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Policy Ideology in European Mass Publics, 1981–2016

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Policy Ideology in European Mass Publics, 1981–2016

Devin Caughey[*]   Tom O'Grady[†]   Christopher Warshaw[‡]

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Abstract

Using new scaling methods and a comprehensive public opinion dataset, we develop the first survey-based cross-national measures of mass policy ideology in Europe. Our dataset covers 27 countries and 36 years and contains nearly 2.7 million survey responses to 109 unique issue questions. Estimating an ordinal group-level IRT model in each of four issue domains, we obtain biennial estimates of the absolute economic conservatism, relative economic conservatism, social conservatism, and immigration conservatism of men and women in three age categories in each country. Aggregating the group-level estimates yields estimates of the average conservatism in national publics in each biennium between 1981–82 and 2015–16. The four measures exhibit different cross-sectional cleavages and contrasting temporal dynamics, illustrating the multidimensionality of mass ideology in Europe. Subjecting our measures to a series of validation tests, we show that they perform as well as or better than one-dimensional proxies for mass conservatism—left–right self-placement and median-voter scores—and that the constructs they measure are distinct and substantively important. We foresee many uses for these scores by scholars of public opinion, electoral behavior, representation, and policy feedback.

Contents

1   Introduction

How do citizens' policy preferences vary across countries? How do they differ across issue domains? How have they changed over time? What are the sources of these ideological differences? How do mass preferences affect electoral and policy outcomes? Which political institutions inhibit or enhance government responsiveness to citizens' preferences? Such questions lie at the heart of the field of European politics and of political science generally. To study them, scholars require measures of mass policy preferences that can be compared across countries and over time. Despite decades of cross-national survey research in Europe, however, measures that meet these standards remain elusive.

The key barrier to cross-national measures is a lack of survey questions repeated consistently across years and European countries. As a consequence, cross-national research on representation and related topics in European politics has relied instead on indirect proxies for mass policy preferences. By far the most common of these proxies are, first, the average citizen's self-placement on a left–right scale (Inglehart and Klingemann 1976; Huber 1989) and, second, the left–right location of the median voter as inferred from the ideological scores of party manifestos (Kim and Fording 1998; De Neve 2011). The development of these measures was an understandable response to the limitations of existing data and statistical methods, and many excellent and influential studies of the role of mass ideology in European politics would hardly have been possible without them. With these measures, scholars have examined such central issues as governments' ideological congruence with the mass public (Huber and Powell 1994; Schmitt and Thomassen 1997; McDonald and Budge 2005; Mayne and Hakhverdian 2017), their responsiveness to ideological shifts in popular preferences (Adams et al. 2004, 2006; Ezrow et al. 2010), and how these relationships are influenced by electoral rules and institutions (Powell 2000; Blais and Bodet 2006; Powell 2009; Golder and Stramski 2010; Ferland 2016).

But as even many scholars that use them admit, these proxies are not ideal measures of citizens' policy preferences per se. Left–right self-placement can depend greatly on political context, imperiling comparison across countries and time, and like other measures of ideological identification is often driven as much by partisan and symbolic attachments as by "operational" policy preferences (Inglehart and Klingemann 1976; Thorisdottir et al. 2007; see also Ellis and Stimson 2012). For their part, median-voter scores hinge on assumptions about party manifesto scores' comparability across countries and the primacy of left–right ideology in determining voters' partisan choices (Kim and Fording 1998, 76–7), thus begging some of the very questions that we wish to answer. Moreover, both of these proxies presume that ideological variation in Europe takes place along a single left–right dimension, an assumption that, however plausible in earlier eras, is called into question by the increasing salience of political conflict over non-economic issues (Inglehart 1990; Kitschelt 1994; Knutsen 1995; Kriesi et al. 2006). There is, in short, a clear need for summary measures of mass ideology that are derived directly from citizens' policy preferences, can be compared across time and countries, and reflect the multidimensional character of European politics.

This article introduces measures of mass ideology in European publics designed to meet this need. Taking advantage of recent advances in ideological scaling methods, we estimate the domain-specific policy conservatism of men and women in three age categories and twenty-seven European countries in each biennium between 1981–82 and 2015–16. Specifically, we estimate an ordinal variant of Caughey and Warshaw's (2015) dynamic group-level item response theory (DGIRT) model on a comprehensive dataset of multi-country public opinion surveys, distinguishing among economic, social/postmaterial, and immigration/nationalism issues. For economic issues, we further distinguish between policy "mood," which captures citizens' preferences for less government activity *relative* to current policy (Stimson 1991), and "absolute" conservatism, which does not depend explicitly on the policy status quo. Because the DGIRT model estimates conservatism at the level of population

groups rather than individuals, it surmounts the problem of sparse and uneven question availability that has until now stymied the creation of dynamic, cross-national measures of policy ideology in Europe. This allows us to paint a rich new portrait of the conservatism of European mass publics across multiple issue domains.

Although most of our findings are consistent with previous survey research on issue-specific attitudes, many diverge sharply from the ideological patterns implied by self-placement or median-voter scores. According to our estimates, the European public has become more economically conservative in absolute terms since the 1980s, but its economic mood—that is, its conservatism relative to the policy status quo—has shifted leftward. Europeans have also become somewhat less conservative on immigration and much less so on social issues. Cross-sectionally, we find that men have always been substantially more conservative than women on economic issues, but not on immigration or (until recently) social issues. On social and immigration issues, conservatism increases markedly with age. On economics, age differences are more muted, but Europeans older than 60 tend to be less conservative than their younger counterparts.

All four measures exhibit a rich–poor gradient across countries that generally divides countries in Northern Europe from those in the South and East. On social and immigration issues, Northern Europeans are the most progressive and Southern and Eastern Europeans are the most conservative. On economic issues, the gradient is reversed. Most Northern publics are more economically right-wing, especially in terms of mood. By contrast, Southern Europe and most of Eastern Europe, with the exception of a few wealthier countries, tend to be very left-wing on economics. Across countries, economic mood thus has a strong negative association with social and immigration conservatism (which are positively correlated with each other), whereas absolute economic conservatism covaries with economic mood but is essentially uncorrelated with social and immigration conservatism. These patterns indicate that a single left–right dimension cannot capture cross-national ideological variation in

Europe. In line with this, we find that self-placement and median-voter scores are at best weakly associated with policy conservatism in any domain (as well as with each other).

To demonstrate the validity of our measures of policy conservatism, we show that they have a strong cross-sectional correlation with responses to highly ideological survey questions in their respective domains. Our conservatism scores also faithfully reflect longitudinal trends in mass conservatism as estimated by Stimson's (1991) Dyad Ratios algorithm. In addition, we evaluate the relationship between our mass ideological measures and government policies. Cross-sectionally, mass-level social progressivism strongly predicts the strength of countries' gay rights policies, and progressivism on immigration does so on pro-immigrant policies. Moreover, within-country, variation in economic mood predicts variation in welfare generosity. Notably, our conservatism scores are more highly correlated with each of these policy outcomes than are self-placement and median-voter scores. We also show that mass economic conservatism predicts voting behavior. Overall, we conclude that the ideological constructs measured by our mass conservatism scores are both substantively important and fundamentally distinct from those measured by self-placement and median-voter scores.

2   Policy Ideology in European Mass Publics

The correspondence between citizens' preferences and government policies lies at the core of normative justifications for democracy, if not its very definition, and is thus a central concern of comparative politics (Dahl 1989; for an empirical review, see Powell 2004). Scholars of European politics, site of many of the world's longest-standing democracies, have accordingly developed a rich literature on the content and structure of mass policy preferences.

Citizens' specific attitudes are typically presumed to be structured along one or more ideological dimensions, rooted in divergent interests and values. The cleavage over the distribution of economic resources has always played a central role in structuring ideological

conflict and party competition in Europe. Since the seminal work of Lipset and Rokkan (1967), however, the literature on parties and mass behavior has recognized "the importance of alternative, 'second' dimensions of political conflict" over religion and other cultural issues (Häusermann and Kriesi 2015, 202). These two main ideological dimensions, typically labeled *economic* and *cultural*, have survived or even been reinforced by the rise of new issues such as environmentalism and gay rights, with their content evolving over time as new issues arise (e.g., Inglehart 1984; Kitschelt 1994). One possible exception to this pattern is the recent emergence of issues of national identity, particularly as related to immigration, which some scholars argue has now become a distinct third dimension of political conflict (Heath et al. 1999; Kitschelt and Rehm 2014; but see Kriesi et al. 2006).

The content and relative importance of these ideological dimensions has varied across time and countries. As Inglehart (1990) argues, the increasing salience of "postmaterialist" concerns has been tied to rising levels of wealth. Younger generations, socialized in more affluent circumstances, have placed greater emphasis on postmaterialist values and have tended to be more left-libertarian than their forebears (Inglehart 1985; Kriesi 1998, 174–6). Moreover, postmaterialism has emerged at different rates across countries depending on their level of economic development. For this and other reasons, scholars have found substantial ideological variation in issue attitudes across European publics, with much of the cross-national variation falling along north–southeast, rich–poor lines.

On economic issues, the publics of Southern and Eastern European countries have generally been found to be more left-wing than their Northern European counterparts. Bonoli (2000), for example, shows that Southern Europe, along with France, stands out as particularly supportive of government intervention in the economy. Similarly, Papadakis and Bean (1993) and Kenworthy and McCall (2008) find Italians to be more supportive of economic redistribution than Northern European publics. Renwick and Tóka (1998), Lipsmeyer and Nordstrom (2003), and Dallinger (2010) find that, with the possible exception of the Czech

Republic, Eastern European countries are more left-wing on government spending and other economic issues than countries in Western Europe. Paradoxically, there is at best mixed evidence that the generosity of welfare states is positively correlated with mass support for economic redistribution, government provision of social benefits, or related issue positions (Jaeger 2006). In particular, Scandinavians, despite enjoying arguably the most generous welfare states in the world, express less support for redistributive policies than Germans, Austrians, and other Central Europeans (Jaeger 2009).

The cross-national patterns on cultural and postmaterial issues are the reverse of economics. On the whole, research on these issues has found that Northern European countries are the most socially progressive, while Southern and Eastern European countries are the most conservative. On gender issues, for example, a small set of countries have highly egalitarian views: the Scandinavian countries plus the Netherlands. Southern and Eastern European countries are the most traditional, with other countries in the middle (Renwick and Tóka 1998; Treas and Widmer 2000; Sjöberg 2004). Likewise, studies of support for gay rights find a clear north–south and east–west income gradient across countries. Most European countries saw big rises in support for gay rights over the period we examine, with the Scandinavian countries (excluding Finland) and the Netherlands showing the biggest rises. By contrast, aside from Spain, Southern and Eastern European countries did not see substantial rises in support and remain quite opposed to homosexuality (Andersen and Fetner 2008; Akker, Ploeg, and Scheepers 2013; Pew Research Center 2017). Environmental issues exhibit similar cross-national patterns (Inglehart 1995; Franzen and Vogl 2013).

As noted above, some scholars have advocated treating immigration and related issues of national identity as a distinct ideological dimension. Multi-nation survey research of immigration has been comparatively rare, but what work exists finds cross-country patterns similar to those on social issues. Austria, Greece, Hungary, Poland and Portugal stand out as relatively conservative on immigration, and Sweden, Denmark and Switzerland as

relatively progressive (Semyonov, Raijman, and Gorodzeisky 2008; Meuleman, Davidov, and Billiet 2009). While correlated with social/cultural attitudes in cross section, immigration attitudes have not been found to share the social issues' clear liberalizing trend over time. In fact, different cross-national studies have documented a mix of increasing, decreasing, and stable trends in anti-immigration attitudes since the late 1980s (Ceobanu and Escandell 2010, 312–3).

2.1 Previous Approaches to Summarizing Mass Ideology

Despite the wealth of cross-national opinion data that has accumulated over the past several decades, scholars of European politics have faced substantial hurdles to summarizing general ideological trends across time and countries. The problem, notes Dalton (2010, 105), is that the "diversity of issues across elections and nations [makes it] difficult to systematically and meaningfully compare" mass ideology across political contexts. To surmount these difficulties with direct survey measures of mass issue attitudes, scholars of European politics have turned to proxy measures intended to summarize mass ideology in ways that are comparable across countries and over time. The two most important are citizens' self-placement on a left–right ideological scale and the ideological location of the median voter as inferred from election results and party manifestos.

2.1.1 Self-Placement on a Left–Right Scale

Beginning with the European Community's 1973 Eurobarometer survey, a large number of cross-national surveys in Europe have included a question asking respondents to place their political views on a ten-point left–right scale, making it the only question that has been asked regularly and consistently across countries and over time. Since their introduction, left–right self-placement scores have been used by numerous works to summarize ideological differences across countries and time (e.g., Huber 1989; Knutsen 1998) and to test substantive theories

of democratic politics (Huber and Powell 1994; Schmitt and Thomassen 1997; Adams et al. 2004; Blais and Bodet 2006). From the beginning, however, scholars have expressed skepticism towards "the classic view of the left–right dimension...as a super-issue which summarizes the programmes of opposing groups," arguing instead that citizens' ideological self-placement reflects partisan and other group identities, as well as symbolic associations, at least as much as it does issue preferences (Inglehart and Klingemann 1976, 244; see also Huber 1989; Knutsen 1997).[1]

Self-placement scores have also been criticized for differential item functioning, as the meaning of ideological labels can vary substantially across countries and even across individuals and social groups within the same country (Thorisdottir et al. 2007; Lo, Proksch, and Gschwend 2014; Bauer et al. 2017).[2] "Thus, to a German blue-collar worker," writes Dalton (2010, 105), "Left may still mean social welfare policies; to a young German college student it may mean environmental protection and issues of multiculturalism." If policy preferences are multidimensional, this last fact is particularly problematic because it implies that an individual's self-placement can depend on which policy issues they associate with those labels. In short, although left–right self-placement is the best single-question indicator of mass ideology, it is far from an ideal summary of citizen's policy preferences.[3]

2.1.2 Inferred Median-Voter Locations

In response to the perceived inadequacies of self-placement scores, Kim and Fording (1998) developed an alternative measure of voter ideology: the median voter's inferred position on

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[1]Klingemann (1979) found that only a minority of European voters know what sorts of policies are associated with the labels "left" and "right."

[2]Several recent studies have used anchoring vignettes and other methods to address the problem of differential item functioning across contexts (e.g., Lo, Proksch, and Gschwend 2014; Bakker et al. 2014). Unfortunately, the survey questions required to use such techniques have not been regularly included on European surveys and thus cannot be used to create measures that extend back more than a decade or so.

[3]Although survey questions on particular issues are not immune to the effects of partisan and symbolic attachments, ideological identitification is likely to be more susceptible to such influences. Abstract concepts such as "left" and "right" are more difficult for ordinary citizens to understand, increasing the likelihood that they will rely on heuristics such as their affect towards the social groups they associate with each label.

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a left–right scale (see also De Neve 2011). This measure is premised on a spatial model of elections in which the only systematic determinant of vote choice is voters' proximity to parties on a left–right ideological dimension. Under this model, the location of the median voter can be inferred from the distribution of vote share across parties with different ideological positions, which Kim and Fording (1998) measure using the Comparative Manifesto Project (CMP) ideological ratings of party platforms (Budge et al. 2001). Assuming that this unidimensional spatial model holds and that the coding of party positions is comparable across countries and over time, median-voter scores are valid measures of mass policy preferences. Median-voter scores' calculability in years and countries without survey data make them particularly powerful measures, and they have been used by a large number of substantive studies (e.g., Stevenson 2001; McDonald and Budge 2005; Adams and Somer-Topcu 2009; Kim, Powell, and Fording 2010; Pontusson and Rueda 2010).

Notwithstanding their usefulness, median-voter scores have been subject to a number of criticisms (for a compelling summary, see Warwick and Zakharova 2012). Some of these criticisms stem from problems with the CMP codings that underlie the median-voter scores (Curini 2010; Mikhaylov, Laver, and Benoit 2012). But even granting the validity of the CMP measure of party positions, the spatial-voting assumptions required to infer the location of the median voter from party vote shares are arguably quite strong because they rule out any systematic influences on vote choice aside from ideology. More to the point, insofar as median-voter scores are used to evaluate mass–elite linkages, these assumptions risk begging the question by presuming what they seek to demonstrate.

Finally, both median-voter and self-placement scores share the assumption that European politics takes place along a single left–right dimension. Whether or not this assumption is reasonable for elite politics (for evidence against, see Warwick 2002), it runs counter to the large literature reviewed earlier that emphasizes the multidimensionality of societal cleavages and mass policy preferences. Given that the issue-specific evidence suggests that many coun-

tries are left-wing on some issues but right-wing on others, the inadequacy of the assumption of unidimensionality is particularly glaring if the goal is cross-national comparison.

2.2 Inferring Ideology from Issue Preferences

The limitations of self-placement and median-voter scores are widely recognized, and even works that employ them sometimes admit that a direct survey-based measure of mass policy ideology would be preferable. Several recent reviews have called for more attention to and better measures of (multidimensional) issue preferences in the mass public (Powell 2004, 290–1; Evans 2010, 636–7; Franklin 2010, 654). At present, however, self-placement and median-voter scores are pretty much the only available options for scholars who require a time-varying, cross-national measure of mass ideology. Stevenson (2001, 623–4), for example, laments that while scholars of U.S. politics have measured mass ideology by "combining information from thousands of different survey questions," in other democracies "the available survey data on the policy opinions of citizens . . . are not nearly as comprehensive . . . , rendering similar measurements for these countries impossible" and requiring the use of proxy measures instead. The crux of the problem, as Kim and Fording (1998, 75) put it, is the lack of "enough identical questions. . . across enough countries to provide a reasonable basis for a survey-based measure of ideology." Though survey-based time-series of mass policy ideology have been constructed for single countries (Bartle, Dellepiane-Avellaneda, and Stimson 2011; Stimson, Thiébaut, and Tiberj 2012; McGann 2014), to date there has been no equivalent measure available for time-series cross-sectional (TSCS) analyses across multiple countries.

In the following sections, we describe a strategy for measuring mass ideology that overcomes the problem of sparse survey data and yields dynamic, cross-national, domain-specific measures of mass policy ideology across European countries. Our approach shares elements in common with both existing methods. Like self-placement scores, our measures are based on self-reported assessments of political preferences. Like the median-voter approach, how-

ever, we do not measure mass ideology directly, but rather treat it as a latent trait whose distribution can be inferred from aggregate data on citizens' political preferences. Unlike prior approaches, we do not assume a priori that mass ideology is unidimensional, but rather allow it to differ across issue domains. Generating these measures requires both a great deal of survey data and a measurement model linking the data to latent policy ideology. Below, we describe each of these in turn.

3   Survey Data and Issue Domains

We constructed a comprehensive dataset containing all multi-year cross-national surveys conducted in Europe between 1981 and 2016. These include the European Social Survey (ESS), various modules of the International Social Survey Program (ISSP), the European Values Survey (EVS), the Pew Global Attitudes Survey, and some special editions of the Eurobarometer. Almost all Western and Southern European countries and 9 countries from the former Eastern Bloc appear in the data, for a total of 27 nations in all.[4] For most of Western Europe, the dataset begins in 1981 with the first cross-national surveys with usable issue questions, but many countries, including Greece, Cyprus, and most of Eastern Europe, do not appear in the data until the end of the 1980s. Every survey question in the dataset concerns domestic policy issues and was asked with identical wording across multiple years and countries.

In light of the debates over the dimensionality of Europeans' issue preferences, we sorted questions into three substantive domains: economic, social, and immigration. The *economic* domain captures the classic left–right divide over the size and scope of government and its role in mitigating inequality. The *social* domain comprises postmaterial and cultural issues such as gender equality, abortion, gay rights, environmental protection, and libertarianism versus

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[4]The dataset omits a few European countries, such as Luxembourg, Malta, Croatia, and Serbia, that have been surveyed too infrequently for reliable inference.

authoritarianism.[5] The *immigration* domain encompasses not only questions on immigration itself but also those related to nationalism and national identity.

Within the economic domain, we further distinguish between questions that ask about policy values or outcomes directly and those that ask about the direction of change relative to current policy.[6] We refer to questions in the first category as *absolute* and those in the second as *relative.* This second category roughly corresponds to James Stimson's concept of public policy *mood*—the public's desire for the government to "do more or less, spend more or less, and tax more or less" (Stimson 2012, 25). Because relative preferences depend on the policy status quo, two individuals from countries with different policies may well differ in their relative preferences even if they share the same absolute preferences. Lipsmeyer and Nordstrom (2003, 340), for example, report that Eastern and Western Europeans do not differ on average in their opinions regarding the scope of state responsibility for the needy, but support for increases in state welfare spending is nevertheless significantly higher in Eastern Europe. In short, there are both conceptual and empirical reasons to measure absolute and relative economic conservatism separately from one another.

Dataset	# Respondents	# Questions	Year Range
absolute economic	801,725	37	1981–2016
relative economic	616,674	17	1985–2016
social	691,549	34	1981–2016
immigration	551,425	21	1990–2016

Table 1: Summary statistics

We thus created four separate datasets with non-overlapping question sets: absolute

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[5]Although environmental issues are often considered part of a second, "postmaterial" dimension (Inglehart 1995), not all authors agree (e.g., Kriesi et al. 2006). To check whether their inclusion drives our results, we re-estimated our models without environmental issues in the social scale and found that our results were virtually identical (see Supplementary Information (SI), Section 3). Section 2 of the SI also shows that the environmental items are in fact positively correlated with the other social issues items.

[6]We do not make the same distinction for social and immigration questions because relative questions are much less common in those domains, and none are included in our scales.

economic, relative economic, social, and immigration. As Table 1 indicates, each dataset contains at least 17 survey questions and half a million unique respondents. The absolute economic and social datasets extend back to 1981 while the relative economic and immigration data begin in 1985 and 1990, respectively.[7] By estimating our measurement model separately on each dataset, we produce four distinct measures of mass conservatism.

