Research Article

Is The Median Voter Hypothesis Valid in Developed Countries?

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Abstract: According to the median-voter hypothesis, the size of the public sector in terms of the redistribution of income is determined by the majority rule. This hypothesis suggests that an increase in average income relative to median income increases the size of government, because voters that have the median income are the decision-making voters. The meaning of the size of the public sector here is social expenditures, tax rates, and public debts. This paper aims to analyze the validity of the median-voter hypothesis on the basis of 24 developed countries for the period 2004-2018. Results of the analysis conducted via the Arellano-Bover/Blundell-Bond Two-Stage System Generalized Method of Moments influentially support the claims of the median voter hypothesis about social expenditures, tax rates, and public debts. Results are also valid in terms of their different versions that include control variables of the constructed master patterns.

Keywords: Median voter hypothesis, Public debts, Social expenditures, Marginal tax rate, Dynamic panel data analysis
Jel Codes: H10, H30, C23

Gelişmiş Ülkelerde Ortanca Seçmen Hipotezi Geçerli mi?

Öz: Ortanca seçmen hipotezine göre gelirin yeniden dağıtımı açısından kamu kesimi büyüklüğü, çoğunluk kuralı tarafından belirlenir. Bu hipotez, ortalama gelirin ortanca gelire göre artışının kamu büyüklüğünü artırdığını ileri sürer. Çünkü ortanca gelire sahip olan seçmen karar verici seçmendir. Burada kamu büyüklüğünden kasıt ise, sosyal harcamalar, vergi oranları ve kamu borçlarıdır. Bu çalışma da ortanca seçmen hipotezinin geçerliliğini, 24 gelişmiş ülke üzerinden 2004-2018 dönemi için araştırmayı amaçlar. Arellano-Bover/Blundell-Bond İki Aşamalı Sistem Genelleştirilmiş Momentler Methodu ile yapılan analiz sonuçları; ortanca seçmen hipotezinin sosyal harcama, vergi oranları ve kamu borçlanması ile ilgili iddialarını güçlü bir şekilde desteklemektedir. Sonuçlar, kurulan ana modellerin kontrol değişkenlerini içeren farklı versiyonları açısından da geçerlidir.

Anahtar Kelimeler: Ortanca seçmen hipotezi, Kamu borçları, Sosyal harcama, Marjinal vergi oranı, Dinamik panel veri analizi
Jel Kodları: H10, H30, C23

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1. Introduction

There have been various arguments in the literature related to the interpretation of the increase in the size of the public sector and public borrowing. The major ones are the Baumol Hypothesis, Wagner's Law, the Leviathan Model, and the Displacement Effect Theory. On the other hand, the arguments about financing government expenditures by borrowing generally emphasize the transfer of the financing load of government expenditures in the current period to the next generation. It is also underlined that borrowing of the government is a politically easy and risk-free financing method for politicians, specifically in democratic countries, as well as a tool for taxing the next generation.

Models were first proposed by Black (1948) and Bowen (1943), associate the level of government expenditures with voter preferences. In this frame, the median voter, defined as the decision-maker, is described as the voter for whom the number of people who have a higher income is equal to those who have a lower income. However, in the median voter hypothesis that Meltzer & Richard (1981) suggested, the size of the public sector is evaluated in terms of social expenditures and tax rates, and the preferences of median voter are introduced as an important determiner of this size. Besides the hypothesis, the increase in government borrowing is linked to the state of the income of the median voter regarding average income. A median voter, whose income recedes from the average income, wants to tax the next generation thuswise.

The hypothesis asserts that voters who have a median income are the decision-makers in a situation where majority rule is prevailing. Voters who have a lower income than decision-maker voters prefer programs that include expenditures directed to higher taxes and more redistribution. Voters who have a higher income than decision-maker voters have a reverse situation. According to the hypothesis, in addition, decision-maker voter chooses to tax the future wealthy as much as the current wealthy. Since with economic growth next generation will be wealthier than now, the income is intertemporal redistributed by shifting the tax load to the future (Meltzer & Richard, 1981).

