Ideological Polarization and Income Inequality in the Korean Regions

Hyun-Chool LEE and Alexandre REPKINE

Abstract

Based on the results of a survey conducted in the aftermath of Korean local elections held in 2018, we measure the extent of ideological polarization across Korean regions and analyze the relationship between income inequality and several measures of ideological polarization in Korean society. We estimate that Korean regions are polarized to the same extent as Korea taken as a whole. Regionally, we find a positive association between the extent of income divergence from the regional mean and ideological polarization, while surprisingly, the extent of aggregate regional income inequality does not seem to be an important factor. Our empirical results suggest that this relationship is mainly driven by an increased demand for redistribution policies on the part of the economically disadvantaged electorate, and the opposition of wealthier voters to the implementation of such policies. Finally, economic security appears to be an important factor mitigating ideological polarization as we find that younger, better educated, and wealthier voters are more likely to view their political views to be located closer to the ideological mean.

Keywords: ideological polarization, Korea, income inequality, redistribution policies, party polarization

Introduction

Ideological polarization has long been argued to be a cause of political unrest, social conflict, and an inefficient supply of public goods (Grechyna 2016). Several studies have found that Korean society has become increasingly polarized in recent years (S. Kim 2015; Kang 2017; Jung 2018; Kim and Lee 2021). Indeed, before the democratization took off in 1987, political landscape in South Korea was dominated by the right-wing political views leaving little room for ideological variation, either within society or the political parties representing it. In the early 1990s important social cleavages began to divide Korean society along the ideological lines (H. Lee 2007).

Korean regionalism, for instance, became a major contributing factor to the ideological divisions between the liberal and conservative part of the population and affecting Korean voters' choices (Lee and Repkine 2020). The Asian Financial Crisis in 1997 and the advent of the global financial crisis of 2008 further contributed to the widening of the gap between liberal and conservative groups (Sonn 2017). At the same time, both financial crises brought about significant changes in the Korean households' income distribution and the extent of income inequality. Thus, certain studies argue that economic inequality in Korea has been steadily rising since the Financial Crisis of 1997 with the distribution of both wages and household income becoming increasingly unequal (Shin 2012).

In the international context, there is plenty of empirical evidence suggesting that ideological polarization, both among voters and political parties, is a function of voter income distribution. In the Western European context it's been shown how increased income inequality encourages economically disadvantaged voters to favor right-wing parties (Han 2016). Similarly, increased income inequality has been demonstrated to result in a larger number of economically disadvantaged voters lending their support to extreme left- or right-wing political parties as these voters' major motivation is to do away with the existing political environment (Rooduijn and Burgoon 2017; Park and Lee 2018). Some scholars argue that political party polarization is likely to follow increased voter polarization as political

parties will adjust their agendas to better fit changes in the voter preferences (Garand 2010).

In this paper we use the results of a unique survey conducted in the aftermath of Korean local elections of 2018 in order to study the association between voter income inequality and ideological polarization in Korean society. As argued above, both have been on the increase in Korea since the early 1990s and are likely to be associated. It appears especially interesting to study this association in the Korean context since Korea is one of the world's most homogeneous countries that lacks social cleavages along racial, ethnic, or religious divisions that are important in multicultural economies such as the United States (Johnston et al. 2020). It is worthwhile noticing, however, that there has been a recent surge in anti-immigration rhetoric, especially regarding Korean Chinese, which may have contributed to Korea's ideological polarization. However, given the absence of questions regarding this particular problem in our survey, we are unable to address this issue in the current study.

The existing literature on ideological polarization often views the latter as a geographical phenomenon in the sense of the ideological divide one observes between the Democratic coastal areas and the inland Republican states in the United States, or an ideological conflict between Korea's south-east and south-west. In this study, however, we focus on the ideological polarization within Korean regions as we demonstrate that the extent of their ideological polarization is of the same order with that of Korea as a whole. For instance, the extent of political party polarization within Korean regions varies between 1 and 14 percent, which is comparable to the aggregate Korean level of 8 percent. The focus of this study then is on the determinants of region-level ideological polarization rather than the Korean regionalism.

The survey data used for the analysis in this study were collected right after the Candlelight Protests of 2016 and 2017 that led to the impeachment of former President Park Geun-hye, a first in Korea's constitutional history and which lead to a change in political power. However, at roughly the same time, conservative voters conducted "Taegukgi rallies" that continued even after Park's impeachment (H. Lee 2018). While in many ways the time

period covered by our study is a special one as it comes right after the presidential impeachment, this is also a time where the problems of Korean ideological polarization became more pronounced relative to the pre-impeachment period (Jung 2018), making the post-impeachment ideological polarization all the more interesting to study. We fully recognize, however, that the results of this study will have to be verified for later periods, a line of research we intend to pursue in the future.

While some studies exist on the link between socio-economic cleavages and income inequality in Korea, such as Kang (2017), who provides a comparison between Korea and the thirty-two OECD economies for the period between 2004 and 2014, we believe the association between ideological polarization and income inequality in Korea has not been extensively examined to date within the revealed preference framework that links voter socio-economic characteristics to ideological preferences at the individual voter level.

The rich survey results in our possession allow us to infer a socio-economic and ideological profile of two thousand respondents in a representative sample, as well as their region of residence. As a result, we capture the extent of income inequality and ideological polarization at both regional and individual levels. At a regional level income inequality is computed as a standard Gini coefficient, while the voter and political party polarization indices are calculated on the basis of a seminal study by Esteban and Ray (1994).

Rather obviously, regional measures and, in general, the aggregate measures of both income inequality and ideological polarization, are functions of the individual voter's characteristics and choices. Thus, the results of a model by Esteban and Ray imply that their polarization index reaches its maximum in the case of a society divided into two equal-sized groups with all individuals being either extreme left or extreme right according to some scale (Esteban and Ray 1994). In the context of this study this would be the liberal-conservative scale (Downs 1957). At the level of the individual voter, this situation would correspond to each individual characterized by the largest deviation of his or her ideological score from the ideological mean. In fact, a weighted sum of such deviations is the basis for a

spectrum of the variance-based group measures of ideological polarization (Sigelman and Yough 1978). We refer to the absolute value of such a deviation as an ideological divergence and interpret it as a measure of the individual voter's contribution to the overall level of ideological polarization. Similarly, while the extent of income inequality at a regional level is commonly measured by the Gini coefficients, at an individual level we look at the voter income divergence from the mean. We discuss the abovementioned indices in detail in section four below.