We emphasize that our categorization of questions was based on ex ante substantive judgement and not on statistical criteria for selecting the "correct" number of latent dimensions, making it analogous to confirmatory rather than exploratory factor analysis. As we report in the SI (Figure S7), however, we find that nearly all questions in the same dataset are positively correlated, and there is a clear drop-off in explanatory power between the first principal component and higher-order ones. We therefore consider it reasonable to summarize the variation in each dataset with a single latent trait. We recognize, however, that other scholars might make different choices, and to facilitate this we are making our full code available online, together with instructions for how survey questions could be combined differently to produce estimates for other domains or for different numbers of dimensions.

3.1 Illustrative Survey Questions

To illustrate the patterns in our survey data, Figure 1 plots opinion trends on three survey items in each domain (absolute economic, relative economic, social, and immigration). Results are shown for four countries—Hungary, Italy, Norway, and Great Britain—from different parts of Europe. As this figure makes clear, ideological differences across countries differ substantially depending on the issue domain.

The top row of Figure 1 plots trends on three questions that tap into absolute economic preferences: whether the government should be responsible mitigating income inequality, tax

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[7]As Figures S1 and S2 in the SI show, each question is repeated rarely and unevenly across time, but together the survey data provide coverage of a large majority of country-years since 1981. The SI also provides full information on the sources, wording, and response scales of each question.
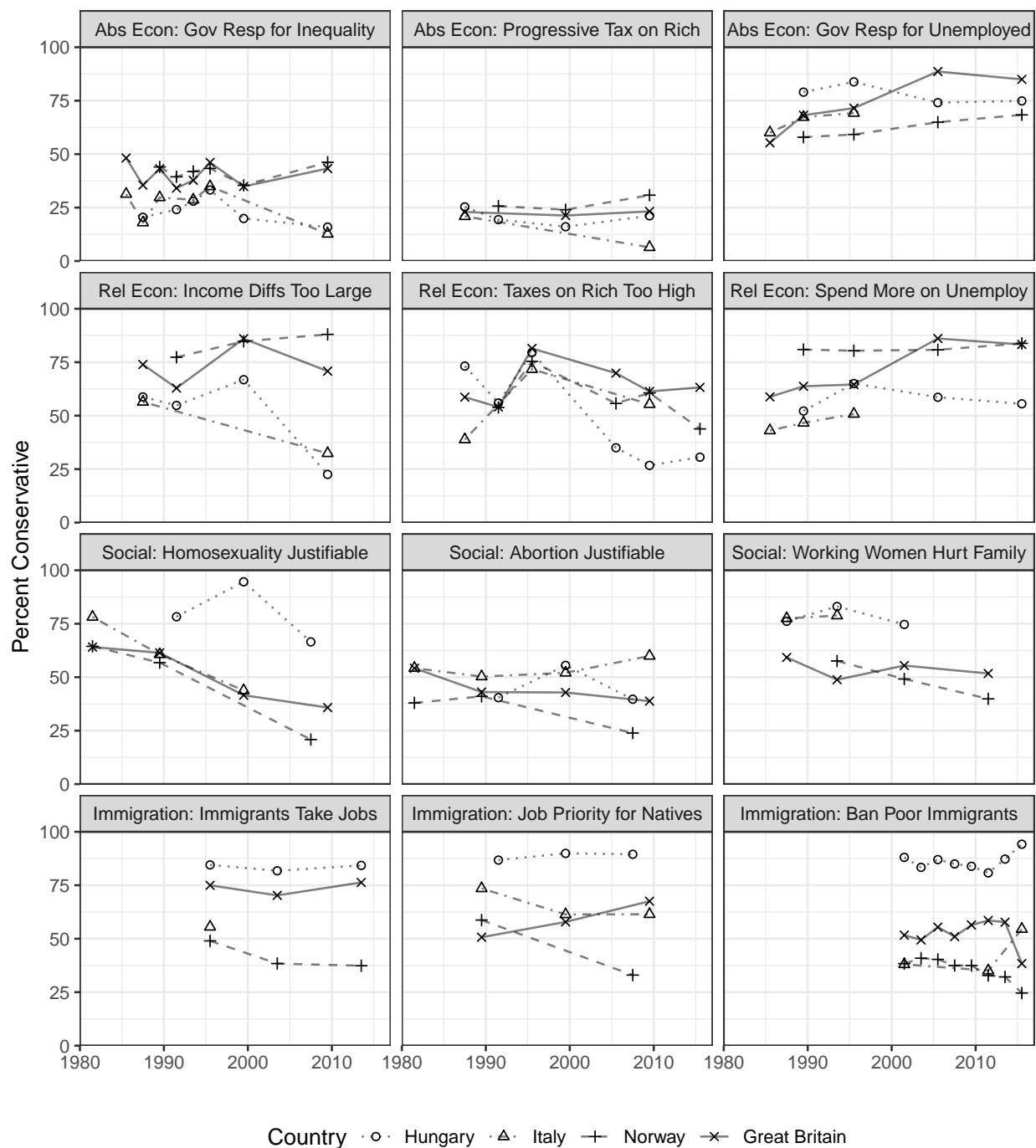
Figure 1: Opinion trends on illustrative survey questions for four countries. The horizontal axis indicates the proportion of respondents in the country who were more conservative than average on that question.

the rich at a higher rate than the poor, and be responsible for providing for the unemployed. The relative positioning of the countries differs somewhat depending on the question. Great Britain is usually the most conservative country on all three questions, especially since 2000, whereas Italy and Hungary tend to be further left. Norway, by contrast, is relatively conservative on income inequality and progressive taxation, but the most leftwing on providing for the unemployed. In general, Hungary and Italy drifted leftward between the 1990s and 2000s, whereas Norway and Great Britain remained stable or became more conservative. The overall pattern, however, is that opinions on absolute economic issues have remained fairly consistent over time.

Opinion change tends to be larger on questions concerning change relative to the status quo (second row). This makes sense, since relative preferences are a function both of absolute preferences and of current conditions. For example, the British public's position on whether income differences are too large and taxes on the rich too high (second row, first and second columns) shifted sharply rightward between the early and late 1990s, despite little change in the British public's general opposition to government responsibility for inequality and progressive taxation (top row, first and second columns). Hungary exhibited an even more striking leftward shift on these relative questions between the communist-era 1980s and the 2000s. The influence of the status quo may also explain why Norwegians are consistently leftwing on responsibility for the unemployed (first row, third column) but rightwing on whether to spend more on the unemployed (second row, third column), given that even a left-leaning citizen might regard Norway's unusually expansive welfare state as overly generous.

Cross-national differences on social and immigration questions are almost directly opposite to those on economics. On both non-economic domains, Norwegians are clearly the most progressive of the four publics, especially in recent years. On the other end of the ideological spectrum, Hungarians express by far the greatest conservatism on immigration and (except

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for abortion) social issues. Unlike the other three domains, social issues exhibit an overall trend towards greater progressivism over time, particularly with regard to homosexuality. On immigration, there is some evidence of countervailing opinion trends across countries. Most strikingly, during the refugee crisis of the 2010s, support for banning immigrants from poor countries jumped in Hungary and Italy but fell sharply in Great Britain and to a lesser extent Norway.

As this analysis illustrates, the idiosyncratic variation on individual survey items and their uneven availability across countries and time can make it difficult to discern common trends. Nevertheless, suggestive patterns do emerge when we analyze questions within domains and compare across them. In the next section, we describe a measurement strategy that enables us to bring these patterns into clearer relief using data on many more questions and countries.

4   Measurement Model

Using survey responses to estimate citizens' ideology requires a measurement model that connects the (observed) data to the (unobserved) latent trait. Item response theory (IRT) provides a convenient framework for this task. In an IRT model, subjects' responses are jointly determined by their score on the latent trait—in our case, their domain-specific conservatism—and by the characteristics of the particular question. Because most survey items in our dataset offer multiple ordered response options (e.g., strongly agree, agree, neither agree nor disagree, etc.), we employ an ordinal IRT model. In the probit version of this model, subject i's probability of responding to question q with response option $k \in 1 \ldots K_q$ is

$$\Pr(y_{iq} = k \mid \theta_i, \beta_q, \boldsymbol{\alpha}_q) = \Phi(\beta_q \theta_i - \alpha_{q,k-1}) - \Phi(\beta_q \theta_i - \alpha_{q,k}), \tag{1}$$

where Φ is the normal cumulative distribution function, θ_i is i's domain-specific conservatism, β_q is the "discrimination" of item q with respect to that trait, and the $K_q + 1$ thresholds $\boldsymbol{\alpha}_q$ are ordered as $-\infty = \alpha_{q,0} < \alpha_{q,1} < \ldots < \alpha_{q,K-1} < \alpha_{q,K} = \infty$ (Fox 2010, 12–14).[8]

In a typical application, an individual-level IRT model would be used to estimate each respondent's conservatism based on his or her responses to multiple issue questions in a given domain (e.g., Treier and Hillygus 2009). Unfortunately, because European surveys conducted in different countries and time periods have included different survey questions, and each respondent usually answers no more than a handful of questions, an individual-level approach is not feasible in the European context. Our solution to this difficulty is to marginalize over the distribution of conservatism across individuals and instead estimate *average* conservatism in different segments of the public, using a group-level IRT model (Mislevy 1983). Although our main focus in this application is cross-national comparison, we estimate conservatism at a lower level of aggregation, in groups defined by the cross-classification of country, gender, and age categories. In addition to being substantively interesting, these population groups were chosen because they are measured in a standardized way across countries and surveys and because their population proportions are available from census data, which means that national conservatism can be estimated by weighting the group estimates to match their distribution in the population.

The specific model we use is an ordinal variant of the Bayesian dynamic group-level IRT model developed by Caughey and Warshaw (2015; cf. McGann 2014; Vandeweerdt 2018). In an ordinal DGIRT model, the probability that in period t a randomly sampled member i of population group g selects response option k to item q is

$$\Pr(y_{iq} = k \mid \bar{\theta}_{g[i]t[i]}, \beta_q, \boldsymbol{\alpha}_q, \sigma_\theta^2) = \Phi\left(\frac{\beta_q \bar{\theta}_{g[i]t[i]} - \alpha_{q,k-1}}{\sqrt{1 + \beta_q^2 \sigma_\theta^2}}\right) - \Phi\left(\frac{\beta_q \bar{\theta}_{g[i]t[i]} - \alpha_{q,k}}{\sqrt{1 + \beta_q^2 \sigma_\theta^2}}\right) = \pi_{tgqk}, \quad (2)$$

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[8]In the case of $K_q = 2$ categories ("0" and "1"), the ordinal model reduces to the conventional binary IRT model: $\Pr(y_{iq} = 2 = \text{"1"}) = \Phi(\beta_q\theta_i - \alpha_{q,1}) - \Phi(\beta_q\theta_i - \infty) = \Phi(\beta_q\theta_i - \alpha_q)$.

where $\bar{\theta}_{gt}$ is the average of θ_i in group g at time t and σ_θ^2 is the variance of θ_i within groups. The vector of probabilities $\boldsymbol{\pi}_{tgq} = (\pi_{tgq1}, \ldots, \pi_{tgqK_q})$ can then be linked to the data via a multinominal sampling model,

$$\boldsymbol{s}_{tgq} \sim \text{Multinomial}(\boldsymbol{\pi}_{tgq}), \tag{3}$$

where $\boldsymbol{s}_{tgq} = (s_{tgq1}, \ldots, s_{tgqK_q})$ is the number of respondents in group g who in period t selected category k in response to question q.

In each period, the prior distribution for $\bar{\theta}_{gt}$ is given by a local-level transition model, $\bar{\theta}_{gt} \sim \text{N}(\bar{\theta}_{g,t-1}, \sigma_\theta^2)$. In periods when data are sparse (or absent), this transition model smooths (or imputes) estimates of $\bar{\theta}_{gt}$ based on the estimates for adjacent years. To identify the polarity of the latent conservatism space, we restrict each β_q to be positive (and recode the survey data so that higher responses are more conservative). To identify its location and scale, we normalize the $\bar{\theta}_{tg}$ to have zero mean and unit variance across groups and time periods. We sampled from the posterior distribution of this model using the Bayesian programming language Stan (Stan Development Team 2018). We ran 4 chains with 2000 iterations each, with the first half of each chain as warmup, and based inferences on 4000 samples from the posterior distribution. For further details on the derivation and implementation of the model, see Sections 8 and 9 of the SI.

5   Estimates of Mass Policy Conservatism

By applying the ordinal DGIRT model to each of our four datasets, we obtained four biennial measures of the average conservatism of men and women aged 16–34, 35–59, and 60+ in each European country.[9] As noted above, our decision to estimate conservatism at the level of gender $\times$ age groups was based on a combination of substantive considerations and data

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[9]Some surveys include 16 and 17 year-olds, but most begin at 18.

availability. First, ideological differences between sexes and age groups are theoretically and politically important. Second, these demographic variables are measured consistently across surveys, and data on each group's population share are available for all countries and periods from Eurostat (`http://ec.europa.eu/eurostat/data/database`). The latter data are necessary in order to poststratify the group estimates into estimates of national averages. Other potential interesting variables, such as party identification or education, were not examined because they either were measured differently across surveys or did not appear in the Eurostat data, precluding poststratification.[10]

We begin by examining ideological trends for men and women and for the three age groups. In line with existing literature (e.g., Iversen and Rosenbluth 2006), we find that on economic issues, European men, especially young men, have consistently displayed greater conservatism than their female counterparts (Figure 2, top panels).[11] By contrast, on social and immigration issues (bottom panels), men and women are much more similar. There is tentative evidence that a gender gap has developed recently on social issues, as well as hints among young men and women that a similar gap may be emerging on immigration. Overall, however, gender differences are much less pronounced on social and immigration issues than on economics.

Age divides European publics as well, but in different ways across issue domains.[12] On

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[10]Future users of our method may be interested directly in group-specific rather than national averages, in which case population data for poststratification would not be necessary. Our online guide and code allows users to flexibly estimate their own measures of ideology for particular groups, potentially using subsets of surveys, countries or years where the relevant data are available.

[11]Figure 2 presents averages across countries, without weighting for country population size. The posterior probability that men are more conservative than women is greater than 95% in every biennium for 16–34 year-olds, in every biennium except 1983–84 and 1985–86 for 35–59 year-olds, and for every biennium from 1989–90 onwards for those aged 60+. Note that because estimates of men and women are strongly correlated within year, the confidence intervals exaggerate the overlap between the posterior distributions of men and women.

[12]Our data do not allow us to easily distinguish whether the patterns by age are due to the impact of age itself or to cohort effects, although the patterns could certainly potentially be explained by generational replacement. In any case, our ultimate interest is in using these sub-group results to form national totals. Future research, though, could employ age-period-cohort analysis to address this question.
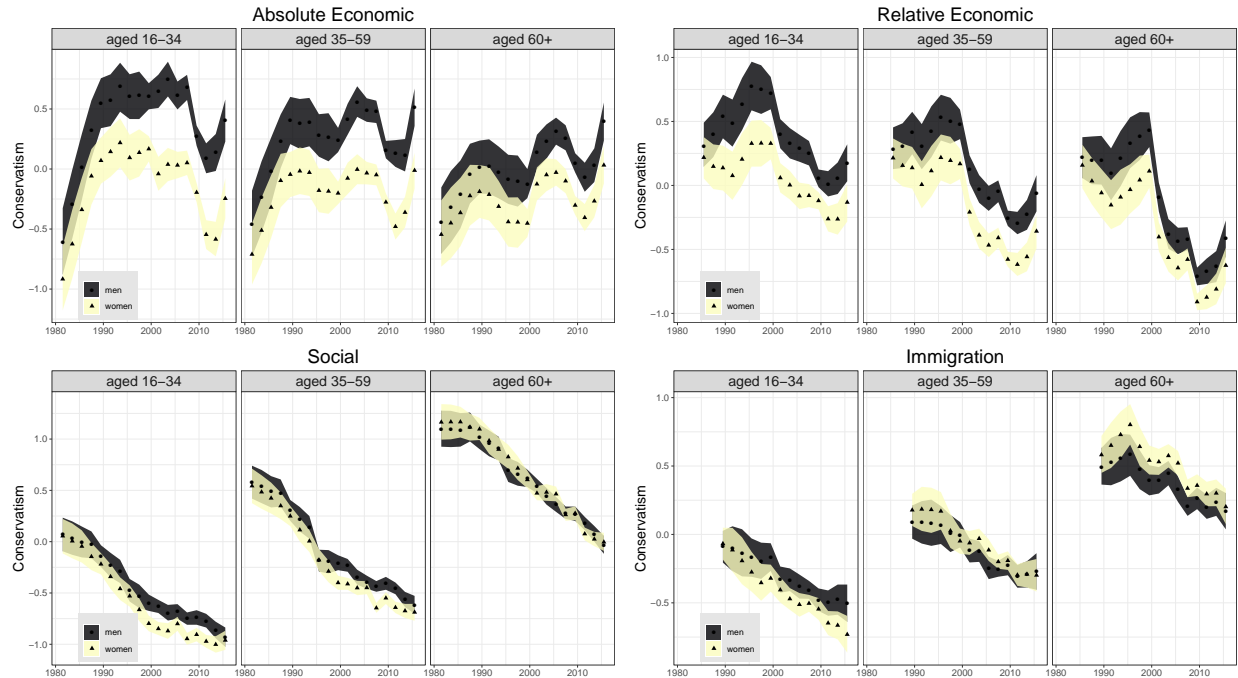
Figure 2: Trends in mass conservatism by gender, age group, and issue domain. Triangles and lighter color indicate women; circles and darker color indicate men.

economic issues, the elderly have been a little more left-wing than the two younger age groups across most of the period, with the young and middle-aged holding very similar positions. For social and postmaterial issues, there is a very clear gradient by age. The youngest people have always been much more socially progressive than the middle-aged, who in turn have always been much more progressive than the oldest. Similarly, on immigration, the elderly are more conservative than the two younger age groups across the whole period.

The four conservatism measures also differ in their trends over time. The economic conservatism of the average European public increased substantially in the 1980s. Then economic conservatism plateaued and changed little between the 1990s and the years preceding the Great Recession of 2008–09. During and immediately after the 2008–09 crisis, all groups shifted sharply leftward on economics. This proved to be only a temporary change, however, with economic conservatism reverting to its pre-crisis levels by the end of our data in 2016.

In contrast, economic mood has trended in a liberal direction since the mid-1990s among all age groups. The divergence between absolute conservatism and policy mood on economic issues could be due to the general retrenchment of the welfare state that occurred across Europe at this time. This retrenchment could have led to thermostatic responsiveness, whereby the public reacts to the decline in the size of government by preferring greater government spending (Soroka and Wlezien 2010).

Social conservatism, on the other hand, declined steadily over the whole thiry-six years of our data, with the most rapid changes occurring in the 1980s and 1990s for the two younger age groups. Due to lack of survey data, we can estimate immigration conservatism only since 1989. We find that it too decreased over the period, albeit less than social conservatism did. Over the past decade, as the immigration crisis in Europe has intensified, this leftward movement appears to have stalled among most age groups.

To estimate mean conservatism in each country-biennium, we average the estimates for gender-age strata, weighted in proportion to their composition of national populations at each point in time. Figures 3 and 4 plot these estimates over time, separately for each country. Within each panel, countries are ordered according to their average conservatism across years on the respective measure.

All four figures show a clear north–south ideological divide, but the direction of this cleavage differs across domains. Southern European countries, most notably Greece, tend toward the left-wing end of the economic scales (Figure 3) but are closer to the conservative end of the social and immigration scales (Figure 4). In contrast, Northern countries, such as Denmark and the Netherlands, are the least conservative on social issues and immigration but are more conservative on economics, particularly mood. Meanwhile, on social issues and immigration, Eastern European countries are almost all amongst the most conservative and tend to be similar to Southern European countries. On economic issues, most Eastern European countries also share greater progressivism with their Southern counterparts, al-

Figure 3: Economic conservatism and mood within countries over time. Within each plot, countries are ordered by their conservatism. Each country's time series begins in the first biennium with survey data from that country. Subsequent biennia without survey data are indicated with hollow circles.

