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Firm profits and government activity: An empirical investigation[†]

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Abstract

Recent studies suggest that firm profits have risen to a level far above than what would have been earned in a competitive economy. It has been hypothesized that these profits, generated by market power, allow firms to influence the activity of the government. However, despite an abundance of theoretical investigations, the empirical examinations for the validity of this hypothesis have been largely neglected. Against this background, here we perform a detailed empirical study on the potential effects of firm profits and markups on government size and effectiveness. Using data on 30 European countries for a period of 17 years and an Instrumental Variables approach, we find that there exists a robust and stable negative relationship between firm gains and the activity of the state. Our results indicate that, even in such a homogeneous group of countries, firm power may dictate the decline in state activity and, successively, lead to emergence and persistence of inefficient states.

1 Introduction

As the world is facing a severe crisis caused by the COVID-19 pandemic, government intervention in the form of fiscal stimuli to keep the economies afloat will undoubtedly reshape and redefine the role of the state in the future. Parallel to the measures taken by the public authorities aimed at reducing the potential impact of the health crisis, fiscal stimulus packages were made by governments to help the private sector in order to save jobs and businesses. Following the IMF's motto - "a global crisis like no other needs a global response like no other", public spending as a share of GDP is projected to rise even further, changing the global economic landscape to a point of no return. Over the course of history, movements in government spending have been shown to be very rigid - temporary increases proved to be permanent and decrements to a lower level highly unlikely to happen. This raises important questions such as: What determines the movements in government expenditures as percentage of GDP, i.e. state size? Are these determinants

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related to the quality of public good provision, competition regulation, correction for market failures, promotion of economic and political stability, protection from natural catastrophes and wars and etc., or what is simply known as government effectiveness?

Without a doubt, government size and effectiveness have been at the focus of the public economics research community for a long period of time as the subject of many, yet still, ongoing debates. There have been many factors studied in the literature that have been used to explain cross-country differences in terms of size and efficiency of government services. The most dominant theories are: Wagner's Law which is concerned with the relationship between growth of national income and government involvement in the economy (Wagner, 1911); Rodrik's theory of trade openness that explains government size as social insurance against external risks, Rodrick (1998); Alesina and Wacziarg's theory of country size which states that large countries can afford to have smaller governments because they already benefit from a sizable market that reduces their need to be open to trade (Alesina and Wacziarg, 1998); and Easterly and Ross's demographic theory which argues that high ethnic diversity is closely associated with small state size (Easterly and Ross, 1997).

To the best of our knowledge, no research so far has investigated the role of firm profits as a determinant of government size and efficiency. Our study aims to close this gap by including profits as an additional explanatory variable along those that have already been suggested in the literature to explain the variation in government activity, both across countries and across time.

The two research hypotheses that we investigate are: i) a negative association between firms' profits and government size; and also ii) a negative association between firms' profits and government effectiveness. The claim that profits are negatively associated with government expenditure is surprising at first sight. What could be a potential explanation for this phenomenon? One frequently used argument in the literature is that big states have a negative influence on market outcomes, and this is usually explained with the presence of corruption and institutional weaknesses (for example, Goel and Nelson 1998, Alesina and Angeletos 2005, Arvate et al. 2010, and Holcombe 2013). Alternatively, one can also look at the profits-state size relationship through the lens of the role of firms in shaping political decisions related to economic issues. In general, firms aim to maximize profits and pay the lowest possible tax to the state. To achieve this purpose, firms may use different channels and try to influence political processes within a country. The lighter forms of influence include proposals to the chambers of commerce regarding taxes, customs duties or other economic policy issues. More sophisticated forms include media campaigns (with open or hidden participation) about the design of economic policies and lobbying of government officials and parliamentary members for their support. The hardest forms of influence include, but are not limited to financing (mostly unofficial) of political leaders, politicians and media, which then leads to receiving different types of favors in return.

Another potential explanation for this interaction between firms and the government is known in the literature as "crony capitalism". This is an economic and political system in which firms make profits not as a result of competition, but rather as a result of inefficient state allocation of subsidies, tariffs, quotas, entry and regulatory barriers etc. (Hughes 1999,

Wei 2001, Peev 2002, Kang 2003, Hughes et al. 2004, Rajan and Zingales 2004, Singh 2006, James 2008, Zingales 2012, Djankov 2015, Zywicki 2015, Pei 2016, Diwan and Schiffbauer 2018, Ngo and Tarko 2018). One theoretical investigation of such an effect is presented in Acemoglu et al. (2011). The authors developed a theoretical case to explain the emergence and persistence of inefficient states in which elites capture democratic processes and keep taxation low, at the costs of aggregate inefficiencies. Indeed, we would expect that this is the case for less developed countries, which have only a small fraction of their GDP raised in tax revenue and invested by the government. But, the main logic of this explanation, that businesses and political elites can manipulate economic rules and therefore influence both state size and effectiveness, is universal, and can also apply to developed countries, such as countries in the European Union.

Even more so, Zingales (2012) has written that: "When a business gains excessive market power, so that it can increase prices indiscriminately, customers can seek protection through the political process. But when a business obtains both market and political power, escape becomes impossible. Under these circumstances, the system starts to resemble a socialist economy instead of a free market. In a socialist economy, the political system controls businesses; in a crony capitalist system of this kind, businesses control the political process. The difference is slim: both way, competition is absent and freedom shrinks. Without competition, economic life becomes unfair, favoring the connected insider."

In this paper, we present empirical evidence that this argument is valid even for a relatively homogenous group of developed countries – European Union countries - most of which are required to pass through the same legislation harmonization process and have a common market. We find that there exists a robust and stable negative relationship between the magnitude of firms' profits, measured through profit markups and profit shares, and countries' government size and effectiveness. The relationship is robust in the sense that: (a) it is not an artifact created by outliers; and (b) it does not change under alternative model specifications.

This paper is organized as follows. In Section 2 we give a comprehensive overview of the literature that motivated our research. Then, in Section 3, we describe the econometric model and the data used for verification of our hypotheses. In Section 4 we present our main findings. Finally, the last section concludes.

2 Literature review

One of the earliest theories of public finance is Wagner's law (Wagner, 1911) which states that there is a long run tendency of the relative share of the public sector to increase with the growth of per capita real national income. Wagner listed three main reasons for this upward trend of government involvement in the economy. First, the increasing societal complexity will require greater protective and regulatory activity by the public sector. Second, the growth in real income would facilitate the relative expansion of income-elastic expenditures on "culture and welfare". And finally, he asserted that economic development and changes in technology require that the government take over the management of

natural monopolies in order to enhance economic efficiency (Henrekson, 1993).

In terms of government size, most of the theories are focused either on the determinants of demand for public services or on the determinants of supply for public services (Shelton, 2007). Factors that are most often cited within demand-oriented theories are: national income, trade openness, demographic trends, ethnic fragmentation and wars. Their common denominator is a necessity for the state to provide insurance against various types of risks.