Several debates are also available in literature related to that debt financing of government expenditure is associated with generational redistribution of income. Among these, according to Modigliani (1961), tax financing of government expenditure will replace consumption, while debt financing will take the place of investment. Debt financing will not impose a burden on the current generation, on the contrary, it will increase their welfare. Because of an expenditure that is debt-financed in the current period, the next generations will take over a smaller capital stock. On the other hand, the study of Buchanan (1958) emphasizes the efficiency of debt financing of expenditures although it indicates that the debt will be a burden for the next generations. If the expenditures are efficient, besides the cost burden, a benefit is also likely to be transferred to the next generation. There is also a possibility of the net benefit being high. Another argument about generational income transfer through debting is suggested by Barro (1974) with Ricardian Equivalence Theorem. According to this approach, it is asserted that financial effects that involve the changes in proportional tax and debt financing amounts of specific government expenditure will not effect on total demand, interest rates, and capital formation. In addition to this, Barro, under the existence of uncertainty regarding an individual's tax liabilities in the future, underlines that public debt export might increase general risks in household balance sheets, and therefore it might decrease household wealth.

Empirical evidence concerning the validity of the median voter hypothesis, comprehension of the increase emerging in social expenditure, tax rates, and public borrowing will be guidance for the design of the policies on the issue. It is observed that very few studies are available when the literature is searched on the subject. However, it can be said that the number of the current studies is even fewer. Studies that test public borrowing within the scope of the median voter hypothesis are hardly to be encountered. Considering all these reasons, it is estimated that the paper will contribute to the literature

on the subject. On the other hand, this paper focuses on developed countries with relatively advanced democracy. Because a developed democracy is needed so that voters can vote their preferences for social programs that are in their favor.

The plan of the paper is as follows. Section 1 presents the empirical literature on the subject. Section 2 explains the dataset, model and method used in the paper. Section 3 includes the findings from the econometric analysis. Finally, Section 4 concludes the paper.

2. Empirical Literature Related to the Subject

The panel regression results conducted on 19 OECD countries for the period 1960-1981 by Lindert (1996) demonstrate, in the face of the rise in income skewness handled as the rate of average to median income, increase in social expenditures, and decrease in nonsocial expenditures. The study also shows the increased effect of voter participation on social expenditures.

Colagrossi et al. (2019), in a study conducted via data from the year 2014 on 28 European countries, reveal a positive relationship between the skewness among income groups and redistribution demand from the government. Additionally, with regard to the study, people who believe that they have a high social status and that equal opportunity is prevalent in society, support the government intervention in the economy less than the others.

The results of panel regression analysis that Gouveia & Masia (1998) made on the US states for the period 1970-1991 show the negative relationship between the increase in the rate of average income to median income, and social expenditures.

In a panel regression analysis made by Milanovic (2000) on 24 countries, it is stated that the increase in average income compared to median income causes further redistribution.

In the study conducted by Borge & Rattsø (2004) on Norway, the effect of income skewness, revealed in the form of an increase in average income compared to median income, on tax structure is investigated. According to the analysis results, in a state of a more skewed income distribution, the tax load is moved towards estate tax which is in proportion to income.

The results of panel regression made by Barnes (2012) on 50 US states for the period between 1978-2002 reveal that the increase in average income against median income has a very small effect on redistribution expenses.

In the results of the survey that Agranoc & Palfrey (2015) conducted on 228 subjects, it is demonstrated that higher inequality causes higher tax rates.

In a panel regression analysis made by Larcinese (2007) on 41 countries for a period of 1972-1998, it is highlighted that political participation needs to be taken into consideration in specifying the effect of average and median income differences on social expenditures. The variables of political participation and income skewness included in the model become significant. Yet, results can vary according to the method used.

Results of panel regression analysis carried out by Wong (2017) on 18 OECD countries for the years 1970-2009 confirm a positive relationship between average income against median income and redistribution.

3. Data Set, Model, And Method

In the paper uses annual data from 24 developed countries whose data are available and published for the period 2004-2018. These are Austria, Belgium, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Norway, Poland, Portugal, Spain, Sweden, The United States of Amerca, Slovenia, Lithuania, Latvia, Estonia, Czechia, Netherlands and Slovakia. Information related to the variables used in the paper is presented in Table 1.

