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Citizens' Confidence in Government and Inefficient Public Spending. Is there a Trust Trap?

Eduardo de Sá Fortes Leitão Rodrigues

REM – Research in Economics and Mathematics

Rua Miguel Lupi, 20
1249-078 LISBOA
Portugal

Telephone: +351 - 213 925 912
E-mail: rem@iseg.ulisboa.pt

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Citizens' Confidence in Government and Inefficient Public Spending. Is there a Trust Trap?

Eduardo de Sá Fortes Leitão Rodrigues (edfortes@phd.iseg.ulisboa.pt)

Instituto Superior de Economia e Gestão (ISEG)

Research in Economics and Mathematics (REM)

Research Unit on Complexity and Economics (UECE) - Rua Miguel Lupi 20, 1249-078 Lisbon, Portugal.

Universidade Federal Rural do Rio de Janeiro (UFRRJ)

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Abstract

The concept of trust is present in the most different areas of scientific knowledge. Associated with moral and philosophical perspectives, it influences the reputation of public institutions, and interferes with economic performance and welfare. Thus, trust is a complex interpersonal and organizational concept but closely linked to social capital, greasing the wheels of relationships and interaction between agents and public institutions. This article aims to assess the effects of inefficient/unproductive government spending on public trust and whether there is evidence of a trust trap.

To investigate these effects, we use dynamic regression models and the Generalized Method of Moments (GMM) approach for panel models of 43 (2006-2019) and 33 (2006-2017) developed and developing countries. To further the investigation, we run panel vector autoregression (PVAR) models with the largest sample (43 countries). Our paper focuses on the response of trust in government to the effect of inefficient public spending and income inequality (GINI index). Moreover, we investigate whether the government's high level of inefficiency interferes with this relationship and whether there is evidence of a trust trap.

The findings point to significant adverse effects of inefficient public spending on public trust, providing empirical support, and confirming the assumptions of some theoretical works. Our models indicate a threshold in the relationship between trust and inefficient government spending, that is, a trust trap. In short, to a certain extent, it is possible to regain trust by reducing the inefficiency of public spending. However, after this threshold, the recovery of trust requires a greater effort on the part of governments.

Keywords: Inefficient Government Spending, Confidence, Social Capital, Trust Trap.

JEL codes: C23, H40, D72.

1. Introduction

Trust in government has significantly declined in some countries, especially in the United States since the late 1960s (Intawan and Nicholson, 2018). In the European context, trust in government has been reduced due to economic events, corruption, or disclosure of classified information (Pérez-Morote et al., 2020).

Through enhanced evidence, we want to understand how inefficient government spending can erode public trust. Trust and social capital go far beyond direct effects, but they are the basis of human contact and relationship and the role of trust in relations between citizens and institutions. Therefore, the corrosion of these concepts compromises government performance and the effectiveness of economic and social activities. For Lopes (2015), trust has a central relevance, because it is an essential part of social capital, which refers to characteristics of social organization, such as values, norms and networks that facilitate coordination and cooperation for mutual benefit.

An important and intriguing issue is how governance and the management of public resources have affected the image of the government, interfered with public trust and economic performance. In other words, to what extent can inefficiency in public spending erode the image of a government and what is the effort to restore it?

We can define that a trusting agent or institution may be exempt from control or monitoring, entirely or partially. Economically, this brings several advantages, for example, reduced transaction costs (Fukuyama, 1995). In this sense, trust is a central element of social capital, greasing the wheels of social and economic transactions, fostering collaborative actions and its erosion has caused concern (Arrow 1974; Gordon et al., 2017). In a broad sense, the trust of citizens in government is important, as it speaks to the quality of the relationship that exists between citizens and the government and the willingness to cooperate with the government, enhancing the results of public policies. Therefore, due to the implications of public trust in government, this issue has attracted considerable interest from academics and public administration officials (Porumbescu, 2017).

In an institutional environment, political trust occurs when citizens assess the government and its performance as implementers of plans and promises defined as correct and efficient, even in the absence of inspection or control. However, trust is a delicate commitment that is often threatened as governments have significant power in resource allocation and there are strong economic and political interests involved in resource management.

This power is materialized through different forms of intervention, expenditures, subsidies, and taxes. Thus, we observe, to a greater or lesser degree, the influence and interference of interest groups in public administration. Therefore, there are strong incentives for public managers to partner with these specific groups and a wide range of actions that support politicians to take office or get elected, such as campaign contributions and positive mentions in the general media. Thus, rent-seeking and lobbying

are terms directly related to this type of action and can be interpreted in a similar way (Garen and Clark, 2015).

Junior and Garcia-Cintado (2021) point out that this activity has a myriad of definitions for rent-seeking activities, but in general, it can consist of the allocation of scarce public resources to obtain returns from economically inefficient transactions.

The following figure illustrates the dynamics of the number of lobbyists and lobbying spending (adjusted for inflation) in the United States[1]. We note that despite a slight decline after 2011, spending returned to the highest levels in recent years, especially during the COVID-19 pandemic.

Figure 1: Lobbying Spending and Number of Lobbyists (USA).
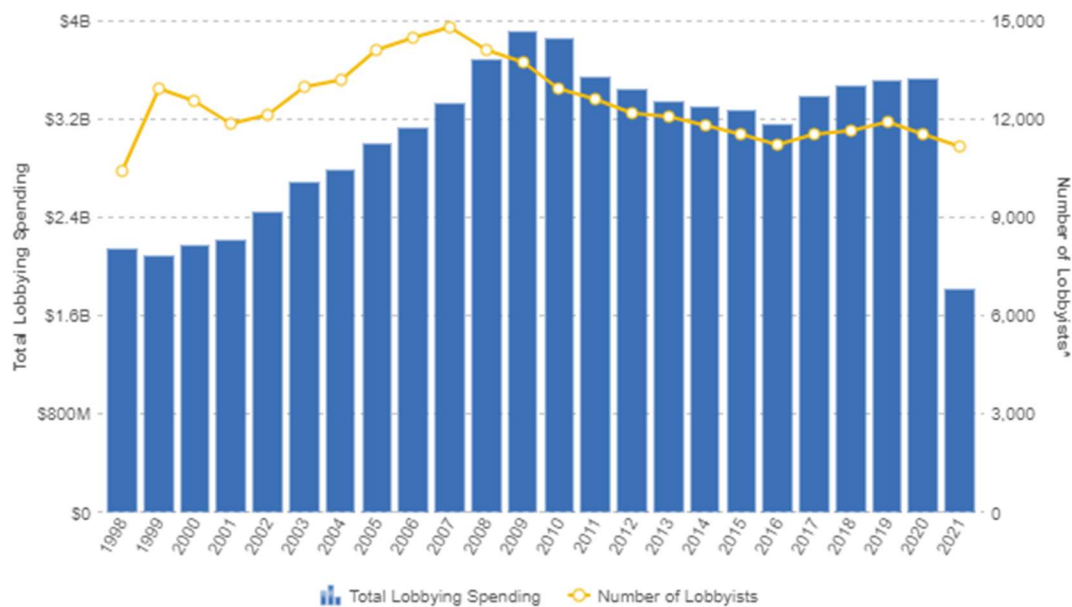
Source: OpenSecrets.org.

The actions of these private groups can affect the management and allocation of public resources and, directly and indirectly, influence economic performance. Directly, by increasing unproductive public expenditures in terms of social welfare, and indirectly, by affecting citizens' trust in government, reducing cooperation, productivity, and economic activity (Alesina and Warcziarg, 2000).

However, there are government expenditures that contribute to economic welfare and development, such as maintaining good contract laws, enforcing property rights, promoting competition, and managing public goods. These actions increase labour productivity, because the citizen's cooperation

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[1] The data is provided by OpenSecrets, an independent and nonprofit research group that tracks the influence of money on U.S. politics[1]. The information is based on data from the Senate Office of Public Records.

with the government enhances the effect of government spending. In this sense, scholars have investigated in which environment the government has broader interests and, therefore, less involved with special interests (Olson, 2000). In the same vein, Besley et al. (2010) indicate that more politically competitive governments engage with policies that favour society's broader aspirations and desires.

In this regard, some papers suggest that public spending directed to unproductive/inefficient activities reduces public trust in the government. Moreover, to undo a negative image of government is more difficult for large and inefficient governments (Garen and Clark, 2015). This behaviour exposes the existence of a threshold, changing the relationship between trust and inefficient/unproductive public spending. We describe this effect as the trust trap.

Using two sets of dynamic panel models from 43 (2006-2019) and 33 (2006-2017) developed and developing countries, our study focuses on the response of citizen trust in government to the effect of inefficient public spending. In addition, we investigate whether the government's high level of inefficiency interferes with this relationship and whether there is evidence of a trust trap. To confirm the results and deepen the study, we used panel vector autoregression (PVAR) models for a sample of 43 countries.

This paper, therefore, contributes to the literature in several different ways: i) provide empirical support for the arguments presented in the literature; ii) offer new findings with subjective and objective metrics of inefficiency in public spending and income inequality on trust, an important element of social capital; iii) analyse the effect of inefficient public spending (IGS), controlling for different degrees of government inefficiency, and iv) as far as we know, there is no other paper that assesses the effect of the trust trap, using panel models with traditional approaches and Generalized Method of Moments (GMM) with large samples.

The results stress that the increase in inefficient public spending and income inequality reduce the level of trust in governments. Furthermore, the models indicate that there is a threshold to the relationship between trust and inefficient governments, that is, a trust trap. In other words, to some extent, it is possible to regain trust by reducing the inefficiency of public spending. However, after this threshold, the recovery of trust requires a greater effort on the part of governments.

This article is organized into three sections in addition to this introduction. We begin with a review of the literature, which points to the importance of trust of agents and cooperation with the government, highlighting the role of trust in government for effective action and the concepts associated with the trust trap. Next, we present the method, estimation strategy and data. Then, we introduce the models and analyse the findings. Finally, the last section gathers the main conclusions of the study.

2. Literature

In this section, we present a discussion of the general background literature related to social capital, trust, and inefficiency in public spending, which are central elements of our models.

The effects of trust and cooperation with national government governments affect different areas of public management such as climate policy. Kulin and Johansson Sevä (2021) use a hierarchical linear models approach (multilevel analysis or MLA), associated with the European Social Survey to estimate the effects of national trust levels on citizens' policy attitudes. The authors point out the influences of trust in government affects the relationship between concern about climate change and climate policy attitudes across the country and highlight that individual trust in government institutions is an important factor in climate policy attitudes.

We can accentuate at least three strands of research that involve trust. The first, in the field of sociology, suggests that trust is a long-term output of historical patterns of associative, and interactions that go beyond the family nucleus and, therefore, some societies would be more prone to association than others.

Fukuyama (1996) argues that distinct economic performances derive from dispositions to establish bonds of trust beyond the family group or clan. The second strand is linked to economic theory and the rational choice approach, in which trust is associated with the trade-off between risk and trust, where moral values and other preferences favour cooperation and affect economic activity.