Social

Immigration

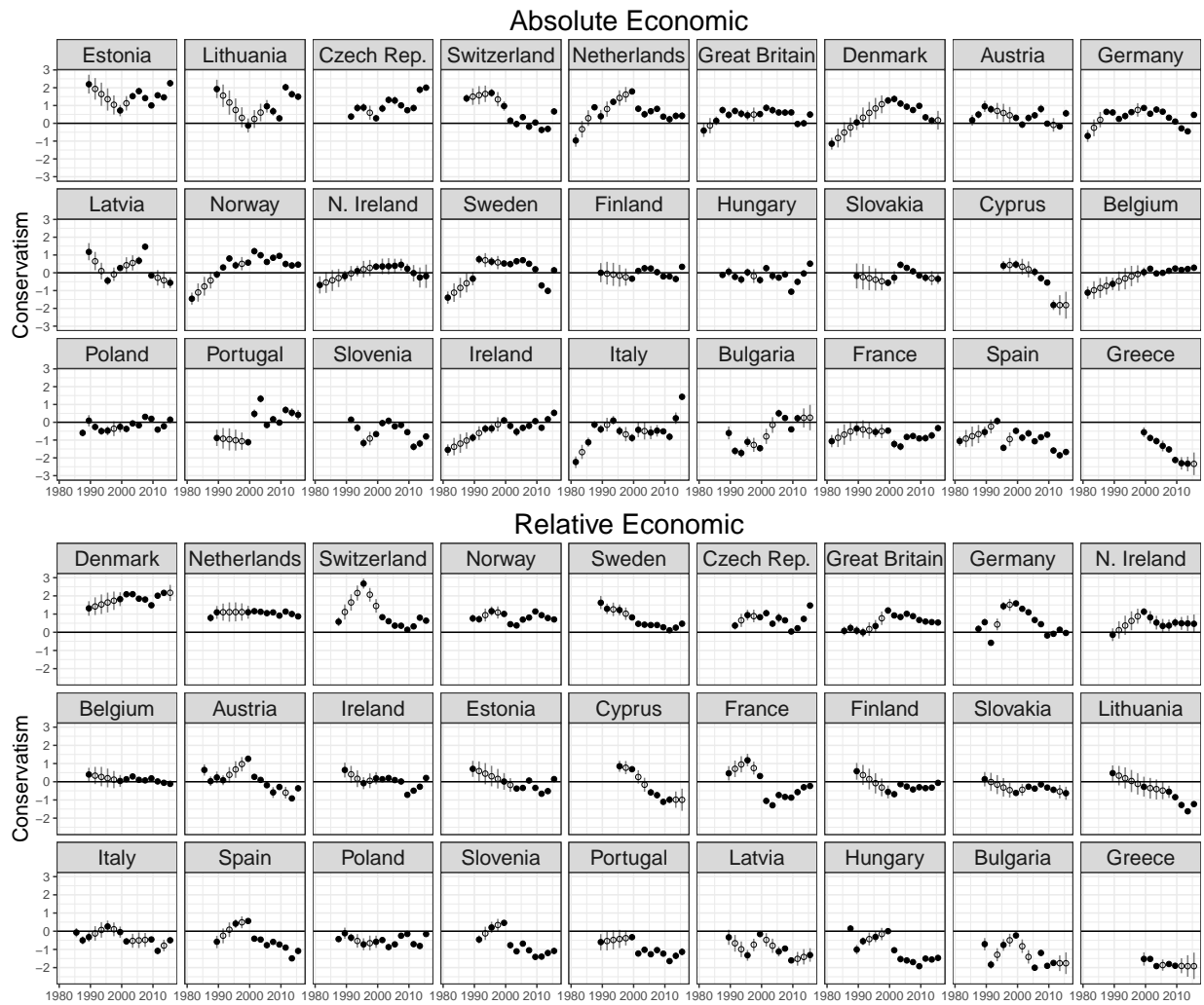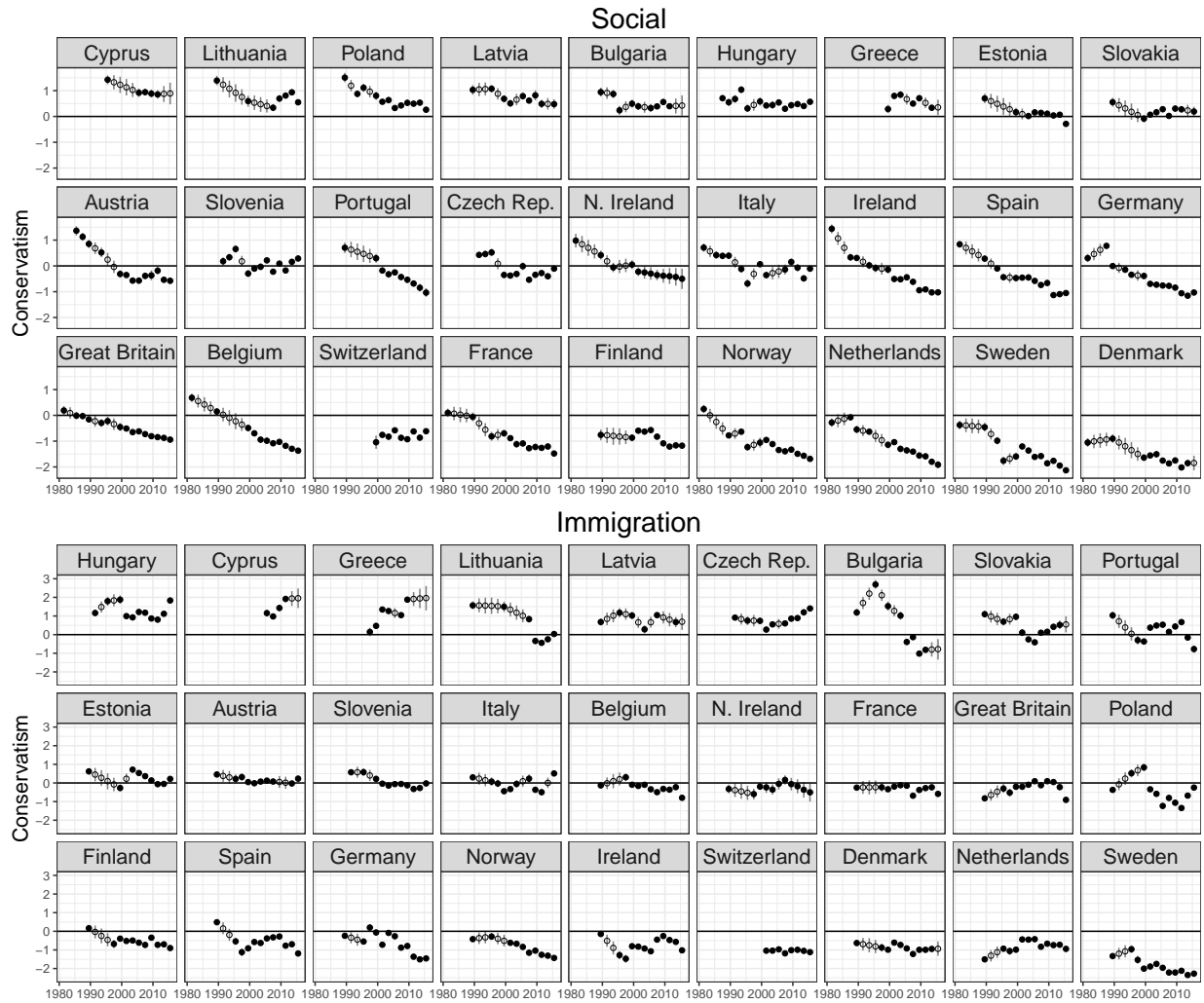Figure 4: Social and immigration conservatism within countries over time. Within each plot, countries are ordered by their conservatism. Each country's time series begins in the first biennium with available survey data. Subsequent biennia without survey data are indicated with hollow circles.

though the Czech Republic (with its highest GDP per capita in Eastern Europe), Estonia, and Lithuania are markedly more conservative on absolute economic queations.

Figure 5 plots the cross-national relationships between the four conservatism measures. As the top-left panel shows, social and immigration conservatism have a strongly positive correlation across countries. Moreover, although their trends have differed somewhat over time, there is little sign that immigration conservatism is emerging as a distinct dimension. In 2015–16, for example, the correlation between the two measures ($R = .78$) was as high as it has ever been. There is also a robust positive correlation between absolute and relative conservatism on economic issues (top-right). There is, however, a distinct cluster of Eastern European nations whose relative conservatism is much lower than their absolute conservatism would suggest, as well as a few Northern countries (most notably Denmark) whose relative conservatism is anomalously high. Again, the differences between the two economic measures probably reflect the different economic policies in place in the two sets of countries.

Although conservatism is highly correlated within the economic and non-economic domains, this is not true across the domains. As the middle panels show, absolute economic conservatism is essentially unrelated to social and immigration conservatism. Even more strikingly, relative economic conservatism has a strong negative association with both social and immigration conservatism. These negative correlations imply that it is not meaningful to say that certain European publics are conservative across the board. Rather, in contemporary Europe, countries that are conservative on relative economic issues are nearly all fairly progressive on social and immigration issues, and countries that have liberal economic moods tend to be right-wing on social and immigration issues (compare Malka, Lelkes, and Soto 2017). These patterns thus provide empirical justification for measuring conservatism separately by domain.
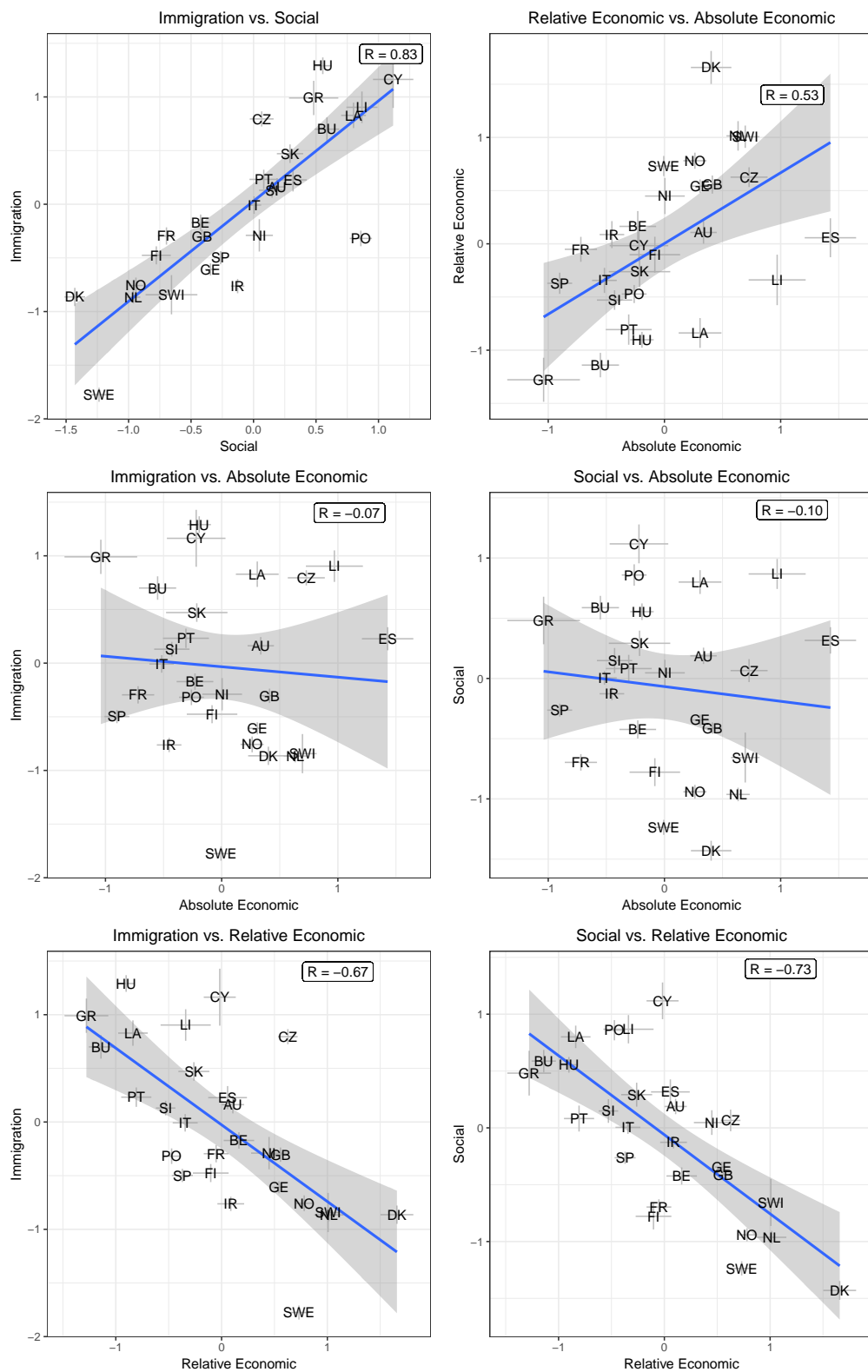
Figure 5: Cross-country correlations between ideological measures. Abbreviations indicate countries' average domain-specific conservatism across all biennia. Grey crosses indicate 95% credible intervals.

6 Validation

We provide evidence for the validity of our measures of mass policy conservatism with two kinds of validation: convergent and construct (Adcock and Collier 2001). The purpose of convergent validation is to show that a new measure is empirically associated with alternative measures of the same concept. We do this by comparing our conservatism estimates with responses to individual survey questions and with alternative longitudinal measures of mass conservatism. We then turn to construct validation, the goal of which is to demonstrate the empirical association between a new measure of a given concept and an existing measure of another (distinct) concept believed to be causally related to the concept of interest. We do this by evaluating the relationships between mass conservatism and government policies in the same domain. Overall, we find abundant evidence that our measures are valid summaries of mass policy preferences in a given domain.

6.1 Convergent Validation: Comparison with Survey Measures

We begin with convergent validation, demonstrating that our measures are strongly correlated with alternative indicators of domain-specific policy preferences. Specifically, we compare our conservatism estimates with responses to highly ideological survey questions in each domain. Figure 6 shows the correlation of our estimates on each domain with one "internal" issue question that is included in the data used to estimate our conservatism scores and one "external" issue question that does not contribute to our estimates.[13] All of these comparisons show a strong correlation between our ideology estimates and specific issue questions on each domain (see SI, Section 10 for more details).

To complement the cross-sectional comparisons above, we also evaluate the over-time

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[13]The "external" questions were in all cases not included in our scales because they were asked in only a single year. In certain cases, such as the European Election Study, it may be possible to incorporate the question in future if is repeated across waves.
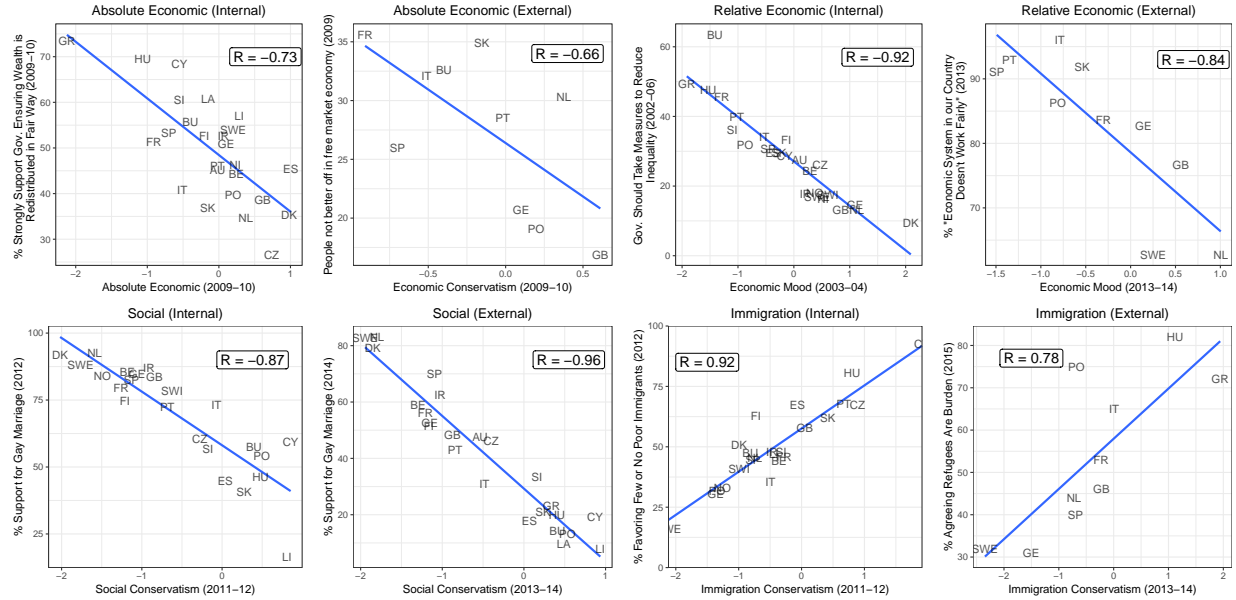
Figure 6: Correlations between domain-specific conservatism and individual issue questions. The first and third columns validate the scale against "internal" issue questions included in the data used to estimate the corresponding conservatism scores, whereas the second and fourth columns validate against "external" questions not included in the original data.

dynamics in our conservatism scores. We do so by using Stimson's (1991) Dyad Ratios algorithm to estimate aggregate trends in domain-specific conservatism and comparing the results with our estimates of average conservatism at each point in time. Since we apply both methods to the same set of data, the primary purpose of this comparison is to show that our results are not driven by the particular model that we use.[14] The Dyad Ratios algorithm is similar to the DGIRT model in that its goal is to summarize broad ideological patterns across many issue-specific questions. The most important difference between the two methods is that Dyad Ratios leverages only longitudinal variation, whereas the DGIRT model accounts for cross-sectional variation as well. Despite the fact that this distinction leads the methods to give items different implicit weights, the two sets of estimates are quite similar. As Figure 7 shows, standardized versions of the two time series generally

[14]We focus this comparison on Western Europe since the large amount of missing data in Eastern European countries limits the time period that Stimson's mood algorithm can be applied for these countries.

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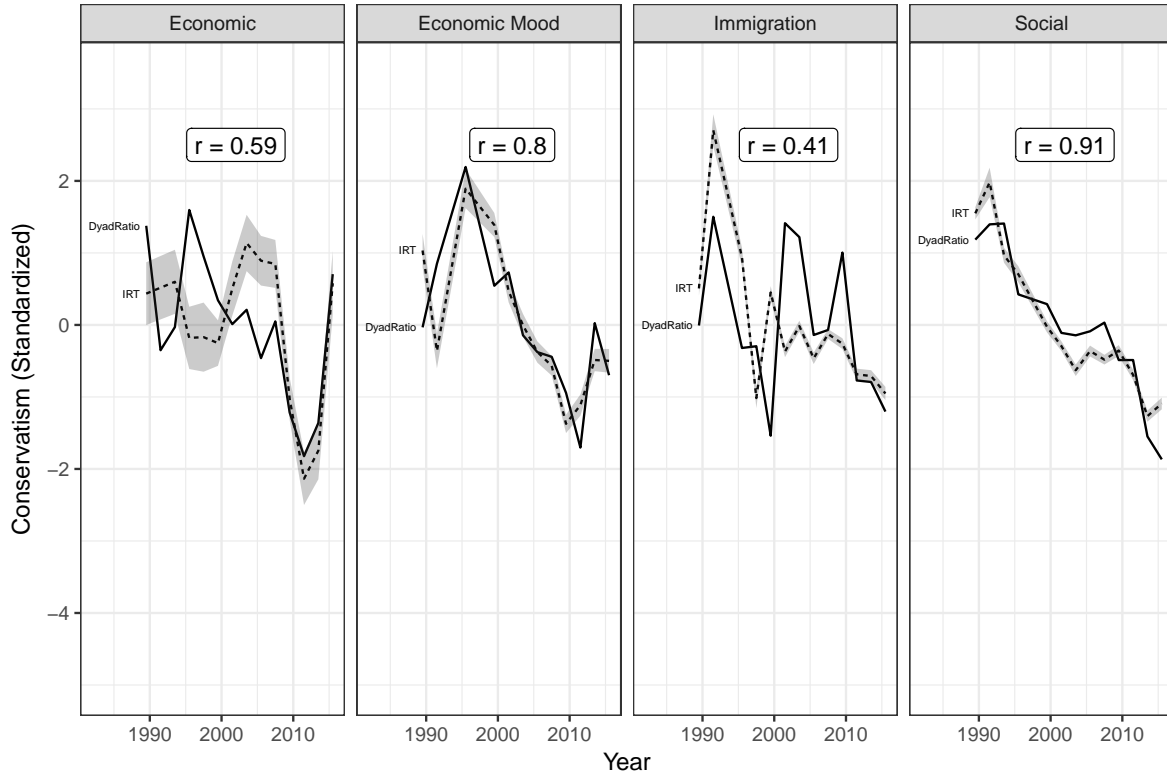
Figure 7: Comparing our domain-specific IRT estimates of mass conservatism in Western Europe (averaged across countries in each biennium) with analogous estimates calculated using Stimson's Dyad Ratios algorithm. Both models use the same data. All series have been standardized to have zero-mean and unit-variance within country, and are coded so that higher scores are conservative.

track each other and are robustly correlated, especially on social and relative economic conservatism. This congruence between the two series provides reassurance that our model faithfully represents longitudinal as well as cross-sectional variation in mass conservatism.

6.2   Construct Validation: Policy Representation and Voting

We now evaluate the relationships between our estimates, and voting and policy outcomes. Assuming that government policies are indeed influenced by mass policy preferences (for a review, see Powell 2004, 282–91) and that mass ideology predicts voting behavior, evidence for these theoretical relationships should constitute construct validation of our measures.

Considering one policy area for social issues, immigration and economic mood, we find that domain-specific ideology not only predicts government policies but also does so better than the two most commonly used measures of mass ideology in the literature to date: left–right self-placement and median-voter positions, both of which were described earlier in Section 2.1. We first report cross-sectional analyses of the social and immigration domains and then describe a panel analysis of economic policy.[15] Finally, we show that absolute economic conservatism is correlated cross-sectionally with voting in European Parliament elections, although here our measure performs about as well as left-right placement.

6.2.1 Social Conservatism and Gay Rights Policy

First, we examine policy responsiveness on gay rights issues using the European Region of the International Lesbian, Gay, Bisexual, Trans & Intersex Association's "Rainbow Map" of the liberalism of countries' gay rights policies. This index is based on over 50 gay rights policies on topics such as same-sex marriage, non-discrimination laws, and family rights. As the left panel of Figure 8 shows, across countries there is a strong negative association between mass conservatism and the expansiveness of gay rights policies ($r = -0.8$). In other words, countries where the public has more progressive social views have more progressive policies. As the right panel shows, this is also true of countries where citizens are more likely to place themselves on the "left," but the correlation is about half as strong ($r = -0.46$) and not statistically significant.[16] This suggests that gay rights policies are more responsive to domain-specific mass conservatism than to general ideological identification.[17]

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[15]We focus on cross-sectional analyses of the social and immigration domain due to the lack of panel data on policy outcomes there. In contrast, there is good time-series data available on economic policy outcomes, and there are a broad array of obvious confounders for cross-sectional comparisons. So we focus on panel analyses there.

[16]Data for left–right self-placement come from all Eurobarometer surveys containing the question over the period. Our country-level measure for each period is the weighted average of all individual responses in that period, as in past studies.

[17]We do not compare policy to median-voter scores because our data end in 2004, and even in years before then are often missing in many countries.

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Figure 8: Cross-sectional responsiveness of gay rights policies to mass social conservatism (left panel) and average self-placement on the left–right scale (right panel).

6.2.2 Immigration Conservatism and Migrant Integration

We next conduct an analogous analysis of immigration policy. To capture ideological variation in countries' immigration policy we use the Migrant Integration Policy Index (MIPEX), which measures policies to integrate migrants in all EU Member States as well as many other countries around the world. The MIPEX is based on 167 policies related to labor market mobility for migrants, anti-discrimination laws, and many other areas related to migration. As Figure 9 shows, the correlation between government policy and mass conservatism is again about twice as strong as its correlation with left–right self-placement ($r = -0.81$ vs. $r = -0.48$). Thus, like gay rights, policies designed to integrate migrants into society appear to respond to citizens' immigration-specific conservatism in the receiving country.