Table 1. Information of Data Set

Variable	Explanation	Source
lnperdebt	Natural logarithm of public debt stock per capita (INT $, 2017 price)	IMF (2022)
lnpersoc	Natural logarithm of social expenditures per capita (INT $, 2017 price)	IMF (2022)
interest	Real long-term government bond yield (%)	IMF (2022) and OECD (2022)
primb	Primary budget balance/GDP	IMF (2022)
growth	Economic growth rate (%, annual change)	IMF (2022)
depend	Rate of dependent population to working population (%)	World Bank (2022)
ratio	Average Income/Median Income (per capita, per day, International $, 2017 price)	Our World in Data (2022)a
inf	Annual average change in consumer price index (%)	IMF (2022)
incmargr	Marginal income tax rate (a single person and childless at 100% of average earnings)	OECD (2022)
partip	Participatory democracy Index	Our World in Data (2022)b

Within the context of the median voter hypothesis, in the case of the increase of the difference between average income and median income against median income, models that are constructed to determine the change emerging in public borrowing, government social expenditures and marginal tax rates, are as below:

$$Model\ 1: lnperdebt = f(ratio, interest, growth, primb, partip) \quad (1)$$
$$Model\ 2: lnpersoc = f(ratio, growth, depend, inf, partip) \quad (2)$$
$$Model\ 3: incmargr = f(ratio, growth, inf, partip) \quad (3)$$

When the models are constructed, different explanatory variables except (ratio) that are estimated to be effective on dependent variables, should also be taken into consideration. In this way, it is aimed to determine the effect of (ratio) on dependent variables properly. The criteria that is influential in the selection of these variables are their being used in the literature frequently, and the accessibility of data.

The dynamic panel data method, in which the lagged value of the dependent variable is included in the model as an explanatory variable, is used in the paper. This model could increase the explanatory power of the model in cases that lagged value of dependent variable has an effect on itself. A lagged autoregressive model can be expressed as follows (Tatoğlu, 2020):

$$Y_{it} = \delta Y_{it-1} + \beta X'_{it} + \mu_i + u_{it} \quad (4)$$

Endogeneity problem is likely to be encountered in models constructed in this form, and estimators could be inconsistent and biased. The endogeneity problem can be overcome by using instrumental variables. However, these instrumental variables are expected to be valid. Sargan test is used for these occasions, and also if heteroskedasticity is exists, it can be tested by Hansen test. Besides, there should not be second-order autocorrelation in the model. Nevertheless, in case of the existence of unit effect in the model, it is necessary to use methods that allow unit effect and independent variables to be in correlation. Arellano-Bover/Blundell-Bond Two-Stage System Generalised Method of Moments can solve this problem efficiently through the orthogonal deviations method, in a case of small period (T) specifically (Tatoğlu, 2020). This method, even in the case of a small cross-section (N), can produce effective results (Soto, 2009).

4. Findings

Descriptive statistics related to the variables used in the constructed model are demonstrated in Table 2. As is seen in the table, in the analysis period, both the average inflation rate and average growth rate of the countries are nearly 2.1 %. The average population dependency rate is almost 49.9 %. The variables that have the highest standard deviation are respectively marginal income tax rate and primary budget balance.

Table 2. Descriptive Statistics Related to Variables

Variable	Observation	Average	Standard Deviation	Minimum	Maximum
lnperdebt	360	1.347	0.219	0.281	1.658
lnpersoc	360	9.084	0.494	7.767	10.138
ratio	360	1.176	0.054	1.046	1.345
primb	360	0.128	4.269	-28.170	20.570
growth	360	2.078	3.632	-14.839	24.371
inf	360	2.059	1.879	-1.684	15.253
depend	360	49.86	4.572	38.658	61.670
incmargr	360	51.286	7.776	33.976	77.153
interest	360	1.790	2.896	-8.821	22.971
partip	360	0.636	0.047	0.334	0.765

When the Wald Test Statistics probability value (0.000<0.001) -which shows the power of explanatory variables to explain the dependent variable- is considered, all of the constructed models are significant. In addition, the null hypothesis claiming that no second-order autocorrelation (AR(2)) is existent, is also accepted. Furthermore, according to the Hansen Test probability values how the validity of instrumental variables, the null hypothesis that asserts 'overidentification restrictions are prevalent' is accepted and, the variables are conceived to be extrinsic.

