.0130	0.0167	0.0120
	St. Dev.	0.0201	0.0138	0.0523	0.0889	0.0253

Table A5: Summary Statistics Sample 2 - Countries (growth rate)

Country	Statistics	Gov. Consumption	Total Tax Revenue	Household Consumption
Australia	Mean	0.4087	-0.0002	-0.2478
	St. Dev.	1.3811	0.7194	0.9721
Austria	Mean	0.0491	-0.0045	-0.2225
	St. Dev.	2.3096	0.6661	0.6137
Belgium	Mean	0.2398	-0.0148	-0.1695
	St. Dev.	2.1081	0.4806	0.6418
Costa Rica	Mean	0.5024	0.1683	-0.1895
	St. Dev.	0.5151	0.3351	1.4728
Czech Republic	Mean	0.2252	0.0281	-0.1641
	St. Dev.	2.4667	0.3346	0.8600
Denmark	Mean	-0.1848	0.0623	-0.1641
	St. Dev.	1.9079	1.2199	0.6094
Estonia	Mean	0.2457	-0.0618	-0.3428
	St. Dev.	2.7870	0.6287	0.8615
Finland	Mean	-0.1030	-0.1014	-0.0197
	St. Dev.	2.1628	0.8296	0.9857
France	Mean	0.2734	0.1925	-0.0758
	St. Dev.	1.5937	0.6091	0.3647
Germany	Mean	0.0357	0.0314	-0.2497
	St. Dev.	1.6659	0.5160	0.8451
Greece	Mean	0.6122	0.1158	0.0798
	St. Dev.	4.1363	0.7346	1.1536
Hungary	Mean	0.0015	-0.0955	-0.1489
	St. Dev.	1.9397	0.6306	1.1139
Iceland	Mean	0.4407	0.2338	-0.2576
	St. Dev.	5.2908	0.8302	1.6532
Ireland	Mean	-0.4664	-0.1529	-1.1613
	St. Dev.	6.0519	0.6334	2.3518
Israel	Mean	-0.3384	-0.0731	-0.1504
	St. Dev.	2.3562	0.9375	0.9991
Italy	Mean	0.2244	0.0262	-0.0193
	St. Dev.	2.0563	0.5942	0.6041

Japan	Mean	0.8162	0.1044	0.0063
	St. Dev.	2.4439	0.5438	0.7966
Korea	Mean	0.6921	0.1276	-0.2858
	St. Dev.	2.0343	0.5764	1.3374
Latvia	Mean	0.2754	0.0117	-0.4713
	St. Dev.	2.5549	0.5863	1.7823
Lithuania	Mean	-0.0800	0.0294	-0.2445
	St. Dev.	4.2163	1.0760	1.6067
Luxembourg	Mean	0.2131	0.0092	-0.5638
	St. Dev.	1.9178	0.7422	1.1685
Netherlands	Mean	0.0542	0.0586	-0.3292
	St. Dev.	1.8257	0.4794	0.5091
New Zealand	Mean	0.4284	-0.0855	-0.0474
	St. Dev.	2.8178	0.9654	0.8337
Norway	Mean	-0.1118	-0.0685	-0.1703
	St. Dev.	1.9589	1.2823	1.8935
Poland	Mean	0.2536	-0.1199	-0.1960
	St. Dev.	2.2805	0.7309	1.0125
Portugal	Mean	-0.3487	0.0554	-0.0404
	St. Dev.	3.3538	0.6859	0.7244
Russia	Mean	-0.0981	0.1140	-0.2403
	St. Dev.	3.5112	0.3128	2.7709
Spain	Mean	0.4071	0.0746	-0.1815
	St. Dev.	2.6444	0.6927	0.5623
Sweden	Mean	-0.3708	-0.0688	-0.1690
	St. Dev.	1.4562	0.7294	0.6885
Switzerland	Mean	0.1847	0.0903	-0.2325
	St. Dev.	1.4092	0.3890	0.7050
United Kingdom	Mean	0.6600	0.0813	-0.1732
	St. Dev.	2.6636	0.4734	1.0642
United States	Mean	0.4245	-0.0372	0.0860
	St. Dev.	2.1382	0.9381	0.4109