6.2.3 Economic Mood and Wage Replacement Rates

Our next piece of construct validation analyzes the over-time relationship between the generosity of welfare policies and publics' economic mood, taking advantage of the greater availability of time series data on economic policies. We regress policy on opinion while con-
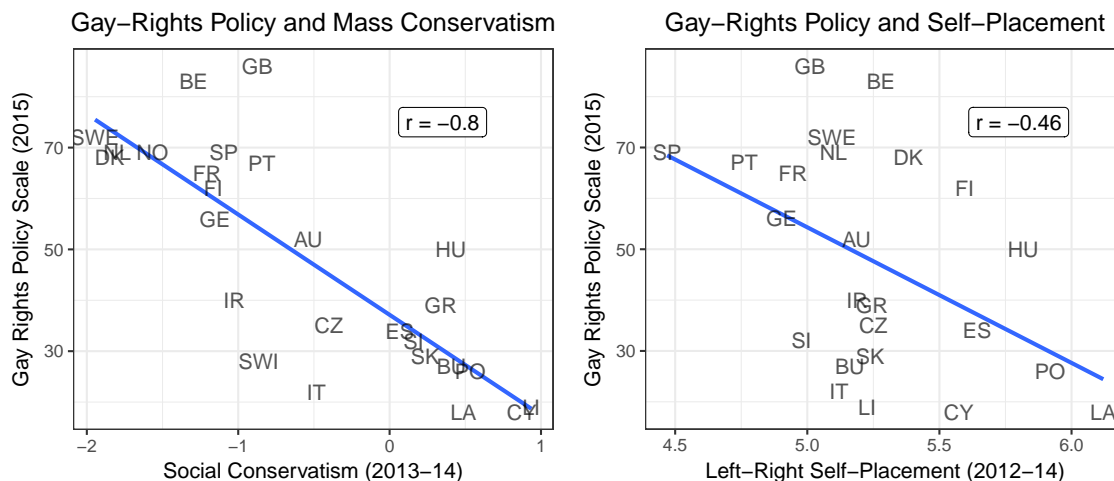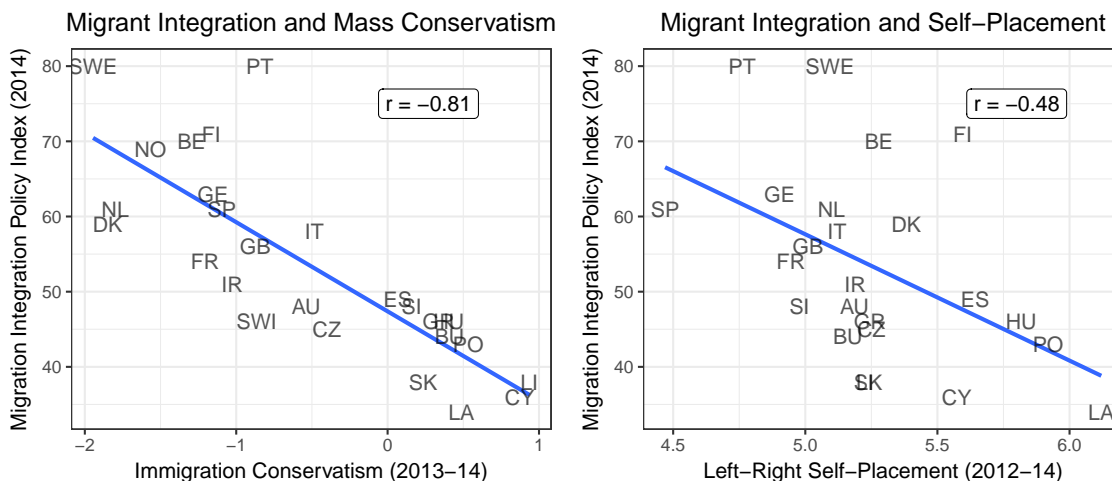
Figure 9: Cross-sectional responsiveness of migrant integration policies to mass immigration conservatism (left panel) and average self-placement on the left–right scale (right panel).

trolling for country- and biennium-specific intercepts, ruling out persistent country-specific factors (as well as continent-wide trends) as confounders to the opinion–policy relationship.[18] The specific policy indicator we analyze is the gross replacement rate—the percent of wages replaced by benefits when a worker loses their job—in each biennium.[19] A score of 100% on this metric implies an extremely generous welfare system that replaces all lost income, and a score of 0% a very stingy one.

Figure 10 summarizes the results of two sets of analysis.[20] For each measure, we conducted two sets of analysis. The first consisted of two-way fixed-effects regression for each of the three measures in turn, containing all possible observations. The sample sizes and coverage differ across these regressions, mainly because median-voter scores are often missing

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[18]We account for within-country dependence by using the wild cluster bootstrap (Esarey 2016) to calculate confidence intervals.

[19]These data were obtained from the OECD. From our twenty-seven countries, data are not available for Cyprus, Northern Ireland and all Eastern European countries except the Czech Republic, Hungary, Poland and Slovakia, so we exclude the eight missing countries from this analysis. In addition, data on Italy are available only through 2005–06 and data on the Czech Republic, Hungary, Poland and Slovakia begin only in 2001.

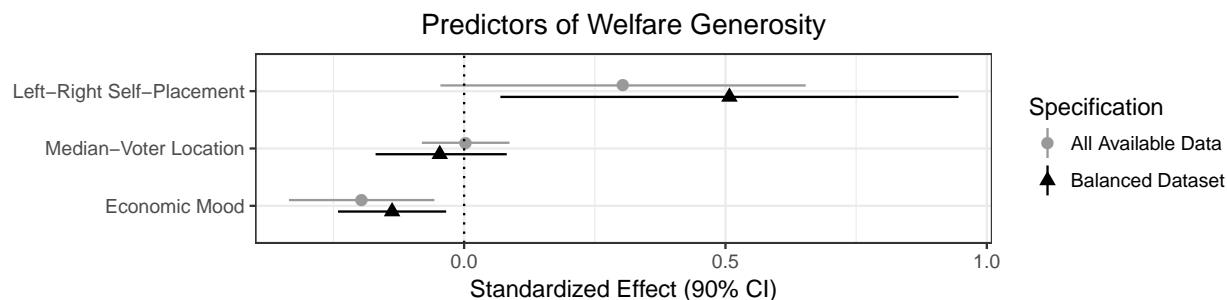[20]Table S1 in the SI presents these regression results in tabular form.

Figure 10: Point estimates and confidence intervals from two-way fixed-effects regressions of welfare replacement rate on left–right self-placement scores (top row), median-voter location (middle row) and our estimated measure of economic mood (bottom row), all coded so that higher values are more conservative. The unit of analysis is the country-biennium. The effects have been standardized by rescaling all variables to have unit-variance across the observations used in the estimation. Confidence intervals are calculated using the wild bootstrap, clustered by country. The available sample size differs for each measure. In each case, the lighter grey measure uses all available data for the item, and the darker measure shows results from a balanced dataset of only complete observations for all three items.

and are only available up to 2004, forcing us to drop almost 70% of country-biennia for that measure.[21] The second analysis also consisted of three regressions, this time with a dataset consisting only of complete observations, so that the samples were identical in each case. The figure shows the coefficients on each of the ideology variables: the predicted response of welfare generosity to a one-unit increase in conservatism (for all three ideology measures, more positive numbers imply greater conservatism).

Regardless of the specification, our measure of mass economic mood exhibits negative co-variation with the wage replacement rate, as should be expected (bottom panel of Figure 10): as the public moves to the right in relative economic terms, demanding less spending, welfare spending becomes less generous. The location of the median-voter, on the other hand, has a within-country relationship with the replacement rate that is close to zero (middle panel). Finally, contrary to what would be expected if policy responded to ideological identification,

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[21]The median voter positions come from an update to the original Kim-Fording dataset produced by De Neve (2011). They are available only in country-biennia when elections were held, and even in this updated data set, they are also only available up to 2004.

an increase in the proportion of citizens' placing themselves on the right is *positively* associated with welfare generosity (top panel). In short, the only variable whose covariance with economic policies is consistent with responsiveness to citizens' preferences is our measure of economic mood. It should be noted that this finding contrasts with the cross-sectional patterns across countries, where the highest-spending countries are often the most supportive of spending cuts. Only when we add country-specific intercepts to control for these stable cross-sectional differences is the positive covariation between conservative economic policymaking and public mood revealed.

6.2.4 Economic Conservatism and European Parliament Elections

Our final piece of construct validation conducts an analogous analysis of absolute economic conservatism. To capture ideological variation in election outcomes, we use data on the share of left-wing parties in the 2013 EU Parliamentary Elections. As Figure 11 shows, the correlation between EU Parliamentary Elections and mass conservatism is moderately strong, though slightly less so than the correlation between election results and self-placement. Thus, EU elections appear to respond to citizens' economic-specific conservatism, but there is no evidence of a superior relationship to self-placement.
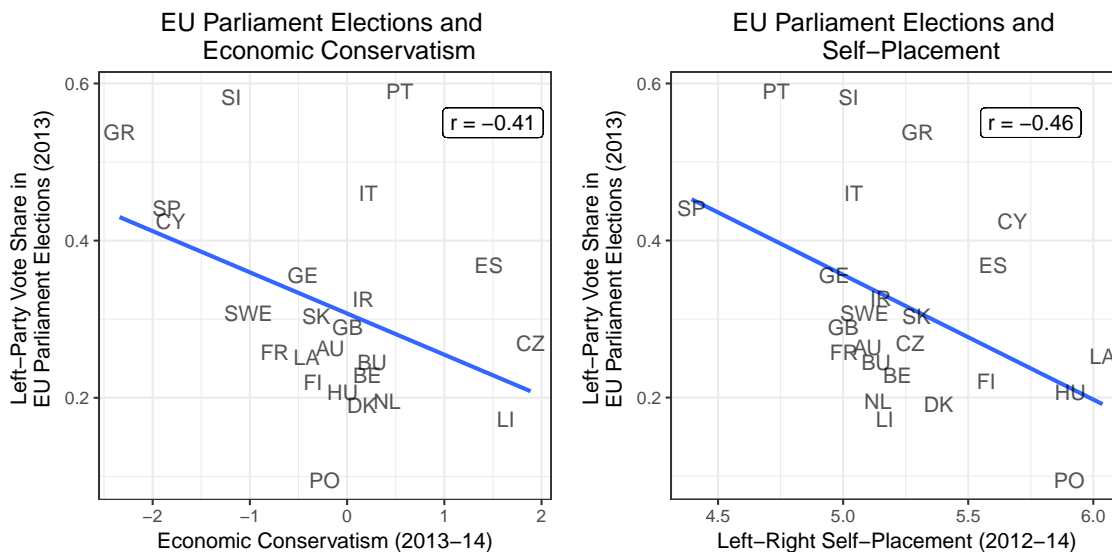
Figure 11: Cross-sectional responsiveness of EU Elections to mass economic conservatism (left panel) and average self-placement on the left–right scale (right panel).

7   Comparison to Proxies for Mass Policy Preferences

We now turn to a direct comparison between our estimates and left–right self-placement and median-voter positions. As noted above, self-placement scores capture citizens' identification with different ideological labels, and median-voter positions are inferred from election results under assumptions of spatial voting. Moreover, both existing measures presume that mass policy preferences in Europe vary along a single left–right dimension. For these reasons, self-placement and median-voter scores may have weak relationships with at least one and possibly all four of our measures of ideology.

This is in fact what we find. Figure 12 summarizes the bivariate relationships between left–right self-placement scores, median-voter scores, and economic, social, and immigration conservatism. The first thing to note is that despite the fact that they purport to measure the same concept, left–right self-placement and median-voter scores are almost uncorrelated ($R = .14$ across countries; $R = -.02$ across country-biennia). Both Danes and Norwegians,
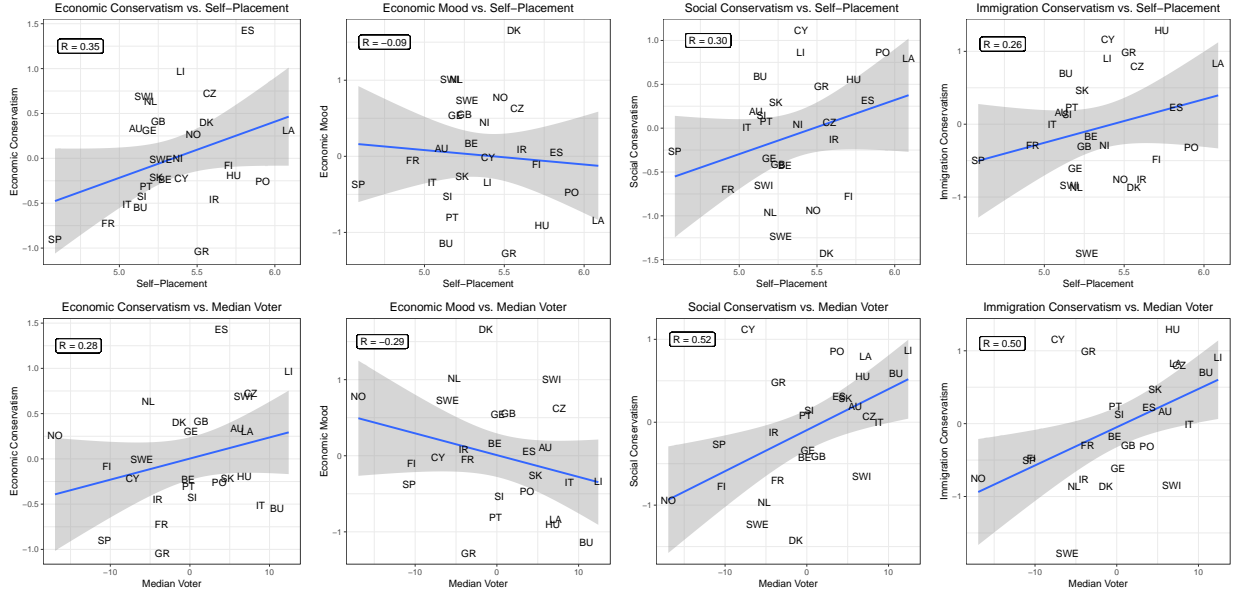
Figure 12: Correlations between self-placement scores, median-voter locations, and our measures of domain-specific conservatism. Each observation is an average for the relevant country across years. The data end in 2004 for the median voter scores and in 2016 for all other plots

for example, tend to place themselves almost identically towards the center-right end of the ideological scale. But according to median-voter scores, the median Danish voter is centrist whereas the median Norwegian is extremely left-wing. Similarly, the median voter in both Italy and Bulgaria is estimated to be very right-wing, but citizens in both countries place themselves on the left. It appears likely that citizens in different countries are thinking of different ideological dimensions when describing their ideological positions. Danes and Norwegians, for example, may be thinking of economic issues given that most place themselves towards the right. On the other hand, Greeks and Poles *also* consistently rate themselves as relatively right-wing, which is in line with their stance on social issues and immigration but not on economics.

Figure 12 shows that both median voter scores and self-placement display a positive but modest correlation with all of our conservatism scales except for relative economic conservatism, although the median voter scores correlate somewhat better with immigration and

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social conservatism. Regressions using our domain-specific measures to explain the two prox-ies for ideology reveal the same patterns. Although there are modest positive correlations in most cases, the predictive power of our survey-based measures is not great: collectively, they explain only 17% of the variation in self-placement scores and 12% of the variation in median voter scores in a multivariate regression.[22]

The temporal patterns in the measures contrast with each other as well. As others (e.g., Knutsen 1998; Medina 2015) have observed, over the past decades there has been little aggregate movement towards the left or right in citizens' ideological self-placement. Median-voter scores, by contrast, are in many countries much more variable over time. As Warwick and Zakharova (2012, 174) note, some of this variation is implausibly large. Portugal, for example, is estimated to have gone from having one of the most right-wing electorates in Europe to one of the most left-wing in just twelve years (1987 to 1999). Similarly, between 1998 and 2001 Denmark moved about a standard deviation to the right on the median-voter scale. Neither countries' survey-based ideological positions changed over those periods in anything like such a dramatic fashion. A likely explanation is that these large shifts are caused by changes in vote shares that may not reflect voters moving closer to certain parties ideologically, but rather the effect of economic conditions, shifts in party positions, or other valence considerations.

In summary, self-placement and median-voter scores, in addition to being essentially uncorrelated with each other, are at best weakly related to survey-derived summaries of the public's domain-specific conservatism. This suggests that the two existing measures are not especially good proxies for mass policy preferences and in fact measure distinct concepts.

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[22]These inferences are from a least-squares regression with economic, social, and immigration conservatism as regressors and the country-biennium as the unit of the analysis, with standard errors clustered by country. The full regression results are shown in Table S2 in the Supplementary Information.

8   Conclusion

We have described the first dynamic, cross-national summaries of mass conservatism derived from Europeans' issue preferences. The measures cover 27 countries, 36 years, and four issue domains: absolute economic, relative economic, social, and immigration. We have validated our measures against individual issue questions, time series of domain-specific policy mood, and policies themselves, finding robust evidence of their validity.

Our measures indicate that since the 1980s, European publics have moved markedly leftward on social issues and modestly so on immigration. Europeans' support for conservative revisions to existing economic policies declined as well, even as their absolute economic conservatism slightly increased. On economics, men have consistently taken more conservative positions than women, but only recently has any sign of an analogous gender gap emerged on social and immigration issues. Social and immigration conservatism increases strongly with age, but on economics, age matters little for absolute conservatism and if anything is associated with lower values of relative conservatism. All four measures exhibit a clear regional divide across countries. Compared to Southern and Eastern Europeans, Northern Europeans tend to be more progressive on social and immigration issues but more conservative on economics.

The negative relationship between between economic conservatism and social and immigration conservatism indicates that cross-national variation in European mass ideology cannot be captured with a single left–right dimension, at least as those labels are commonly understood. Thus, in many contexts our domain-specific measures of policy conservatism may be preferrable to unidimensional measures such as self-placement and median-voter. While the latter remain valuable as measures of ideological identification and electoral preferences, applied scholars should consider whether they capture the construct of theoretical interest.

Given the central place that citizens' policy preferences play in normative and positive theories of politics, the scope of potential applications of our measures is vast. In addition to facilitating descriptive inferences about ideological patterns in the mass public, they can also be used to examine governments' responsiveness to citizens' preferences, as we have shown. These analyses could of course be extended to examine the institutional and contextual moderators of policy representation. Additional topics include the role that mass policy preferences play in electoral outcomes and these preferences' responsiveness to shifting economic and social conditions. We hope and expect that other researchers use our estimates to explore these and other important questions. To facilitate this, we have made our estimates available to the public and will continue to update them as more survey data is released.

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Supplementary Information for "Ideology in European Mass Publics, 1981-2016"

Contents

1. Availability of Data by Survey Question and Country

Figure S1 shows the availability of the survey questions in our data on each domain by biennium. It illustrates the sparseness of the raw survey data. For example, no individual survey question is available in every period.

Figure S1: Coverage of Questions in the three datasets
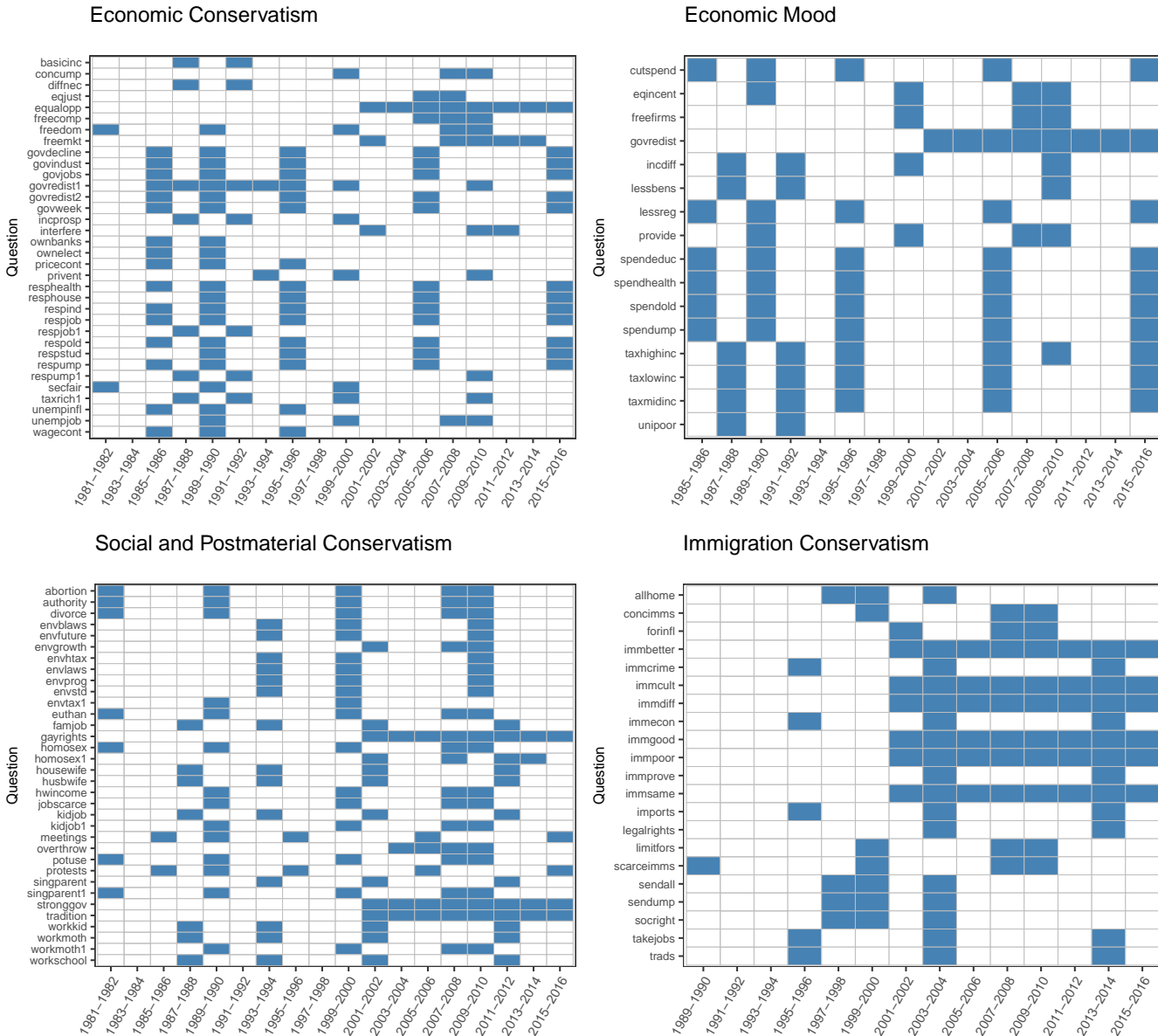
Note: Each square represents the appearance of a given question in a given biennium in the relevant ideological dimension. See the Appendix for full details of each question.