Cameron (1978) was the first to use trade openness as an explanatory variable for government size. In a sample of 18 OECD countries, he demonstrated that trade openness is a strong predictor of the increase in government tax revenues as a share of GDP. The author suggested that more open countries have higher rates of industrial concentration, which tend to foster higher unionization, better collective bargaining process and stronger labor confederations that eventually lead to greater demand for government transfers in the form of social security, pensions, unemployment insurance and job training. In an extended sample of countries, Rodrick (1998) found a positive correlation between trade openness and government expenditure as a share of GDP. He denied the explanatory power of labour organization due to the existence of weak collective bargaining in most developing countries and provided an argument that government expenditures are used to provide social insurance against external risks. Similarly, Alesina and Wacziarg (1998) introduced the argument for country size as a mediating factor in the "openness hypothesis". The authors showed that smaller countries have a larger state size and are more open to trade, while large countries can afford to have smaller governments (and therefore lower taxes) because they already benefit from a sizable market which reduces their need to be open to trade.

On the other hand, Easterly and Ross (1997) present another theory where demographic trends are the main determinant of government size. They reported that high ethnic diversity is closely associated with small state size and conjecture that, at least in their sample of African countries, interest group polarization leads to rent seeking behavior and reduces the consensus for public goods. In a similar fashion, Alesina, Baqir, and Easterly (1999) showed that ethnic fragmentation is negatively related to local financing of productive public goods (education, roads, libraries, sewers and trash pickup) in US cities and areas, even after controlling for other socioeconomic and demographic determinants (including black vs non-black heterogeneity). In a follow up study, Alesina et al. (2003) provided new measures of ethnic, linguistic and religious fractionalization for about 190 countries and confirmed the previously documented relationship between ethnic fragmentation and spending on welfare within a much broader data set. Interestingly, they found similar but less significant results for linguistic fragmentation and showed that religious fragmentation is not correlated with welfare redistribution. Their explanation of this finding is that religious affiliation is the most endogenous variable from the set of these three variables. While ethnicity and language is mostly fixed, religions can be banned and individuals can be motivated to 'hide' their religion in order to avoid repression.

A detailed argumentation of the role of war, especially global, in the expansion of state size

and building institutional capacity can be found in Rasler and Thompson (1985). Besley and Persson (2008) show that civil wars decrease the state's ability to raise revenues, while external wars generally lead to an increase in state capacity. However, Thies with a few papers (2005, 2007) argued that interstate wars in Latin America, as well as in Africa, are not a catalyst for state-building activities.

When it comes to theories focused on the determinants of the supply of public services, the evolution of government expenditure is often seen through the prism of the political organization of a society: political participation, government type, electoral rules etc (Shelton, 2007). For example, Meltzer and Richard (1981, 1983) develop and test a general equilibrium model where the size of the government (measured by the share of income that is redistributed) depends on the relation of mean income to the income of the decisive voter as well as the voting rule. They find that the amount of government spending in the form of redistribution to aggregate income increases with the ratio of mean to median income and with the level of income. Persson and Tabellini (1999) connect the size of the state with the model of electoral system (majoritarian or proportional) and government type (presidential or parliamentary) within a country and find that the size of the government is smaller in countries with presidential regimes. Similarly, Milesi-Ferretti et al. (2002) distinguish between types of government spending (purchases of goods and transfers) and find that governments in countries with majoritarian systems are more focused on spending on public goods whereas governments in countries with proportional systems are more keen to spend on transfers.

Along with government size, economists have also been concerned about the effectiveness of government services. In particular, using a sample of 154 countries, La Porta et al. (1999) look at economic, political and cultural factors that determine government performance, such as property rights indices, bureaucratic delays, school attainment, infrastructure quality, ethnolinguistic fragmentation, religion, latitude and many other variables for a large sample of countries. They find that countries with higher income, ethnolinguistic homogeneity, a common law system or a location further from the equator have better performing governments. Importantly, the authors also find that governments that are more effective are also larger in size and collect higher taxes. Furthermore, Alesina et al. (2003) construct new measures of ethnic, linguistic and religious fragmentation for 190 countries and show that ethnic and linguistic fractionalization are associated with lower quality of government, whereas religious fractionalization is correlated with good governance. Ahlerup and Hansson (2011) study the association between nationalism and government effectiveness for a cross-section of countries and find that nationalism has an inverted U-shaped relationship with government effectiveness. Lee and Whitford (2009) make use of the World Bank Governance Indicators to analyze variation in government effectiveness across countries and across time to find that a significant part of it is explained by a country's relative position in the worldwide income distribution.

3 Methodology

3.1 Model

We specify our econometric model as:

$$Government_{it} = a_0 + a_1 Profit_{it} + a_2 Controls_{it} + \alpha_t + \beta_i + u_{it} \quad (Eq.\ 1)$$

where the dependent variable $Government_{it}$ is either the government size or government effectiveness of country i in period t. We measure the first variable as the log of the share of government total expenditure as a percentage of GDP in the country, whereas the effectiveness is quantified in raw values using the index from the Worldwide Governance Indicators.

To test our main hypothesis for the effect of firm profits on the dependent variables, we use two different quantities: i) profit shares and ii) profit markups. As will be elaborated in more details in the following subsection, both profit shares and markups are calculated as aggregate measures for the total financial gains generated by all firms within an economy.

These variables, however, are not enough to explain government activity, and, therefore, in every regression we also include a set of control variables. The first of these is the Rule of Law in the country, which is expected to have a positive effect on government performance, according to La Porta et al (1999). The second is a measure of the level of economic development of a country and is quantified as the log of GDP per capita in purchasing power terms, which is included as a proxy of the Wagner hypothesis, i.e. is expected to have a positive effect on government activity. The third variable is the size of the economy, approximated through the population of the country. According to the previously mentioned empirical investigations, there is an inverse relationship between the economy and state performance, i.e., as the size of an economy increases, the government size and effectiveness significantly decrease (Alesina and Wacziarg, 1998). The last control variable is the openness of the country, which we measure as the log of the share of international trade as a percentage of GDP. More open economies are expected to have larger and more effective governments because of the increased income risk that greater openness usually entails, Ram (2009).

Finally, in the regression specification we include time (α_t) and country (β_i) fixed effects, in order to account for possible omitted factors that are not controlled by the explanatory variables and may affect the dependent variables.

There might be endogeneity in this model, because government activity can also affect firm profitability. Concretely, government size is directly related to government revenues, which are related to the taxes that the government collects, that are related to firm profits. Hence, bigger governments are likely to lead to lower firm profits. Government effectiveness, similarly, may affect firm profitability, through several channels. On the one hand, more effective governments are more likely to prevent tax evasion, which is likely to reduce firm profitability. On the other hand, more effective governments may also improve profitability, through better enforcement of laws and regulations and more effective institutions.