Table 3. Regression Results of Model 1

Independent Variables	(1)	(2)	(3)	(4)	(5)
lnperdebt (-1)	0.925 (0.000)	0.916 (0.000)	0.948 (0.000)	0.955 (0.000)	0.955 (0.000)
ratio	0.093 (0.042)	0.114 (0.001)	0.076 (0.020)	0.059 (0.044)	0.074 (0.048)
growth		-0.008 (0.000)	-0.007 (0.000)	-0.007 (0.000)	-0.007 (0.000)
primb			-0.003 (0.000)	-0.003 (0.000)	-0.003 (0.000)
partip				0.015 (0.610)	0.020 (0.565)
interest					-0.001 (509)
AR (1)	(0.034)	(0.019)	(0.022)	(0.023)	(0.022)
AR (2)	(0.262	(0.970)	(0.825)	(0.806)	(0.836)
Hansen Statis.	(0.063)	(0.184)	(0.292)	(0.450)	(0.388)
Instr. Variable	14	6	7	9	10
Wald Chi2	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observation	336	336	336	336	336

Note: Probability values in parentheses.

Results concerning public debt stock per capita are displayed in Table 5. Accordingly, the lagged value of the dependent variable has a statistically 1% level of significance and positive marking for all the versions of the model. Political participation and real interest rates (interest) have a statistically no significant effect on explaining public debt stock per capita. However, the increase in emerging economic growth and primary budget balance

(primb) indicates a statistically 1 % significance and negative marking in all the versions of the model. Thus, a decrease is observed in public debt stock per capita against the increase in economic growth and primary balance. The rate of average income against median income is, on the other hand, statistically significant and has positive markings in all the versions of the model. Hence, in response to an increase in the rate of average income against median income, public debt stock per capita also increases.

Table 4. Regression Results of Model 2

Independent Variables	(1)	(2)	(3)	(4)	(5)
lnpersoc (-1)	0.925 (0.000)	0.938 (0.000)	0.922 (0.000)	0.835 (0.000)	0.839 (0.000)
ratio	0.601 (0.000)	0.427 (0.003)	0.512 (0.005)	0.585 (0.002)	0.585 (0.003)
depend		0.002 (0.118)	0.003 (0.032)	0.09 (0.008)	0.008 (0.013)
growth			-0.003 (0.008)	-0.030 (0.004)	-0.002 (0.033)
partip				0.619 (0.081)	0.610 (0.105)
inf					-0.001 (0.493)
AR (1)	(0.004)	(0.004)	(0.003)	(0.009)	(0.009)
AR (2)	(0.440)	(0.386)	(0.828)	(0.822)	(0.730)
Hansen Statist.	(0.433)	(0.590)	(0.480)	(0.645)	(0.635)
Inst. Variable	5	6	8	9	10
Wald Chi2	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observation	336	336	336	336	336

Note: Probability values in parentheses.

The results about social expenditures per capita are shown in Table 3. According to the results, lagged values of social expenditures per capita have a statistically 1% significance and positive markings for all the versions of the model. Against the increase in the ratio of average income to median income, there is also an increase emerging in social expenditures per capita, as well. The result is valid for all the versions constructed with control variables of the model, and statistically significant on 1% level. In addition to this, population dependency rate (depend) except in Column 2, and political participation (partip) in Column 4 are statistically significant in explaining the increase in social expenditures per capita. However, A negative relationship exists between the increase in economic growth rate and social expenditures per capita. Therefore, in response to the increasing economic growth, a decrease emerges in social expenditures per capita. The inflation rate, on the other hand, is not statistically significant in explaining social expenditures per capita.