Figure S2 shows the coverage of countries in our data on each domain across time. It shows the sparseness of the survey data both cross-sectionally across countries and longitudinally within countries.

Figure S2: Coverage of Countries in the three datasets

Economic Conservatism

Economic Mood

Social and Postmaterial Conservatism

Immigration Conservatism
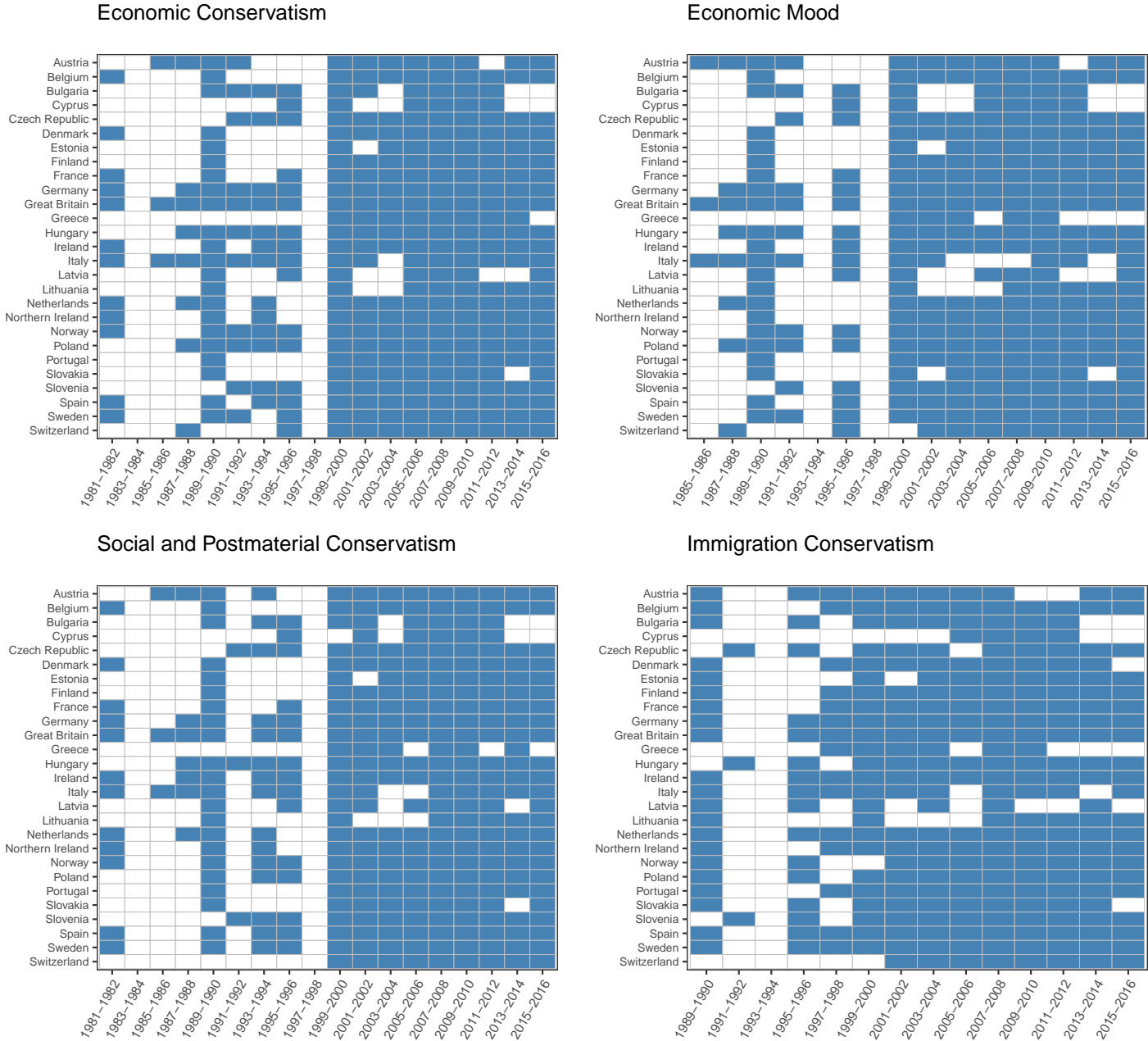
Note: Each square represents the appearance of a given country in a given biennium in the relevant ideological dimension

2.   Inter-Item Correlations and Scree Plots

Our approach is "non-exploratory" in the sense that the dimensionality of the model and issue categorization of survey questions are based on ex ante substantive assumptions rather than inductive statistical evidence. Underlying our analysis, however, are the implicit assumptions that public opinion is correlated within each of our substantive domains (economic conservatism, economic mood, social, and immigration), and that latent conservatism is approximately unidimensional within domain. In this appendix, we present evidence in support of each of these assumptions.

First, we examine the inter-item correlations between the items used to generate each conservatism scale (Figures S3–S6). Due to the prevalence of missing responses, we first summarized the raw data by averaging each question within group-biennia (defining groups as age $\times$ gender $\times$ country), centering these averages within year (to eliminate time effects), and then averaging across biennia within groups. The variance in the transformed dataset is therefore purely cross-sectional. We then calculated the pairwise correlation matrix of the question averages. In general, we find that survey questions within a given domain are highly correlated

To assess the dimensional structure within each domain, we calculated the eigenvalues of the correlation matrix just described. The scree plots in Figure S6 plot each eigenvalue's proportion of the total variance, alongside the eigenvalues of 20 randomly simulated datasets with the same sample size and missiningness pattern. Each scree plot exhibits an "elbow" after the first dimension, which explains at least twice as much variance as the second dimension. This suggests that a single latent dimension summarizes the bulk of systematic variation within issue domains. A single dimension does not capture all domain-specific variation, however, as indicated by the fact that in every domain at least 3 eigenvalues are higher than the distribution of randomly simulated eigenvalues. Indeed, as the correlation plots—particularly Figures S3 and S4—suggest, each domain contains a few questions that, though substantively related to the domain's content, display little covariation with other questions. Nevertheless, the scree plots do support our contention that unidimensionality within domains is a reasonable approximation.

Figure S3: Inter-Item Correlations for the Economic Conservatism Scale
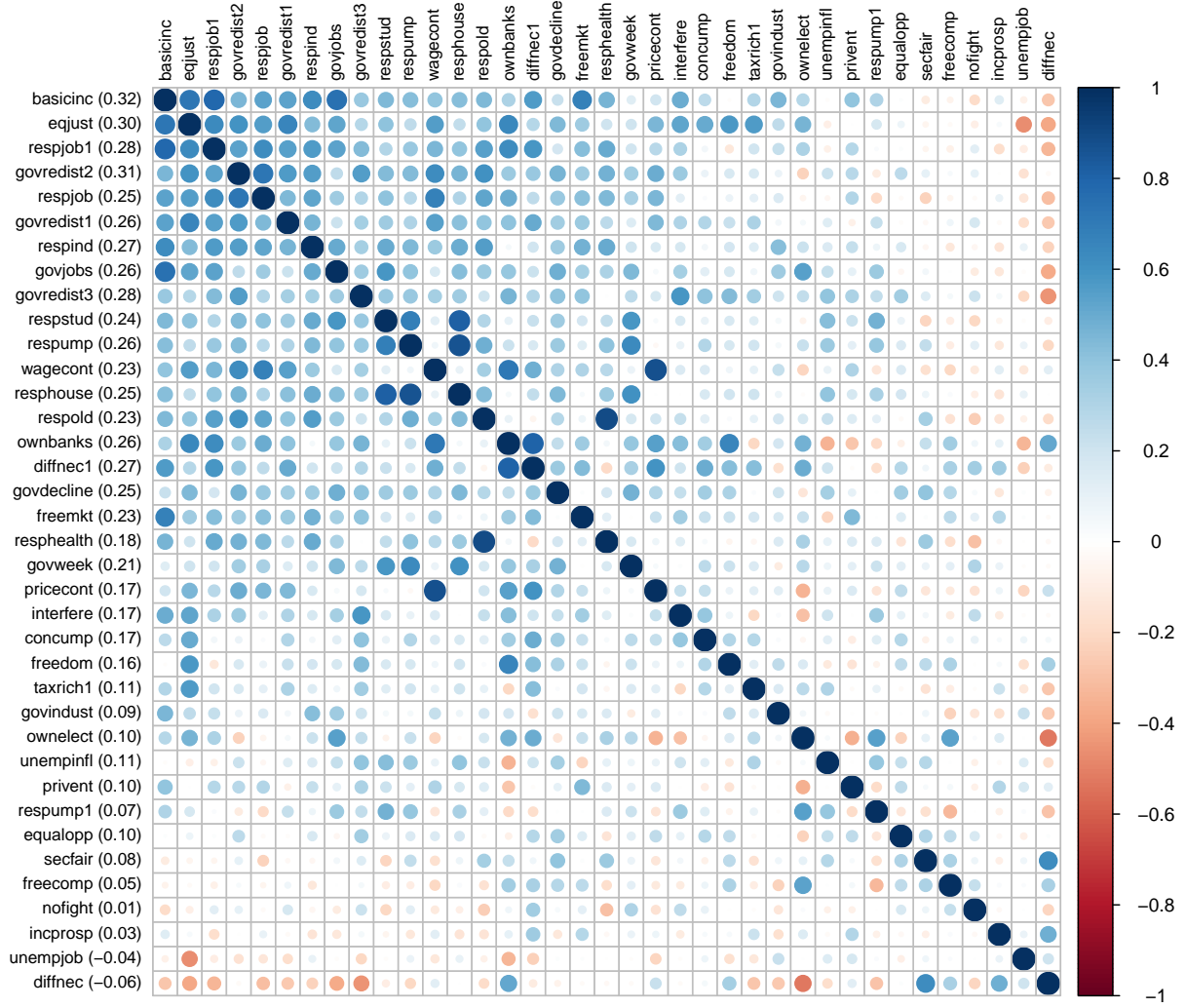
Note: Numbers in parentheses on the *y*-axis indicate the variable's average correlation with other variables.

Figure S4: Inter-Item Correlations for the Economic Mood Scale
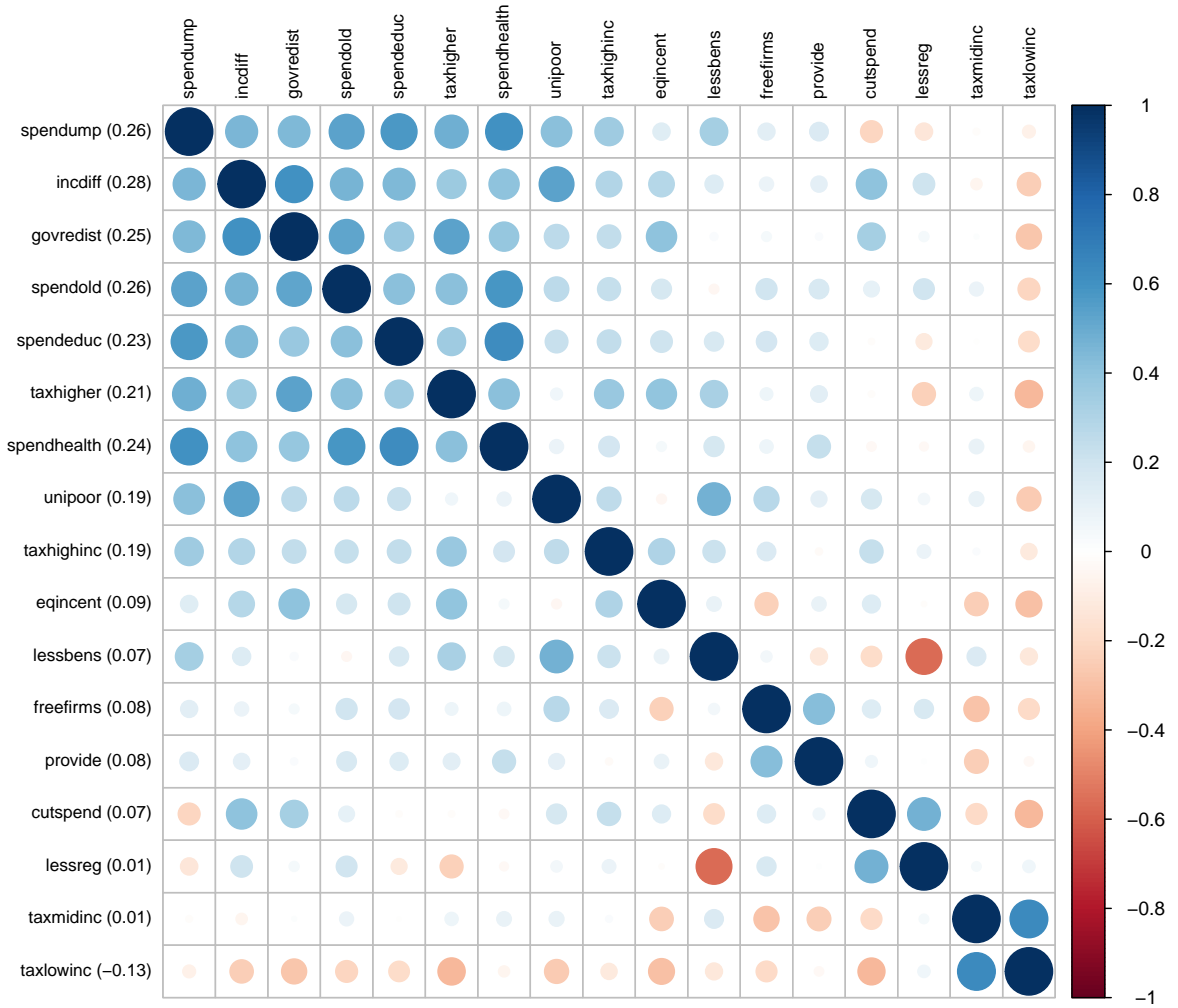
Note: Numbers in parentheses on the *y*-axis indicate the variable's average correlation with other variables.

Figure S5: Inter-Item Correlations for the Social/Postmaterial Issues Scale
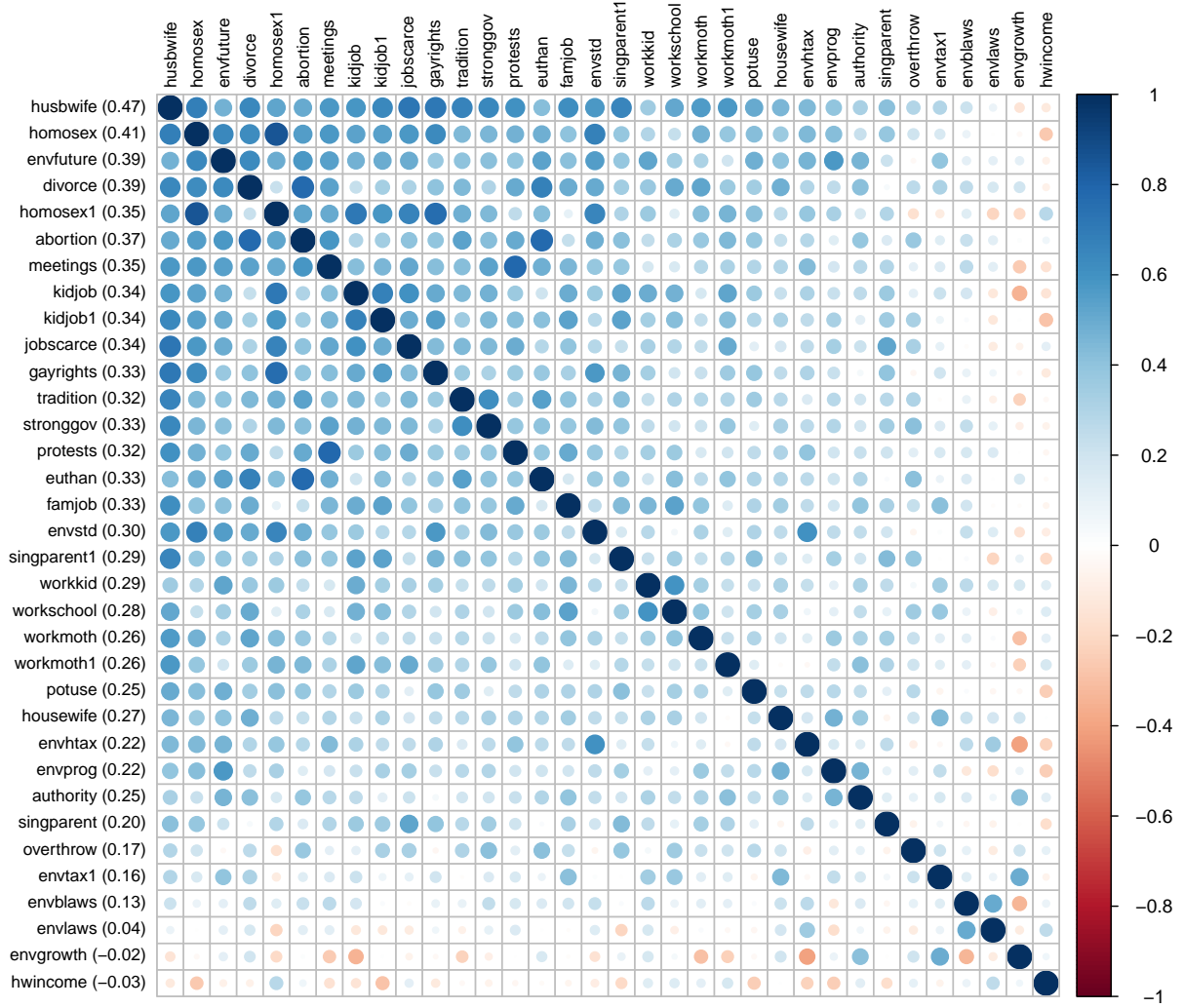
Note: Numbers in parentheses on the *y*-axis indicate the variable's average correlation with other variables.

Figure S5: Inter-Item Correlations for the Immigration Issues Scale
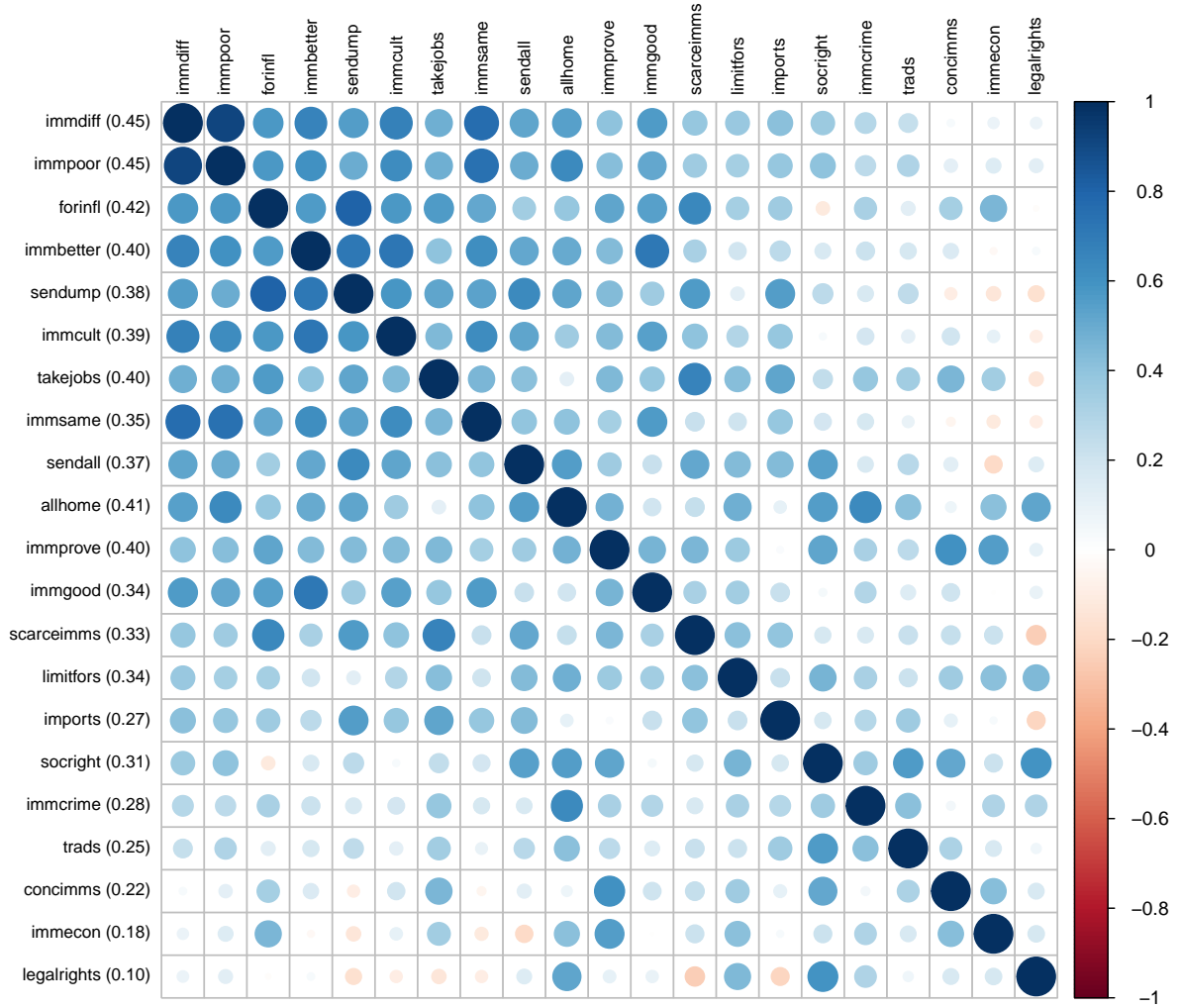
Note: Numbers in parentheses on the *y*-axis indicate the variable's average correlation with other variables.