To address this potential endogeneity, one needs to find a way to isolate the changes in firm profitability which are unrelated to government activity. One standard way to do this is through a Two Stage Least Squares (2SLS) estimation procedure. 2SLS is able to overcome the endogeneity problem by instrumenting firm profits in the first stage of the procedure with variables that are unrelated to government activity:

$$Government_{it} = b_0 + b_1 Profit_{it} + b_2 Controls_{it} + \gamma_t + \delta_i + u_{it} \quad (Eq.\ 2)$$

$$Profit_{it} = c_0 + c_1 Instrument_{it} + c_2 Controls_{it} + \mu_t + \nu_i + e_{it} \quad (Eq.\ 3)$$

The task of finding good instruments is never easy, and here we propose three instruments - oil prices, exchange rates and minimum wages. All of these variables are likely to be related to firm profits - oil prices constitute an important part of firm expenses and are thus likely to reduce firm profits, minimum wages are likely to affect wages in general and through this firm profits as well, while exchange rates determine the price of products on foreign markets and through this affect firm demand as well as their profits. At the same time, they are not directly related to government size or effectiveness, and can be considered exogenous in this setup.

3.2 Derivation of profit markups

Theoretically, in any economic framework that allows firms to set their final prices with a markup over their costs, economic profits are different from zero. One can argue that, when everything else is considered, a higher gap between additional costs of producing an extra unit of output (marginal cost) and the final price for that extra unit of output set by a firm, also leads to greater pricing power of the firm and its ability to generate profit. Intuitively, the price-setting behavior of firms unveils the degree of competition within the economy that can also depend on government regulation (among other factors, such as the industry type, openness to trade etc). However, markups are genuinely difficult to measure because, by definition, they rely on data for marginal costs which are not directly observed. To overcome this difficulty, several approaches have been suggested in the literature. Some of these approaches include the use of micro data or firm level data (De Loecker and Warzynski, 2012; Karabarbounis and Neiman, 2018) or aggregate macro data (Macallan, Millard and Parker, 2008; Balakrishnan and Lopez-Salido, 2002). Here, we obtain an approximation of profit markups by estimating the ratio between the deflator of gross value added and unit labour costs, which captures the relation between final prices and marginal costs in an economy (Bank of Spain, 2019). The gross value-added deflator is calculated as the ratio between nominal value added and real value added, while the unit labour cost is calculated as the ratio between compensation of employees and their productivity.

3.3 Derivation of profit shares

Firm profits can be obtained from macro-data (national accounts) and micro-data (corporate accounts). Due to their methodological consistency across countries and time, we follow Katsimi and Sarandites (2011) and use data from national accounts. The amount of profits generated within an economy can be obtained by decomposing the domestic output into types of factor income that arise from the final production of goods and services.

The profit share is then calculated using aggregates from the national accounts of each country included in the sample, as a ratio between the gross operating surplus and mixed income and the market value of total output.

3.4 Data

The main sources for the data used in our analysis are the World Economic Outlook 2019 database from the IMF and the World Bank main database. Specifically, as a proxy for government size we used data on General government total expenditure (% of GDP), while the data for the second dependent variable, Government Effectiveness, is taken from the World Bank's Worldwide Governance Indicators (WGI). The independent variables, profit shares and profit markups, were calculated using Eurostat data, as described in the previous two subsections.

The annual data cover the period from 2002 to 2018 for 30 countries, yielding a balanced panel with 510 observations. These countries are geographically located in Europe, 28 of them are EU member states as of 2018, 2 are EFTA countries, 11 are non-euro and 19 euro-area countries. On the other hand, when performing 2SLS estimation (instrumental variable regressions) the observations drop to 355 due to missing data on statutory minimum wage. This data is not reported for countries for which minimum wage is set by collective agreements instead of by national laws. The instruments used in our analysis are the minimum wage in 2017 PPP USD collected from the ILOSTAT database, the nominal exchange rate, expressed as local currency units per US$ from the World Bank and oil shock calculated as a product of oil prices and oil share in a country's imports. Oil prices are averages for Brent, WTI and Dubai Fateh, taken from the IMF, while oil imports are from UN Comtrade. The data for the remaining control variables, such as GDP p.c. PPP, Trade (% of GDP), population, is collected from the above mentioned sources. Data sources, variable descriptions and their abbreviations are presented in more detail in Table 1(a).

Table 1(b) shows the descriptive statistics for the variables in the model. Table 1(c) lists the mean values of the included variables over the studied period for each country. As we can see from Table 1(c), given the range and standard deviation, the cross-country differences are approximately the same in terms of the dependent variable and the independent variables of interest, profit shares and markups. France is the country with the highest ratio of government expenditure to GDP, followed by Denmark, Finland and Belgium, whereas Switzerland has the lowest ratio. Mean profit share is highest in Greece, Romania and Ireland, and lowest in Sweden, Denmark and France. The mean markups, on the other hand, are largest in Slovakia, followed by Ireland and Czech Republic. Switzerland is the country with the lowest mean value for the markups. Overall, it seems that countries with higher profit share and markups tend to have lower government size.

Insert Table 1 (a) about here

Insert Table 1 (b) about here

Insert Table 1 (c) about here

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4 Empirical results

4.1 Descriptive analysis

We begin the analysis with a graphical representation of the correlation between government activity and firm profits. Figure 1 shows the scatter plots of these variables for the 28 analysed countries. The top left panel shows the correlation between government size and the profit share, the top right panel between government size and profit markup, the bottom left between government effectiveness and the profit share and the bottom right between government effectiveness and profit markup. All the scatter plots reveal a clear negative association between government activity and firm profits - as firm profits increase, government activity tends to decline.