Finally, from a moral perspective, trust is culturally transmitted, therefore, agents make decisions based on perceptions about what is fair and unfair. For Ostrom and Ahn (2007), the different economic performances observed among nations should be investigated in the light of factors previously omitted, such as trust, reciprocity, formal and informal institutions. In this sense, they argue that the social capital approach considers such factors as the causes of behaviour and results for the community.

Early papers such as Rosenberg and Birdzell (1986) emphasise that the development of a solid moral system with capitalism was an important ingredient in the growth of Western economies. Alessandro et al. (2021) mention that a wide range of works has pointed to trust in institutions or between individuals as a key factor in social evolution and economic performance, as well as in democratic stability. Regarding the trust's relationship with different political regimes, it can assist to understand the impacts of democracy due to its ability to mitigate transaction costs.

For Lopes (2015), some aspects are accentuated in democratic regimes, such as freedom of expression, the possibility of effective collection and press freedom. From this perspective, the author admits that the level of economic activity can be encouraged by the relationship between democracy and trust.

Similarly, Algan et al. (2017) analyse trust and political attitudes, using regional data across Europe. They investigated the reflections of populism on trust with direct implications for national policy. The conclusions imply that economic insecurity is an important determinant of populism and political mistrust. Furthermore, unemployment has a negative influence on trust in national and European institutions. Therefore, this information is vital in a project to restore trust in democracy and institutions in the European Union or national governments.

Berliani et al. (2021) examine how governance affects the government public trust, using six governance indicators for 24 Islamic Cooperation Organizations. The paper presents two approaches, the Fixed and Random Effect Regression for panel data and, as in the study by Algan et al. (2017), political indicators (Political Stability and Control of Corruption) positively affect the level of citizen trust in government.

In the context of the United States and using the American National Election Study's (ANES), Intawan and Nicholson (2018) point out that trust in government has declined dramatically in the United States since the late 1960s, with momentary fluctuations. Using data from U.S. states, Dincer and Uslaner (2010) present evidence of a positive relationship between trust and economic growth. They also point out that the binomial "trust - GDP growth" is more likely in low-income economies, due to the low protection of contractual rights. In this line, Keele (2004) argues that the relationship between social capital and trust has a significant and strong influence on economic performance.

With respect to inequality and based on data from the World Values Surveys, Knack and Keefer (1997) suggest that trust is greater in countries with higher GDP and less income inequality. They admit that low economic development stems from a lack of trust among individuals. In this sense, the authors describe a possible trust channel that affects economic activity, as those countries with a high degree of trust have a lower cost to protect themselves from illegal actions. In a nutshell, the need for formal contracts is less necessary.

In line with Knack and Keefer (1997), Afonso and Rodrigues (2021) stress that low trust can discourage investors from innovating, as they may be forced to pay bribes or costs associated with corruption.

Regarding the role of public policy, Intawan and Nicholson (2018) indicate that the erosion of trust in government over the past 50 years has a plethora of elements, including economic performance, political scandals, and assessments of the quality of public policy. Stevenson and Wolfers (2011) highlight that better economic performance relates to trust in government, based on the assumption that good government policy leads to economic growth. In general, this evidence rests on the view that cooperation, understood as a social norm, applies to government. Therefore, effective governments have a positive, well-defined image and they will receive trust and cooperation in return. Conversely, public administrations considered inefficient and/or corrupt will have greater difficulty in implementing projects that require cooperation, mitigating the expected effects of public policies.

Likewise, Pharr (2000) indicates a negative impact of inadequate procedures for public servants in Japan on trust in government. For Yamamura (2012), the size of government can influence trust, due to the increased bureaucracy of a heavy government. Using individual-level data from Japan and Ordered Probit models, associated with instrumental variables, the author suggests that government size has heterogeneous effects, depending on the group under analysis. Therefore, government size is not associated with trust for non-workers, while for workers there is a negative effect on trust in

government. The paper also highlights the negative influence of government size through rent-seeking activities, increasing public distrust.

In relation to the size of the government, the effect on public trust is still diffuse. Kotera et al. (2012) identify a positive relationship between the size of the government and corruption, for democratic countries. Afonso and Rodrigues (2021) investigate the effect of mistrust, corruption perception, and the effects of government size should be put into perspective. Using dynamic models (Ordinary Least Squares - OLS, Fixed Effects and Generalized Method of Moments), they find that developing economies, regardless of government size, benefit less from reduced corruption. Thus, the government size is not sufficient to explain the negative interference of corruption and trust in economic activity, although the level of government effectiveness is crucial.

Concerning the relationship between government efficiency and trust, Porumbescu (2017) assesses citizens' trust in a public sector institution, the Seoul Metropolitan Government, and describes that the value of citizens' trust in government is enhanced through their contributions to government efficiency. When trust in government is low, policy implementation costs are higher, and citizens are less willing to cooperate with public institutions. On the other hand, when the level of trust in the government is higher, the population tends to be more willing to cooperate with public policies, the co-production of public goods and services is facilitated and we observe the chain of events, that is, efficient government conduct leads to a higher level of trust, cooperation and positive effects on economic performance.

Besley et al. (2010) underline that politically competitive governments are more inclined to favour programs that target the general interests of society. However, there are still many government programs involved in expenditures associated with rent-seeking activities, reducing trust in government as the size of government spending on these activities increases.

Murphy et al. (1993) deepen the analysis and argue the effects argue that public rent-seeking by government officials has an adverse effect on private investments, as it will likely harm innovative activities, since innovation drives economic performance and public rent-seeking hampers economic growth.

Regarding the effect of the allocation and management of public resources and rent-seeking activities, Junior and Garcia-Cintado (2021) investigate the rent-seeking behaviour in an open economy DSGE model for an emerging economy. They stress that income-seeking behaviour is an unproductive and expropriating activity that brings positive gains to particular groups, but not to society. They indicate that, although rent-seeking practices have been observed in all economies over time, nevertheless, developing countries are likely to be where this activity predominates in an intense and visible way. The authors find interesting results that confirm the concept of "good" and "bad" public spending, described by Garen and Clark (2015). They point out that government income transfers to households encourage rent-seeking, whereas fiscal shocks, such as government purchases and public

infrastructure reduce the stimulus of rent-seeking. Along the same lines, Gordon et al. (2017) suggest that the presence and growth of government, driven by interest groups, erodes trust and social capital.

2.1. Conceptual Model

Garen and Clark (2015) investigate the effect of increased unproductive activities, stimulated by the government, on the level of public trust in national government. They argue that there has been an increase in distrust of governments and, even so, we have seen an increase in government size. This apparent inconsistency can be explained by a vicious cycle and the need for politicians to finance and encourage unproductive activities to maintain their status, to take office or get elected.

The cycle starts with disproportionately favoured groups to maintain political status, encouraging unproductive activities and reducing welfare. Thus, the population becomes more suspicious of the government, reducing cooperation and the productivity of public spending. To maintain and guarantee political support, a new governmental stimulus is directed towards specific groups, consequently, the negative effect on trust is accentuated, continuing the cycle.

A unique feature of this process is the non-linearity of the relationship between trust and government participation in unproductive/inefficient activities. In other words, for a high degree of involvement in inefficient activities and loss of public trust, the return to the original point is not trivial, as the recovery of reputation and trust in government may require a greater effort than in the early stages. Thus, we call this phenomenon a trust trap.

Figure 2 points to a pattern (comovement) of increase in public spending (red line) and reduction in trust (blue line) for Brazil, Chile, Colombia and South Africa. For the United States and Greece, there is apparently a subtle and peripheral effect derived from the reduction in government spending.

However, the apparent inconsistency of this insignificant effect may indicate that perhaps the effort to improve the government's image should be more intense and/or the continuous increase in subsidies and other transfers (dashed line) is influencing the dynamics of the trust index.

Figure 2: Trust Index, Subsidies (% of expense) and Government Spending (%GDP).
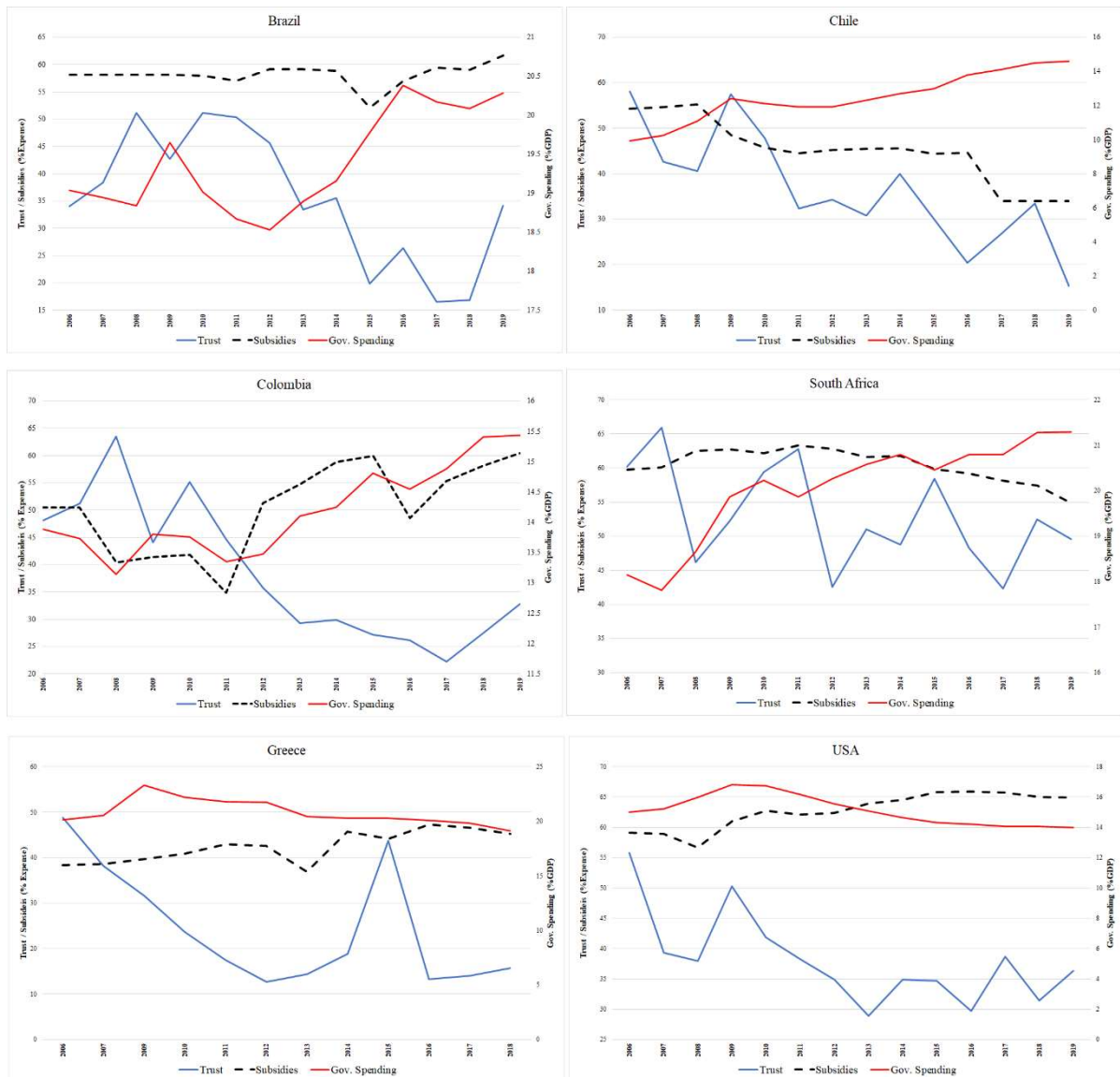
Source: Authors' calculations and OECD.