Figure S7: Scree plots for the four survey datasets. Black lines represent the eigenvalues of 20 randomly simulated datasets.
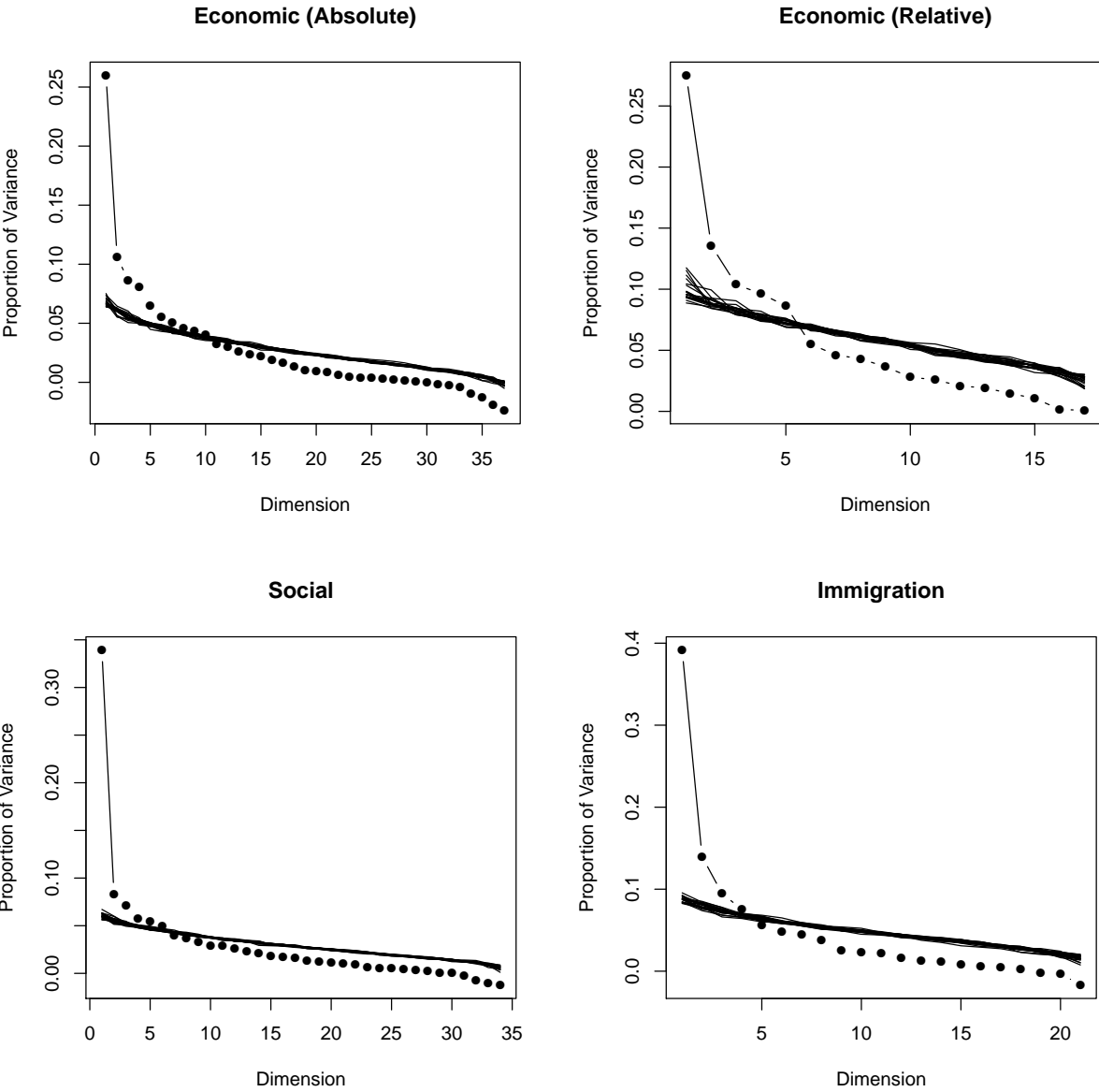
3.   Results for the Social Domain Excluding Environmental Issues

Although environmental issues have often been seen as part of a second, 'postmaterial' dimension (Inglehart 1995), not all authors agree (e.g., Kriesi et al. (2006)). Thus some readers may wonder whether their inclusion drives our results. To check this, we re-estimated our models without environmental issues in the social scale and found that our results were virtually identical. The main results are shown below in Figures S8 and S9, which are the same as the social issues sections of Figures 1 and 3 in the paper except that environmental issues are removed. As in Figure 2, in Figure S9 the countries are ordered from most to least conservative on average. Section 2 above also shows that the environmental items are in fact positively correlated with the other social issues items.

Figure S8: Trends in Mass Conservatism by Gender, Age Group and Dimension (Excluding Environmental Issues from the Social/Postmaterial Scale)
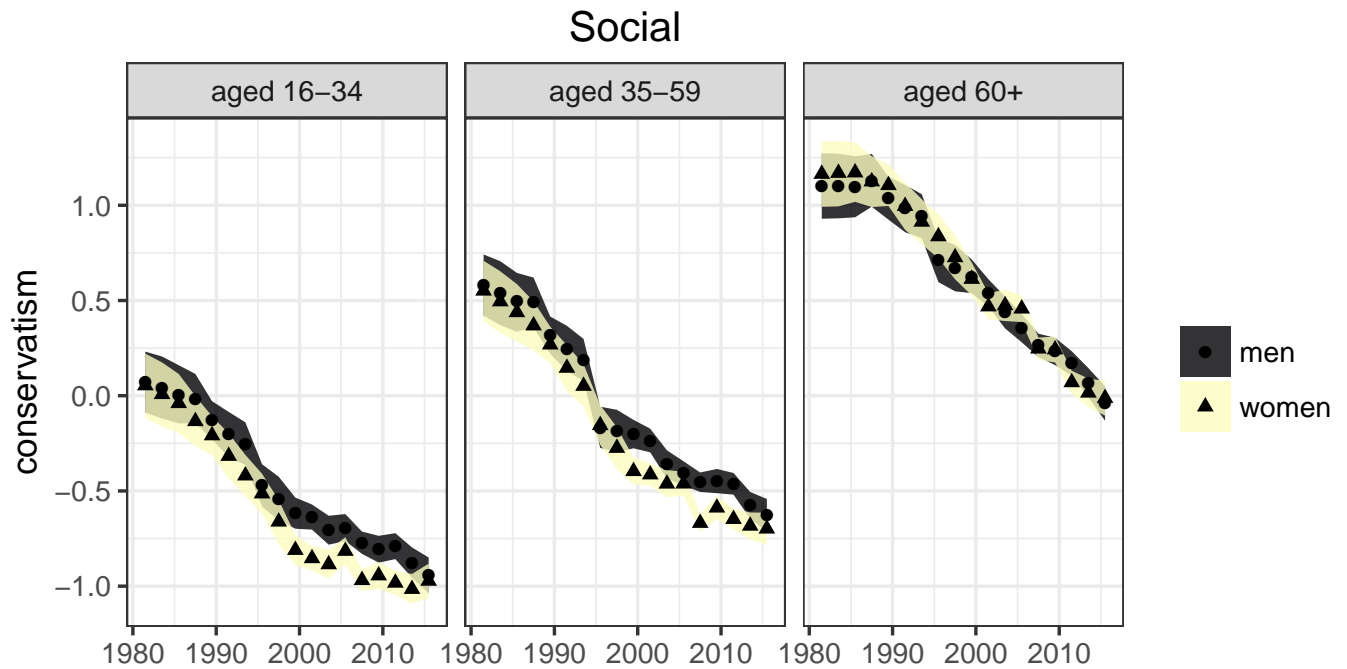
Figure S9: Social Conservatism Within Countries Over Time (Excluding Environmental Issues from the Social/Postmaterial Scale)
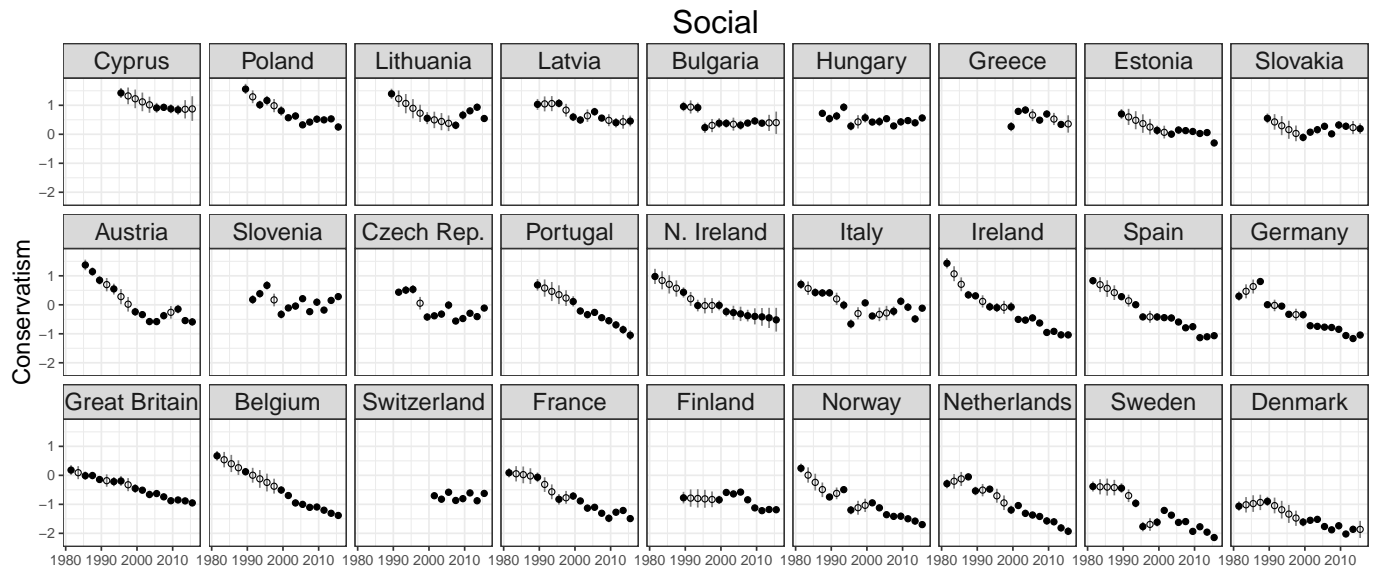
4. Full Regression Results for the Welfare Generosity Model (Figure 9)

Here we show the full regression results that are reported in Figure 8 of the paper. The models explain welfare generosity using our economic conservatism measure as well as previous proxies for ideology (left-right placement and median voter positions). All models focus on variation within countries only: there are two-way fixed effects controlling for both country and biennium. Due to the small number of clusters, P values were calculated using the wild bootstrap method (Esarey 2016), clustering by country. The outcome variable is the net replacement rate. A score of 100% on this metric implies an extremely generous welfare system that replaces all lost income when unemployed, and a score of 0% a system that replaces none at all.

For each measure, we conducted two sets of analysis. The first consisted of two-way fixed-effects regression for each of the three measures in turn, containing all possible observations. The sample sizes and coverage differ across these regressions, mainly because median-voter scores are often missing and are only available up to 2004, forcing us to drop almost 70% of country-biennia for that measure.[1] The second analysis also consisted of three regressions, this time with a dataset consisting only of complete observations, so that the samples were identical in each case.

As explained in the paper, the results show that only our measure of economic conservatism is negatively related to welfare generosity, as theories of policy responsiveness would predict. In the model with all available data, a one-unit rise in economic conservatism (which equals 1.2 standard deviations) is estimated to lead to a fall of 3 percentage points in the net replacement rate. Paradoxically, the coefficients for left-right placement imply that as countries become more conservative, welfare generosity rises.

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1. The median voter positions come from an update to the original Kim-Fording dataset produced by De Neve (2011). They are available only in country-biennia when elections were held, and even in this updated data set, they are also only available up to 2004.

Table S1: Regression Models Explaining Proxies for European Countries' Ideological Positions with our Domain-Specific Measures

Sample:

	All Available Data						Balanced Dataset					
	(1)		(2)		(3)		(4)		(5)		(6)	
	Coef.	P-Value	Coef.	P-Value	Coef.	P-Value	Coef.	P-Value	Coef.	P-Value	Coef.	P-Value
Left-Right Placement	11.93	0.13					19.61	0.077				
Median Voter Position			0.0033	0.94					-0.055	0.47		
Economic Mood					-3.03	0.037					-2.71	0.027
Observations	207		103		245		66		66		66	

Notes:

All models include country and period fixed effects

P values calculated using the Wild bootstrap method, clustered by country

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5. Full Regression Results for the Relationships between Our Models and other Proxies for Ideology

On the next page, we show the full regression results that are reported on page 37-38 of the main paper, describing the relationships between other proxies for ideology and our measures of domain-specific conservatism. Models 1-5 use left-right self-placement as the dependent variable and models 6-10 use the median voter position. In all models the unit of analysis is the country-biennium, and standard errors are clustered by country. Models 1-4 and 5-8 contain only one of the measures as an independent variable; models 5 and 10 contain all four and are referred to as 'multivariate' in the paper.

As described in the paper, our domain-specific conservatism measures correlate at best modestly with the previous proxy measures. The left-right scale runs from 0-10, meaning that, for example, a 1-unit rise in economic conservatism (which equals 1.25 standard deviations) is associated with at most an increase of 0.126 (0.34 of a standard deviation) along the 11-point left-right self-placement scale. Likewise, a 1-unit rise in immigration conservatism (x standard deviations) is associated with at most an increase of 5.524 (0.45 of a standard deviation) in the median voter position, whose scale runs from -33.4 to 34.6. As shown by the R^2 statistics, in the multivariate models our measures of ideology explain less than one-fifth of the variation in the proxy measures.

Table S2: Regression Models Explaining Proxies for European Countries' Ideological Positions with our Domain-Specific Measures

Dependent variable:

	Left-Right Placement					Median Voter Position				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Economic Conservatism	0.085 (0.071)				0.126* (0.065)	2.812* (1.447)				1.827 (1.536)
Economic Mood		−0.011 (0.050)			0.016 (0.063)		−0.299 (1.567)			3.111 (1.955)
Social Issues			0.146** (0.067)		0.195** (0.082)			3.313** (1.666)		0.744 (3.049)
Immigration Issues				0.078 (0.048)	−0.005 (0.063)				3.742*** (1.309)	5.524*** (1.772)
Constant	5.322*** (0.061)	5.323*** (0.061)	5.371*** (0.064)	5.325*** (0.060)	5.377*** (0.058)	0.065 (1.378)	0.698 (1.517)	−0.144 (1.259)	0.915 (1.445)	−0.122 (1.406)
Observations	304	304	304	280	280	139	122	139	102	102
R^2	0.033	0.001	0.083	0.030	0.173	0.033	0.0004	0.036	0.068	0.132

Note: *p<0.1; **p<0.05; ***p<0.01. Standard errors are clustered by country.

6. User Guide for Extending Our Estimates of Policy Ideology in Europe

This guide helps users to access and interpret our measures. We also offer guidance on how to modify or extend the measures, including estimating ideology for different numbers (or types) of dimensions and potential extensions to other demographic subgroups, countries and future surveys.

6.1. Accessing our Measures of Ideology by Country and Period

The scales by country and two-year period are available for download from [website] in csv format. They are available as both post-stratified national totals (as shown in, for example, Figure 2 of the paper) and for the individual demographic subgroups (six gender-age groups per country-period, as shown in Figure 1 of the paper).

6.2. Interpretation of the Scales

Here we offer a few notes on how to interpret our scales for use in substantive applications

6.2.1. The role of the original survey data

It is worth emphasizing that, as with any scaling method, our eventual measures are mainly determined by the underlying data. Tables 1-3 in the main paper, as well as Section 5.1 (Convergent Validation) show that the raw survey data exhibit the same temporal and cross-country patterns as our scales. For instance, our finding that Northern European countries – including Scandinavian countries – are more economically conservative than Southern European countries is a clear feature of the original survey data and is not 'imposed by the model.' Of course, our choice of grouping the data into three dimensions affected the results that we found. But once the questions were grouped, our scales accurately reflected the data that comprises each one.

Hence our findings, or those of anyone choosing to modify or extend our analysis, can only ever be as 'good' or as 'accurate' as the survey data itself. There are a number of potential limitations that could affect the cross-country or over-time comparability of all cross-national survey data or measures derived from it, including our scales and previous measures of European ideology such as those derived from the Eurobarometer's question asking respondents to place themselves on a left-right scale. These limitations include: differences in sampling procedures or survey response patterns that lead to measured cross-country or over-time differences in opinion in the absence of genuine differences; differential item functioning, such that different people in different countries or periods interpret the same questions differently;[2] or differential influence from the 'status quo' across countries (see 2.3 below).

6.2.2. Interpreting Economic Mood vs. Conservatism

As discussed in the main paper, it is important to be cautious when interpreting cross-country differences in our economic mood measure. Whilst our economic conservatism measure should be comparable in an absolute sense, the mood measure is only interpretable relative to the status quo within a country. Because relative preferences depend on the policy status quo, two individuals from countries with different policies may well differ in their relative preferences even if they share the same absolute preferences. This means that, for instance, the fact that Swedes are amongst the most conservative in Europe in terms of mood does not necessarily mean that the average Swede would opt for less redistribution or government spending in an

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2. Although, as explained in the paper, we think that the questions making up our surveys are likely to be much less subject to differential item functioning than questions asking for self-described left-right positions

absolute sense than citizens of other countries. It merely means that the average Swede currently wants cuts to Swedish government spending more than citizens of other countries want cuts in their own governments' spending. This is very likely, of course, to reflect the fact that Swedish government spending is relatively very high. For substantive applications, therefore, it would make sense to focus on within-country variation in mood, perhaps using two-way fixed effects as we do in Figure 9 of the paper.

6.3. Modifying or Extending our Measures: Considerations

Because our estimates were produced with publicly-available software, it is logistically quite easy for future users to modify or extend our measures for their own applications. However, the availability of data – both survey data and demographic data for post-stratification – does impose certain constraints. Our replication archive will contain more specific guidance about how to implement our measurement model and places in the code where specific analytical decisions we made can be altered. Here, we offer some more general guidance on modifications or extensions of our work, particularly the role played by data availability.

6.3.1. Producing estimates for different ideological domains, or modifying our existing domains

As we explain in the paper, our choice of a three-dimensional structure is based on an ex-ante classification that is consistent with the literature on European politics, rather than data-driven criteria for selecting the 'correct' number of latent dimensions. While our analysis of inter-item correlations in the Supplementary Information provides an additional statistical justification for our choices, we certainly do not view our paper as the final word on the dimensionality of European politics. Other analysts may wish to make different choices, and here we explain the issues that arise in doing so.

Logistically, it is very easy to add or delete variables from our existing scales. Our code takes all of the individual cross-national surveys and amalgamates them into a single large dataset. From there, this single dataset is broken down into dimension-specific datasets (e.g. economic issues). One need only change 2-3 lines of our code in order to reassign a variable from one dimension to another, or exclude a variable altogether. Adding in a new variable from one of the surveys requires only a little more work: the additional step of extracting it from the original datasets and potentially re-coding it such that higher values indicate more conservative opinions.

In principle one could easily estimate ideology across fewer dimensions than we do. The single large dataset that we create could be used to produce a uni-dimensional measure of ideology, although we think that our results show that such an enterprise would be inappropriate given the very different cross-national and over-time patterns across dimensions. A more reasonable enterprise might be to combine the immigration and social domains into a single second dimension, given that the cross-country patterns are similar across both domains (even though over-time patterns are very different). Again, this can be achieved with a single line of our code.

It is more difficult, but by no means impossible, to produce estimates for a wider set of dimensions. The constraint that arises is the potential sparse availability of data. In our scales, survey data are available for virtually every two-year period across a reasonably large set of countries. One reason for this is that the scales amalgamate a relatively diverse set of questions. For instance, the 'social issues' scale includes questions on gender equality, gay rights, abortion, euthanasia, marijuana legalization, environmental issues and civil liberties. This is in line with standard definitions of the 'socio-cultural axis' (see e.g. Inglehart 1995). It could be more challenging to estimate a scale for a single issue like abortion or gay rights simply because questions on those issues have been asked less often. We emphasize that such an enterprise is by no means impossible. We merely mean that the results would be based on less data and more imputation than is the case with our scales.

Indeed, one more general issue with an enterprise of this type is that there is a lag between a set of issues becoming politically salient and their inclusion in cross-national opinion surveys over time and countries. The fact that we are only able to estimate our immigration scale from 1989 is telling in its own right. It simply wasn't asked about in cross-national surveys before then. A contemporary example would be authoritarian values. Questions on authoritarianism have not been asked with much frequency in the past, making it impossible to estimate an 'authoritarian' scale with our method at present. Assuming that such questions do begin to be asked more often from now on, it might soon be possible to do so.

6.3.2. Producing estimates with different demographic subgroups

With our approach, in principle there are two reasons to estimate ideology at the sub-group level. One is that an appropriate choice of subgroups can help to more accurately estimate aggregate opinion. When the groups themselves hold different opinions (e.g., opinions on social issues clearly differ by age group), estimating ideological positions for each subgroup first and then combining them with post-stratification should yield better estimates of national ideology. The second reason could be that, rather than being interested in aggregate ideology, the ideological positions of sub-groups are of interest directly. For instance, one might wish to investigate gender differences in ideology. In such a case, there is no need to carry out the post-stratification step.

The distinction between these two cases matters because the latter case requires less data. Extending our measures to other sub-groups would only require choosing groups that are measured consistently across all of the surveys in our data, or at least across a sufficiently large subset of them. Besides age and gender (which we use) education would be an obvious candidate for further sub-group analysis. Virtually every survey measures whether or not respondents have a degree, or have completed secondary education. Other possibilities include employees of the public and private sectors, trade union and non-union members, or urban and rural dwellers. These demographic variables are recorded in many of the surveys.

When using further demographic subgroups as a building block in estimating overall national ideology, one must also post-stratify the subgroup estimates, which imposes constraints on feasibility. It requires demographic data on the proportion of the population of each country in each cell defined by the subgroups. In our case, we needed data on the population shares of women aged 16-34, men aged 16-34, women aged 35-59, men aged 35-59, women aged 60+ and men aged 60+. This data is readily available from censuses and population surveys and is collated across Europe back to the 1960s by Eurostat. However, consistent data on the population shares of men and women of different ages with certain educational qualifications is *not* readily available, which would make it challenging to use education as a grouping variable. That is why we did not use education in our analysis, because our ultimate interest was in national ideologies rather than those of sub-groups.