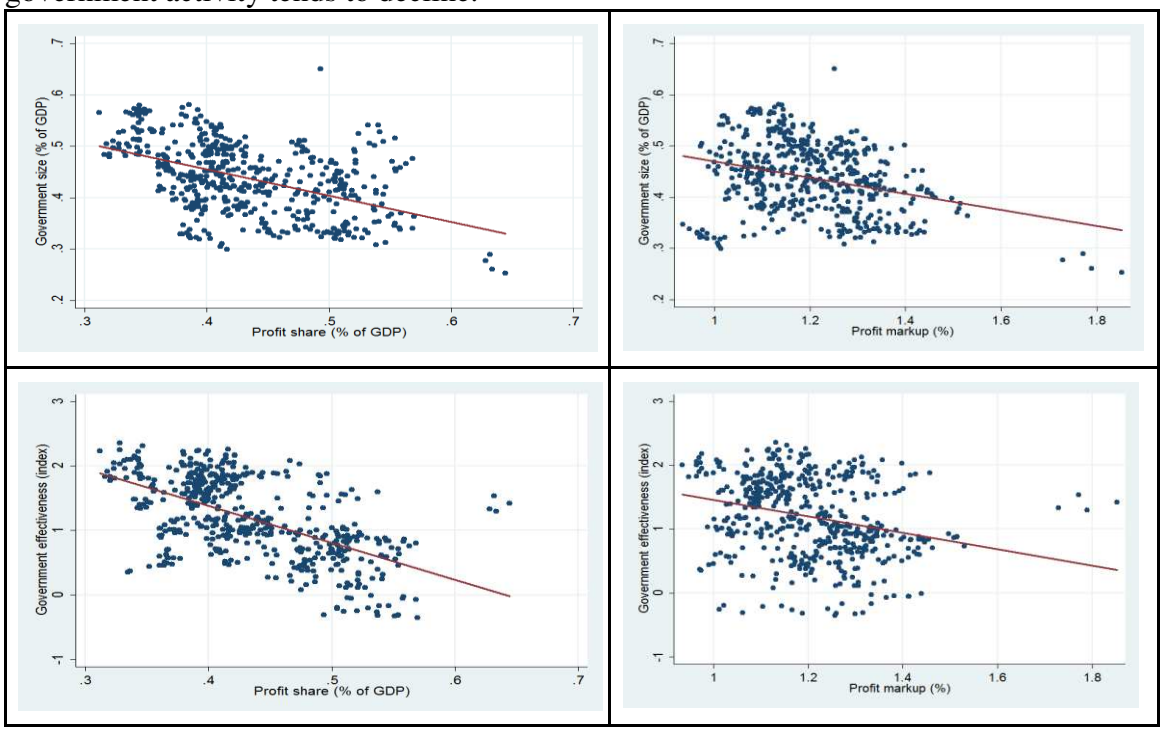

Figure 1: **Relationship between government activity and firm profitability.**
Sources: IMF's World Economic Outlook database for the general government expenditures, as percentage of GDP; World Bank's World Governance Indicators for government effectiveness; Profit share and profit markup as explained in the text.

4.2 OLS results

We next present the Ordinary Least Squares (OLS) results of the model shown in Eq. 1. Besides being the simplest estimation procedure, OLS also provides consistent, unbiased and efficient in situations when there is exogeneity among regressors and the errors are homoscedastic and serially uncorrelated. Even though the exogeneity assumption is unlikely to hold in our case, the OLS has been the most frequently used method for studying the determinants of the government size and effectiveness - see for example Shelton (2007), Ram (2009) and Beekman (2014). To account for the potential problem of heteroscedasticity and serial correlation, the standard errors of each coefficient are corrected by implementing the clustered standard errors procedure. Table 2 reports these results, where the dependent variable in the regressions is shown in the heading row.

Insert Table 2 about here

Columns (1) and (2) show the results where the dependent variable is the government size, columns (3) and (4) where the dependent variable is the government effectiveness. We observe that both profit shares and markups exhibit a negative marginal effect on government size and effectiveness. In the government size regressions, the effects are highly significant statistically. A 1% increase in the profit share results in an average decrease in the government size of 0.6% and a reduction in the government effectiveness of 0.4 units, while an increase in the level of markups is associated with an average decrease in the government size of 0.5% and a decrease of government effectiveness of 0.2 units. As for the control variables, the rule of law is significant in all the regressions, with a positive sign, implying that countries with a better rule of law have bigger and more effective governments. GDP per capita is also significant in all of the regressions, with negative coefficients in the size regressions, and positive in the effectiveness regressions. The negative sign in the size regressions is against the Wagner law, as it implies that more developed countries actually have smaller governments. The positive sign in the government effectiveness regressions is as expected, as it implies that more developed countries have more effective governments. Population is negative in all regressions, although significant in only a few, implying that bigger countries have smaller and less effective governments, as expected. Trade, finally, is insignificant in all regressions, which might be explained by the similarity of the analysed countries.

4.3 2SLS results

As emphasized in Acemoglu et al. (2011) the relationship between firm profits and state activity may be endogenous. In this case the ordinary OLS estimator provides biased estimates and, hence, it is not suitable to quantify the effect of private sector profits on the

state activity. As a means to solve this potential problem, as explained above, we propose a 2SLS estimation, where firm profits are instrumented by oil prices, exchange rates and minimum wages. Table 3 presents the 2SLS estimation of Eq. 2 and 3, where the dependent variable is the government size.

Insert Table 3 about here

Columns (1) and (2) of Table 3 show the results for the profit share, where column (2) shows the first stage regression, while column (1) the second stage regression. From the first stage regression, it can be seen that the three instruments are all strong in explaining the dynamics of the profit share – they are all highly significant and with expected signs. The minimum wage and the oil prices are negative, implying that when they increase, firm profits decline, while the exchange rate is positive, meaning that when the exchange rate depreciates vs. the USD, firm profits increase, due to the higher foreign demand. The F test for the significance of the three variables is 23.2, way higher than the rule of thumb value of 10, meaning that the instruments are not weak. From the second stage regression, it can be seen that the profit share is now even stronger than in the OLS estimation – its coefficient is around 1 and highly significant, implying that a 1% increase in the profit share results in an average decrease in the government size of 1%.

Columns (3) and (4) of Table 3 show the results for the profit markup. These results are very similar to the previous. The three instruments from the first stage regression are strong predictors for the profit markups – all of them are individually significant at 1%, with the expected signs, and the F test value for their joint significance is 26.1. Then, in the second stage regression, the markup is highly significant for the government size and with a bigger coefficient than in the OLS estimation (-0.6), implying that if markups increase by 1%, government size declines by 0.6%.

When the control variables are in question, their coefficients in the 2SLS estimates are very similar to the previously elaborated OLS results.

Insert Table 4 about here

Table 4 presents the 2SLS results for government effectiveness. Columns (1) and (2) show the results for the profit share, while columns (3) and (4) for the profit markup. The first stage regressions in both cases are very similar to the government size results – the three instruments turn out to be strong predictors of the profit shares and profit markups. Then, the second stage regressions indicate that the effects of the profit variables on government effectiveness are again negative, significant and stronger than in the OLS case – 1%

increase in the profit share leads to a decline in government effectiveness by 1 unit, while 1% increase in the profit markup declines the government effectiveness by 0.7 units.

4.2 Robustness checks

We conduct several robustness checks. First, we reduce the sample of estimation by eliminating several first and last years from the sample. Next, we reduce the sample by removing the observations with the lowest and highest values. Then, we reduce the instrument set to two variables instead of three. Finally, we change the specification of our model by including two additional explanatory variables: the fraction of elderly population in the country and the control of corruption.

Table 5 shows the results of the regressions with reduced number of years, for government size. The first three columns show the results where the explanatory variable is the profit share, the last three columns for the profit markups. The first of these columns presents results where the first several years of the sample are excluded, the second of the columns - where the last several years are excluded, and the third - where both first and last couple of years are excluded. In all the cases around 20% of the observations are excluded. The exact time periods are indicated in the heading rows of the table. It can be seen that the coefficients on the profit variables remain similar as before - highly significant and negative, even with slightly higher magnitude than previously.