We highlight that the size of government (government expenditures or subsidies and other transfers) is only a first indication of socially inefficient management, because part of this expense generates efficiency for the system and is directed towards productive activities. For this reason, Garen and Clark separate public spending into productive (good) and unproductive (bad), and we will proceed in the same way.

To explain the historical comovement of government size and distrust in the national government, Garen and Clark model the impacts of unproductive public spending in contrast to government spending that incorporates value and increases productive activity.

They present a model with two equilibria, one good equilibrium (high trust in government) and low rent-seeking, and the second is bad (low trust in government). For the authors, a straightforward finding

is that trust in government is a declining function of government actions that generate rent-seeking and unproductive activity.

However, this function depicts different sensitivity levels (elasticities) depending on the degree of unproductive activities implemented by the government. In this context, the economy can become trapped in a large government (high unproductive public spending) and low trust equilibrium. Thus, once policies have been adopted that move the economy from a good to a bad equilibrium, moving back to the original point is not easy, because the economy remains in a bad equilibrium. At this moment, the trust trap materializes and hinders that, even with the reduction of unproductive public expenditures, the trust in the government returns to its previous level.

The following figure illustrates the possible stable equilibria, described in the model by Garen and Clark (2015). Point E(1) shows the initial equilibrium between cooperation with the government (L), which directly depends on trust in government. On the other hand, we observe the amount of effort devoted to non-productive activities (S) that depends on the incentives for these activities, for example, when the interference of groups or particular interests increases the government incentive and expenses to non-productive projects, reducing welfare.

The authors describe that government spending is divided into two types: good spending that leads to productive effects and unproductive spending (related to S), which does not increase the efficiency of economic activity. When the government allocates more resources to the latter, it shifts the line S(1) to S(2), establishing a new equilibrium point, E(2).

Point E(1) is a good equilibrium, indicated by the binomial "high trust - low non-productive activity", providing a high level of utility for society. Further increases in S move the economy to E(2), moving the economy from a good to a bad equilibrium. This new point E(2) is associated with a low level of legitimacy and trust in government, depicted by a lower L.

Figure 3: Equilibrium Points: Trust versus Unproductive Government Activities.
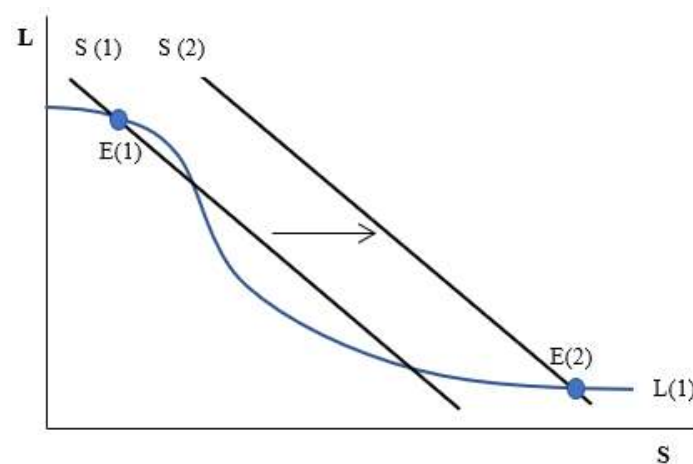
Source: Adapted from Garen and Clark (2015).

The relationship between trust and unproductive activities is not linear, and the efforts to move between different equilibrium points are different.

Therefore, in addition to the negative relationship between trust in government and unproductive economic stimuli, this conceptual model points to a second important finding, a threshold, or a trust trap. Thus, "Once this threshold is crossed, trust and cooperation move to low levels and the economy is in a bad equilibrium. To return to a good equilibrium, S must fall by enough to go back across this threshold. Small reductions in S are not sufficient; L is locally inelastic and so trust is mired at low levels and the economy remains in a bad equilibrium." (Garen and Clark, 2015, p.26).

The authors admit that they have not brought empirical evidence to support this conclusion but that it is plausible, as it says that, for authorities with a bad reputation, even if there were significant changes in their behaviour, they had little effect on public cooperation and trust in government.

In the next sections, we present the method, the data, and investigate whether the increase in inefficient public spending affects trust in government, as well as the presence of a trust trap.

3. Method, Estimation Strategy and Data

In terms of statistical methods, our research emphasises the statistical method, and we use a set of analytical and computational approaches, examining the characteristics of a population through observations of a sample. Specifically, we use regressions associated with dynamic models with panel data. Regarding the type of research, our study can be classified as descriptive and exploratory (*ex-post-facto*), because we study the facts that occurred, not allowing the manipulation of variables. (Gil, 2002). Next, we present some concepts, assumptions and key variables used in statistical models.

3.1. Definitions and Data.
3.1.1. Trust

The literature provides different dimensions that influence trust in public institutions and indicators to measure public trust, such as anti-corruption and integrity indices, policy coherence for sustainable development. In our paper, we use Trust in Government Index (Trust) which is widely used and developed by the Organization for Economic Co-operation and Development (OECD). It has the advantage of having broad coverage and applying consistent methodology for cross-country studies and, defined as the proportion of people who report having trust in the government. Therefore, the results reflect the proportion of respondents who answered "yes".

### 3.1.2. Government Spending and Inefficiency Government Spending (IGS)

In this paper, the General government final consumption expenditure[2] (GC) variable represents the behaviour of government spending, and we examine how the productive effort for government efficiency is transmitted to the population. There are different measures for government efficiency, such as government financial health, Regulatory Quality, Rule of Law, and in this article, we use Government Effectiveness[3], developed by the World Bank. To determine the degree of efficiency/inefficiency of government spending, we weighted government consumption (GC) by the normalized Government Effectiveness (GEFF) index and then calculated the Inefficient Government Spending (IGS).

$$Ineff = (1 - GEFF) \qquad (1)$$
$$IGS = GC \times Ineff \qquad (2)$$

where $GEFF \in [0,1]$[4]. In our models, we consider that countries with the highest 30% score (Ineff. Index) have high inefficient government expenditures. Figure 4 shows a subtle relationship between the Trust index and government spending. However, the perception of the inefficiency of public spending (Ineff) and the weighted inefficient public spending (IGS) have a negative relationship with the population's trust in governments.

Figure 4: Trust, Gov. Spending (GC), Ineff. Gov. Spending (IGS) and Ineff. Index (Ineff).
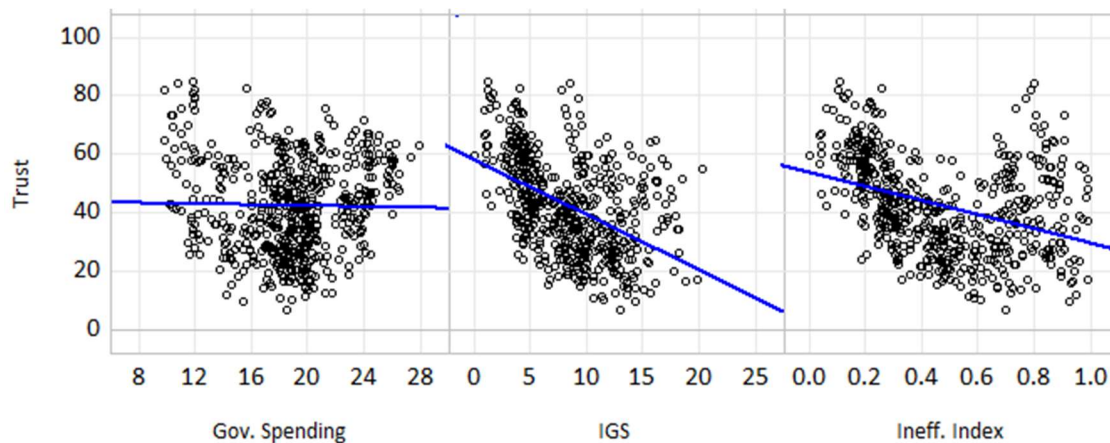
Source: Authors' calculations and OECD.

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[2] "General government final consumption expenditure (formerly general government consumption - % GDP) includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes most expenditures on national defense and security but excludes government military expenditures that are part of government capital formation." - World Bank national accounts data, and OECD National Accounts data files.

[3] "Perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies." - http://info.worldbank.org/governance/wgi/

[4] *GEFF* equal to 1 means maximum effectiveness.

To assess the influence of subsidies and income inequality on public trust, we adjusted the previous series, including the subsidies and other transfers (World Bank), as well as the GINI coefficient series (OECD). In the first model, we examine a set of 43[5] countries over 14 years (2006-2019). Tables 1 and 2 present the annual averages.

Table 1: Sample 1: Trust, Gov. Spending, Subsidies, and Inefficient Gov. Spending (2006 -2019).

Id	Countries	Trust	Gov. Spending	Subsidies	Ineff Gov Spending	Id	Countries	Trust	Gov. Spending	Subsidies	Ineff Gov Spending
1	AUS	50.06	18.03	0.74	4.47	23	ISL	37.56	23.75	29.53	6.99
2	AUT	43.54	19.76	0.68	5.24	24	ISR	37.55	22.76	37.91	8.48
3	BEL	44.65	23.29	0.23	7.54	25	ITA	27.08	19.49	46.04	13.43
4	BGR	25.86	16.47	0.10	12.71	26	JPN	31.39	19.48	.	6.27
5	BRA	35.42	19.39	0.80	17.39	27	LTU	25.94	17.79	56.33	9.88
6	CAN	57.18	20.71	0.88	4.21	28	LUX	74.13	16.68	50.11	3.88
7	CHE	75.49	11.84	0.57	1.44	29	LVA	22.61	18.08	52.34	9.71
8	CHL	36.42	12.47	0.15	5.34	30	MEX	36.61	11.58	62.11	9.07
9	COL	38.38	14.18	0.28	12.04	31	NLD	59.12	24.79	77.96	4.92
10	CRI	37.28	16.26	0.51	11.63	32	NOR	64.73	22.13	65.03	3.71
11	CZE	31.60	19.55	0.74	9.62	33	NZL	60.44	18.82	43.41	5.02
12	DEU	50.70	19.39	0.88	4.99	34	POL	29.91	18.26	44.45	11.21
13	DNK	56.29	25.47	0.53	2.96	35	PRT	32.27	18.75	43.56	8.25
14	ESP	34.69	19.29	0.55	9.01	36	ROU	21.14	15.35	35.23	13.97
15	EST	36.08	18.98	0.89	8.57	37	RUS	50.07	18.19	63.20	16.89
16	FIN	56.92	23.32	0.68	2.53	38	SVK	29.65	18.70	49.02	10.19
17	FRA	37.42	23.52	0.72	7.56	39	SVN	27.22	19.30	45.85	8.87
18	GBR	41.63	19.99	0.32	5.64	40	SWE	54.81	25.53	70.88	4.13
19	GRC	25.52	20.71	0.38	14.10	41	TUR	55.77	14.13	49.28	10.66
20	HUN	31.54	20.41	0.17	12.61	42	USA	38.06	15.13	62.77	4.38
21	IND	69.01	10.70	0.67	8.87	43	ZAF	52.87	20.06	60.44	13.97
22	IRL	48.78	15.64	0.71	5.08						

Source: Authors' calculations, OECD, and World Bank Database.