The questions posed in this study are as follows:

> Q1) Are the voters' extreme ideological scores statistically related to the regional income inequality and the individual income divergence from the mean and, if yes, with what sign?
> Q2) Is being relatively wealthy or poor associated with a higher probability of voting for a political party tending to an extreme end of the ideological spectrum?

We find that, surprisingly, the voter ideological divergence either in terms of their self-assigned ideological scores or in terms of the ones they assign to their preferred political parties is not a function of regional-level income inequality levels. However, an important role appears to be played by individual voter incomes and their divergence from the mean. In particular, wealthier individuals appear to prefer those political parties that are closer to the ideological center. At the same time, ideological and income divergences from the mean appear to be positively associated with each other. In other words, voters belonging to the lowest and the highest income brackets are the ones who tend to harbor political views located closer to the extreme ends of the ideological spectrum. Finally, we find that both relatively poor and relatively wealthy individuals are likely to support a conservative political party. We interpret our results to imply that the government policies aiming at the alleviation of income inequality in Korea may be also decreasing the extent of ideological polarization.

This study is organized as follows. We start by discussing in the

following section a set of channels through which an unequal income distribution may translate into a higher extent of ideological polarization in the society. Then, in the third section we summarize the survey results and discuss the construction of the polarization and divergence indices. We present our empirical results in section four, and discuss them in the concluding section five.

Ideological Polarization and Income Inequality

Existing literature identifies several channels through which changes in income inequality may affect the extent of ideological polarization (Winkler 2019). A substantial part of these studies is based on the conjecture that income inequality affects polarization through social demand for redistribution. One of the key contributions in this area is a seminal model of the median voter in which more taxation and redistribution is associated with a larger difference between the lower median, and a higher mean income (Meltzer and Richard 1981). The median voter model allows one to create a link with the models of endogenous economic growth making it possible to conclude that *"in less equal societies more redistribution is sought by a majority of the population"* (Alesina and Rodrik 1994, 478–479).

Increased social demand for redistribution is likely to increase the extent of voter and political party polarization as the median voter is likely to demand redistribution of income toward the poor (Alt and Iversen 2017). An increased support for redistribution by economically disadvantaged voters will then run into conflict with the resistance to it on the part of the wealthy, contributing to voter polarization. Political party polarization is likely to follow as political parties adjust their agendas to better fit changes in voter preferences (Garand 2010).

Economic inequality in Korea has been steadily rising since the Financial Crisis of 1997, with the distribution of both wages and household incomes becoming increasingly unequal (Shin 2012). Some studies argue that increased income inequality results in larger numbers of economically

disadvantaged voters lending their support to the extreme left- or right-wing political parties as these voters' major motivation is to do away with the existing political environment (Rooduijn and Burgoon 2017). Along a similar line of reasoning, other scholars find that income inequality leads to a deterioration in social capital and a lack of social trust, resulting in more support for the right-wing parties (Jesuit et al. 2009). In Western Europe, it's been shown how increased income inequality encourages economically disadvantaged voters to vote for right-wing parties (Han 2016). More income inequality is thus likely to exacerbate the problem of ideological polarization.

It is important to note that demand for redistribution is obviously not the only factor that may affect the proclivity of the electorate to vote for right-wing parties. The latter, for instance, have been recently on the rise in the countries of Northern Europe whose governments are well-known for conducting redistribution welfare policies. Anders Breivik who massacred innocent people in Norway, one of the world's most developed welfare states, is one salient example in this regard. The rise of right-wing parties in Northern Europe, however, is more related to the attitude towards immigration that underwent important changes as immigrants from the Middle East started to flow into Europe in recent years.

Some authors, however, find evidence that increased levels of experienced income inequality are associated with *less* demand for redistribution and as a result less proclivity to vote for political parties on the extreme left (Roth and Wohlfart 2018). As a result of the anchoring effect, voters who have experienced income inequality in the past think of it as a normal part of their lives, resulting in a decreased demand for redistribution (Kahneman and Tversky 1979).

An important feature of this study is that both ideological and income divergence are measured at an individual level relative to the regional mean as opposed to the overall Korean mean. Given that our theoretical focus is on the redistribution demand, the region-based measures of ideological divergence are capturing the fact that, while many economic policies are implemented at the national level, local or regional governments have a certain freedom in adjusting tax rates (such as the income tax rate) and

formulating welfare policies.[1] For instance, starting from the January 24, 2021, each foreign legal resident of Gyeonggi-do province was eligible to receive 100,000 Korean won in support funds as part of the provincial government's policy to mitigate the economic consequences of COVID-19, reflecting the fact that this province hosts more than half a million foreign residents. In addition, as we demonstrate in section four, the extent of ideological polarization *within* Korean regions is at the same level as that of Korea as a whole, thus warranting the analysis of Korea's ideological polarization at a regional level. To put it differently, while the regional issues are producing an important impact on the Korean voter choice so that the Korean electorate is polarized as a whole, there is a similar degree of ideological polarization within the Korean regions that needs to be explained.

Survey Description and Summary Statistics

Our study is based on a survey conducted in 2018 by Myongji University's Center for Research on the Future Politics in the aftermath of the Korean local elections. The survey's seventy-six questions focus on voter participation, general political attitude, political awareness, attitudes toward political parties, the current government and economy, and social, security, and environmental issues.

The sample frame contains two thousand adult respondents aged nineteen and above who were contacted between June 15 and 28, 2018. The sampling was conducted according to the proportional allocation extraction based on the respondents' gender, region, and age taking into account the observed ratios of the educational achievement and economic activity using the CAWI (computer-assisted web interview) approach. The sampling error is 2.2 percent.

This survey respondents are almost equally represented by males

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1. We thank an anonymous reviewer for an important remark regarding the difference between region- and country-based measures.

Table 1. The Ideological Placement of Korea's Voters and Political Parties by the Survey Respondents (2018)

Response variable	Mean	Standard deviation	Skewness	Scale
DP score on a liberal-conservative scale	3.19	2.23	0.45	0-10
LKP score on a liberal-conservative scale	7.63	2.75	-1.06	0-10
BP score on a liberal-conservative scale	5.73	2.06	0.04	0-10
DPP score on a liberal-conservative scale	4.39	2.08	0.03	0-10
JP score on a liberal-conservative scale	3.04	2.37	0.45	0-10
Self-placement on a liberal-conservative scale	4.62	2.05	0.12	0-10

Note: Democratic Party (DP), Liberty Korea Party (LKP), Bareun Mirae Party (BP), Democracy and Peace Party (DPP), Justice Party (JP).