Insert Table 5 about here

Table 6 shows the results with reduced number of years, for government effectiveness. The columns are the same as before - the first three columns show the results where the explanatory variable is the profit share, the last three columns show the results for profit markups. Again, results remain very stable - profit variables are negative and highly significant, and on some occasions even with a stronger magnitude than in the baseline regressions.

Insert Table 6 about here

We next present the results when the observations with lowest and highest values for the government activity and firm profits variables are excluded from the sample, in Table 7. The coefficients for the profit variables remain roughly the same as before in magnitude, just the significance of the profit variables in the government effectiveness regressions declines.

Insert Table 7 about here

We continue the robustness check by reducing the instrument set to to two variables, instead of all of the three variables. Table 8 shows the results for government size, table 9 for government effectiveness. The first three columns of the two tables show the results for the profit share variables, the last three for the profit markup. The instrument set is indicated in the heading row of the tables. It can be seen that results remain largely unchanged - in Table 8, the profit variables are always highly significant and with coefficients similar to the baseline ones. In Table 9, the profit variables are insignificant just in the cases where the instrument set consists of the oil prices and the minimum wage.

Insert Table 8 about here

Insert Table 9 about here

Finally, we change the model specification and investigate if our model is robust to omission of significant explanatory variables. For this purpose we include two additional variables in the model. First, we include the log of the fraction of the population above 65 in the country. This variable is a proxy of the demographic constitution of the country. It is known that the demographics play an important role in the production of the long-run government supply and demand. Concretely, the aging population should exert a positive influence on the government spending by increasing the expenditures for social security and medical care, thus additionally affecting the effectiveness of the government, (Shelton, 2007) and Lee and Lin (1994). Second, we add the corruption variable from WGI. The control of corruption "captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption". By definition the control of corruption evaluates the condition of the state with respect to being captured by elites and private interests. Therefore, it may serve as an alternate measure for the magnitude of crony capitalism in an economy to our profit quantities. The results are displayed in Table 10. In each specification, the markups and profit shares remain significant explanatory variables with negative marginal effect. Out of the newly specified explanatory variables, the aging population is significant only when the government effectiveness is the dependent variable. Similarly, the control of corruption appears in certain cases (at 10% level), though its marginal effect varies. In fact, there are cases when it has the incorrect sign, i.e., a larger control for corruption also implies a larger government, which is contrary to the definition of crony capitalism, Kotera et al (2012).

Insert Table 10 about here

To conclude, the robustness analysis supports the previous findings, that firm profits exhibit a sizable and significant negative effect on government activity.

5 Conclusion

We investigated the potential impact of firm profits on government size and effectiveness for a panel of European countries. This was done by considering countrywise aggregated indices of profit shares and margins as measures for the level of firm gains within an economy. By utilizing simple regression techniques, we showed that profits have a significant negative effect on government size and effectiveness. To test the validity of our findings, a series of robustness checks was performed which take into account the possible presence of outliers and the relevant instrument selection. All of these approaches confirmed our initial results. Hence, the discovered pattern is non-trivial and may play a major role in shaping the state activity.

We conjectured several possible explanations for the direction and the magnitude of the relationship between firm profits and government size and its effectiveness. Among these conjectures was the role of firms in shaping political decisions related to economic issues. Another possible explanation was the effect of crony capitalism, i.e., the presence of an economic system in which businesses thrive not as a result of risk, but rather as a return on money amassed through a nexus between a business class and the political class. By definition, crony capitalism is directly related to the presence of corruption within a state, but may not necessarily represent a synonymous concept. In this aspect, we believe the observation that our measures of firm gains offer a more plausible explanation for the effect of firm power on government activity.

But apart from the increase in profits from a macroeconomic perspective, another trend that is worth mentioning is the increase in profit concentration within a relatively small number of companies. In a 2015 report by the McKinsey Global Institute, it was reported that 10% of the world's publicly listed companies make around 80% of all the profits. According to *The Economist,* this "superstar effect" - observed for large and global companies - is most visible in the United States. This has also been confirmed in the literature for some of the largest economies in the world, but mostly for the US (De Loecker and Eeckhout, 2017; Grullon, Larkin and Michaely, 2015; Bessen, 2016; Philippon, 2019,1). In fact, using an example for the telecommunications industry, Philippon (2019,2) explains that the relationship between competition and concentration arises from rent-seeking behavior among big firms that continuously lobby to increase their profits. Autor et al. (2019) show that the increase in the aggregate markup comes through as a result of

an increase in the market share of big companies, or "superstar firms" with the use of micro-data. Finally, using industry-level data, Barkai (2017) studied the shares of labor, capital and profits and their interaction with market competition to find that increases in market concentration occur simultaneously with a decline in the labor share and an increase in the profit share. In this context, further analysis of the correlation and/or causality between the trend of increasing profits and the trend of increasing concentration of profits within a few companies/industries represents an interesting direction for future research.

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Variable	Code	Definition	Data Source	Observations
General government total expenditure (% of GDP)	gov_size	Total expenditure consists of total expense and the net acquisition of nonfinancial assets.	World Economic Outlook Database, IMF	510
GDP per capita, constant prices PPP; 2011 international dollars	gdp_ppp_pc	GDP is expressed in constant international dollars per person. Data are derived by dividing constant price purchasing-power parity (PPP) GDP by total population.	World Economic Outlook Database, IMF	510
Population (persons)	pop	For census purposes, the total population of the country consists of all persons falling within the scope of the census.	World Economic Outlook Database, IMF	510
Population ages 65 and above (% of total population)	pop65	Population ages 65 and above as a % of the total population. Population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship.	World Development Indicators Database, World Bank	510
Trade (% of GDP)	trade	Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product.	World Development Indicators Database, World Bank	510
Government Effectiveness	gov_eff	Government Effectiveness captures 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.	Worldwide Governance Indicators Database, World Bank	510
Rule of Law	rule_of_law	Rule of Law captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.	Worldwide Governance Indicators Database, World Bank	510
Control of Corruption	corruption_control	Control of Corruption captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.	Worldwide Governance Indicators Database, World Bank	510
DEC alternative conversion factor (LCU per US$)	e_rate	The DEC alternative conversion factor is the underlying annual exchange rate used for the World Bank Atlas method. It is expressed in local currency units per U.S. dollar.	World Development Indicators Database, World Bank	510
Statutory nominal gross monthly minimum wage, 2017 USD PPP	minw	Data refer to the minimum monthly earnings of all employees as of December 31st of each year. Minimum wages are not reported for countries for which collective bargaining is in place for minimum wages.	International Labour Organization, ILOSTAT	355
Profit share	profits	The profit share is calculated using aggregates from the National Accounts of each country included in the sample, as a ratio between the gross operating surplus and mixed income and the market value of total output.	Annual Macroeconomic database of the European Commission (AMECO)	510
Profit markups	markups	Profit markups are calculated by estimating the ratio between the deflator of gross value added and unit	Bank of Spain, Quarterly Report on the Spanish Economy, Q2 2019, Box 4:	510

		labour costs, which captures the relation between final prices and marginal costs in an economy (Bank of Spain, 2019). The gross value-added deflator is calculated as the ratio between nominal value added and real value added, while the unit labour cost is calculated as the ratio between compensation of employees and their productivity.	Recent developments in Euro Area Labour Costs and Markups	
Oil shock	oil_shock	Calculated as a product of oil prices and oil share in each country's imports. Oil prices are the average for the Brent, West Texas Intermediate and Dubai Fateh. Oil imports refer to tariff code 27 - Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes.	Oil prices - IMF; Imports - UN Comtrade.	510