In addition to the effectiveness perception index provided by the World Bank, we also use an objective metric through Data Envelopment Analysis (DEA) in our second model.

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[5] When we include the GINI coefficient, the sample was reduced due to gaps in the database.

Since the work of Charnes et al. (1978), DEA stands out as a multivariable technique for evaluating the productivity of decision units (DMUs), informing possible directions for improving the status quo of inefficient units.

To calculate efficient/inefficient government spending, we use two series provided by Afonso et al. (2020), Public Sector Performance (PSP) and Public Expenditure (PE). In our paper, we re-evaluated the sample of authors, adjusting the series according to our research question and with the other series, as the Trust Index has gaps. Finally, we recalculate the indices using the DEA approach, and for the second model, we use a sample with 33 economies over 12 years (2006-2017).

Table 2: Sample 2: Trust, Gov. Spending, and Inefficient Gov. Spending (2006 -2017).

Id	Countries	Trust	Gov. Spending	Ineff. Gov. Spending	Id	Countries	Trust	Gov. Spending	Ineff. Gov. Spending
1	AUS	50.64	17.88	2.27	18	ISR	36.16	22.77	7.65
2	AUT	42.35	19.83	9.72	19	ITA	28.02	19.60	9.40
3	BEL	45.76	23.34	11.80	20	JPN	29.99	19.46	7.31
4	CAN	57.04	20.65	7.17	21	LTU	24.17	18.00	6.15
5	CHE	73.39	11.84	2.16	22	LUX	73.54	16.64	6.83
6	CHL	38.43	12.12	0.12	23	LVA	22.75	18.00	6.13
7	CZE	30.65	19.56	7.77	24	NLD	58.29	24.86	10.81
8	DEU	49.47	19.25	8.86	25	NOR	64.97	21.62	10.23
9	DNK	55.13	25.71	14.27	26	NZL	59.45	18.86	7.21
10	EST	35.15	18.83	7.13	27	POL	27.19	18.32	7.74
11	FIN	54.93	23.07	12.29	28	PRT	29.45	19.08	8.82
12	FRA	37.30	23.58	12.84	29	SVK	30.03	18.59	7.29
13	GBR	42.22	20.21	8.02	30	SVN	26.30	19.50	9.23
14	GRC	25.13	20.96	10.14	31	SWE	55.55	25.46	13.68
15	HUN	29.35	20.54	9.56	32	TUR	55.80	14.13	2.72
16	IRL	46.75	16.32	5.93	33	USA	38.76	15.31	5.17
17	ISL	35.13	23.66	9.28					

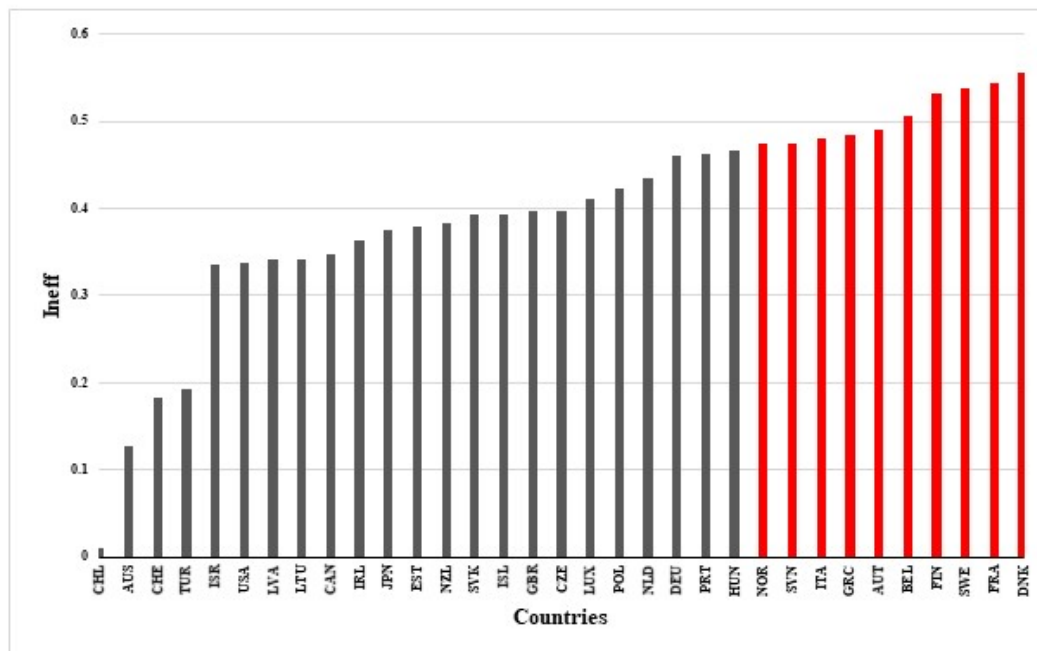Source: Authors' calculations, OECD, and World Bank Database.

Under these circumstances, we used two different measures or metrics, the first derived from the individuals' perception of efficiency (GEFF - World Bank) and the second is an objective measure, an outcome of the DEA models.

Figure 5 shows the ranking (average) of the different metrics for the inefficiency indices (two samples). Red bars represent those countries that have the highest 30% inefficiency scores or the lowest 30% efficiency scores.

Figure 5: Inefficient Index (2006 -2019).
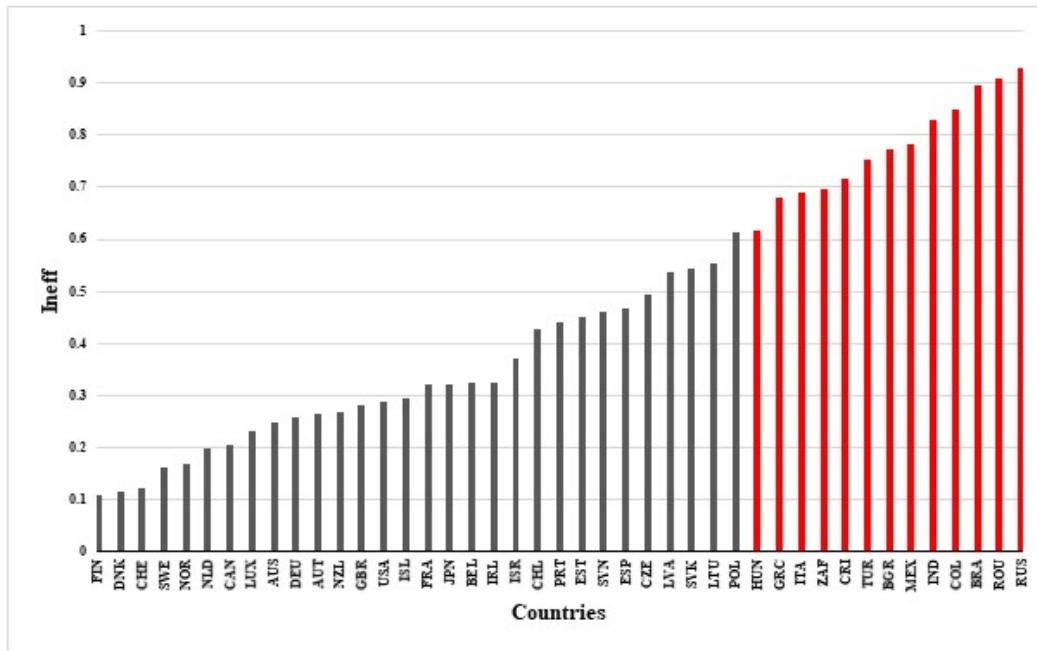
Sample 1 (43 Countries)

Sample 2 (33 Countries)

Source: Authors' calculations, OECD, and World Bank Database.

Table 3: Series and Data Sources.

Original Series	Data Source	Code
General government final consumption expenditure (% of GDP).	World Bank	NE.CON.GOVT.ZS
Subsidies and other transfers (% of expense)	World Bank	GC.XPN.TRFT.ZS
Government Effectiveness - GEFF (estimate).	World Bank	GE.EST
Trust in Government.	OECD	TRUSTGOV
Income Inequality (GINI coefficient).	OECD	INCOMEINEQ
Public Sector Efficiency and Public Expenditure composite indicators.	Afonso, A., Jalles, J., and Venâncio, A. (2020)	PSP and PE

3.2. Causality

Although empirical and theoretical studies (Yamamura, 2012; Garen and Clark, 2015) already admit the direction of causality, that is, government spending/attitudes affecting trust and even after we have identified a strong relationship between the variables, we decided to confirm the precedence relationship by using the regression model with panel data and applying the Granger causality test[6].

Following this protocol, we increase the confidence of the results, because a high degree of association between two variables may not be a sufficient condition to determine the direction of causality between them.

Thus, the Granger causality approach analyses whether a variable x causes y, and how much of the current y is explained by lagged values of x. In this way, we assess whether the lagged values can improve the explanation. If the result is confirmed, we say that x Granger-cause y, and helps to predict y.

The use of causality tests in time series models is extensive, but its application to panel data is a relatively recent field of study (Hurlin, 2004). Thus, to improve the identification of the causal sense, we check if IGS Granger causes trust, therefore, if the past values of IGS are useful to predict the current value of the trust (vice versa).

However, we underline that Granger causality measures precedence but does not by itself indicate causality in a broad and general sense. Next, we present the models and results for the panel unit root test and the Granger causality test.[7]

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[6] The method, associated with the F-test, examines whether the coefficients of the lagged variables are jointly invalid.

[7] The results were obtained with the EViews software.

$$Trust_t = \sum_{i=1}^{n} \mu i IGS_{(t-1)} + \sum_{j=1}^{n} \pi j Trust_{(t-j)+U_t} \qquad (3)$$

$$IGS_t = \sum_{i=1}^{n} \mu i IGS_{(t-1)} + \sum_{j=1}^{n} \pi j Trust_{(t-j)+U_t} \qquad (4)$$

Table 4: Panel Unit Root Tests.

Method 1: Levin, Lin and Chu	Statistic	Prob	Obs
Null: Unit root assumes common unit root process	-7.08782	0.0000	464

Method 2: PP - Fischer Chi-square	Statistic	Prob	Obs
Null: Unit root assumes individual unit root process	198.733	0.0000	464

Source: Authors' calculations, OECD, and World Bank Database.

Table 5: Granger Causality Test.

