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# On Determinants of Political Polarization

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**Abstract**

Political polarization has been shown to significantly influence a country's economic performance. However, little is known about the drivers of political polarization. In this article, we aim to identify the main determinants of political polarization using Bayesian Model Averaging to overcome the problem of model uncertainty. We find that the level of trust within a country and the degree of income inequality are the most robust determinants of political polarization.

*Keywords:* political polarization determinants, Bayesian model averaging.
*JEL Classification Numbers:* D63, D72, P5, Z13.

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# 1 Introduction

Political polarization has a major influence on economic performance and has been shown to significantly affect investment rates (Azzimonti, 2011), fiscal policy (Lindqvist and Östling, 2010; Song, 2012), legislative productivity (Hacker, 2004; McCarty, Poole, and Rosenthal, 2006), macroeconomic volatility (Azzimonti and Talbert, 2014; Alt and Lassen, 2006), income inequality (McCarty, Poole, and Rosenthal, 2006), and, eventually, the development path of the economy (Frye, 2002). Political polarization reflects the degree of the divergence of attitudes toward political matters in a society and might in turn depend on the evolution of economic outcomes. Whether political polarization is a historical, cultural, or economic phenomenon is an empirical question.

In this paper, we address this question by studying the determinants of political polarization in a sample of 66 countries. Given that little is known about the main underlying factors that affect political polarization, we use the Bayesian Model Averaging (BMA) method of estimation to account for model uncertainty. To estimate political polarization, we use measures based on voters' self-reported political preferences as constructed by Lindqvist and Östling (2010). We extend their variables to include more countries, relying on data from the World Values Survey. We consider three groups of potential explanatory variables: economic, socio-historical, and geographic. The variables are selected from related discussions in the political science literature.

We find that the most robust determinants of political polarization are trust and income inequality in a country. A lower level of trust and higher income inequality contribute to higher political polarization. This implies that political polarization is a socio-historical and an economic phenomenon.

# 2 Data

## 2.1 The Measures of Political Polarization

We construct the political polarization measures using data from the World Values Survey (WVS).[1] The WVS consists of nationally representative surveys conducted in almost

[1] Other authors relied on the political polarization measures constructed from surveys; see, for example, Alt and Lassen (2006), Lindqvist and Östling (2010), and Iversen and Soskice (2015).

100 countries, using a common questionnaire, and includes about 1,000 respondents per country. We use information from six waves of this survey covering the time period 1989-2010, for 66 countries for which all necessary data is available.

For each wave and for each country in the sample, we construct the political polarization measures by computing the standard deviation of the scores the responders assign in response to the question "How would you place your views on this scale [from 1 to 10]?" for the following statements:

1. 1 means that you completely agree with the statement, "Competition is good. It stimulates people to work hard and develop new ideas," and 10 means that you completely agree with the statement, "Competition is harmful. It brings out the worst in people."

2. 1 means that you completely agree with the statement, "People should take more responsibility to provide for themselves," and 10 means that you completely agree with the statement, "The government should take more responsibility to ensure that everyone is provided for."

3. 1 means that you completely agree with the statement, "Incomes should be made more equal," and 10 means that you completely agree with the statement, "We need larger income differences as incentives."

4. 1 means that you completely agree with the statement, "Private ownership of business should be increased," and 10 means that you completely agree with the statement, "Government ownership of business and industry should be increased."

These questions reflect attitudes to different policy problems: competition, government spending, income inequality, and private-state ownership. We denote the respective polarization measures as COM, GOV, ININ, and PRST; their descriptive statistics are reported in Table 1.

## 2.2 Potential Determinants of Political Polarization

We distinguish three groups of potential determinants of political polarization: economic, socio-historical, and geographic. Below we describe each potential determinant of political polarization in detail.

*Economic determinants*

**1. The real gross domestic product (GDP) per capita.** We want to study whether political polarization is (at least partially) determined by a country's economic conditions. The GDP is the most common measure of economic performance and has been shown to be a significant factor promoting the emergence of democratic political institutions (see Londregan and Poole, 1996). We expect higher GDP to decrease political polarization. Data Source: World Bank.

**2. Income inequality.** This variable is the most frequently discussed correlate of political polarization in the literature (see McCarty, Poole, and Rosenthal, 2006; Pontusson and Rueda, 2008; Londregan and Poole, 1996; Garand, 2010, among others). We consider the Gini coefficient after redistribution as the measure of income inequality. Data Source: World Income Inequality Database.

**3. Globalization.** Similar to GDP, globalization, or the openness of a country to foreign capital flows, is a proxy for economic development. Globalization can be affected by political frictions within a country, and can influence the evolution of political frictions. We measure globalization as the foreign direct investment share of the GDP. Data Source: Sturm and De Haan (2015).