(49.7%) and females (50.3%). Most come from the Gyeonggi-do province (25.1%), followed by Seoul (19.6%) and Busan (6.9%). The youngest respondent is nineteen years old, while the oldest one is eighty-seven. The median age is forty-seven, which is a little higher than the median age estimate of forty-three reported by the CIA's World Factbook (2022). More than half the respondents either have a regular job (37.6%) or are housewives (19.4%). Irregular workers constitute 10.7 percent of the survey sample. The share of student respondents is 5.4 percent. About a third of the regularly employed respondents are office workers (33.5%) followed by employees of small firms with less than nine people (17.6%), the manufacturing industry (13.9%), and the service sector (13.5%).

Table 1 below presents a summary of the ideological scores given by the respondents to Korea's political parties and to themselves on a liberal-conservative scale. The most liberal attitude receives a zero score, while the most conservative receives a score of ten.

Empirical Results

In this section we first demonstrate that the extent of ideological polarization

when measured within the Korean regions is similar to the country as a whole and. We believe this finding is especially important in light of the literature on Korean regionalism because it implies that Korean voters are as polarized within their regions as they are in Korea as a whole. We then define and summarize the indices of ideological and income divergence in the Korean regions. Finally, we present the results of our analysis of the statistical association between measures of ideological divergence, regional income inequality, and income divergence.

Regional Ideological Polarization in Korea

Figure 1 below visualizes the distributions of survey respondents' self-assigned ideological scores on a liberal-conservative scale. The zero score corresponds to the most liberal attitude, while the score of ten represents the
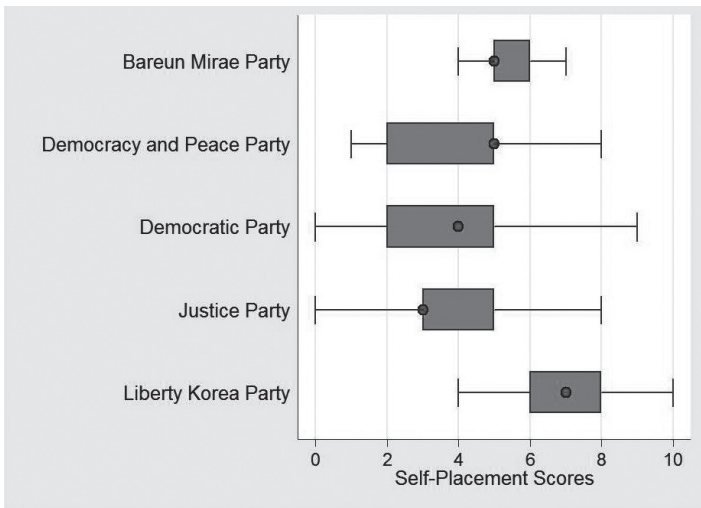

Figure 1. Self-Placement of the survey respondents on the ideological scale by favored political party

Note: The size of the box corresponds to the distance between the 25th and the 75th percentiles. The dots represent the medians. The "whiskers" outside of the boxes represent lower and upper adjacent values characterizing the distributions of the self-assigned scores.

most conservative disposition (Downs 1957).

A group of voters supporting three of the five major competitors in the election of 2018, namely, the Democratic Party, Democracy and Peace Party, and Justice Party, can be characterized as center-left with the medium scores of 4, 5, and 3, respectively, on a liberal-conservative scale. This is in contrast to a median self-placement ideological score of 7 of the voters supporting Korea's most right-wing, the Liberty Korea Party.

Polarized societies are defined as ones characterized by a high extent of ideological differentiation among the major political parties or groups of voters (Downs 1957), which is why we adopt the following measure of polarization for our analysis (Esteban and Ray 1994):

$$\tilde{P} = K \sum_{i=1}^{N} \sum_{j=1}^{N} v_i^{1+\alpha} v_j \left| p_i - p_j \right| \tag{1}$$

where $p_i = 1..5$ is the median ideological score self-assigned by the voters favoring one of the five Korean parties whose representatives took part in the general election of 2018, and v_i is the voting shares of political party i. We set $\alpha = 0.6$ in (1) following a seminal study where this measure was used (Montalvo and Reynal-Querol 2005).

The polarization measure in (1) was shown to be measuring an extent to which the actual distribution of ideological preferences in the society differs from a bi-modal distribution representing two equal-sized groups located at the opposite extremes of an ideological scale (Montalvo and Reynal-Querol 2005). Polarization measure $\tilde{P}$ in (1) varies between zero and one assuming the value of unity if two equal-sized groups hold totally opposite ideological beliefs.

We refer to the measure $\tilde{P}$ in (1) as voter polarization. In case the value of p_i in (1) is equal to the median of the ideological scores assigned by the voters to their preferred political party rather than to themselves, we refer to the polarization measure in (1) as political party polarization. The two are not the same since the self-assigned ideological scores will in general differ from the scores assigned to the political parties by the voters preferring those parties.

Table 2 below lists the values of political party and voter polarization measures in the Korean regions.

It is rather surprising that, while several studies find that the extent of ideological polarization in Korea has recently increased, the measured values of either political party or voter polarization are nowhere close to 100 percent in any one of Korea's regions (Dalton and Tanaka 2008; Hur et al. 2019; Jaung 2019). For the country as a whole, political party polarization is estimated at a level of 8.06 percent compared to 5.78 percent for voter polarization.

Another important insight suggested by Table 2 is that the level of ideological polarization *within* Korean regions varies a lot across regions, in

Table 2. Regional Political Party and Voter Polarization in Korea (2018)

Region	Polarization	
	Political party	Voter
All regions	8.06	5.78
Seoul	8.31	5.77
Busan	7.35	6.48
Daegu	10.14	9.76
Incheon	8.11	6.61
Gwangju	0.66	2.49
Daejeon	11.14	8.90
Ulsan	10.47	7.77
Gyeonggi-do	8.37	5.84
Gangwon-do	13.48	11.07
Chungcheongbuk-do	3.44	4.90
Chungcheongnam-do	7.29	5.39
Jeollabuk-do	2.03	1.31
Jeollanam-do	3.09	1.47
Gyeongsangbuk-do	12.30	8.59
Gyeongsangnam-do	10.84	9.00
Jeju-do	7.46	5.71

Source: Authors' calculations based on the survey results.
Note: Unit is percentage(%).

many cases exceeding that characterizing Korea as a whole. Thus, the extent of both voter and political party polarization is substantially higher in Gangwon-do compared to Seoul, while Korea's southwestern provinces of Jeollabuk-do and Jeollanam-do exhibit almost no polarization at all. Indeed, these provinces are known for being strongholds of more liberal voters so a low level of ideological polarization in these provinces would not seem surprising. However, we do not observe similarly low polarization levels in the two southeastern provinces of Gyeongsangbuk-do and Gyeongsangnam-do that are also known to be strongholds of more conservative voters.