Null Hypothesis (Lags:1)	F-Statistic	Prob.	Obs
IGS does not Granger Cause Trust	10.6778	0.0012	512
Trust does not Granger Cause IGS	0.40126	0.5267	

Source: Authors' calculations, OECD, and World Bank Database.

Examining the results in Table 4, which analyses the presence of unit root and non-stationary series, we do reject the null hypothesis for both methods. Furthermore, from the results in Table 5, we cannot reject the hypothesis that Trust does not Granger cause IGS. Contrary, the test fails to reject the null, and we cannot reject the hypothesis that IGS does not Granger cause Trust. Therefore, it appears that Granger causality runs one-way from IGS to Trust and not the other way[8].

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[8] Although the optimal number of lags is equal to 1 (Schwarz criterion), we verify that with two or three lags, we reject the hypothesis that IGS does not Granger cause Trust.

4. Model Specification

4.1. Endogeneity

As in our paper, different studies are involved in estimating the effect or influence of an x_t variable on another y_t. In other words, we can estimate the equation:

$$Y = \beta X + \varepsilon \qquad (5)$$

Thus, the traditional OLS method solves this issue by establishing the following expression:

$$min(Y - \beta X)'(Y - \beta X) \rightarrow \beta (X'X)^{-1}X'Y \qquad (6)$$

To establish a good estimate, it must be unbiased and that x_t is not correlated with the error term ($E[\varepsilon_t | x_t] = 0$). So, we should note for a sample:

$$\sum_{t=1}^{T} x_t(y_t - \beta_1 x_t) = 0 \qquad (7)$$

However, in many situations, this condition is not valid, and the conditional error expectation is not null. A strategy to circumvent this issue is the application of instrumental variables (IV). Briefly, we select a variable z_t that is correlated with x_t and that is not correlated with the error term and, therefore, can adequately represent x_t.

$$\sum_{t=1}^{T} z_t(y_t - \beta_1 x_t) = 0 \qquad (8)$$

For the instrument's validity to be confirmed, the covariance of z_t and x_t must be different from zero. Moreover, we need to check the exogeneity, that is, that the covariance of the instrument and the error term is equal to zero. Next, we detail the estimation strategy with the Generalized Method of Moments (GMM) and how the instrumental variables are incorporated into the models.

4.2. GMM approach

The Generalized Method of Moments has some advantages compared to other approaches, such as OLS, because it addresses issues such as the endogeneity of explanatory variables. The first papers for dynamic models (GMM) use the first difference transformation (FD), initially investigated by Arellano and Bond (1991). However, a later paper (Arellano and Bover, 1995) examines a new transformation (forward orthogonal deviations or FOD) with robust results. Furthermore, Hayakawa (2009), Roodman (2009) and Phillips (2019) point out that in some cases FOD performs better than FD, especially when the database has gaps, optimizing the sample size.

In our models, we present different settings for the dynamic model panel, as we examine not only the isolated effect of public spending inefficiency, but we also control for the degree (high/low) of

government spending inefficiency. Therefore, our basic dynamic model specification for Trust Index (Y_{it}) can be defined as:

$$Y_{it} = \alpha Y_{i,t-1} + X'_{it}\beta + e_t + u_{it} \qquad (9)$$

where Y_{it} is the dependent variable (Trust Index), X'_{it} represents the vector of explanatory variables (1xk), α is a scalar, representing the persistence or the memory of the process that affects Y_{it}, and β is the vector of coefficients (kx1).

The subscript i denotes countries across the time periods (t). The compound error (u_{it} and e_t.), and the random term of variation in our independent variable is derived from idiosyncratic error (u_{it}) and time-invariant error, e_t. It is precisely this term that we investigate when we analyse fixed effects, and whether it is correlated with explanatory variables or not. Furthermore, we introduce the lagged dependent variable $Y_{i, t-1}$ as an element for the concept of dynamic panel, exploring the dimension of the time series.

Our baseline models[9] have two explanatory variables (inefficient government spending and dummy high inefficient government spending) or three explanatory variables (inefficient government spending, dummy high inefficient government spending, and income inequality), in addition to the lagged dependent variable $Y_{i, t-1}$.

To address the issue of endogeneity, we used dynamic models (GMM), and we identified an appropriate strategy for instrumental variables, that is, we used the FOD technique because it has better coefficient properties compared to FD, and because in our sample, some countries have missing data (gaps). The GMM specification is in line with the Arellano-Bond two-step[10], and in model 1, we assume that the maximum sampling period (t) is equal to 14 years and 43 countries (i), while for model 2 the sample is 12 years and 33 countries.

Regarding instrumental variables, we use lagged level variables, such as instrumental variables for endogenous variables and estimation parameters by GMM, in line with Anderson and Hsiao (1982), and Arellano and Bond (1991).

To ensure that the chosen instrumental variable (z) is adequate, we examine whether it is correlated with the explanatory variable (x) for which it will be an instrument. Another requirement highlighted by Wooldridge (2010) is that the instrument is not correlated with the error term (e).

$$Cov(z, x) \neq 0 \qquad (10)$$
$$Cov(z, e) = 0 \qquad (11)$$

---

[9] In addition to these main models, we have included a complementary model, which investigates the effect of government subsidies and transfers.

[10] In our study the samples are large, but if they were relatively small, we could use one-step, because some studies have observed that the two-step GMM estimator standard deviations tend to be biased (Santos et al., 2012).

The first hypothesis (10) is known as the relevance of instruments and, therefore, z must be correlated with the explanatory variable (x). Regarding the hypothesis associated with equation 11, it indicates the exogeneity of the instruments. Thus, in the context of omitted variables, instrumental exogeneity means that z has no correlation with the omitted variables (Wooldridge, 2010).

A simple way to test the hypotheses mentioned is to estimate a regression between the desired variables and estimate the coefficients (β). Since $\beta = \frac{Cov((z,x)}{Var(z)}$, we can test the hypothesis by examining the p-value.

5. Empirical Analysis: models, results, and discussion
5.1. Dynamic panel regression models

In this section, we examine the effects of Inefficient Government Spending (IGS) on Trust, as well as the assumptions mentioned in the literature. To gain intuition, we start with an analysis of the average results between 2006 and 2019, and subsequently, we analyse the findings of dynamic panel models.

The trust index is represented by the Trust in Government (OECD), and it depicts the proportion of agents who claim to have trust in the national government. Using the Trust index and IGS measured by the average between the years 2006 and 2019, the data suggest that the higher the level of inefficient public spending, the lower the level of trust (see Figure 6). For instance, the Greek economy has relatively lower levels of trust and has higher levels of IGS. We also observe that countries such as the United States (which is situated below the trend line) would expect the level of trust to be higher.
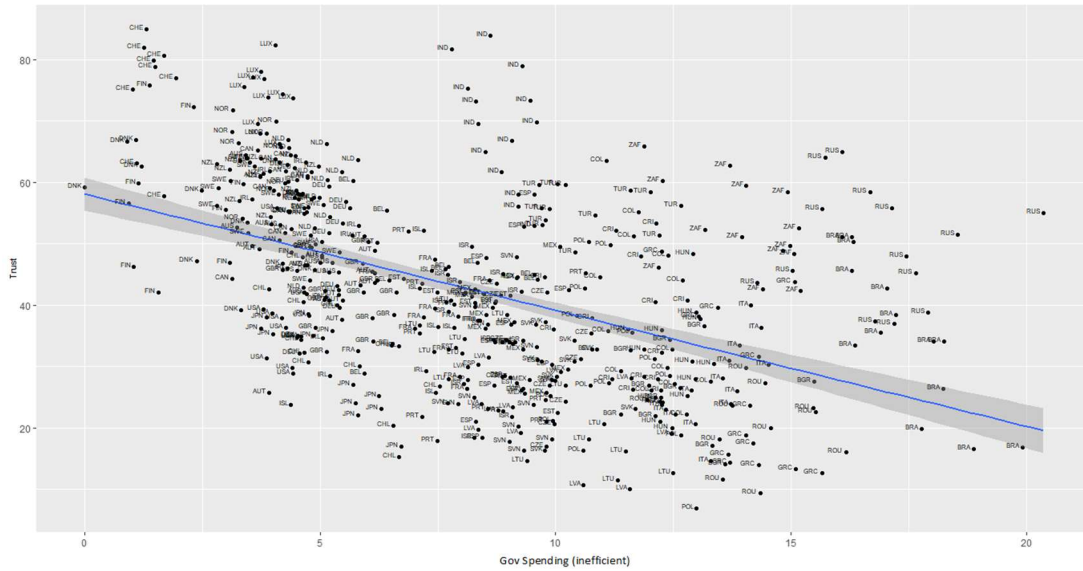
Figure 6: Trust and Inefficient Government Spending - IGS (average 2006 - 2019).
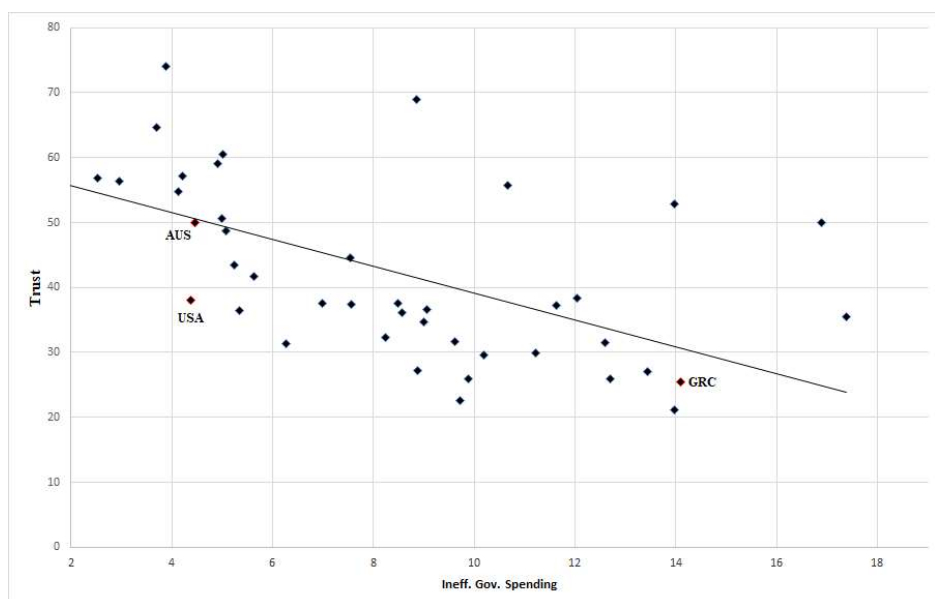
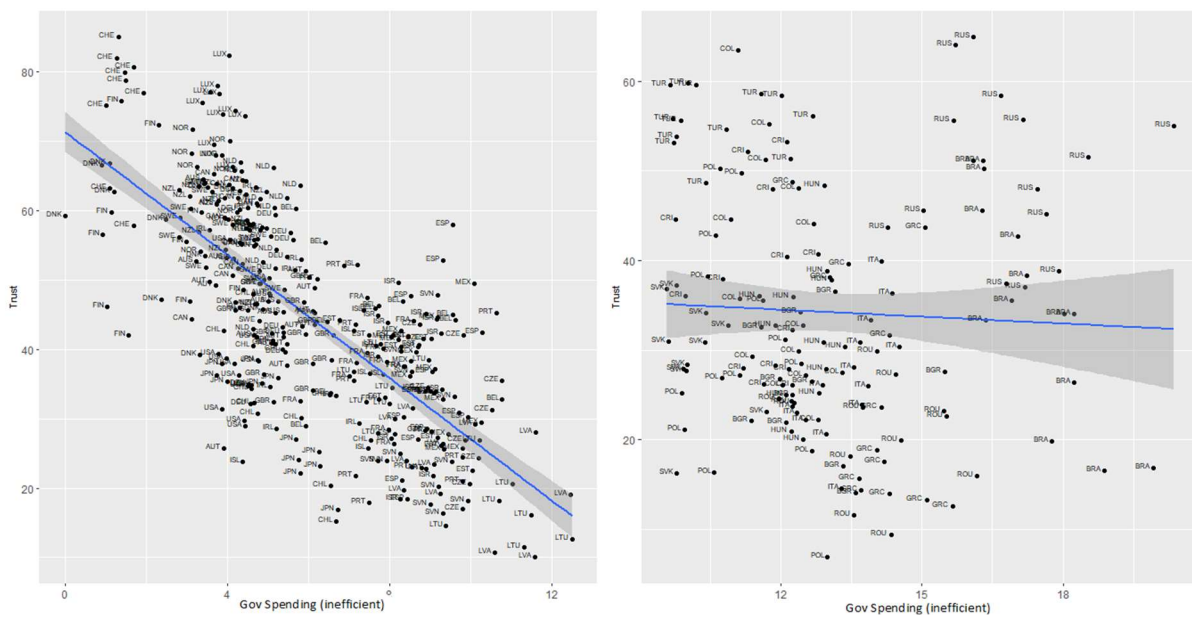Source: Authors' calculations and OECD Database.