**4. Government expenditure.** The size of the public sector depends on political frictions, in particular, on political polarization (Lindqvist and Östling, 2010). However, government expenditures can affect the evolution of political attitudes in society. A government that spends a significant fraction of its revenues on public goods, such as schools or medical care, can improve the overall social attitude toward politicians in society and decrease political polarization. We use the general government final consumption expenditure. Data Source: World Bank.

*Socio-historical determinants*

**5. Media status**. The degree of proliferation, independence, and overall quality of the media can have a nontrivial effect on political polarization in a country through a direct influence on public opinion. Bernhardt, Krasa, and Polborn (2008), Prior (2013), DellaVigna and Kaplan (2007) and Gerber, Karlan, and Bergan (2009) study the relationship between the media and political polarization. As a measure of media quality, we use the indicator of freedom of the press, defined as follows: (1) free, (2) partly free, and

(3) not free. Data source: Freedom House.

**6. Ethnolinguistic fractionalization.** This variable accounts for cultural diversity, which can influence the distribution of attitudes to political matters. Esteban and Ray (2011) consider fractionalization and inequality as proxies for polarization and determinants of conflict in a country. Data source: We use the ethnolinguistic fractionalization measure constructed by Desmet, Ortuño-Ortin and Wacziarg (2012), variable ELF(1).

**7. Trust (a proxy for social networks)**. Political polarization can be a consequence of social interactions and discussions. An individual's opinion about a particular party or policy can be affected by the opinions of his or her neighbors, relatives, or friends. Axelrod (1997), Baldassarri and Bearman (2007), and Iversen and Soskice (2015), among others, study the role of social networks in political polarization. As a proxy of social networks, we use the measure of trust in the country, computed as the inverse of the average value of the responses to the statement "Most people can be trusted" ("yes" is counted as 1, "no" is counted as 2) for each country and wave in the WVS survey. Data source: WVS.

**8. Democracy.** Democratic societies have more freedom in defining, discussing, and adjusting their political attitudes. As a measure of democracy in the country, we use the Freedom House indicator, which ranges from 0 to 10 where 0 is the least democratic and 10 is the most democratic. Data source: Freedom House.

*Geographic determinants*

**9. Population density**. This variable can influence the quantity and quality of communications among a country's citizens (social networks), if face-to-face communication is preferred to phone or the internet. Data source: World Bank.

**10. Absolute latitude.** This variable is a proxy for a country's geographic factors. Together with ethnolinguistic fractionalization, this time-invariant factor accounts for unobserved country heterogeneity. Data source: World Bank.

Table 1 reports the descriptive statistics for all listed explanatory variables.

# 3 Methodology

We identify the underlying factors that explain the political polarization by using a BMA approach[2] to account for model uncertainty (arising because of the lack of clear theoretical

[2]Moral-Benito (2012) describes the use of BMA for panel data.

guidance on the determinants of political polarization). BMA estimates models for all possible combinations of the regressors and takes a weighted average over all the candidate models. For the implementation of the BMA methodology, we try a number of different priors on the parameter space and on the model space. We report the results for uniform prior on the model space and "hyper-g" prior on the parameter space, although our conclusions are robust to different specifications of the priors.[3]

We consider cross-section and panel data separately. The cross-section data includes 66 countries, one observation for each country, for years in the range 1989-2010. The dependent variable is the measure of political polarization in country-year; the time-varying explanatory variables are the lagged averages over five-year periods (to smooth the effect of economic fluctuations).

In order to explore the availability of the data and increase the number of observations and the information set, we also consider unbalanced panel data for 66 countries, 1 to 6 observations per country (survey waves). For the panel model, we do not use the country individual fixed effect since we are interested in identifying time-invariant determinants (such as geography or cultural factors). We capture unobserved heterogeneity across countries using the absolute latitude and ethnolinguistic fractionalization measures. We control for different time trends by cross-sectional demeaning of the data (by subtracting from each observation the mean of the variable across the countries for every time period). For the panel model, we use the second lag of the regressors to ensure that the time-varying variables possess relevant information for the dependent variable, generated from the survey in the current year.

# 4 Results

Tables 2 and 3 present the results for the cross-section estimation and the panel estimation, respectively. The tables report the posterior mean and standard deviation (SD), which can be interpreted as the weighted average of all the model-specific coefficient estimates, and the posterior inclusion probability (PIP), which indicates the relevance of each regressor in explaining political polarization.