Ideological Divergence

At an individual level, it makes sense to examine the extent to which an ideological score assigned by a particular voter to a political party or to him/herself deviates from the ideological mean in the region of the voter's residence. As mentioned in the Introduction, a weighted sum of such deviations is the basis for a spectrum of the variance-based group measures of ideological polarization (Sigelman and Yough 1978). Here S_i^k denotes the ideological score assigned by an individual voter i in region k either to himself or to his preferred political party. $\overline{S}^k$ denotes the average value of such scores in region k. Consider the following measure:

$$\Delta D_i^k = \frac{\left| S_i^k - \overline{S}^k \right|}{\sigma_S^k} \tag{2}$$

where σ_S^k is the standard deviation of ideological score S in region k.

Higher values of ΔD_i^k would pertain to those voters whose ideological view of either themselves or the political party they prefer is rather divergent from the general ideological sentiment in the region. In other words, and to borrow the terminology of Rogowski and Sutherland (2016), higher ΔD_i^k pertain to *ideologically divergent* individuals whose prevalence contributes to the political polarization of a group of voters at a regional level. In Table 3 we report summary statistics for ΔD_i^k where D_i^k is a self-assigned ideological score or a score assigned to one's preferred political party.

Table 3. Ideological Divergence of Korean Voters in Terms of Self-Assigned and Preferred Political Party Scores

Region	Individual ideological divergence							
	Political party				Voter			
	Median	SD	Min	Max	Median	SD	Min	Max
All regions	0.72	0.55	0.01	2.32	0.55	0.66	0.01	2.65
Seoul	0.76	0.54	0.02	2.22	0.74	0.63	0.23	2.76
Busan	0.77	0.57	0.01	2.32	0.60	0.68	0.13	2.51
Daegu	0.83	0.59	0.13	1.96	0.46	0.73	0.01	2.34
Incheon	0.74	0.58	0.05	2.03	0.39	0.71	0.10	2.54
Gwangju	0.66	0.79	0.09	2.35	0.62	0.60	0.14	2.98
Daejeon	0.87	0.51	0.20	1.80	0.56	0.52	0.03	2.15
Ulsan	0.77	0.84	0.10	2.25	0.38	0.68	0.18	3.21
Gyeonggi-do	0.71	0.53	0.02	2.07	0.67	0.67	0.17	2.65
Gangwon-do	0.92	0.50	0.02	1.53	0.25	0.78	0.02	2.45
Chungcheongbuk-do	0.50	0.59	0.03	2.38	0.24	0.68	0.24	2.67
Chungcheongnam-do	0.59	0.60	0.17	2.47	0.27	0.67	0.25	2.84
Jeollabuk-do	0.72	0.52	0.04	2.43	0.51	0.58	0	2.04
Jeollanam-do	0.74	0.60	0.05	2.80	0.55	0.63	0.02	3.19
Gyeongsangbuk-do	0.65	0.54	0	1.63	0.59	0.69	0.08	2.48
Gyeongsangnam-do	0.73	0.52	0.13	1.63	0.84	0.66	0.02	2.16
Jeju-do	0.69	0.57	0.05	2.28	0.42	0.71	0.10	2.51

Source: Authors' calculations based on the survey results of the survey.

In all regions, Korean voters' ideological scores tend to be less than one standard deviation away from the regional mean. However, we observe significant deviations from this mean as well. In Jeollanam-do province, a region in Honam, the maximum score given to one's preferred political party deviates from the mean by almost three standard deviations, with similar values achieved in Jeollabuk-do, another Honam region, and both Chungcheong provinces. Jeollanam-do also features the highest maximum deviation of the self-assigned score, exceeding three standard deviations from the provincial mean. We thus conclude that, while most Korean voters'

ideological scores are clustered around the regional mean, there is certainly that part of the electorate whose ideological orientation significantly diverges from the mean, contributing to the ideological polarization of Korean society.

Inequality of Income Distribution in Korea

A standard way of measuring the extent of income inequality in an economy is to compute a Gini coefficient based on the shares of income earned by different income classes. Gini measures were used in studies of the relationship between income inequality and economic growth in Korea (Shin 2012) and in the Asia-Pacific region (Yang and Greaney 2017). General studies of income inequality in Korea also rely on this measure (Ku et al. 2018).

Gini coefficient for a discrete distribution of incomes typically applicable to the analysis of survey data is computed as follows:

$$G = \frac{1}{2\mu} \sum_{i=1}^{n} \sum_{j=1}^{n} f(y_i) f(y_j) |y_i - y_j| \tag{3}$$

where n is the number of income classes, y_i is the representative income level of income class i, $f(y_i)$ is the share of population falling in the income class i, and $\mu = \sum_{i=1}^{n} y_i f(y_i)$ is the population's average income. The Gini coefficient in (3) increases with more income inequality and varies between zero and unity.

By the early 1990s Korea's income distribution was the most equalized in the country's history since the era of industrialization, but began to worsen in the early 2000s with Korea's Gini coefficient increasing from 0.28 in 1996 to 0.41 in 2011 (Ku et al. 2018). A more recent estimate by the CIA put the Gini coefficient in Korea at 0.36 in 2016 (CIA 2022). By comparison, in Sweden, a country well-known for its income redistribution policies, the Gini coefficient was estimated at 0.25 in 2013. At the other extreme, in South Africa the Gini coefficient reached 0.63 in 2013.

In Table 4 we report the value of Gini coefficients computed according to (3) on the basis of respondents' answers to the following question: "What is your household's monthly income approximately equal to?" Eleven answer options were given with the lowest income bracket identified as incomes below one million *won* (approximately 800 USD), while the top income earners would report receiving more than ten million *won* (8,000 USD).

The Gini coefficient for Korea as a whole is surprisingly close to the 1996 level of 0.28 (Ku et al. 2018), and to Sweden's 2013 level of 0.25, even if Korea is not known to be actively pursuing income redistribution policies. In the provinces of Chungcheongbuk-do and Chungcheongnam-do incomes appear to be distributed most equally, with the Gini coefficient there at 0.248 and 0.245, respectively. The city of Ulsan is estimated to have the most unequal income distribution, with a Gini coefficient of 0.327.