To confirm the adverse effect of inefficient governments on trust, we expanded the sample (figure 7). Subsequently, we examine the trust trap hypothesis and identify the indication of a change in the slope of the line (trust trap), that is, in the relationship between agents' trust and the inefficiency of government spending (figures 8 and 9).

Figure 7: Trust Index and Inefficient Government Spending -IGS (Sample 1).
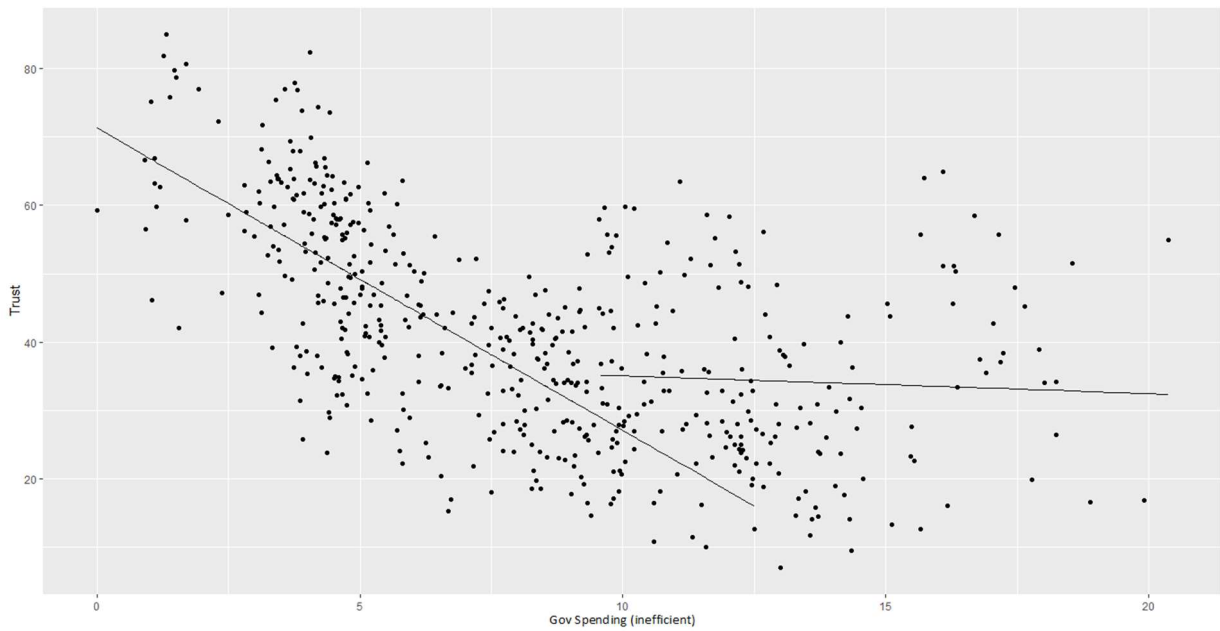

Source: Authors' calculations and OECD Database.

Figure 8: Trust Index and Low/High Inefficient Government Spending -IGS (Sample 1).

Source: Authors' calculations and OECD Database.

Figure 9: Trust Index and Inefficient Government Spending (Sample 1) – "Trust-Trap".

Source: Authors' calculations and OECD Database.

To confirm the hypotheses of the adverse effect of inefficient governments and the trust trap, we use as the main strategy a dynamic panel approach (GMM). This approach also controls the endogeneity of the lagged dependent variable in a dynamic model, particularly when there is a correlation between the error term and the explanatory variables. Furthermore, the GMM controls omitted variable bias and unobserved panel heterogeneity. Tables 6 and 7 present the tests for using the GMM models and instrumental variables, as presented in the previous section. The results reveal that the correlation between the explanatory variable and its instrument is statistically significant (Table 6). The second requirement is that the instrumental variable is not correlated with the error term. This requirement was also verified (Table 7), demonstrating that the instrumental variables are not correlated with the error terms.

Table 6: Exploratory Variables and Instrumental Variables.

Dependent Variable	IGS		Dummy IGS High Ineff		GINI		Isub		Dummy Isub High Ineff	
	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.
IGS (-1)	0.974	0.000								
Dummy IGS High Ineff (-1)			0.948	0.000						
GINI (-1)					0.971	0.000				
Isub (-1)							0.970	0.000		
Dummy Isub High Ineff (-1)									0.998	0.000

Source: Authors' calculations and OECD Database.

Table 7: Error Term and Instrumental Variables.

Dependent Variable	Error Term	
	Coefficient	Prob.
IGS (-1)	0.266538	0.3219
Dummy IGS High Ineff (-1)	-0.060476	0.8090
GINI (-1)	2.506221	0.7710
Isub (-1)	-0.006307	0.9312
Dummy Isub High Ineff (-1)	-0.027220	0.7453

Source: Authors' calculations and OECD Database.

Next, we initially use three dynamic panel approaches: OLS, Fixed Effects (FE), and GMM (FOD). Although the focus of our study is the GMM approach, we also include the two other approaches to compare results, confirm patterns and the magnitude of effects. To assess the effects of public spending inefficiency, we designed two sets of three models (OLS, FE and GMM). Although dynamic models deal well with the issue of omitted variables, we incorporated the coefficient of income inequality (GINI) into the second set of models, in line with Knack and Keefer (1997). With these new attributes, we increased the robustness of the results and confirmed the signs of the previous models.

The findings suggest that an increase in IGS hinders agents` trust (statistically significant coefficients). Besides that, the last three models confirm the negative effects of the IGS on trust, as well as indicate that increases in income inequality can lead to a reduction in the reputation of public administration, eroding trust in national governments (see Table 8).

Table 8: Dynamic models: OLS, Fixed Effects and GMM (FOD).

	OLS	FE	GMM	OLS	FE	GMM
Dependent	(1)	(2)	(3)	(4)	(5)	(6)
Variable	Trust	Trust	Trust	Trust	Trust	Trust
Trust (-1)	0.803358***	0.38896***	0.393639***	0.707422***	0.322852***	0.324106***
	(0.025756)	(0.039700)	(0.020189)	(0.038936)	(0.05580)	(0.008347)
IGS	-0.389214***	-2.010396***	-1.86731***	-0.866620***	-1.622350***	-2.515038***
	(0.102341)	(0.366821)	(0.136798)	(0.169098)	(0.490605)	(0.139414)
GINI				-10.14550	-75.14984*	-122.2910***
				(8.513315)	(40.54863)	(14.50992)
c	11.57219***	42.61102***		21.83730***	63.80596***	
	(1.705661)	(3.872548)		(3.426128)	(14.12918)	
Adj R sq	0.732203	0.789726		0.743001	0.803684	
DW	2.143639	1.945232		2.053830	2.055186	

Prob F	0.0000	0.0000		0.0000	0.0000	
Prob(J-statistic)			0.489729			0.503116
Countries	43	43	43	38	38	38
Observations	512	512	469	296	296	258

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

Source: Authors' calculations and OECD Database.

Moving forward, we use the GMM approach to investigate the trust trap hypotheses. After analyzing the full sample, we divide the countries according to the degree of inefficient public spending and investigate whether high levels of inefficiency matters. Regardless of the technique, the findings confirm that higher inefficient public spending leads to a decrease in the level of trust in governments.

Moreover, OLS and GMM models suggest that there is a threshold in the relationship between trust and inefficient governments. In other words, to some extent, it is possible to regain trust by reducing spending inefficiency. However, after this threshold, the recovery of trust requires a greater effort on the part of governments.

Therefore, in addition to the negative effect of the IGS variable on trust in the government, the dummy IGS High Ineff emphasises that countries, with high inefficient government spending, have an additional positive effect on the sensitivity of the trust index, changing the resulting coefficient and highlighting the threshold effect (trust trap).

As in the previous models, table 9 presents six models, but now we include the dummy variables, and a seventh model to capture the effect of subsidies. Thus, models 4, 5 and 6 additionally investigate the effect of income inequality (GINI index), and confirm i) the harmful effects of public inefficiency (IGS) on trust, ii) the indication of the trust trap and finally, iii) the negative impact of income inequality on public trust. Lastly, the seventh model corroborates the effects of the IGS and the trust trap, and also underlines the peripheral influence of inefficient subsidies (Isub[11]).

As we can notice, the subtle effect of Isub on the trust is altered when we examine the incremental impact of the dummy Isub High Ineff. In this sense, we realize that for governments with a high degree of inefficiency, the effect on citizens' trust in government is adverse and significant.

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[11] To build this new variable, we use the same principle as the IGS, that is, we multiply the value of subsidies and other transfers by the inefficiency (perception) of the government.

Table 9: Dynamic models: OLS, Fixed Effects and GMM (FOD) – Trust Trap.