Table 5. Regression Results of Model 3

Independent Variables	(1)	(2)	(3)	(4)
inmargr (-1)	0.774 (0.000)	0.789 (0.000)	0.792 (0.000)	0.830 (0.000)
ratio	9.61 (0.022)	9.03 (0.065)	9.02 (0.000)	2.23 (0.094)
growth		-0.051 (0.074)	-0.033 (0.113)	-0.012 (0.605)
inf			-0.032 (0.547)	-0.016 (0.807)
partip				9.51 (0.091)
AR (1)	(0.030)	(0.030)	(0.020)	(0.011)
AR (2)	(0.323)	(0.322)	(0.323)	(0.318)
Hansen Statis.	(0.322)	(0.256)	(0.827)	(0.517)
Instr. Variable	9	13	10	10
Wald Chi2	(0.000)	(0.000)	(0.000)	(0.000)
Observation	336	336	336	336

Note: Probability values in parentheses.

When the results are examined in Table 4, it is seen that the lagged value of the marginal income tax rate has a statistically 1% level of significance and positive marking for all the versions of the model. Economic growth, except in Column 2, and inflation rate in all versions are not statistically significant in explaining the dependent variable. The rate of average income to median income (ratio) possesses statistically significance and positive markings for all versions in explaining the marginal income tax rate. Consequently, in response to an increase emerging in the rate of average income against median income, there becomes an increase in the marginal income tax rate as well.

5. Conclusion

Meltzer & Richard (1981), who explain the size of public sector with the preferences of the voters with the median income, argue that if the median income falls below the average income, income taxes for high-income people and government expenditures for low-income people will increase. They also conceive the public borrowing as a means that taxes the next generations and that when median income diverges from average income negatively, reflects the preference of the decision-making voter. Thereby, as the result of that median income falls below average income, public borrowing will increase and the income will redistributed as intertemporal.

The results of the analysis conducted on 24 developed countries for the period of 2004-2018 through the Arellano-Bover/Blundell-Bond Two-Stage System Generalised Method of Moments support all the allegations of the median voter hypothesis influentially. Since, the (ratio) variable that is defined as the rate average income against median income, in all the different versions constructed with diverse control variables for 3 basic models, provides results consistent with the providences of the median voter hypothesis.

When the findings are evaluated together, in the result of the fact that average income increases in proportion to median income, they indicate that decision-making voters prefer expenditure programs directed to themselves using borrowing and taxing the high-income.

Although the result regarding public borrowing shows consistency with the desire of the median voter, whose income diverges from average income negatively, to tax the next generations, it also supports the discussions of Modigliani (1961).

Another consideration related to the data obtained is that, in opposition to what was asserted by Larcinese (2007), political participation does not increase the explanatory power of the skewness between average income and median income on social expenditures and tax rates. Using different political participation indexes could be a reason, yet, if it is assumed that the difference does not arise from this reason, it is likely to be conceived that the high-income are effective in political participation.

On the other hand, Alesina & Rodrik (1994) point out that it might not be possible for the redistribution to occur only by direct transfers. Outside direct transfers, certain practices such as progressive taxation of income and minimum wage legislation could also be essential instruments of redistribution. In addition, Persson & Tabellini (1994) highlight resolving the incentive problems based on commitment shortage on taxing the patent rights and the capital and expending of tax income apart from redistribution. However, the results of this study reveal that direct transfers, tax rates directed to the high-income group, and public borrowing hold their importance as a redistribution mechanism for the given period. Yet, the issue that which method would be more effective in redistribution needs more discussion. When policies are determined to eliminate the skewness among income groups, the effects on different economic parameters need to be taken into consideration, to avoid financial and economic problems which could create greater inequalities in the future. It should not be ignored that public debts that have reached high levels in most European countries recently can cause an economic crisis that would increase income inequalities. Therefore, taxing the next generations through public borrowing in the redistribution of income may not be a convenient policy for generations in the current period. Barro (1974) also draws attention to the point that growing public debt may increase the risk in household balance sheets and hence decrease its wealth.