Since the voting decisions are individual, we believe the divergence of an individual's income from the regional mean might be a factor influencing one's ideological orientation. We thus compute a variable ΔI_i^k according to (2) setting S_i^k to be equal to the income level of individual *i* in region *k*. Similar to the ideological divergence, we refer to ΔI_i^k as income divergence. By construction income divergence, ΔI_i^k is independent of the regional Gini coefficient, which is an aggregate distributional income inequality

Table 4. Income Inequality in Korea (2018)

Region	Gini coefficient	Region	Gini coefficient
All regions	0.271	**Gangwon-do**	0.250
Seoul	0.270	**Chungcheongbuk-do**	0.248
Busan	0.288	**Chungcheongnam-do**	0.245
Daegu	0.275	**Jeollabuk-do**	0.266
Incheon	0.240	**Jeollanam-do**	0.275
Gwangju	0.321	**Gyeongsangbuk-do**	0.287
Daejeon	0.243	**Gyeongsangnam-do**	0.266
Ulsan	0.327	**Jeju-do**	0.258
Gyeonggi-do	0.261		

Source: Authors' calculations based on the survey results.

Table 5. Income Divergence from the Regional Mean in Korea

Region	Income divergence			
	Median	SD	Min	Max
All regions	0.69	0.62	0.02	2.76
Seoul	0.71	0.62	0.07	2.27
Busan	0.69	0.59	0.13	2.58
Daegu	0.75	0.59	0.07	2.93
Incheon	0.51	0.67	0.06	3.21
Gwangju	0.66	0.59	0.06	2.19
Daejeon	0.45	0.64	0.01	3.06
Ulsan	0.68	0.58	0.10	2.64
Gyeonggi-do	0.81	0.63	0.03	2.55
Gangwon-do	0.54	0.72	0.06	3.78
Chungcheongbuk-do	0.52	0.66	0.03	3.28
Chungcheongnam-do	0.56	0.65	0.11	3.27
Jeollabuk-do	0.54	0.59	0.01	2.64
Jeollanam-do	0.68	0.64	0.15	3.08
Gyeongsangbuk-do	0.71	0.60	0.09	2.48
Gyeongsangnam-do	0.63	0.63	0.16	3.07
Jeju-do	0.76	0.58	0.08	2.46

Note: Each entry represents the number of standard deviations of a voter's income from the region's median income.

characteristic. Table 5 below displays summary statistics of income divergence in the Korean regions.

Similar to the case of the ideological scores discussed above, Korean voters' incomes tend to cluster around the regional mean with a certain part of the electorate earning incomes that are relatively far from the regional mean. In the next section we attempt to relate individual voters' diverging ideological choice to the measures of regional income inequality and individual income divergence.

Ideological Polarization and Income Inequality

In this sub-section we attempt to answer research question Q1 we formulated in the Introduction, namely, whether voters' extreme ideological scores are statistically related to regional income inequality and individual income divergence. For this purpose we estimate the following base empirical specification:

$$\Delta D_i^k = \alpha_0 + \alpha_1 \Delta I_i^k + \alpha_2 Gini^k + \Gamma \vec{X}_i^k + H^k + Y^k + \varepsilon_i^k \qquad (4)$$

where $i \in [1, 2000]$ indexes the respondents, $k = 1..17$ indexes regions, and ε_i^k are i.i.d. normal random errors. ΔD_i^k measures the extent of ideological divergence of voter i residing in region k in terms of a self-assigned ideological score or a score assigned to his preferred political party. Similarly, ΔI_i^k is the value of income divergence in region k where voter i resides. Note that specification (4) includes both an aggregate measure of income inequality computed at a regional level, $Gini^k$, and income divergence ΔI_i^k that represents an individual deviation of a voter's income from the regional mean.

$\vec{X}_i^k$ is a vector of individual controls that includes the logarithm of income $LINC_i^k$, gender dummy GEN_i^k, age variable AGE_i^k, education level EDU_i^k, relative well-being $RELWELL_i^k$ as assessed by the respondents on a scale from zero to ten, a dummy variable for the retired status RET_i^k, a dummy for the housewife status HSW_i^k, a dummy for the student status $STUDY_i^k$, and a dummy for the unemployed status U_i^k. Finally, given the importance of regional thinking to Koreans' voting behavior documented in Lee and Repkine (2020), we include dummies H_i^k and Y_i^k for Korea's southwestern Honam (Jeollabuk-do and Jeollanam-do), and southeastern Yeongnam (Gyeongsangbuk-do and Gyeongsangnam-do) regions, respectively.

In estimating specification (4), the Gini coefficient may not be exogenous to both political party system and voter polarization in the sense that the two measures of ideological polarization may be affecting the extent of regional income inequality. For instance, since more polarized regions

may be less likely to implement redistribution policies, they may also be characterized by a larger extent of income inequality (Winkler 2019). If this is the case, the estimates of (4) will be biased. Instrumenting the Gini coefficient is one way to circumvent this problem, for example, by using past values of the observed variables as instruments, which is common practice in empirical research (Bai and Ng 2010). We follow this approach and instrument the Gini coefficient with its past values computed on the basis of a similar survey conducted in 2015. In Table 6 we report the instrumented maximum likelihood estimation results of specification (4) where the diversion of ideological scores assigned by the voters to their preferred political parties is assumed to be a function of a set of voter characteristics discussed above.

The correlation coefficient between Gini coefficients in 2018 and 2015 is fairly high at 98 percent, which is why we conclude that choosing the past values of this measure of income inequality is not prone to the problem of weak instruments. Instrumenting with past values also solves the problem of endogeneity since for obvious reasons the future values of ideological divergence cannot affect past values of income inequality.

Surprisingly, and in contrast to the literature linking ideological polarization to income inequality, neither income divergence nor the Gini coefficients are estimated to be statistically associated with the extent to which ideological scores assigned by Korean voters to their preferred political parties diverge from the ideological mean. As mentioned in the Introduction, income inequality can be assessed at both regional and at individual levels. We conclude that in the case of ideological scores assigned to voters' preferred political parties neither measure is of a statistically significant importance.