	OLS	FE	GMM	OLS	FE	GMM	GMM
Dependent Variable	(1) Trust	(2) Trust	(3) Trust	(4) Trust	(5) Trust	(6) Trust	(7) Trust
Trust (-1)	0.756200*** (0.028586)	0.388621*** (0.039710)	0.379980*** (0.022366)	0.653075*** (0.042253)	0.314998*** (0.05424)	0.320340*** (0.011658)	0.320901*** (0.027832)
IGS	-1.000540*** (0.196642)	-2.238266*** (0.446011)	-2.16635*** (0.213917)	-1.478692*** (0.259539)	-2.139054*** (0.550277)	-2.714988*** (0.155333)	-3.945028*** (0.668750)
Dummy IGS High Ineff	0.417156*** (0.115075)	0.675496 (0.751898)	0.894840** (0.422468)	0.421296*** (0.136330)	2.429070** (1.198621)	0.595782* (0.313676)	3.056926*** (1.039959)
GINI				-17.11189** (8.692590)	-62.92271 (40.75295)	-128.1017*** (19.65100)	
Isub							0.868423*** (0.194840)
Dummy Isub High Ineff							-1.138872*** (0.291537)
c	16.99647*** (2.253988)	41.78898*** (3.979961)		29.90673*** (4.276261)	56.38807*** (1451306)		
Adj R sq	0.738442	0.789640		0.750242	0.806047		
DW	2.093488	1.953234		2.005289	2.077620		
Prob F	0.0000	0.0000		0.0000	0.0000		
Prob(J-statistic)			0.454936			0.471285	0.520930
Countries	43	43	43	38	38	38	42
Observations	512	512	469	296	296	258	440

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

Source: Authors' calculations and OECD Database.

To further check whether the level of inefficient government spending matters, and to carry out more in-depth research, we ask whether, using another efficiency index with a different sample, the results would be similar, confirming the previous findings.

In this sense, as suggested by Afonso et al. (2020), we further investigated government spending efficiency with a non-parametric technique, Data Envelopment Analysis (DEA). In short, DEA can be described as a non-parametric technique, based on linear programming, for the evaluation of the efficiencies of organizations (Decision Making Units - DMUs), for example, schools, banks, or at the

macro level, states, and countries. In our paper, we use DEA[12] to compute the production frontier for 33 advanced economies, considering the following function:

$$Z_i = f(X_i), i = 1, \ldots, 33 \qquad (12)$$

where Z_i is the composite output measure (Public Sector Performance, PSP[13]) and X_i is the composite input measure (Public Expenditure to GDP ratio). For efficiency scores, we assume variable-returns to scale because countries might not operate at their optimal scale.

For this purpose, we create a cross-country panel dataset, covering a sample of 33 countries for the period between 2006 and 2017. Figure 10 depicts the production possibility frontier for 2006, highlighting the countries that define the frontier, such as Switzerland (CHE). This representation allows us to verify that there would be conditions for improvements in relation to the efficiency gains for other countries.

Figure 10: Production Possibility Frontier (2006).
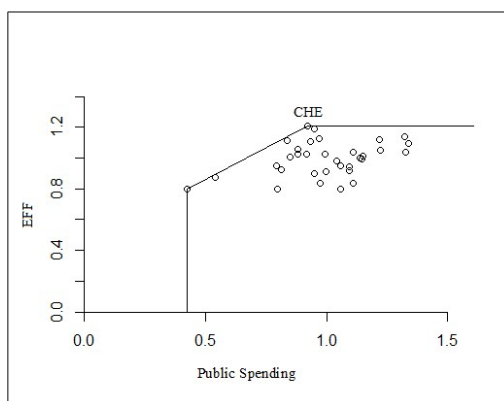
Source: Authors' calculations and adapted from Afonso et al. (2020)

After examining the efficiency scores for the sample, we calculate the values of inefficient public spending for each country and investigate the effects of government inefficiency, inequality income on trust and the existence of the trust trap.

The findings suggest a negative relationship between government inefficiency and trust in the government and we find (significant) signs of a trust trap, confirming the previous pattern. Looking at country groups, those countries with low performance in public spending have a harder time increasing public trust, even after reducing inefficiency. In contrast, countries with low inefficiency in the public

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[12] We use an input-oriented assessment, and the package 'Benchmarking' - https://cran.r-project.org/web/packages/Benchmarking/Benchmarking.pdf.
[13] The output derives from performance in areas such as education (PISA scores), health (life expectancy), infrastructure, and government functions: allocation, distribution, and stabilisation (see Afonso et al., 2005).

sector can raise the trust index with less effort (Table 10). As we have done before, we confirm the hypotheses for using the instrumental variables of this new model (see Tables A1 and A2 in the Appendix).

Despite showing the correct signs, the Fixed Effects approach does not point to a significant coefficient for the trust trap effect, however, the GMM models support the hypothesis that an increase in the IGS score (increase in inefficiency) and income inequality reduce the confidence level. In addition, we confirm the trust trap effect for countries with high levels of IGS.

Table 10: Dynamic models: OLS, Fixed Effects and GMM (FOD) - DEA Efficient Scores.

	OLS	FE	GMM	GMM
Dependent	(1)	(2)	(3)	(4)
Variable	Trust	Trust	Trust	Trust
Trust (-1)	0.841817***	0.318509***	0.303519***	0.250364***
	(0.030078)	(0.049977)	(0.040070)	(0.009023)
IGS	0.03487	-1.293304***	-1.677937***	-2.217405***
	(0.187908)	(0.311240)	(0.199618)	(0.045203)
Dummy IGS x	-0.068720	1.131888	0.952935***	0.310259*
High Ineff	(0.122300)	(0.890982)	(0.348093)	(0.184322)
GINI				-157.8058***
				(9.914278)
c	6.635195***	34.96397***		
	(1.896201)	(4.015274)		
Adj R sq	0.712111	0.796648		
DW	2.155728	2.017079		
Prob F	0.0000	0.0000		
Prob(J-statistic)			0.348535	0.333937
Countries	33	33	33	28
Observations	322	322	256	159

*** - significant at 1%; ** - significant at 5%; * - significant at 10%. Standard deviations in brackets.
Source: Authors' calculations and adapted from Afonso et al. (2020)

5.2. Panel Vector Autoregression (PVAR) Models[14]

Some studies have inquired about the causal direction between public service quality and trust. For Ruscio (1996) the concept of trust does not necessarily have a single causal direction, because it can be

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[14] To investigate the models, we use the Stata (15.1) software.

both cause and effect. Along these lines, Bouckaert and Van de Walle state that "The implicit hypothesis in recent quality initiatives in Western government administrations is that quality leads to satisfaction and satisfaction to trust. We have already shown that the first relation (quality-satisfaction) is not obvious, because of the multitude of other factors involved, and because of the importance of perceptions and expectations" (Bouckaert and Van de Walle 2001, p. 15).

The authors add that "Even if we only suppose performance is direction of causality related to trust, it might well be that a trusting attitude leads to a better perception of service delivery" (Bouckaert and Van de Walle 2001, p. 15).

In this regard, this subsection presents a complementary analysis to the previous models. To examine the hypothesis that there is a bidirectional effect between Trust and IGS, we use a distinct approach, Panel Vector Autoregression (PVAR) models. We run our PVAR (order p) with the larger sample (43 countries) over a 14-year period (2006-2019).

$$Y_{it} = Y_{it-1}B_1 + \cdots + Y_{it-p+1}B_{p-1} + Y_{it-p}B_p + X_{it}C + u_i + e_{it}$$
$$i \in \{1,2,\ldots,43\}, t \in \{1,2,\ldots,14\}$$

(13)

Where Y_{it} is a vector of dependent variables and X_{it} is a vector of endogenous variables for each country (i), in year t. The linear coefficients of each country can be correlated with the error (biased estimates). Thus, we follow Abrigo and Love (2016) and use FOD transformation, adding instruments with lagged data to circumvent this issue. Then, taking logs and first-differencing the series (Trust and IGS[15]), we implement the preliminary tests (unit root and the optimal number of lags) and find that our time series are stationary (see Appendix).

In order to identify shocks, we use the Cholesky decomposition in the variance-covariance structure of the residuals and define the contemporary effects between the variables, *dligs* and *dlt*. After defining the variables and performing the preliminary tests, we simulate the impulse response functions (IRF), whose graphs are shown in the figure below.

The first figure highlights some important results. First, it confirms the negative effect of the inefficiency of public spending on trust in government. In other words, the increase in the IGS has a negative (statistically significant) impact on the variation of the public trust.

In the left panel, we see that a shock in dligs (Δ%IGS) decreases dlt (Δ%Trust) by about 3% in the current year, then by a bit more in the next year as the lagged effect kicks in. From the second year on, the effect decays rapidly to zero, with the statistical significance of the effect vanishing at about three years.

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[15] *Diff(Log IGS) = dligs, and Diff(Log Trust) = dlt.*

In the right panel, we see the estimated impacts (with low significance) of a shock to dlt (Δ% Trust) on dligs (Δ%IGS). The first thing to notice is that the impact is zero in the current year. The second noteworthy finding is that the dynamic effect that occurs in the second year promotes public efficiency (decline in public inefficiency) as a possible result of higher cooperative behaviour and greater demand from citizens. After that moment, the effect dissipates in the third year (Figure 11).

Figure 11: IRF – PVAR (Full sample).
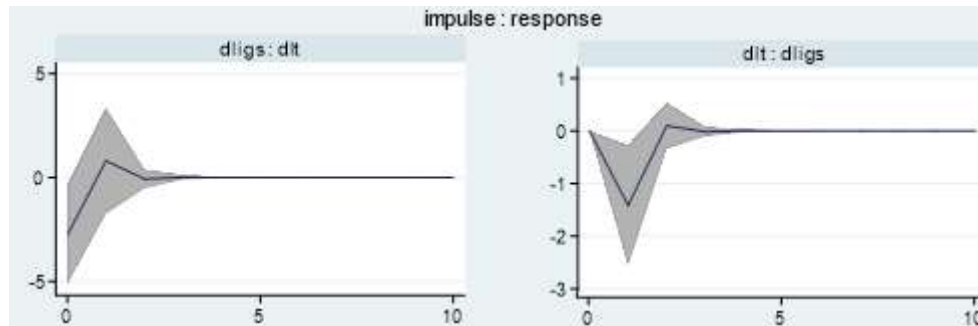
Source: Authors' calculations and OECD Database.

Subsequently, we estimate two models, one for countries with low public inefficiency and the second for countries with high public inefficiency. The findings are shown in the two figures below. An inspection of the IRFs (Figure 12) indicates the negative and significant impact of increasing the IGS on the public trust for economies with a high level of government efficiency (low public inefficiency)

Figure 12: IRF – PVAR (Low Public Inefficiency).
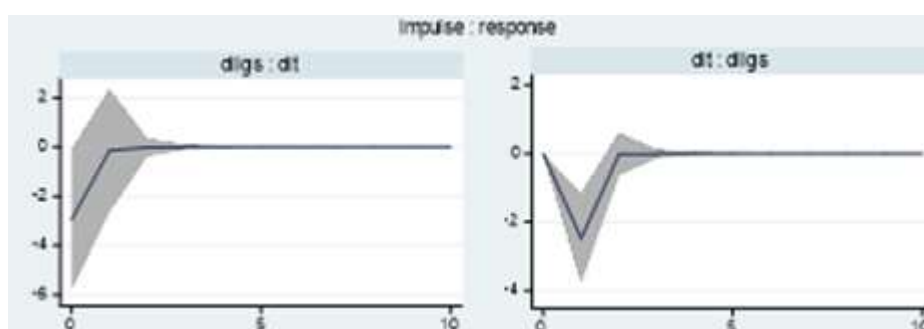
Source: Authors' calculations and OECD Database.