The results of the cross-section and panel estimates suggest that the most robust

[3]See Zeugner and Feldkircher (2009) on advantages of "hyper-g" prior.

determinants of political polarization (which have the highest PIP across all political polarization measures) are trust and income inequality.[4] The only exception is the panel estimates for the PRST polarization measure where real GDP and trust constitute robust determinants of polarization (PIP=0.9597), while income inequality has a PIP of 0.5788 (implying weak evidence for a regressor). Higher trust reduces polarization, and higher inequality increases polarization, for all polarization measures.

Among the other potential determinants of political polarization, media status has a high PIP for COM and ININ polarization measures, for panel model estimates. The results suggest that lower freedom of the media increases polarization. For the political polarization measure that reflects the attitude to the size of the government, GOV, the government expenditure is another robust determinant. A larger government reduces disagreement in a society about how large the government expenditures should be. Similarly, for the political polarization measure based on opinions about public policy on competition, COM, population density is a significant determinant: More people per square kilometer tend to disagree less on competition policy. This can be, at least partially, because the concentration of people within a given territory determines to some extent the degree of competition on that territory. This points to a possible shortcoming of the polarization measures used: The attitude toward a particular policy can be influenced by the existing status of that policy.

The remaining variables have a low PIP and insignificant coefficients, implying that there is insufficient evidence to consider these variables as regressors.

# 5 Conclusions

The results of this study suggest that the most robust determinants of political polarization in a society are trust and income inequality. Higher trust in people and lower income inequality reduce political polarization. Freedom of the media, government expenditures, population density, and real GDP appear to be the other significant factors that reduce political polarization in a country. We conclude that political polarization is a socio-historical and an economic phenomenon.

[4] According to Raftery(1995), evidence for a regressor with a posterior inclusion probability from 50 - 75% is called weak, from 75 - 95% positive, from 95 - 99% strong, and from 99% very strong.

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Table 1: Summary statistics.

| Variable | Mean | SD | Correlation with: | | | |
|---|---|---|---|---|---|---|
| | | | COM | GOV | ININ | PRST |
| **Polarization Measures** | | | | | | |
| COM | 2.464 | 0.343 | 1 | | | |
| GOV | 2.810 | 0.363 | 0.690 | 1 | | |
| ININ | 2.799 | 0.364 | 0.680 | 0.755 | 1 | |
| PRST | 2.684 | 0.441 | 0.675 | 0.831 | 0.836 | 1 |
| **Time-invariant variables** | | | | | | |
| Fractionalization | 0.575 | 0.055 | 0.130 | 0.269 | 0.271 | 0.347 |
| Absolute Latitude | 0.378 | 0.181 | -0.434 | -0.603 | -0.469 | -0.491 |
| **Time-varying variables** | | | | | | |
| Media Status | 12.712 | 1.831 | 0.322 | 0.306 | 0.372 | 0.537 |
| Trust | 0.132 | 0.149 | -0.554 | -0.444 | -0.457 | -0.540 |
| Income Inequality | 37.544 | 9.453 | 0.581 | 0.641 | 0.612 | 0.621 |
| FDI | 18.119 | 16.759 | -0.234 | -0.324 | -0.187 | -0.253 |
| Gov. Expenditure | 15.434 | 5.089 | -0.340 | -0.531 | -0.310 | -0.387 |
| Real GDP | 8.451 | 1.491 | -0.356 | -0.448 | -0.438 | -0.664 |
| Pop. Density | 116.599 | 144.372 | -0.137 | 0.181 | -0.015 | 0.116 |
| Democracy | 7.649 | 2.596 | -0.164 | -0.186 | -0.306 | -0.444 |

Table 2: Determinants of political polarization: cross-section estimates.