Table 1. (a) **Data sources and description.**

Statistic	***e_rate***	***gov_size***	***profits***	***markups***	***gdp_ppp_pc***	***pop***	***trade***	***gov_eff***	***rule_of_law***	***oil_shock***	***minw***	***corruption_control***	***pop65***
Observations	510	510	510	510	510	510	510	510	510	510	355	510	510
Mean	10.02	0.44	0.43	1.20	35698.99	17.09	1.16	1.19	1.18	8.10	911.87	1.10	0.17
Std. Dev.	40.91	0.07	0.06	0.13	15761.99	21.97	0.64	0.61	0.63	6.78	481.87	0.81	0.03
Minimum	0.50	0.25	0.31	0.93	10738.43	0.40	0.45	-0.36	-0.26	0.33	150.92	-0.44	0.10
1st quartile	0.75	0.39	0.39	1.10	24977.11	4.24	0.71	0.73	0.75	3.48	516.31	0.37	0.15
Median	0.89	0.44	0.42	1.19	33824.67	8.23	1.01	1.16	1.17	6.17	825.21	1.06	0.17
3rd quartile	3.04	0.49	0.49	1.29	42816.03	16.55	1.42	1.73	1.78	10.86	1278.10	1.88	0.18
Maximum	281.52	0.65	0.64	1.85	98537.42	82.90	4.08	2.35	2.10	47.37	2084.71	2.47	0.23

Table 1. (b) **Sample summary statistics.**

Country	*e_rate*	*gov_size*	*profits*	*markups*	*gdp_ppp_pc*	*pop*	*trade*	*gov_eff*	*rule_of_law*	*oil_shock*	*minw*	*corruption_control*	*pop65*
Austria	0.81	0.51	0.41	1.16	43400.61	8.42	0.99	1.69	1.86	5.21	/	1.71	0.18
Belgium	0.81	0.52	0.39	1.04	40651.05	10.86	1.52	1.57	1.38	7.74	1553.14	1.49	0.18
Bulgaria	1.59	0.34	0.50	1.26	15865.50	7.44	1.13	0.14	-0.08	9.74	343.16	-0.15	0.19
Croatia	6.04	0.48	0.36	1.07	20338.37	4.31	0.85	0.54	0.17	9.74	721.49	0.14	0.18
Cyprus	0.81	0.40	0.41	1.20	34292.89	0.80	1.21	1.25	1.02	13.58	/	1.01	0.12
Czech Republic	22.38	0.42	0.51	1.33	28014.22	10.40	1.32	0.95	0.98	4.13	564.39	0.40	0.16
Denmark	6.04	0.53	0.34	1.14	43795.09	5.54	0.97	2.07	1.94	4.78	/	2.34	0.17
Estonia	0.81	0.38	0.42	1.25	24404.56	1.34	1.43	1.03	1.14	8.96	483.74	1.10	0.18
Finland	0.81	0.53	0.40	1.17	39430.91	5.35	0.76	2.09	1.98	10.00	/	2.29	0.18
France	0.81	0.55	0.35	1.10	38398.77	62.59	0.57	1.51	1.44	7.78	1518.33	1.38	0.18
Germany	0.81	0.46	0.39	1.11	41940.35	81.27	0.79	1.61	1.69	6.02	1824.35	1.83	0.20
Greece	0.81	0.49	0.54	1.23	28099.30	10.96	0.58	0.52	0.56	15.96	980.84	0.09	0.19
Hungary	226.40	0.49	0.41	1.30	23489.63	9.98	1.52	0.69	0.74	4.31	576.69	0.40	0.17
Ireland	0.81	0.37	0.53	1.43	50700.50	4.49	1.81	1.49	1.66	6.42	1380.95	1.58	0.12
Italy	0.81	0.49	0.48	1.20	35674.16	59.35	0.53	0.47	0.45	8.58	/	0.24	0.21
Latvia	0.79	0.37	0.47	1.30	20258.35	2.12	1.08	0.76	0.75	7.30	442.18	0.31	0.18
Lithuania	0.81	0.35	0.48	1.31	22662.02	3.11	1.28	0.82	0.78	15.06	486.97	0.38	0.17
Luxembourg	0.81	0.42	0.40	1.21	91974.34	0.51	3.35	1.73	1.82	6.88	1759.95	1.99	0.14
Malta	0.81	0.41	0.45	1.28	30882.25	0.42	2.73	1.06	1.36	17.18	996.27	0.85	0.16
Netherlands	0.81	0.44	0.41	1.09	46292.09	16.60	1.36	1.84	1.82	10.86	1591.37	2.04	0.16
Norway	6.76	0.45	0.45	1.33	63603.31	4.92	0.70	1.90	1.96	3.22	/	2.12	0.15
Poland	3.35	0.43	0.50	1.28	21343.84	38.09	0.85	0.59	0.61	6.25	689.45	0.50	0.14
Portugal	0.81	0.47	0.41	1.14	26681.16	10.46	0.72	1.10	1.12	8.74	767.51	1.03	0.19
Romania	3.30	0.34	0.54	1.22	17181.16	20.54	0.71	-0.23	0.04	5.56	394.27	-0.19	0.16
Slovak Republic	0.81	0.41	0.53	1.44	24545.66	5.40	1.63	0.82	0.52	5.41	494.47	0.26	0.13
Slovenia	0.81	0.43	0.37	1.03	28501.99	2.03	1.33	1.03	1.00	6.63	975.09	0.89	0.17
Spain	0.81	0.42	0.44	1.14	33128.23	45.35	0.59	1.18	1.10	10.15	914.14	1.00	0.18
Sweden	7.60	0.50	0.33	1.29	43373.75	9.47	0.84	1.93	1.93	7.73	/	2.21	0.18
Switzerland	1.10	0.32	0.39	0.98	54012.23	7.82	1.12	1.98	1.87	3.16	/	2.08	0.17
United Kingdom	0.63	0.40	0.39	1.09	38033.39	62.78	0.57	1.63	1.71	5.97	1232.95	1.80	0.17