The logarithm of income consistently comes out negative and statistically significant in all but one of the nested specifications, suggesting that wealthier voters tend to view political parties to be less polarized. This finding accords with the line of reasoning linking the extent of political party polarization to the demand for redistribution discussed in the second section above (Alesina and Rodrik 1994).

Rather surprisingly, the dummies for the Honam and Yeongnam

Table 6. Divergence of Preferred Political Party Scores

Determinants	Dependent variable: divergence of preferred political party scores						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Logarithm of income	-0.061 (0.036)*	-0.062 (0.035)*	-0.052 (0.036)	-0.081 (0.038)**	-0.079 (0.038)*	-0.076 (0.038)**	-0.096 (0.038)**
Income divergence	0.015 (0.029)	0.017 (0.029)	0.019 (0.029)	0.019 (0.029)	0.019 (0.029)	0.018 (0.029)	0.031 (0.029)
Gini	0.370 (0.799)	0.121 (0.797)	0.147 (0.795)	0.097 (0.793)	0.091 (0.794)	0.128 (0.798)	0.177 (0.798)
Gender		0.043 (0.035)	0.048 (0.035)	0.050 (0.035)	0.054 (0.040)	0.054 (0.040)	0.051 (0.040)
Age		0.004 (0.001)***	0.004 (0.001)***	0.004 (0.001)***	0.004 (0.001)***	0.004 (0.001)***	0.004 (0.001)***
Education			-0.050 (0.036)	-0.058 (0.036)*	-0.058 (0.035)*	-0.062 (0.037)*	-0.063 (0.036)*
Relative well-being				0.022 (0.013)*	0.021 (0.013)*	0.021 (0.013)	0.018 (0.013)
Retired					0.036 (0.094)	0.033 (0.094)	0.023 (0.094)
Housewife					0.018 (0.055)	0.019 (0.055)	0.001 (0.055)
Student						0.070 (0.085)	0.046 (0.086)
Unemployed							-0.243 (0.078)***
Yeongnam	0.027 (0.044)	0.025 (0.040)	0.026 (0.040)	0.023 (0.040)	0.023 (0.040)	0.024 (0.040)	0.029 (0.040)
Honam	-0.082 (0.049)	-0.071 (0.048)	-0.070 (0.048)	-0.078 (0.048)	-0.078 (0.048)	-0.077 (0.048)	-0.078 (0.048)
Constant	0.817 (0.277)***	0.678 (0.186)***	0.791 (0.206)***	0.761 (0.204)***	0.768 (0.204)***	0.746 (0.207)***	0.801 (0.206)***
No. obs.	976	976	976	976	976	976	976

Note: Robust standard errors in parentheses. (***), (**), and (*) stand for 1%, 5%, and 10% significance levels, respectively.

regions are never estimated to be statistically significant. This finding is in contrast with another study whose authors argue that Korean voting patterns are heavily influenced by voter region of origin and age (Lee and

Repkine 2020). The findings in the former study, however, relate to the share of votes obtained by different political parties in the Korean regions, while this study deals with the extent to which voters might or might not have extreme political views either themselves or in the political parties they favor. The absence of a statistically significant association between the Honam and Yeongnam dummies and ideological divergence suggests that Korean voters' proclivity to hold either very conservative or very liberal ideological views is not influenced by their region of origin. To put it differently, while Honam voters in general hold more liberal political views, the extent to which an average Honam voter's ideological orientation deviates from the regional mean is similar to that of the Yeongnam voter and the rest of Korea.

Similar to the conclusions of our aforementioned study (Lee and Repkine 2020), however, we also find that age is a statistically significant factor, with older voters tending to view the political parties more polarized compared to the younger generation. Finally, more educated voters seem to view political parties less polarized.

To summarize, more educated and wealthier voters appear to view the political party world as less polarized, while getting older seems to be associated with more polarized perceptions. Since wealth and education both contribute to economic stability, with the aged population often struggling with economic difficulties, we conclude that economic uncertainty or instability is an important factor contributing to a more polarized view of the political party environment. It is worthwhile noting that the relative measures of wealth, namely, the Gini coefficients and income divergence, are not likely to make one's views of political parties more polarized, implying that the economic stability mentioned above is to be understood in the absolute, not relative, sense.

In Table 7 we report the results of the same type of analysis using divergence of the self-assigned ideological scores as a dependent variable.

Similarly to the estimates presented in Table 6, we find no consistent statistically significant effect of either Gini coefficients or the Honam/ Yeongnam dummies on the extent of divergence in self-assigned ideological scores. In other words, neither income inequality at the regional level nor

Table 7. Divergence of Self-Assigned Ideological Scores

Determinants	Dependent variable: divergence of self-assigned ideological scores						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Logarithm of income	0.013 (0.029)	0.012 (0.029)	0.008 (0.030)	-0.011 (0.033)	-0.015 (0.033)	-0.013 (0.033)	-0.021 (0.034)
Income divergence	**0.044 (0.024)***	**0.046 (0.025)***	**0.045 (0.025)***	**0.047 (0.025)***	**0.046 (0.025)***	**0.045 (0.025)***	**0.052 (0.025)****
Gini	0.391 (0.682)	0.385 (0.683)	0.379 (0.683)	0.351 (0.683)	0.338 (0.682)	0.354 (0.683)	0.367 (0.682)
Gender	**0.061 (0.030)****	**0.062 (0.030)****	**0.060 (0.030)****	**0.060 (0.030)****	0.044 (0.034)	0.042 (0.034)	0.043 (0.034)
Age		**0.002 (0.001)****	**0.002 (0.001)****	**0.002 (0.001)****	**0.003 (0.001)****	**0.003 (0.001)****	**0.003 (0.001)****
Education			0.020 (0.031)	0.014 (0.031)	0.012 (0.031)	0.007 (0.031)	0.007 (0.031)
Relative well-being				0.014 (0.012)	0.016 (0.012)	0.015 (0.012)	0.014 (0.012)
Retired					-0.031 (0.071)	-0.034 (0.072)	-0.037 (0.072)
Housewife					-0.048 (0.045)	-0.048 (0.045)	-0.055 (0.045)
Student						0.076 (0.073)	0.060 (0.074)
Unemployed							**-0.111 (0.061)***
Yeongnam	-0.023 (0.034)	-0.028 (0.034)	-0.028 (0.034)	-0.030 (0.034)	-0.031 (0.034)	-0.031 (0.034)	-0.029 (0.034)
Honam	0.016 (0.043)	0.009 (0.044)	0.008 (0.044)	0.005 (0.044)	0.004 (0.044)	0.005 (0.044)	0.004 (0.044)
Constant	0.587 (0.151)	0.491 (0.157)***	0.445 (0.174)***	0.428 (0.174)**	0.438 (0.177)**	0.421 (0.177)**	0.453 (0.178)***
No. obs.	1993	1993	1993	1993	1993	1993	1993

Note: Robust standard errors in parentheses. (***), (**), and (*) stand for 1%, 5%, and 10% significance levels, respectively.