A final consideration when it comes to estimation for further subgroups is computing time. In our experience, increasing the number of subgroups being estimated leads to substantial increases in computing time. While we managed to estimate our models with six subgroups within a reasonable timeframe, even adding one more grouping variable such as whether respondents have a degree would double the number of subgroups from six to twelve. This is likely to lead the models to require substantially more computational time.

7. Details of Survey Items Included in the Models

Key to datasets: ISSP = International Survey Program; ROG = "Role of Government" survey modules; INEQ = "Social Inequality" survey modules; ENV = "Environment" survey modules; NI = "National Identity" survey modules; F+G = "Family and Gender" survey modules; ESS = European Social Survey; EVS = European Values Survey; EB VAL = Eurobarometer special surveys on social values; EB EMP = Eurobarometer special surveys on employment and social policy; EB POV = Eurobarometer special surveys on poverty and social exclusion; PEW = Pew Global Attitudes Survey

Table S3: Variables included in the Economic Conservatism Scale

Variable Name	Survey	Years Covered	Question Wording	Response Options
govredist1	ISSP ROG, ISSP INEQ., ISSP ENV	1985, 1990, 1992, 1993, 1996, 1999, 2000, 2009, 2010	What is your opinion of the following statement: "it is the responsibility of the government to reduce differences in income between those with high incomes and those with low incomes"	5-point 1 = agree strongly, 5 = disagree strongly
wagecont	ISSP ROG	1985, 1990, 1996	"Here are some things the government might do for the economy. Please show which actions you are in favor of and which you are against" . . . control of wages by law	5-point 1 = strongly favor, 5 = strongly against
pricecont	ISSP ROG	1985, 1990, 1996	[as above] . . . control of prices by law	5-point 1 = strongly favor, 5 = strongly against
govjobs	ISSP ROG	1985, 1990, 1996, 2006	[as above] . . . financing of projects to create new jobs	5-point 1 = strongly favor, 5 = strongly against
govindust	ISSP ROG	1985, 1990, 1996, 2006	[as above] . . . support for industry to develop new products and technology	5-point 1 = strongly favor, 5 = strongly against
govdecline	ISSP ROG	1985, 1990, 1996, 2006, 2016	[as above] . . . support for declining industries to protect jobs	5-point 1 = strongly favor, 5 = strongly against
govweek	ISSP ROG	1985, 1990, 1996, 2006, 2016	[as above] . . . reducing the working week to create more jobs	5-point 1 = strongly favor, 5 = strongly against
unempinfl	ISSP ROG	1985, 1990, 1996	If the government had to choose between keeping down inflation or keeping down unemployment, to which do you think it should give the highest priority?	2-point 1 = unemployment, 2 = inflation

Table 1 – *Continued from previous page*

Variable Name	Survey	Years Covered	Question Wording	Response Options
ownelect	ISSP ROG	1985, 1990, 1996	What do you think should be the government's role in each of these industries and services should be? …Electricity	1 = Own it 2 = control prices and profits, don't own 3 = neither
ownbanks	ISSP ROG	1985, 1990, 1996	[as above] …Banking and Insurance	As above
respjob	ISSP ROG	1985, 1990, 1996, 2006, 2016	On the whole, do you think it should or should not be the responsibilty of the government to …provide a job for everyone who wants one	4-point 1 = definitely should be 4 = definitely should not be
resphealth	ISSP ROG	1985, 1990, 1996, 2006, 2016	[as above] …provide healthcare for the sick	As above
respold	ISSP ROG	1985, 1990, 1996, 2006, 2016	[as above] …provide a decent standard of living for the old	As above
respind	ISSP ROG	1985, 1990, 1996, 2006, 2016	[as above] …provide industry with the help it needs to grow	As above
respump	ISSP ROG	1985, 1990, 1996, 2006, 2016	[as above] …provide a decent standard of living for the unemployed	As above
govredist2	ISSP ROG	1985, 1990, 1996, 2006, 2016	[as above] …reduce income differences between the rich and poor	As above
respstud	ISSP ROG	1990, 1996, 2006, 2016	[as above] …give financial help to university students from low-income families	As above
resphouse	ISSP ROG	1990, 1996, 2006, 2016	[as above] …provide decent housing for those who can't afford it	As above
equalopp	ESS	2002, 04, 06, 08, 10, 12, 14, 16	"It is important that every person in the world should be treated equally, and everyone should have equal opportunities in life."	6-point top 3 responses indicate disagreement
unempjob	EVS	1990, 1999-00, 2008-10	[as above] 1 = people who are unemployed should have the right to refuse a job they do not want …10 = people who are unemployed should have to take any job available or lose their unemployment benefits	10-point
secfair	EVS	1981-2, 1990 1999-00	"Imagine two secretaries, of the same age, doing practically the same job. In your opinion is it fair or not fair that one secretary is paid more than,	2-point 1 = unfair, 2 = fair

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Table 1 – Continued from previous page

Variable Name	Survey	Years Covered	Question Wording	Response Options
			the other if she is quicker, more efficient and more reliable at her job?"	
freedom	EVS	1981-2, 1990 1999-00, 2008-10	What is more important, freedom or equality?	3-point / 1 = equality, 3 = freedom
concump	EVS	1990, 1999-00, 2008-10	To what extent do you feel concerned about the living conditions of the unemployed?	5-point / 1 = very much, 5 = not at all
diffnec	ISSP INEQ	1987, 1992, 2009	In order to get people to work hard, do you think large differences in pay are necessary?	4-point / 1 = definitely not, 4 = absolutely
incprosp	ISSP INEQ	1987, 1992, 1999	Do you agree or disagree with these statements ..."large differences in income are necessary for a country's prosperity"	5-point / 1 = strongly disagree, 5 = strongly agree
unipoor	ISSP INEQ	1987, 1992	Please show how much you agree or disagree with these statements ..."the government should provide more chances for children from poor families to go to university"	5-point / 1 = strongly agree, 5 = strongly disagree
respjob1	ISSP INEQ	1987, 1992	[as above] ..."the government should provide a job for everyone who wants one"	5-point / 1 = strongly agree, 5 = strongly disagree
respump1	ISSP INEQ	1987, 1992, 2009	[as above] ..."the government should provide a decent standard of living for the unemployed"	5-point / 1 = strongly agree, 5 = strongly disagree
basicinc	ISSP INEQ	1987, 1992	[as above] ..."the government should provide everyone with a guaranteed basic income"	5-point / 1 = strongly agree, 5 = strongly disagree
taxrich1	ISSP INEQ	1987, 1992, 1999, 2009	Do you think that people with high incomes should pay a larger share of their income in taxes than those with low incomes, the same share or a smaller share?	5-point / 1 = much larger share / 5 = much smaller share
privent	ISSP ENV	1993, 2000, 2010	How much do you agree or disagree with the following statements ..."private enterprise is the best way to solve my country's problems"	5-point / 1 = strongly disagree, 5 = strongly agree
freecomp	EB VAL	2006, 2008, 2009	For each of the following propositions, tell me if you agree or disagree ..."Free competition is the best guarantee for economic prosperity "	4-point / 1 = totally disagree, 4 = totally agree
eqjust	EB VAL	2006, 2008, 2009	[as above] ..."We need more equality and justice even if this means less freedom for the individual"	4-point / 1 = totally disagree, 4 = totally agree

Table 1 – *Continued from previous page*

Variable Name	Survey	Years Covered	Question Wording	Response Options
govredist3	EB POV	2009, 2010	For each of the following propositions, tell me if you agree or disagree …"the government should ensure that the wealth of the country is redistributed in a fair way to all citizens"	4-point 1 = totally agree, 4 = totally disagree
nofight	EB POV	2002, 2010	[as above] "There is no point in trying to fight poverty, it will always exist"	4-point 1 = totally disagree, 4 = totally agree
diffnec1	EB POV	2009, 2010	[as above] "Income inequalities are necessary for economic development" some are poor	4-point 1 = totally disagree, 4 =totally agree
freemkt	PEW	2002, 07, 08, 09	Most people are better off in a free market economy, even though some people are rich and some are poor	4-point 1 = completely disagree, 4 = completely agree
interfere	PEW	2002, 09, 11, 12	whatâĂŹs more important in (survey country) society âĂŞ that everyone be free to pursue their lifeâĂŹs goals lifeâĂŹs goals without interference from the state, or that the state play an active role in society so as to guarantee that nobody is in need?	4-point 1 = option 2, 2 =option 1

Table S4: **Variables included in the Economic Mood Scale**

Variable Name	Survey	Years Covered	Question Wording	Response Options
cutspend	ISSP ROG	1985, 1990, 1996, 2006, 2016	In favour or oppose cuts in government spending	5-point 1 = strongly against, 5 = strongly in favor
lessreg	ISSP ROG	1985, 1990, 1996, 2006, 2016	In favour or oppose less government regulations of business	5-point 1 = strongly against, 5 = strongly in favor

Table 2 – *Continued from previous page*

Variable Name	Survey	Years Covered	Question Wording	Response Options
spendhealth	ISSP ROG	1985, 1990, 1996, 2006, 2016	Listed below are various areas of government spending. Please show whether you would like to see more or less government spending in each area. Remember that if you say "much more", it might require a tax increase to pay for it ... "Health"	5-point 1 = spend much more, 5 = spend much less
spendeduc	ISSP ROG	1985, 1990, 1996, 2006, 2016	[as above] "Education"	5-point 1 = spend much more, 5 = spend much less
spendold	ISSP ROG	1985, 1990, 1996, 2006, 2016	[as above] "Old Age Pensions"	5-point 1 = spend much more, 5 = spend much less
spendump	ISSP ROG	1985, 1990, 1996, 2006, 2016	[as above] "Unemployment Benefits"	5-point 1 = spend much more, 5 = spend much less
taxhighinc	ISSP ROG, INEQ	1987, 1992, 1996, 2006, 2016	Taxes for those with high incomes are too high or too low	5-point 1 = much too low, 5 = much too high
taxmidinc	ISSP ROG, INEQ	1987, 1992, 1996, 2006, 2016	Taxes for those with middle incomes are too high or too low	5-point 1 = much too low, 5 = much too high
taxlowinc	ISSP ROG, INEQ	1987, 1992, 1996, 2006, 2016	Taxes for those with low incomes are too high or too low	5-point 1 = much too low, 5 = much too high
incdiff	ISSP INEQ	1987, 1992, 1999, 2009	Differences in income in my country are too large	5-point 1 = Strongly Agree, 5 = Strongly Disagree
incdiff	ISSP INEQ	1987, 1992, 2009	The government should spend less on benefits for the poor	5-point 1 = Strongly Disagree, 5 = Strongly Agree
unipoor	ISSP INEQ	1987, 1992	The government should provide more chances for children from poor families to go to university	5-point 1 = strongly agree, 5 = strongly disagree
govredist	ESS	2002, 04, 06, 08,	The government should take	5-point

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Table 2 – *Continued from previous page*

Variable Name	Survey	Years Covered	Question Wording	Response Options
		10, 12, 14, 16, 16	measures to reduce differences in income levels	1 = agree strongly, 5 = disagree strongly
taxhigher	EB POV	2009, 2010	People who are well-off should pay higher taxes so the government has more means to fight poverty	4-point 1 = totally agree, 4 = totally disagree
eqincent	EVS	1990, 1999-00, 2008-10	"How would you place your views" on this scale? 1 = incomes should be made more equal, 10 = we need larger income differences as incentives	10-point
freefirms	EVS	1999-00, 2008-10	[as above] 1 = the state should control firms more effectively …10 = the state should give more freedom to firms to provide for themselves	10-point
provide	EVS	1990, 1999-00, 2008-10	[as above] 1 = the government should take more responsibility to ensure that everyone is provided for, 10= people should take moreresponsibility for providing for themselves	10-point

Table S5: **Variables included in the Social and Postmaterial Issues Model**

Variable Name	Survey	Years Covered	Question Wording	Response Options
meetings	ISSP ROG	1990, 1996, 2006, 2016	There are many ways people or organisations can protest against a government action they strongly oppose. Please show which you think should be allowed and which should not be	4-point 1 = definitely, 4 = definitely not

Table 3 – *Continued from previous page*

Variable Name	Survey	Years Covered	Question Wording	Response Options
protests	ISSP ROG	1990, 1996, 2006, 2016	allowed: "Organizing public meetings to protest against the government' [as above] "Organising protest marches and demonstrations"	4-point 1 = definitely, 4 = definitely not
kidjob	ISSP F+G,	1988, 1994, 2002, 2012,	To what extent do you agree or disagree...? "A pre-school child is likely to suffer if his or her mother works"	5-point 1 = strongly disagree, 5 = strongly agree
workmoth	ISSP F+G	1988, 1994, 2002, 2012	[as above] "A working mother can establish just as warm and secure a relationship with her children as a mother who does not work"	5-point 1 = strongly agree, 5 = strongly disagree
famjob	ISSP F+G	1988, 1994, 2002, 2012	[as above] "All in all, family life suffers when the woman has a full-time job"	5-point 1 = strongly disagree, 5 = strongly agree
housewife	ISSP F+G	1988, 1994, 2002, 2012	[as above] "Being a housewife is just as fulfilling as working for pay"	5-point 1 = strongly disagree, 5 = strongly agree
husbwife	ISSP F+G	1988, 1994, 2002, 2012	[as above] "A man's job is to earn money a woman's job is to look after the home and family"	5-point 1 = strongly disagree, 5 = strongly agree
singparent	ISSP F+G	1988, 1994, 2002, 2012	[as above] "One parent can bring up a child as well as two parents together"	5-point 1 = strongly agree, 5 = strongly disagree
workkid	ISSP F+G	1988, 1994, 2002, 2012	Do you think that women should work work outside the home full-time, part-time or not at all under the following circumstances? "When there is a child under school age"	3-point 1 = work full-time, 3 = stay at home
workschool	ISSP F+G	1988, 1994, 2002, 2012	[as above] "After the youngest child starts school"	3-point 1 = work full-time, 3 = stay at home
envfuture	ISSP ENV	1993, 1990, 2010	How much do you agree or disagree with each of these statements... "we worry too much about the future of the environment and not enough about	5-point 1 = strongly disagree, 5 = strongly agree

Table 3 – Continued from previous page

Variable Name	Survey	Years Covered	Question Wording	Response Options
			prices and jobs today"	
envprog	ISSP ENV	1993, 1990, 2010	[as above] "People worry too much about human progress harming the environment"	5-point 1 = strongly disagree, 5 = strongly agree
envhtax	ISSP ENV	1993, 1990, 2010	"How willing would you be to pay much higher taxes in order to protect the environment?	5-point 1 = very willing, 5 = very unwilling
envstd	ISSP ENV	1993, 1990, 2010	"How willing would you be to accept cuts in your standard of living in order to protect the environment?	5-point 1 = very willing, 5 = very unwilling
envlaws	ISSP ENV	1993, 1990, 2010	If you had to choose, which of the following would be closest to your views? "government should let ordinary people decide for themselves how to protect the environment, even if it means they don't always do the right thing", or "government should pass laws to make ordinary people protect the environment, even if it interferes with people's rights to make their own decisions"	2-point 1 = second statement, 2 = first statement
envblaws	ISSP ENV	1993, 1990, 2010	[As above - substitute "businesses" for "ordinary people"]	2-point 1 = second statement, 2 = first statement
kidjob1	EVS	1990, 1999-00, 2008-10	To what extent do you agree or disagree...? "A pre-school child is likely to suffer if his or her mother works"	4-point 1 = strongly disagree, 4 = strongly agree
envtax1	EVS	1990, 1999-00, 2008-10	I am now going to read out some statements about the environment. For each one read out, can you tell me whether you agree strongly, agree, disagree or strongly disagree? "I would agree to an increase in taxes if the extra	3-point 1 = strongly agree, 4 = strongly disagree

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Table 3 – *Continued from previous page*

Variable Name	Survey	Years Covered	Question Wording	Response Options
authority	EVS	1981-2, 1990 1999-00, 2008-10	money is used to prevent environmental pollution"	3-point 1 = good thing, 3 = bad thing
			Here is a list of various changes in our way of life that might take place in the near future. Please tell me for each one, if it were to happen whether you think it would be a good thing, a bad thing, or don't you mind?	
jobscarce	EVS	1990, 1999-00, 2008-10	Do you disagree or agree with the following statements: "When jobs are scarce, men have more right to a job than women"	3-point 1 = disagree, 3 = agree
singparent1	EVS	1981-2, 1990 1999-00, 008-10	[as above] "If someone says a child needs a home with both a father and a mother to grow up happily, would you tend to agree or disagree?	3-point 1 = disagree, 3 = agree
workmoth1	EVS	1990, 1999-00, 2008-10	People talk about the changing roles of men and women today. For each of the following statements I read out, can you tell me how much you agree with each: "A working mother can establish just as warm and secure a relationship with her children as a mother who does not work"	4-point 1 = agree strongly, 4=disagree strongly
hwincome	EVS	1990, 1999-00, 2008-10	[as above] "Both the husband and wife should contribute to household income	4-point 1 = agree strongly, 4=disagree strongly
homosex	EVS	1981-2, 1990 1999-00, 2008-10	"Please tell me for each of the following statements whether you think it can always be justified, never be justified, or something in between: "homosexuality"	10-point 1 = always justified, 10=never justified
abortion	EVS	as above	[as above] "Abortion"	as above
divorce	EVS	as above	[as above] "Divorce"	as above
euthan	EVS	as above	[as above] "Euthanasia (terminating the life of the incurably sick)"	as above

Table 3 – *Continued from previous page*

Variable Name	Survey	Years Covered	Question Wording	Response Options
potuse	EVS	as above	[as above] "Taking the drug marijuana or hashish"	as above
tradition	ESS	2002, 04, 06, 08, 10, 12, 14, 16	"It is important to try to follow the customs handed down by religion or family"	6-point; top 3 responses indicate agreement
natenvt	ESS	2002, 04, 06, 08, 10, 12, 14, 16	"It is important to look after nature and the environment"	6-point; top 3 responses indicate disagreement
stronggov	ESS	2002, 04, 06, 08, 10, 12, 14, 16	"It is important that the government is strong and ensures safety"	6-point; top 3 responses indicate disagreement
gayrights	ESS	2002, 04, 06, 08, 10, 12, 14, 16	"To what extent do you agree or disagree that gay men and lesbians should be free to live their life as they wish?"	5-point; 1=agree strongly, 5=disagree strongly
overthrow	ESS	2002, 04, 06, 08, 10	"To what extent do you agree or disagree that political parties that wish to overthrow democracy should be banned?"	5-point; 1=disagree strongly, 5=agree strongly
homosex1	PEW	2002, 07, 11, 13,	"Homosexuality is a way of life that should be accepted by society"	2-point; 1=agree, 2=disagree
envgrowth	PEW	2002, 07, 08, 09, 10	"Protecting the environment should be given priority, even if it causes slower growth and some loss of jobs"	4-point; 1=completely agree, 4=completely disagree

Table S6: Variables included in the Immigration Model

Variable Name	Survey	Years Covered	Question Wording	Response Options
trads	ISSP NI	1995, 2003, 2013	How much do you agree or disagree with the following statements? "It is	5-point; 1=disagree strongly, 5=agree strongly

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Table 4 – Continued from previous page

Variable Name	Survey	Years Covered	Question Wording	Response Options
			is impossible for people who do not share this country's customs and traditions to become fully [nationality]"	
immcrime	ISSP NI	1995, 2003, 2013	[as above] "Immigrants increase crime rates"	5-point 1=disagree strongly, 5=agree strongly
immecon	ISSP NI	1995, 2003, 2013	[as above] "Immigrants are generally good for this country's economy'	5-point 1=agree strongly, 5=disagree strongly
takejobs	ISSP NI	1995, 2003, 2013	[as above] "Immigrants take jobs away from people who were born in this country."	5-point 1=agree strongly, 5=disagree strongly
immprove	ISSP NI	2003, 2013	[as above] "Immigrants improve this society by bringing in new ideas and cultures"	5-point 1=agree strongly, 5=disagree strongly
legalrights	ISSP NI	2003, 2013	[as above] "Legal immigrants to this country who are not citizens should have the same rights as citizens"	5-point 1=agree strongly, 5=disagree strongly
imports	ISSP NI	1995, 2003, 2013	[as above] "We should limit the import of foreign products in order to protect the national economy"	5-point 1=disagree strongly, 5=agree strongly
immgood	ESS	2002, 04, 06, 08, 10,12,14,16	Is it generally good or bad for the country's economy that people come to live here from other countries?	11-point 1=good, 11=bad
immcult	ESS	2002, 04, 06, 08, 10,12,14,16	Is the country's cultural life generally undermined or enriched by immigrants coming to live here?	11-point 1=enriched, 11=undermined
immbetter	ESS	2002, 04, 06, 08, 10,12,14,16	Is the country a better or worse place to live as a result of immigrants coming to	11-point 1=enriched, 11=undermined

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Variable Name	Survey	Years Covered	Question Wording	Response Options
			live here?	
immsame	ESS	2002, 04, 06, 08, 10,12,14,16	To what extent do you think this country should allow people of the same race or ethnic group as most of the country to come and live here?	4-point top 3 signal agreement
immdiff	ESS	2002, 04, 06, 08, 10,12,14,16	[as above] …different race or ethnic group?	4-point top 3 signal agreement
immpoor	ESS	2002, 04, 06, 08, 10,12,14,16	[as above] …people from the poorer countries outside Europe?	4-point top 3 signal agreement
scarceimms	EVS	1990, 1999-00, 2008-10	'When jobs are scarce, employers should give priority to native people over immigrants'	3-point 1=disagree, 3=agree
concimms	EVS	1999-00, 2008-10	To what extent do you feel concerned about the living conditions of immigrants in your country?	5-point 1=very much, 5=not at all
limitfors	EVS	1999-00, 2008-10	'Which one of the following do you think the government should do about people from less developed countries coming here to work?	4-point top 2: prohibit/place limits
forinfl	PEW	2002, 07, 09, 12	'Our way of life needs to be protected against foreign influence'	4-point 1=completely disagree, 4=completely agree
socright	EB VAL	1997, 2000, 2003	'Legally established immigrants from outside the European Union should have the same social rights as citizens.'	2-point 0=agree, 1=disagree
sendump	EB VAL	1997, 2000, 2003	'Legally established immigrants from outside the European Union should be sent back to their country of origin if they	2-point 0=disagree, 1=agree