| Variable | PIP, Post. Mean, Post. SD. | | | |
|---|---|---|---|---|
| | **COM** | **GOV** | **ININ** | **PRST** |
| Trust | **0.8069** | **0.8835** | **0.9588** | **0.9794** |
| | -1.4442 | -1.6483 | -2.3735 | -3.2041 |
| | 0.9977 | 0.8807 | 0.9495 | 1.0765 |
| Income Inequality | **0.7990** | **0.9691** | **0.8973** | **0.8874** |
| | 0.0093 | 0.0141 | 0.0114 | 0.0139 |
| | 0.0066 | 0.0051 | 0.0060 | 0.0074 |
| Real GDP | 0.2670 | 0.2812 | 0.3997 | 0.5613 |
| | 0.0031 | 0.0081 | 0.0176 | -0.0388 |
| | 0.0190 | 0.0199 | 0.0329 | 0.0445 |
| Gov. Expenditure | **0.8917** | **0.9796** | 0.2631 | 0.3321 |
| | -0.0186 | -0.0223 | -0.0009 | -0.0038 |
| | 0.0100 | 0.0075 | 0.0045 | 0.0077 |
| Media Status | 0.3588 | 0.4558 | 0.2674 | 0.2042 |
| | 0.0236 | -0.0354 | -0.0061 | -0.0012 |
| | 0.0501 | 0.0504 | 0.0372 | 0.0339 |
| Absolute Latitude | 0.3161 | 0.1925 | 0.2617 | 0.2385 |
| | 0.0641 | -0.0140 | 0.0062 | 0.0457 |
| | 0.1885 | 0.1174 | 0.1517 | 0.1906 |
| Fractionalization | 0.2616 | 0.1789 | 0.2428 | 0.2088 |
| | -0.0286 | 0.0074 | 0.0131 | 0.0267 |
| | 0.1204 | 0.0823 | 0.1129 | 0.1287 |
| FDI | 0.3721 | 0.1837 | 0.3336 | 0.2452 |
| | 0.0010 | 0.0000 | 0.0008 | 0.0006 |
| | 0.0021 | 0.0010 | 0.0019 | 0.0019 |
| Democracy | 0.3494 | 0.2150 | 0.4596 | 0.2925 |
| | 0.0072 | 0.0010 | -0.0138 | -0.0064 |
| | 0.0162 | 0.0093 | 0.0213 | 0.0166 |
| Pop. Density | **0.9116** | 0.1867 | 0.2714 | 0.1947 |
| | -0.0006 | -0.0000 | -0.0000 | 0.0000 |
| | 0.0003 | 0.0001 | 0.0002 | 0.0001 |

The table reports the BMA results with uniform model prior and "hyper-g" prior. For each explanatory variable, each column contains results in the following order: posterior inclusion probability (PIP), posterior mean, and standard deviation. Number of observations: 66. The time-varying explanatory variables are lagged averages over five years.

Table 3: Determinants of political polarization: panel estimates.

| **Variable** | **PIP, Post. Mean, Post. SD** | | | |
|---|---|---|---|---|
| | **COM** | **GOV** | **ININ** | **PRST** |
| Trust | **1.0000** | **0.8136** | **0.9512** | **0.9907** |
| | -2.4444 | -0.9792 | -1.5995 | -2.2602 |
| | 0.4848 | 0.6407 | 0.6664 | 0.6713 |
| Income Inequality | **0.9119** | **0.9543** | **0.9744** | 0.5788 |
| | 0.0083 | 0.0104 | 0.0119 | 0.0049 |
| | 0.0041 | 0.0042 | 0.0043 | 0.0054 |
| Real GDP | 0.1994 | 0.1804 | 0.2205 | **0.9597** |
| | -0.0028 | -0.0002 | 0.0001 | -0.1035 |
| | 0.0130 | 0.0108 | 0.0152 | 0.0399 |
| Gov. Expenditure | 0.3752 | **0.9888** | 0.2496 | 0.2750 |
| | -0.0032 | -0.0207 | -0.0013 | -0.0023 |
| | 0.0054 | 0.0063 | 0.0040 | 0.0053 |
| Media Status | **0.8008** | 0.2833 | **0.8004** | 0.6589 |
| | 0.1081 | 0.0180 | 0.0976 | 0.0910 |
| | 0.0787 | 0.0453 | 0.0737 | 0.0883 |
| Absolute Latitude | 0.2672 | 0.2495 | 0.2365 | 0.2504 |
| | 0.0532 | -0.0479 | 0.0299 | 0.0591 |
| | 0.1360 | 0.1314 | 0.1193 | 0.1618 |
| Fractionalization | 0.1895 | 0.5275 | 0.4158 | 0.6883 |
| | -0.0179 | 0.1621 | 0.1137 | 0.3117 |
| | 0.0774 | 0.1943 | 0.1809 | 0.2701 |
| FDI | 0.1710 | 0.1953 | 0.5496 | 0.5571 |
| | 0.0001 | -0.0002 | 0.0020 | 0.0025 |
| | 0.0007 | 0.0009 | 0.0023 | 0.0028 |
| Democracy | 0.6091 | 0.3750 | 0.3803 | 0.3592 |
| | 0.0221 | 0.0091 | 0.0089 | 0.0118 |
| | 0.0229 | 0.0165 | 0.0182 | 0.0223 |
| Pop. Density | **0.8893** | 0.1824 | 0.3185 | 0.1848 |
| | -0.0004 | 0.0000 | -0.0001 | -0.0000 |
| | 0.0002 | 0.0001 | 0.0001 | 0.0001 |

The table reports the BMA results with uniform model prior and "hyper-g" prior. For each explanatory variable, each column contains results in the following order: posterior inclusion probability (PIP), posterior mean, and standard deviation. Number of observations: 136. The time-varying explanatory variables are lagged twice.