Korean regionalism appear to play an important factor in a voter's more polarized view of either the political parties or themselves. Also similarly to Table 6, we find that older individuals tend to place themselves away from

the ideological mean.

An important distinction with the estimates in Table 6 is that the divergence of self-assigned ideological scores does not seem to be affected by the absolute level of income, as the logarithm of income is never estimated to be statistically significant. Interestingly, and in contrast to Table 6, income divergence is estimated to be statistically significant and positively associated with the extent of divergence of the self-assigned ideological scores.

The estimates in Table 7 suggest that older voters and those whose incomes diverge from the regional mean are more likely to hold more polarized ideological views of themselves. Higher levels of income divergence are associated with either the relatively poor or the relatively rich. Since the older and poorer individuals are more likely to be economically insecure, their proclivity to hold polarized views of themselves is in line with the findings presented in Table 6, i.e. when divergence of ideological scores assigned to political parties was taken to be a dependent variable (H. Lee 2021). However, our estimates in Table 7 also suggest that wealthier voters will be more likely to place themselves towards one of the extreme ends of the ideological continuum. Given our finding of a statistically insignificant coefficient on the regional Gini coefficient, this association is likely to hold irrespective of income distribution in the region as a whole. This finding is in line with another study suggesting that increased income inequality results in more social support for the less moderate (i.e., more conservative or more liberal) parties, as both kinds of political parties tend to strive for change to the existing order (Rooduijn and Burgoon 2017).

Income Inequality and Demand for Redistribution

In this sub-section we aim to answer question Q2 from in the Introduction, namely, whether being relatively wealthy or poor is associated with a higher probability of voting for a political party tending to an extreme end of the ideological spectrum. The discussion in section two above suggests that voters belonging to the bottom income brackets are likely to have higher demand for redistribution policies, inducing resistance to such

redistribution by wealthier individuals. Assuming that redistribution policies are normally conducted by more liberal parties while the opposition thereto comes from more conservative ones, the standoff between those who demand and oppose income redistribution policies is likely to result in a positive association between income divergence and the probability of voting for liberal or conservative parties.

We define a set of categorical variables assuming the value of unity in case of a respondent supporting a political party on the left or right of the ideological spectrum according to some cutoff value (Winkler 2019). More specifically, we define PRX_i to be equal to unity if respondent i supported a political party with the ideological score of X or higher on a liberal-conservative scale from zero to ten as reported by the respondent. For instance, $PR9_i = 1$ for a respondent preferring a political party to which he assigned an ideological score of nine or higher. $PR9_i = 0$ if respondent i assigned a score of eight or lower to a party of his choice. In case respondent i chose not to identify his preferred party, our best guess is that he or she prefers a political party that is neither left- nor right-wing, which is why we set $PR9_i = 0.5$ in this case. In a similar fashion we define three categorical variables PLX_i that assume the value of unity in case the preferred political party is given an ideological score of X or less.

In all of the above cases the values of X and Y act as cutoff values used to single out the respondents with extreme ideological preferences. As there are no obvious guidelines on how to choose these cutoff levels, we decided to set $X = 8, 9, 10$ for right-wing preferences, and $X = 0, 1, 2$ for left-wing preferences.

Denoting P_i^* to be the value of a dummy variable PLX_i or PRX_i defined above, we estimate the following empirical specification:

$$\Pr\left\{P_i^* = 1\right\} = \Phi\left(\beta_1 \Delta I_i^k + \beta_2 Gini^k + \Lambda \vec{X}_i + H_i + Y_i + \eta_i\right) \tag{5}$$

where $\Pr\left\{P_i^* = 1\right\}$ is the probability of a particular outcome e.g. of a respondent voting for a political party located on the left side of the political spectrum, and $\Phi(\bullet)$ is a cumulative distribution function, e.g. standard normal. The determinants ΔI_i^k, $Gini^k$, $\vec{X}_i$, H_i and Y_i are the same set of

controls we used in estimating (4). Table 8 reports the results of the ordered
probit estimation of (5).

Table 8. Extreme Ideological Preferences and Income Inequality,
Ordered Probit Estimation

Determinants	Probability of the preferred political party's ideological score being					
	Less than or equal to			Greater than or equal to		
	0	**1**	**2**	**8**	**9**	**10**
Logarithm of income	**-0.160**	-0.078	-0.021	**-0.141**	**-0.143**	**-0.138**
	(0.057)*	(0.054)	(0.053)	**(0.055)**	**(0.058)**	**(0.058)***
Income divergence	**0.074**	0.009	-0.040	**0.079**	**0.097**	**0.074**
	(0.043)*	(0.042)	(0.041)	**(0.044)***	**(0.046)**	**(0.046)***
Gini	-0.685	1.372	0.073	**-2.308**	**-2.874**	**-3.274**
	(1.272)	(1.243)	(1.227)	**(1.238)***	**(1.255)**	**(1.270)**
Gender	**-0.147**	-0.082	-0.051	**-0.108**	**-0.173**	**-0.184**
	(0.061)	(0.059)	(0.058)	**(0.060)***	**(0.061)***	**(0.063)***
Age	**-0.006**	**-0.004**	-0.001	**0.004**	0.001	-0.002
	(0.002)*	**(0.002)***	(0.002)	**(0.002)***	(0.002)	(0.002)
Education	**-0.179**	**-0.154**	**-0.090**	**-0.100**	-0.070	-0.080
	(0.054)*	**(0.052)***	**(0.051)***	**(0.053)***	(0.054)	(0.055)
Relative well-being	-0.023	-0.017	-0.023	-0.006	**-0.033**	**-0.049**
	(0.018)	(0.017)	(0.017)	(0.018)	**(0.019)***	**(0.019)***
Retired	0.190	0.106	0.102	0.080	**0.270**	**0.351**
	(0.130)	(0.126)	(0.123)	(0.130)	**(0.138)**	**(0.142)**
Housewife	0.110	**0.127**	0.044	0.085	0.052	0.100
	(0.074)	**(0.072)***	(0.070)	(0.073)	(0.075)	(0.076)
Student	-0.081	-0.075	0.055	0.118	0.032	0.015
	(0.131)	(0.127)	(0.128)	(0.133)	(0.134)	(0.138)
Unemployed	-0.103	-0.149	-0.106	-0.001	-0.018	0.037
	(0.103)	(0.099)	(0.099)	(0.106)	(0.107)	(0.111)
Yeongnam	**0.105**	0.046	-0.008	0.069	**0.130**	**0.138**
	(0.060)*	(0.056)	(0.055)	(0.058)	**(0.060)**	**(0.062)**
Honam	-0.071	0.106	**0.210**	**-0.394**	**-0.404**	**-0.398**
	(0.089)	(0.087)	**(0.086)***	**(0.085)***	**(0.086)***	**(0.087)***
No. obs.	1993	1993	1993	1993	1993	1993