Table 1. (c) **Mean values of the studied variables per country.**

	(1)	(2)	(3)	(4)
	OLS	***OLS***	***OLS***	***OLS***
VARIABLES	***gov_size***	***gov_size***	***gov_eff***	***gov_eff***
profits (log)	-0.560***		-0.368	
	(0.169)		(0.284)	
markups (log)		-0.505***		-0.195
		(0.180)		(0.159)
gdp_ppp_pc (log)	-0.309***	-0.337***	0.355**	0.330**
	(0.098)	(0.089)	(0.145)	(0.129)
trade (log)	-0.015	-0.010	0.223	0.198
	(0.109)	(0.106)	(0.221)	(0.225)
pop (log)	-0.145	-0.248***	-0.462	-0.549*
	(0.123)	(0.087)	(0.341)	(0.311)
rule_of_law	0.095*	0.091**	0.422***	0.429***
	(0.049)	(0.042)	(0.073)	(0.074)
Constant	2.098**	3.185***	-2.491	-1.698
	(0.919)	(0.869)	(2.219)	(1.763)
Observations	510	510	510	510
R-squared	0.518	0.533	0.386	0.381
Number of countries	30	30	30	30

Note: Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2: **OLS results.**

	(1)	(2)	(3)	(4)
	Second stage	*First stage*	*Second stage*	*First stage*
VARIABLES	*gov_size*	*profits*	*gov_size*	*markups*
profits (log)	-0.998***			
	(0.187)			
markups (log)			-0.581***	
			(0.114)	
minw (log)		-0.116***		-0.170***
		(0.022)		(0.027)
e_rate (log)		0.172***		0.303***
		(0.044)		(0.056)
oil_shock (log)		-0.038***		-0.063***
		(0.008)		(0.010)
gdp_ppp_pc (log)	-0.279***	0.225***	-0.357***	0.229***
	(0.048)	(0.033)	(0.041)	(0.042)
trade (log)	-0.042	0.139***	-0.043	0.241***
	(0.059)	(0.035)	(0.059)	(0.045)
pop (log)	0.108	0.353***	-0.256***	0.021
	(0.124)	(0.063)	(0.083)	(0.080)
rule_of_law	0.083***	-0.068***	0.089***	-0.108***
	(0.027)	(0.018)	(0.026)	(0.023)
Observations	355	355	355	355
R-squared	0.567		0.593	
Number of countries	22	22	22	22
F test for instruments	53.35		76.73	

Note: Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3: **2SLS results for government size.**

	(1)	(2)	(3)	(4)
	Second stage	*First stage*	*Second stage*	*First stage*
VARIABLES	*gov_eff*	*profits*	*gov_eff*	*markups*
profits (log)	-0.976**			
	(0.409)			
markups (log)			-0.672***	
			(0.252)	
minw (log)		-0.116***		-0.170***
		(0.022)		(0.027)
e_rate (log)		0.172***		0.303***
		(0.044)		(0.056)
oil_shock (log)		-0.038***		-0.063***
		(0.008)		(0.010)
gdp_ppp_pc (log)	0.511***	0.225***	0.445***	0.229***
	(0.105)	(0.033)	(0.091)	(0.042)
trade (log)	0.506***	0.139***	0.534***	0.241***
	(0.129)	(0.035)	(0.129)	(0.045)
pop (log)	-0.177	0.353***	-0.508***	0.021
	(0.271)	(0.063)	(0.184)	(0.080)
rule_of_law	0.313***	-0.068***	0.309***	-0.108***
	(0.059)	(0.018)	(0.057)	(0.023)
Observations	355	355	355	355
R-squared	0.443		0.464	
Number of countries	22	22	22	22
F test for instruments	53.35		76.73	

Note: Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4: **2SLS results for government effectiveness.**

	(1)	(2)	(3)	(4)	(5)	(6)
	After 2005	*Before 2016*	*After 2004 and Before 2017*	*After 2005*	*Before 2016*	*After 2004 and Before 2017*
VARIABLES	*gov_size*	*gov_size*	*gov_size*	*gov_size*	*gov_size*	*gov_size*
profits (log)	-1.609***	-0.960***	-1.637***			
	(0.215)	(0.312)	(0.297)			
markups (log)				-1.032***	-0.538***	-0.926***
				(0.126)	(0.177)	(0.154)
gdp_ppp_pc (log)	-0.214***	-0.328***	-0.226***	-0.384***	-0.379***	-0.417***
	(0.073)	(0.062)	(0.084)	(0.054)	(0.056)	(0.060)
trade (log)	0.215**	-0.032	0.289***	0.217***	-0.047	0.210**
	(0.087)	(0.073)	(0.106)	(0.078)	(0.069)	(0.085)
pop (log)	0.609***	-0.137	0.326*	0.110	-0.412***	-0.180
	(0.164)	(0.143)	(0.176)	(0.113)	(0.115)	(0.122)
rule_of_law	-0.002	0.107***	0.014	0.008	0.105***	0.038
	(0.036)	(0.034)	(0.040)	(0.032)	(0.033)	(0.033)
Observations	275	288	251	275	288	251
R-squared	0.544	0.494	0.417	0.646	0.532	0.577
Number of countries	22	21	22	22	21	22
F test for instruments	49.81	26.45	34.50	67.85	45.12	56.88

Note: Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5: **Results for government size with reduced number of years.**

	(1)	(2)	(3)	(4)	(5)	(6)
	After 2005	*Before 2016*	*After 2004 and Before 2017*	*After 2005*	*Before 2016*	*After 2004 and Before 2017*
VARIABLES	*gov_eff*	*gov_eff*	*gov_eff*	*gov_eff*	*gov_eff*	*gov_eff*
profits (log)	-0.617*	-1.448**	-1.052**			
	(0.373)	(0.673)	(0.507)			
markups (log)				-0.516**	-0.964**	-0.765**
				(0.245)	(0.381)	(0.299)
gdp_ppp_pc (log)	0.335***	0.461***	0.462***	0.290***	0.388***	0.355***
	(0.127)	(0.134)	(0.144)	(0.105)	(0.121)	(0.115)
trade (log)	0.204	0.580***	0.404**	0.254*	0.591***	0.417**
	(0.151)	(0.158)	(0.182)	(0.151)	(0.149)	(0.165)
pop (log)	-0.492*	-0.421	-0.628**	-0.643***	-0.844***	-0.941***
	(0.284)	(0.309)	(0.301)	(0.219)	(0.246)	(0.237)
rule_of_law	0.346***	0.379***	0.327***	0.335***	0.367***	0.329***
	(0.063)	(0.072)	(0.069)	(0.062)	(0.070)	(0.065)
Observations	275	288	251	275	288	251
R-squared	0.334	0.378	0.309	0.352	0.428	0.353
Number of countries	22	21	22	22	21	22
F test for instruments	49.81	26.45	34.50	67.85	45.12	56.88

Note: Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6: **Results for government effectiveness with reduced number of years**