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Table 4 – *Continued from previous page*

Variable Name	Survey	Years Covered	Question Wording	Response Options
			are unemployed.'	
sendall	EB VAL	1997, 2000, 2003	'Legally established immigrants from outside the European Union should all be sent back to their country of origin'	2-point 0=disagree, 1=agree
allhome	EB VAL	1997, 2000, 2003	'All illegal immigrants should be sent back to their country of origin without exception'	2-point 0=disagree, 1=agree

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8. Exposition of the Ordinal DGIRT Model

8.1. Individual-Level Model

We assume that subject i's latent preference on question q, y_{iq}^*, is governed by the stochastic utility model

$$y_{iq}^* = \beta_q \theta_i + \epsilon_{iq}, \tag{1}$$

where θ_i is i's domain-specific conservatism, β_q is question q's "discrimination," and $\epsilon_{iq} \sim \mathrm{N}(0, \sigma_q^2)$ is an iid utility shock. For ordinal question q, the categorical response $y_{iq} = k \in \{1 \dots K_q\}$ is observed if $\alpha_{q,k-1} < y_{iq}^* \leq \alpha_{qk}$, where $\alpha_{q,k-1}$ is the "threshold" for response option k to question q. The probability that i selects response option k is

$$
\begin{aligned}
\pi_{iqk} &= \Pr(y_{iq} = k \mid \theta_i, \beta_q, \boldsymbol{\alpha}_q) \\
&= \Pr(k - 1 < y_{iq} \leq k) \\
&= \Pr(\alpha_{q,k-1} < y_{iq}^* \leq \alpha_{qk}) \\
&= \Pr(\alpha_{q,k-1} < \beta_q \theta_i + \epsilon_{iq} \leq \alpha_{qk}) \\
&= \Pr(\alpha_{q,k-1} - \beta_q \theta_i < \epsilon_{iq} \leq \alpha_{qk} - \beta_q \theta_i) \\
&= \Pr\left(\frac{\alpha_{q,k-1} - \beta_q \theta_i}{\sigma_q} < \frac{\epsilon_{iq}}{\sigma_q} \leq \frac{\alpha_{qk} - \beta_q \theta_i}{\sigma_q} \right) \\
&= \Phi\left(\frac{\alpha_{qk} - \beta_q \theta_i}{\sigma_q} \right) - \Phi\left(\frac{\alpha_{q,k-1} - \beta_q \theta_i}{\sigma_q} \right) && \left(\frac{\epsilon_{iq}}{\sigma_q} \sim \mathrm{N}(0, 1) \right) \\
&= \left[1 - \Phi\left(-\frac{\alpha_{qk} - \beta_q \theta_i}{\sigma_q} \right) \right] - \left[1 - \Phi\left(-\frac{\alpha_{q,k-1} - \beta_q \theta_i}{\sigma_q} \right) \right] \\
&= \left[1 - \Phi\left(\frac{\beta_q \theta_i - \alpha_{qk}}{\sigma_q} \right) \right] - \left[1 - \Phi\left(\frac{\beta_q \theta_i - \alpha_{q,k-1}}{\sigma_q} \right) \right] \\
&= \Phi\left(\frac{\beta_q \theta_i - \alpha_{q,k-1}}{\sigma_q} \right) - \Phi\left(\frac{\beta_q \theta_i - \alpha_{qk}}{\sigma_q} \right). \tag{2}
\end{aligned}
$$

Equation (2) is the probit version of the (individual-level) ordinal IRT model.

8.2. Group-Level Model

Suppose the quantity of interest is not individual-level conservatism θ_i, but rather the average conservatism $\bar{\theta}_g$ of population groups $g \in \{1 \dots G\}$. If conservatism is distributed within groups as

$$\theta_{i[g]} \sim \mathrm{N}(\bar{\theta}_g, \sigma_\theta^2), \tag{3}$$

then the distribution of latent preferences is

$$y_{i[g]q}^* \sim \mathrm{N}(\beta_q \bar{\theta}_g, \sigma_q^2 + \sigma_\theta^2) \tag{4}$$

and the probability that a randomly sampled member $i[g]$ of group g selects response option k to item q is

$$
\begin{aligned}
\Pr(y_{i[g]q} = k \mid \bar{\theta}_g, \beta_q, \boldsymbol{\alpha}_q, \sigma_\theta^2) &= \Pr(\alpha_{q,k-1} < y_{i[g]q}^* \leq \alpha_{qk}) \\
&= \Phi\left(\frac{\beta_q \bar{\theta}_g - \alpha_{q,k-1}}{\sqrt{\sigma_q^2 + \beta_q^2 \sigma_\theta^2}}\right) - \Phi\left(\frac{\beta_q \bar{\theta}_g - \alpha_{q,k}}{\sqrt{\sigma_q^2 + \beta_q^2 \sigma_\theta^2}}\right) \\
&= \pi_{gqk}.
\end{aligned}
\tag{5}
$$

Equation (5) is the probit version of the *group-level* ordinal IRT model.

8.3. Sampling Model

Let $s_{gqk} = \sum_{i \in g} 1_{y_{iq}=k}$ denote the number of respondents in group g who selected category k in response to question q. If (conditional on π_{gqk}) responses are iid sampled within groups, these totals follow the multinomial distribution

$$
\mathbf{s}_{gq} \sim \text{Multinomial}(\boldsymbol{\pi}_{gq}),
\tag{6}
$$

where $\mathbf{s}_{gq} = (s_{gq1}, \ldots, s_{gqK_q})$ and $\boldsymbol{\pi}_{gq} = (\pi_{gq1}, \ldots, \pi_{gqK_q})$. The assumption of iid sampling will be violated if respondents' sampling probabilities are not equal and/or there are multiple responses per respondent (which would introduce dependence among responses; for details see Fox, Mulder, and Sinharay 2017, 1002). As noted by Caughey and Warshaw (2015), both problems can be addressed by weighting the responses y_{iq} and using the weighted sum $s_{gqk}^* = \sum_{i \in g} w_i \times 1_{y_{iq}=k}$. In brief, each subject i is assigned a weight w_i that is inversely proportional to the product of i's (estimated) sampling probability and the number of questions i answered. The effect of the latter is to decrease the effective sample size for the estimates of $\bar{\theta}_g$ in proportion to the number of duplicated respondents. Unless responses of a given person are perfectly correlated, the latter correction is conservative in the sense that it overstates the uncertainty surrounding estimates of $\bar{\theta}_g$. Finally, following Ghitza and Gelman (2013), we also divide s_{gqk}^* by a design effect (weakly greater than 1) to account for the added variability induced by within-group variation in weights.

8.4. Dynamic Model

We allow groups' conservatism to differ across time periods $t \in 1 \ldots T$, and we model the evolution of $\bar{\theta}_{gt}$ using a local-level transition model,

$$
\bar{\theta}_{gt} \sim \text{N}(\bar{\theta}_{g,t-1}, \sigma_{\bar{\theta}}^2),
\tag{7}
$$

where the transition variance $\sigma_{\bar{\theta}}^2$ is a parameter to be estimated. The model in (7) thus serves as a dynamic prior for $\bar{\theta}_{gt}$, smoothing or (in the limit) imputing estimates in periods with little or no survey data.

8.5. Priors

Aside from $\bar{\theta}_{gt} \, \forall t > 1$, all unbounded parameters are assigned a $\text{N}(0,1)$ prior. The standard deviations $\sigma_{\bar{\theta}}$ and σ_θ are assigned half-Cauchy$(0,1)$ priors with positive support.

8.6. Identification

We impose the following (standard) identification restrictions on the stochastic utility model,

- $\sigma_q = 1 \, \forall q$

- $\alpha_{q0} = -\infty \ \forall q$

- $\alpha_{qK_q} = +\infty \ \forall q,$

as well as the following (standard) restrictions on the IRT model,

- $\beta_q > 0 \ \forall q$

- $\sum_g \sum_t \bar{\theta}_{gt} = 0$

- $\mathrm{Var}(\bar{\theta}_{gt}) = 1.$

The last two restrictions are achieved by normalizing $\bar{\theta}_{gt}$ to be mean-zero and unit-variance within each Monte Carlo iteration.

8.7. Likelihood

Substituting π_{tgqk} for π_{gqk} and s^*_{tgqk} for s_{gqk}, the likelihood of the multinomial sampling model in (6) is

$$L(\boldsymbol{\pi} \mid \boldsymbol{s}^*) = \prod_{t=1}^{T} \prod_{g=1}^{G} \prod_{q=1}^{Q} C_{tgq} \prod_{k=1}^{K_q} (\pi_{tgqk})^{s^*_{tgqk}}, \tag{8}$$

where the multinomial coefficient $C_{tgq} = (\sum_k s_{tgqk})! / \prod_k (s_{tgqk}!)$ is a constant that that can be ignored for the purposes of estimation. After dropping C_{tgq}, substituting in (5), and imposing the identification restriction $\sigma_q = 1 \ \forall q$, we obtain the likelihood for the full model:

$$L(\boldsymbol{\beta}, \boldsymbol{\alpha}, \bar{\boldsymbol{\theta}}, \sigma_\theta^2 \mid \mathbf{s}^*) = \prod_{t=1}^{T} \prod_{g=1}^{G} \prod_{q=1}^{Q} \overbrace{\prod_{k=1}^{K_q} \underbrace{\left[\Phi\left(\frac{\beta_q \bar{\theta}_{tg} - \alpha_{q,k-1}}{\sqrt{1 + \beta_q^2 \sigma_\theta^2}} \right) - \Phi\left(\frac{\beta_q \bar{\theta}_{tg} - \alpha_{q,k}}{\sqrt{1 + \beta_q^2 \sigma_\theta^2}} \right) \right]^{s^*_{tgqk}}}_{\text{ordinal group-level IRT model}}}^{\text{multinomial model}}. \tag{9}$$

This likelihood, in conjunction with the priors and identification restrictions described above, characterizes the ordinal dynamic group-level IRT model used in the paper.

9. Stan Code for the Ordinal DGIRT Model

```
functions {
  real p2l_real (real x) { // coverts scalar from probit to logit scale
    real y;
    y = 0.07056 * pow(x, 3) + 1.5976 * x;
    return y;
  }
  vector p2l_vector (vector x) { // coverts vector from probit to logit scale
    vector[num_elements(x)] y;
    for (i in 1:num_elements(x)) {
      y[i] = 0.07056 * pow(x[i], 3) + 1.5976 * x[i];
    }
    return y;
  }
}
```

```
data {
  int<lower=1> T;                  // number of years
  int<lower=1> G;                  // number of covariate groups
  int<lower=1> Q;                  // number of items/questions
  int<lower=1> D;                  // number of latent dimensions
  int<lower=1> K;                  // max number of answer options
  real<lower=0> SSSS[T, G, Q, K];  // number of responses (possibly non-integer)
  real beta_sign[Q, D];            // sign restrictions on betas
  int unused_cut[Q, (K-1)];        // indicates categories with no responses
  int<lower=0,upper=1> evolving_alpha;
  int<lower=0> N_nonzero;
}
parameters {
  real raw_bar_theta_N01[T, G, D]; // group means (pre-normalized, N(0,1) scale)
  ordered[K-1] raw_alpha[T, Q];    // thresholds (difficulty)
  real beta_free[D, Q];            // discrimination (unconstrained)
  real<upper=0> beta_neg[D, Q];    // discrimination (negative)
  real<lower=0> beta_pos[D, Q];    // discrimination (positive)
  vector<lower=0>[D] sd_theta_N01; // standard normal
  vector<lower=0>[D] sd_theta_IG;  // inverse-gamma
  vector<lower=0>[D] sd_theta_evolve_N01; // standard normal
  vector<lower=0>[D] sd_theta_evolve_IG;  // inverse-gamma
  real<lower=0> sd_alpha_evolve_N01;       // standard normal
  real<lower=0> sd_alpha_evolve_IG;        // inverse-gamma
}
transformed parameters {
  // Declarations
  real raw_bar_theta[T, G, D]; // group means (pre-normalized)
  real bar_theta[T, G, D];     // group means (normalized)
  matrix[Q, D] beta;           // discrimination
  ordered[K-1] alpha[T, Q];    // thresholds (difficulty)
  vector[D] sd_theta;          // within-group SD of theta
  vector[D] sd_theta_evolve;   // transition SD of theta
  real sd_alpha_evolve;        // transition SD of alpha
  cov_matrix[D] Sigma_theta;   // diagonal matrix of within-group variances
  vector[D] mean_raw_bar_theta;
  vector[D] sd_raw_bar_theta;
  // Assignments
  sd_theta = sd_theta_N01 .* sqrt(sd_theta_IG); // sd_theta ~ cauchy(0, 1);
  sd_theta_evolve = sd_theta_evolve_N01 .* sqrt(sd_theta_evolve_IG); // ditto
  sd_alpha_evolve = sd_alpha_evolve_N01 * sqrt(sd_alpha_evolve_IG);  // ditto
  Sigma_theta = diag_matrix(sd_theta .* sd_theta);
  for (t in 1:T) {
    if (t == 1) {
      for (g in 1:G) {
        for (d in 1:D) {
          raw_bar_theta[t, g, d] = raw_bar_theta_N01[t, g, d];
        }
      }
      for (q in 1:Q) {
        vector[K-1] alpha_prior_mean;
        alpha_prior_mean =
          rep_vector(100, K-1) .* to_vector(unused_cut[q, 1:(K-1)]);
```

```
        alpha[t, q] =
          alpha_prior_mean + raw_alpha[t, q]; // alpha[1] ~ N(0/100, 1)
      }
    }
    if (t > 1) {
      for (g in 1:G) {
        for (d in 1:D) {
          // implies raw_bar_theta[t] ~ N(raw_bar_theta[t-1], sd_theta_evolve)
          raw_bar_theta[t, g, d] = raw_bar_theta[t-1, g, d]
            + sd_theta_evolve[d] * raw_bar_theta_N01[t, g, d];
        }
      }
      for (q in 1:Q) {
        for (k in 1:(K-1)) {
          if (evolving_alpha == 0) {
            alpha[t, q][k] = alpha[1, q][k]; // copy first period
          }
          if (evolving_alpha == 1) {
            // implies alpha[t,q] ~ N(alpha[t-1, q][k], sd_alpha_evolve)
            alpha[t, q][k] =
              alpha[t-1, q][k] + sd_alpha_evolve * raw_alpha[t, q][k];
          }
        }
      }
    }
  }
  // Identify location and scale
  for (d in 1:D) {
    mean_raw_bar_theta[d] = mean(to_matrix(raw_bar_theta[1:T, 1:G, d]));
    sd_raw_bar_theta[d] = sd(to_matrix(raw_bar_theta[1:T, 1:G, d]));
    for (t in 1:T) {
      for (g in 1:G) {
        bar_theta[t, g, d] = (raw_bar_theta[t, g, d] - mean_raw_bar_theta[d])
          ./ sd_raw_bar_theta[d];
      }
    }
  }
  // Identify polarity
  for (q in 1:Q) {
    for (d in 1:D) {
      if (beta_sign[q, d] == 0) {
        beta[q, d] = beta_free[d, q];
      }
      if (beta_sign[q, d] < 0) {
        beta[q, d] = beta_neg[d, q];
      }
      if (beta_sign[q, d] > 0) {
        beta[q, d] = beta_pos[d, q];
      }
    }
  }
}
model {
```

```stan
    vector[N_nonzero] SSSS_summands; // to store log-likelihood for summation
    int SSSS_pos = 0;
    // Priors
    for (t in 1:T) {
      for (q in 1:Q) {
        raw_alpha[t, q][1:(K-1)] ~ normal(0, 1);
      }
    }
    to_array_1d(raw_bar_theta_N01[1:T, 1:G, 1:D]) ~ normal(0, 1);
    to_array_1d(beta_free[1:D, 1:Q]) ~ normal(0, 10);
    to_array_1d(beta_neg[1:D, 1:Q]) ~ normal(0, 10);
    to_array_1d(beta_pos[1:D, 1:Q]) ~ normal(0, 10);
    sd_theta_N01 ~ normal(0, 1);                // sd_theta ~ cauchy(0, 1);
    sd_theta_IG ~ inv_gamma(0.5, 0.5);          // ditto
    sd_theta_evolve_N01 ~ normal(0, 1);         // ditto
    sd_theta_evolve_IG ~ inv_gamma(0.5, 0.5);   // ditto
    sd_alpha_evolve_N01 ~ normal(0, 1);         // ditto
    sd_alpha_evolve_IG ~ inv_gamma(0.5, 0.5);   // ditto
    // Likelihood
    for (t in 1:T) {
      for (q in 1:Q) {
        real z_denom;
        vector[K-1] cut;
        z_denom =
          sqrt(1 + quad_form(Sigma_theta[1:D, 1:D], to_vector(beta[q][1:D])));
        cut = p2l_vector(alpha[t, q][1:(K-1)] / z_denom);
        for (g in 1:G) {
          for (k in 1:K) {
            if (SSSS[t, g, q, k] > 0) {
              real eta;
              SSSS_pos += 1;
              eta = p2l_real(beta[q][1:D] * to_vector(bar_theta[t, g, 1:D])
                            / z_denom);
              SSSS_summands[SSSS_pos] =
                SSSS[t, g, q, k] * ordered_logistic_lpmf(k | eta, cut);
            }
          }
        }
      }
    }
    target += sum(SSSS_summands);
}
generated quantities {
  vector[D] sd_theta_std = sd_theta[1:D] ./ sd_raw_bar_theta;
  vector[D] sd_theta_evolve_std = sd_theta_evolve[1:D] ./ sd_raw_bar_theta;
}
```

10.   Additional Details on Convergent Validation

We began our validation analysis in the main text with convergent validation, demonstrating that our measures are strongly correlated with alternative indicators of domain-specific policy preferences. Specifically, we compare our conservatism estimates with responses to highly ideological survey questions in each domain. Figure S10 (Figure 6 in the main text) shows the correlation of our estimates on each domain with one "internal" issue question that is included in the data used to estimate our conservatism scores and one "external" issue question that does not contribute to our estimates.[3] All of these comparisons show a strong correlation between our ideology estimates and specific issue questions on each domain. The upper-left panels show that our estimates of economic conservatism in 2009–10 have a correlation of 0.73 with a redistribution question from the 2009–10 Eurobarameter that we include in our dataset and a 0.66 correlation with a question about support for a free market economy from the 2009 TransAtlantic Trends Survey that we did not include. The upper-right panels show that our estimates of economic mood have a correlation of 0.92 with a redistribution question from the 2002–06 ESS that we include in our dataset and a nearly equally strong correlation (0.78) with a question on economic fairness in the respondent's country from the 2013 TransAtlantic Trends Survey that we did not include. The lower-left panel shows that our social estimates have correlations of 0.87 with an internal question about support for gay rights from the 2012 ESS, and 0.96 with an external question about gay rights in the 2014 European Election Study that we did not include. Finally, the lower-right panel indicates that our estimates have correlations of 0.92 with an internal question on immigration from the 2012 ESS, and 0.78 with an external question about whether immigrants are a burden in Pew's 2014 Global Attitudes survey that we did not include.

Figure S10: Correlations between domain-specific conservatism and individual issue questions. The left column validates the scale against "internal" issue questions included in the data used to estimate the corresponding conservatism scores, whereas the right column validates against "external" questions not included in the original data.
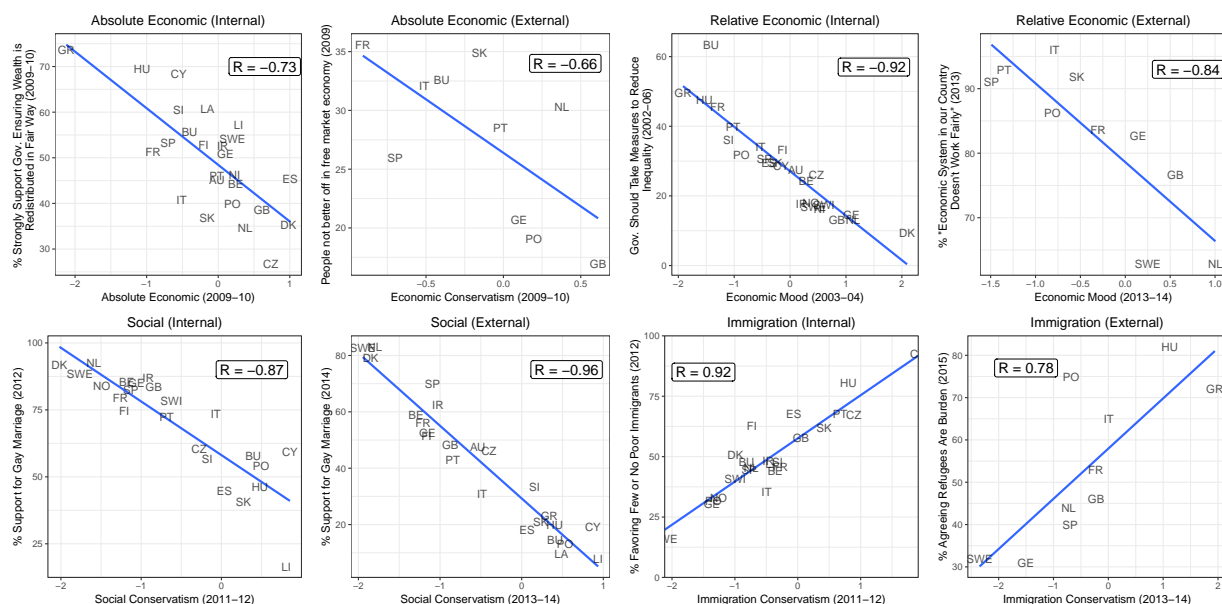
---

3. The "external" questions were in all cases not included in our scales because they were asked in only a single year. In certain cases, such as the European Election Study, it may be possible to incorporate the question in future if is repeated across waves.

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