Note: Robust standard errors in parentheses. (***), (**), and (*) stand for 1%, 5%, and 10%
significance levels, respectively. The ideological score of 0 corresponds to the most liberal
stance with the score of 10 characterizing the most conservative attitude.

Income divergence appears to increase the probability of voting for a political party perceived to be on the right of the ideological spectrum. It also appears to increase the probability of voting for parties perceived to be on the extreme left. These findings suggest that belonging to either the bottom or the top income bracket, which corresponds to the high values of income divergence variable, increases the probability of supporting those parties that are perceived to be further away from the ideological mean, which is consistent with the theory of demand for redistribution of income discussed above. Indeed, according to this theory, poor voters will support far-left political parties believing they will institute more income redistribution policies, while wealthier voters will tend to support conservative parties, believing the latter will resist the implementation of such policies. Interestingly, wealthier individuals seem to choose to support more moderate political parties, as implied by the negative and mostly significant coefficient on the logarithm of income. We interpret this finding to suggest that since wealthier individuals are also likely to be more economically secure they would care less about redistribution policies.

Regional income inequality as measured by the Gini coefficient only seems to affect the probability of voting for a party perceived to be on the far right of the ideological spectrum, but not a party perceived to be on the left end of it. Specifically, voters in those regions where incomes are distributed less equally are less likely to vote for the more conservative parties, possibly because the latter may be perceived as one of the reasons behind income inequality itself.

Our results strongly suggest that more educated voters are less likely to support more liberal political parties, while the probability of supporting a more conservative party does not appear to be affected by voter education level. Finally, Honam voters appear to be less likely to support conservative political parties, while the Yeongnam voters appear more likely to support them. Regarding the probability of supporting a liberal party, the presence of regional effects appears to be less convincing.

Conclusion

Since ideologically polarized societies are prone to political conflict and economic inefficiency, it is important to both measure the extent of ideological polarization, and to study the factors affecting it. It is especially interesting to study ideological polarization in Korean society since on the one hand, this is a widely debated issue both in academia and social media, while on the other hand, ideological polarization in a highly homogeneous society such as Korea is unlikely to be caused by factors commonly causing ideological cleavages in multicultural societies.

We computed aggregate measures of ideological polarization both for Korea as a whole, and for each of the sixteen regions of origin reported by survey respondents. Interestingly, the level of ideological polarization within almost all Korean regions is estimated at the same level with that of Korea as a whole, warranting the analysis of an association between ideological polarization and income inequality at the regional level.

Following existing literature on the determinants of ideological polarization, we focused on the link between income inequality, and both political party and voter polarization.

While several channels have been identified in the existing literature that link ideological polarization with income inequality, we find that an explanation based on the median voter theorem (Meltzer and Richard 1981) and further elaborated on in (Alesina and Rodrik 1994) to be the most suitable for the Korean context. This explanation is based on the hypothesis of a higher demand for redistribution policies on the part of the economically disadvantaged voters with income earners belonging to the top bracket opposing the implementation of these policies. As a result, the more a voter's income diverges from the regional mean, the more likely this voter is to support a party that he or she perceives to be either more conservative or more liberal.

The results of our empirical analysis indicate that the probability of a voter supporting more conservative or more liberal political parties in the Korean regions increases the more their incomes diverge from the regional mean. A higher degree of income divergence is also found to be positively

associated with voters assigning more conservative scores to themselves. Both higher probabilities of voting for parties located towards the right and left of the political party ideological spectrum, and the tendency of voters to self-assess themselves to be closer to the ideological spectrum's ends rather than the mean contribute to increased polarization in society. We thus take our empirical results as evidence supporting the hypothesis of increased demand for income redistribution discussed above.

We were rather surprised to find that an aggregate measure of regional income inequality, i.e. the Gini coefficient, almost never comes out statistically significant in our empirical work, implying that the association between income inequality and ideological polarization depends on individual income rather than the collectively measured income inequality. For instance, according to our estimates, a relatively higher or lower income earner will be more likely to vote for a more conservative or a more liberal party irrespective of how equal or not incomes are distributed among other voters in the region.

Level of income itself is found to be negatively associated with extreme ideological preferences and the proclivity to assign ideological scores to one's preferred political parties that are located further from the ideological mean, implying that wealthier individuals tend to be characterized by a more moderate ideological orientation. The same conclusions can be drawn about the more educated voters who are less likely to vote for parties on the left of the political spectrum or to assign extreme ideological scores to political parties in general. Interestingly, older voters tend to view both political parties, and themselves as more polarized compared to the younger generation. Since the wealthier, younger, and more educated individuals are likely to be characterized by a higher extent of economic security, or the prospects thereof, we suggest that economic security is an important socio-economic factor that reduces the extent of ideological polarization in Korean society.

In contrast to other studies on the Korean political landscape, such as that of Lee and Repkine (2020; 2022), regionalism does not appear to play an important role in determining the extent of regional ideological polarization. Thus, it is only when we analyze the probability of voting for

more conservative parties that we discover the tendency of Yeongnam voters to give those parties more support compared to voters from Honam. In other words, the role of regionalism appears to be less important compared to the individual divergence of income from the regional mean and other socio-economic factors such as income level, age, and education.

It is worthwhile noting that, given the cross-sectional nature of the dataset at our disposal, there is no way for us to formally test whether the statistically significant associations between measures of income inequality and ideological polarization discussed in this study represent causal relationships.[2] The latter, however, are implied by the theory of demand for redistribution and have to hold in case this theory applies in the Korean case. We thus interpret our empirical results as confirming the validity of the necessary conditions implied by the demand redistribution theory.

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2. We thank an anonymous reviewer for this remark.

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