	(1)	(2)	(3)	(4)
VARIABLES	*Gov. size + Profit share*	*Gov. size + Profit markup*	*Gov. eff. + Profit share*	*Gov. eff. + Profit markup*
profits (log)	-1.315***		-0.919	
	(0.273)		(0.694)	
markups (log)		-0.743***		-0.740
		(0.156)		(0.515)
gdp_ppp_pc (log)	-0.320***	-0.338***	0.515***	0.487***
	(0.047)	(0.038)	(0.110)	(0.107)
trade (log)	-0.087	-0.090*	0.580***	0.625***
	(0.056)	(0.049)	(0.136)	(0.137)
pop (log)	0.139	-0.172**	-0.233	-0.583***
	(0.117)	(0.072)	(0.277)	(0.197)
rule_of_law	0.013	0.049**	0.355***	0.310***
	(0.032)	(0.024)	(0.078)	(0.076)
Observations	305	300	308	300
R-squared	0.416	0.581	0.433	0.483
Number of countries	22	22	21	21
F test for instruments	32.14	45.40	27.98	39.73

Note: Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 7: **Results with low and high values for the variables excluded**

	(1)	(2)	(3)	(4)	(5)	(6)
	Minimum wage + Exchange rate	***Oil prices + Exchange rate***	***Oil prices + Minimum wage***	***Minimum wage + Exchange rate***	***Oil prices + Exchange rate***	***Oil prices + Minimum wage***
VARIABLES	***gov_size***	***gov_size***	***gov_size***	***gov_size***	***gov_size***	***gov_size***
profits (log)	-1.136***	-0.518*	-1.370***			
	(0.247)	(0.273)	(0.241)			
markups (log)				-0.658***	-0.335**	-0.868***
				(0.151)	(0.162)	(0.148)
gdp_ppp_pc (log)	-0.261***	-0.313***	-0.230***	-0.350***	-0.346***	-0.330***
	(0.054)	(0.044)	(0.056)	(0.043)	(0.037)	(0.045)
trade (log)	-0.018	-0.023	0.021	-0.021	-0.046	0.039
	(0.066)	(0.062)	(0.069)	(0.065)	(0.051)	(0.067)
pop (log)	0.178	-0.158	0.295*	-0.238***	-0.272***	-0.189**
	(0.150)	(0.110)	(0.151)	(0.088)	(0.073)	(0.092)
rule_of_law	0.074**	0.097***	0.058*	0.081***	0.103***	0.060**
	(0.030)	(0.026)	(0.031)	(0.028)	(0.023)	(0.029)
Observations	355	510	355	355	510	355
R-squared	0.537	0.517	0.466	0.582	0.521	0.527
Number of countries	22	30	22	22	30	22
F test for instruments	32.81	21.85	39.78	45.07	43.43	52.85

Note: Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 8: **Results for government size with alternative instrument set**

	(1)	(2)	(3)	(4)	(5)	(6)
	Minimum wage + Exchange rate	***Oil prices + Exchange rate***	***Oil prices + Minimum wage***	***Minimum wage + Exchange rate***	***Oil prices + Exchange rate***	***Oil prices + Minimum wage***
VARIABLES	gov_eff	gov_eff	gov_eff	gov_eff	gov_eff	gov_eff
profits (log)	-1.256**	-1.588**	-0.190			
	(0.534)	(0.700)	(0.461)			
markups (log)				-0.919***	-0.910**	-0.134
				(0.336)	(0.403)	(0.301)
gdp_ppp_pc (log)	0.548***	0.470***	0.407***	0.468***	0.365***	0.394***
	(0.116)	(0.113)	(0.107)	(0.095)	(0.091)	(0.091)
trade (log)	0.552***	0.444***	0.374***	0.605***	0.349***	0.381***
	(0.144)	(0.159)	(0.132)	(0.146)	(0.127)	(0.137)
pop (log)	-0.036	-0.084	-0.571**	-0.450**	-0.449**	-0.635***
	(0.324)	(0.282)	(0.289)	(0.195)	(0.183)	(0.187)
rule_of_law	0.295***	0.355***	0.365***	0.284***	0.381***	0.363***
	(0.064)	(0.066)	(0.059)	(0.063)	(0.058)	(0.059)
Observations	355	510	355	355	510	355
R-squared	0.414	0.287	0.470	0.439	0.332	0.473
Number of countries	22	30	22	22	30	22
F test for instruments	32.81	21.85	39.78	45.07	43.43	52.85

Note: Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 9: **Results for government effectiveness with alternative instrument set**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Second stage	*First stage*	*Second stage*	*First stage*	*Second stage*	*First stage*	*Second stage*	*First stage*
VARIABLES	*gov_size*	*profits*	*gov_size*	*markups*	*gov_eff*	*profits*	*gov_eff*	*markups*
profits (log)	-0.986***				-1.185***			
	(0.183)				(0.398)			
markups (log)			-0.582***				-0.778***	
			(0.112)				(0.243)	
minw (log)		-0.123**		-0.181**		-0.123**		-0.181**
		(0.023)		(0.029)		(0.023)		(0.029)
e_rate (log)		0.160**		0.290**		0.160**		0.290**
		(0.045)		(0.057)		(0.045)		(0.057)
oil_shock (log)		-0.039**		-0.062**		-0.039**		-0.062**
		(0.008)		(0.010)		(0.008)		(0.010)
gdp_ppp_pc (log)	-0.242***	0.252**	-0.323***	0.258**	0.362***	0.252**	0.273***	0.258**
	(0.051)	(0.038)	(0.044)	(0.048)	(0.111)	(0.038)	(0.096)	(0.048)
trade (log)	-0.037	0.142**	-0.035	0.244**	0.505***	0.142**	0.529***	0.244**
	(0.059)	(0.035)	(0.058)	(0.045)	(0.127)	(0.035)	(0.126)	(0.045)
pop (log)	0.123	0.359**	-0.253***	0.003	-0.083	0.359**	-0.517***	0.003
	(0.126)	(0.065)	(0.084)	(0.083)	(0.273)	(0.065)	(0.182)	(0.083)
rule_of_law	0.103***	-0.050**	0.091***	-0.108**	0.291***	-0.050**	0.268***	-0.108**
	(0.030)	(0.021)	(0.030)	(0.027)	(0.065)	(0.021)	(0.066)	(0.027)
pop65_log	-0.139	-0.055	-0.166*	-0.105	0.861***	-0.055	0.828***	-0.105
	(0.090)	(0.068)	(0.088)	(0.087)	(0.196)	(0.068)	(0.190)	(0.087)
corruption_control	-0.046*	-0.033*	-0.021	-0.010	0.109**	-0.033*	0.139***	-0.010
	(0.025)	(0.017)	(0.024)	(0.022)	(0.054)	(0.017)	(0.051)	(0.022)
Observations	355	355	355	355	355	355	355	355
R-squared	0.576		0.598		0.457		0.491	
Number of countries	22	22	22	22	22	22	22	22
F test for instruments	55.14		77.98		55.14		77.98	

Note: Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 10: **2SLS results for government size and effectiveness with two additional control variables**