References

Agranov, M. & Palfrey, T. R. (2015). Equilibrium tax rates and income redistribution: A laboratory study. *Journal of Public Economics, 130*, 45-58. https://doi.org/10.1016/j.jpubeco.2015.08.008

Alesina, A. & Rodrik, D. (1994). Distributive politics and economic growth. *The Quarterly Journal of Economics, 109*(2), 465-490. https://doi.org/10.2307/2118470

Barnes, L. (2012). Does median voter income matter? The effects of inequality and turnout on government spending. *Political Studies, 61*(1), 82-100. https://doi.org/10.1111/j.1467-9248.2012.0095

Barro, R. J. (1974). Are government bonds net wealth?. *Journal of Political Economy, 82*(6), 1095-1117. https://doi.org/10.1086/260266

Black, D. (1948). On the rationale of group decision-making. *Journal of Political Economy, 56*(1), 23-34. https://doi.org/10.1086/256633

Borge, L.-E. & Rattsø, J. (2004). Income distribution and tax structure: Empirical test of the Meltzer-Richard Hypothesis. *European Economic Review, 48*(4), 805-826. https://doi.org/10.1016/j.euroecorev.2003.09.003

Bowen, H. R. (1943). The interpretation of voting in the allocation of economic resources. *The Quarterly Journal of Economics, 58*(1), 27. https://doi.org/10.2307/1885754

Buchanan, J. M. (1958). *Public principles of public debt, a defense and restatement*. Homewood, IL: Richard D. Irwin.

Colagrossi, M., Karagiannis, S. & R. Raab (2019). *The median voter takes it all: Preferences for redistribution and income inequality in the EU-28*. Publications Office of the European Union. Luxembourg, ISBN 978-92-76-01908-4.

Gouveia, M. & Masia, N.A. (1998). Does the median voter model explain the size of government?: Evidence from the states. *Public Choice*, 97, 159-177. https://doi.org/10.1023/a:1004973610506

IMF (2022). *Public finance in modern history*. https://www.imf.org/external/datamapper/datasets/FPP (14.12.2022).

Larcinese, V. (2007). Voting over redistribution and the size of the welfare state: The role of turnout. *Political Studies, 55*(3), 568-585. https://doi.org/10.1111/j.1467-9248.2007.0065

Lindert, P. H. (1996). What limits social spending?. *Explorations in Economic History*, *33*(1), 1-34. https://doi.org/10.1006/exeh.1996.0001

Meltzer, A. H. & Richard, S. F. (1981). A rational theory of the size of government. *Journal of Political Economy, 89*(5), 914-927. https://doi.org/10.1086/261013

Milanovic, B. (2000). The median-voter hypothesis, income inequality, and income redistribution: An empirical test with the required data. *European Journal of Political Economy, 16(*3), 367-410. https://doi.org/10.1016/S0176-2680(00)00014-8

Modigliani, F. (1961). Long-Run implications of alternative fiscal policies and the burden of the national debt. *The Economic Journal, 71(*284), 730-755. https://doi.org/10.2307/2228247

OECD. (2022). General statistics; Public sector, taxation and market regulation. https://stats.oecd.org/ (14.12.2022).

Our World in Data. (2022a). Mean vs. median income or consumption. https://ourworldindata.org/grapher/mean-versus-median-monthly-per-capita-expenditure-or-income (14.12.2022)

Our World in Data. (2022b). Distribution of participatory democracy. https://ourworldindata.org/grapher/distribution-participatory-democracy-vdem?time= 2004&country=EST~CZE (14.12.2022)

Persson, T. & G. Tabellini. (1994). Is inequality harmful for growth?. *American Economic Review, 84*(3), 600-621. https://doi.org/10.3386/w3599

Soto, M. (2009). System GMM estimation with a small sample. Barcelona Economics. Working Paper Series, 365.

Yerdelen Tatoğlu, F. (2020). *İleri panel veri analizi (Stata uygulamalı)*. İstanbul: Beta

Wong, M. Y. H. (2017). Median voter and power resources Revisited: A composite model of inequality. *European Political Science Review, 9*(4), 607-628. https://doi.org/10.1017/S175577391600014X

World Bank. (2022). World development indicators. https://databank.worldbank.org/ source/world-development-indicators (14.12.2022).

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