However, the same effect cannot be confirmed for countries with a worse performance in public expenditure management (Figure 13). For these countries, a policy of rebuilding the image or improving the reputation does not have a significant effect on the trust.

This result suggests that for this group of countries, the effort to increase public trust should be more intense. With this, we see signs of the trust trap effect, described in the models of the previous section.

Figure 13: IRF – PVAR (High Public Inefficiency).
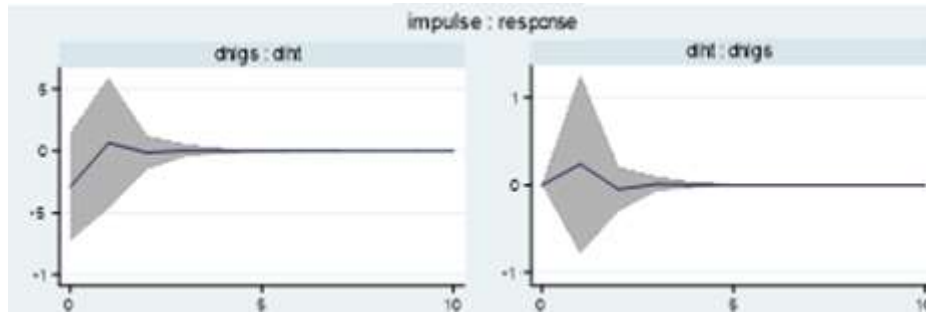
Source: Authors' calculations and OECD Database.

6. Concluding Remarks

Due to the multidisciplinary nature of the theme, scholars emphasise the complexity and challenges that emerge from the different causes of mistrust. Thus, the erosion of reputation, the role of social capital as factors that condition public policy and interfere with economic performance have gained prominence on the agenda of governments. However, the complex and multifaceted nature of trust requires further studies, as the causes of trust in governments, as well as the reaction of public administrators, are still diffuse.

To assess the mentioned effects, we used two samples and two distinct effectiveness concepts to increase the robustness of the results. Our findings enhance that the increase in inefficient public spending and income inequality reduce the level of trust in governments, in line with the literature and with the model proposed by Garen and Clark (2015). In addition, the models point to a threshold in the relationship between trust and inefficient government spending, that is, the presence of a trust trap. In other words, to a certain extent, it is possible to regain trust by reducing the inefficiency of public spending. However, after this level, the recovery of confidence imposes greater control by governments.

We also highlight that, the evidence that the unproductive part of public spending reduces trust can generate a secondary effect, but no less important. The decline of public trust can reduce cooperation and create a transmission channel that inhibits the effectiveness of productive public spending. As stressed by Garen and Clark (2015), many productive functions of government, such as enforcing property rights, increase productivity when there is cooperative involvement of the population.

Thus, just as uncertainty obscures the effectiveness of public spending (Rodrigues 2020; Rodrigues 2021), the reduction of trust in government can generate a transmission channel that reduces the effectiveness of fiscal policy.

In this sense, our experiments contribute by providing empirical support for the arguments presented in the literature, which sometimes do not address empirical results. Therefore, our findings add to a growing corpus of research, highlighting the relevance of social capital and governance in public administration for economic performance.

This paper has some limitations, and we hope in future studies to mitigate them, through a larger sample, controlling for factors such as poverty, in addition to exploring other variables as a trust proxy, such as the two types of trust in government (implicit and trust explicit), pointed out in the article by Intawan and Nicholson (2018). Another interesting study is to examine the secondary effects of trust and the possible transmission channels that affect fiscal policy and economic performance.

Finally, to further study the impact of government performance, we can investigate some issues that remain open and that can be explored. Thus, we can ask whether agents' participation in the economy promotes greater trust, derived from involvement and cooperation (psychological effect), or whether it results from rational cooperation to improve public service. Furthermore, we can separate what is trust in government and satisfaction with government policy or even from a feeling that stems from the benefits of the political regime (Bouckaert and Van de Walle, 2001).

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Appendix

Table A1: Exploratory Variables and Instrumental Variables (Sample 2).

Dependent Variable	IGS		Dummy High Ineff		GINI	
	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.
IGS (-1)	0.853185	0.0000				
Dummy High Ineff (-1)			1.196898	0.0000		
Dummy High Ineff (-2)			-0.203388	0.0000		
GINI (-1)					0.974419	0.0000

Source: Authors' calculations and adapted from Afonso et al. (2020).

Table A2: Error Term and Instrumental Variables (Sample 2).

| Dependent Variable	Error Term	
	Coefficient	Prob.
IGS (-1)	0.065252	0.8272
Dummy High Ineff (-1)	-1.420353	0.3317
Dummy High Ineff (-2)	1.347105	0.3454
GINI (-1)	14.60444	0.3508

Source: Authors' calculations and adapted from Afonso et al. (2020).

Table A3: Descriptive Statistics (PVAR).

| Descriptive Statistics				
Stats	*lt*	*dlt*	*ligs*	*dligs*
Mean	3.661395	0.0015514	1.988832	0.0128359
SD	0.4254776	0.2592081	0.5684822	0.1154894
Min	1.928164	-1.194181	-0.0912137	-0.5342942
Max	4.442627	1.005073	3.01381	0.7269837
Median	3.730739	-0.0021088	2.117358	0.0087218

Source: Authors' calculations.

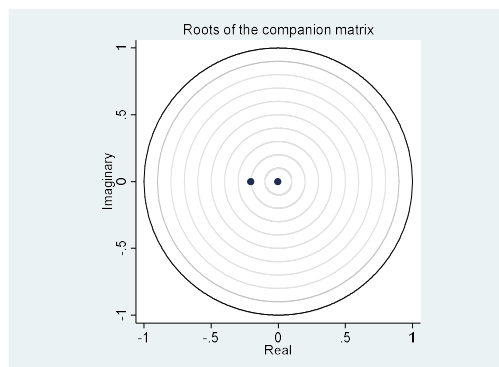Figure A1: Eigenvalue Stability - PVAR (Full Sample 1).
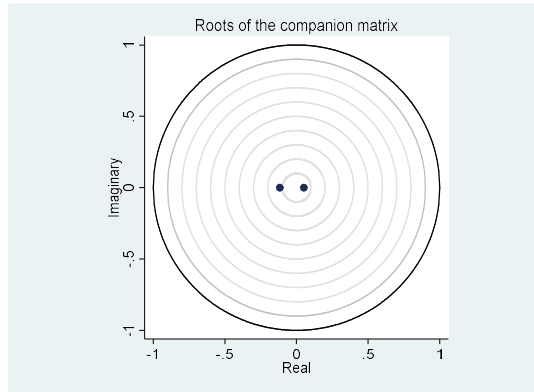
Source: Authors' calculations.

Figure A2: Eigenvalue Stability - PVAR (Low Ineff - Sample 1).
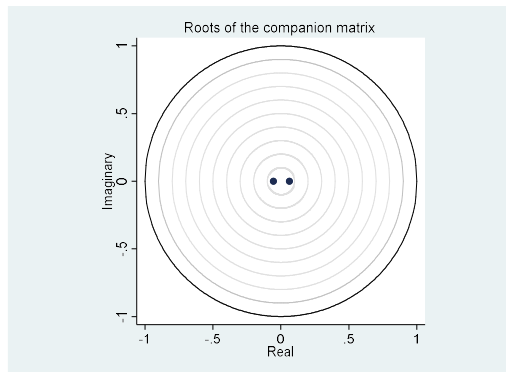
Source: Authors' calculations.

Figure A3: Eigenvalue Stability - PVAR (High Ineff - Sample 1).

Source: Authors' calculations.

Table A4: Unit-root test. IGS (Full Sample 1).

Fisher-type unit-root test. Phillips-Perron tests		
Ho: All panels contain unit roots		
D(Log(IGS))	Statistic	p-value
Inverse chi-squared(58) P	357.9343	0.000
Inverse normal Z	-12.3664	0.000
Inverse logit t(149) L*	-17.8278	0.000
Modified inv. chi-squared Pm	27.8482	0.000

Source: Authors' calculations.

Table A5: Unit-root test. Trust (Full Sample 1).

Fisher-type unit-root test. Phillips-Perron tests		
Ho: All panels contain unit roots		
D(Log(Trust))	Statistic	p-value
Inverse chi-squared(58) P	351.5889	0.000
Inverse normal Z	-12.9839	0.000
Inverse logit t(149) L*	-17.5962	0.000
Modified inv. chi-squared Pm	27.259	0.000

Source: Authors' calculations.

Table A6: Unit-root test. IGS (High Ineff -Sample 1).

Fisher-type unit-root test. Phillips-Perron tests		
Ho: All panels contain unit roots		
D(Log(IGS)) - High Ineff	Statistic	p-value
Inverse chi-squared(26) P	129.9674	0.000
Inverse normal Z	-8.5201	0.000
Inverse logit t(69) L*	-9.912	0.000
Modified inv. chi-squared Pm	14.4177	0.000

Source: Authors' calculations.

Table A7: Unit-root test. Trust (High Ineff Sample 1).

Fisher-type unit-root test. Phillips-Perron tests		
Ho: All panels contain unit roots		
D(Log(Trust)) - High Ineff	Statistic	p-value
Inverse chi-squared(26) P	192.6667	0.000
Inverse normal Z	-10.9149	0.000
Inverse logit t(69) L*	-14.7067	0.000
Modified inv. chi-squared Pm	23.1125	0.000

Source: Authors' calculations.

Table A8: Unit-root test. IGS (Low Ineff Sample 1).

Fisher-type unit-root test. Phillips-Perron tests Ho: All panels contain unit roots		
D(Log(IGS)) - Low Ineff	Statistic	p-value
Inverse chi-squared(58) P	357.9343	0.000
Inverse normal Z	-12.3664	0.000
Inverse logit t(149) L*	-17.8278	0.000
Modified inv. chi-squared Pm	27.8482	0.000

Source: Authors' calculations.

Table A9: Unit-root test. Trust (Low Ineff Sample 1).

Fisher-type unit-root test. Phillips-Perron tests Ho: All panels contain unit roots		
D(Log(Trust)) - Low Ineff	Statistic	p-value
Inverse chi-squared(58) P	351.5889	0.000
Inverse normal Z	-12.9839	0.000
Inverse logit t(149) L*	-17.5962	0.000
Modified inv. chi-squared Pm	27.259	0.000

Source: Authors' calculations.

Table A10: Selection Order Criteria (Sample 1).

Selection Order Criteria			
lag	MBIC	MAIC	MQIC
1	-51.73537	-9.623	-26.578
2	-32.78182	-4.707	-16.010
3	-17.58444	-3.547	-9.199
4	.	.	.

Source: Authors' calculations.