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Economic insecurity and political preferences

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Abstract

Economic insecurity has attracted growing attention, but there is no consensus as to its definition. We characterize a class of individual economic-insecurity measures based on the time profile of economic resources. We apply this economic-insecurity measure to political-preference data in the USA, UK, and Germany. Conditional on current economic resources, economic insecurity is associated with both greater political participation (support for a party or the intention to vote) and more support for conservative parties. In particular, economic insecurity predicts greater support for both Donald Trump before the 2016 US Presidential election and the UK leaving the European Union in the 2016 Brexit referendum.

JEL classifications: D63, D72, I32

1. Introduction

Preferences are fundamental for the understanding of behavior, and the social sciences have devoted a great deal of attention to preferences in the sphere of politics. The existing literature in this area has considered a wide variety of correlates, including the relationship between political preferences and income (Glaeser and Ward, 2006, among many others), individuals' social origins (Druckman and Lupia, 2000), and the role of personality (Malka *et al.*, 2014). Part of this latter work has underlined the link between conservatism and the need for security and the ability to manage uncertainty (Jost *et al.*, 2003, 2007; Malka *et al.*, 2014; Beall *et al.*, 2016); earlier work along these lines emphasizing the roles of aversion to novelty and worries about security can be found in Adorno *et al.* (1950) and Rokeach (1960), for example. Hibbing *et al.* (2014, p. 297) write that 'Compared with liberals, conservatives tend to register greater physiological responses to [features of the environment that are negative] and also to devote more psychological resources to them.'

Following this line of work, our main topic here is economic insecurity and its impact on political preferences. A number of recent contributions have considered the link between economic insecurity and, variously, support for populist parties (Guiso *et al.*, 2020; Guriev and Papaioannou, 2022, among others), a lack of trust toward the EU (Algan *et al.*, 2017; Dustmann *et al.*, 2017; Foster and Frieden, 2017), the 2016 US Presidential election (Inglehart and Norris, 2016; Mutz, 2018, among many others), and the 2016 UK referendum on EU membership (e.g., Sampson, 2017; Colantone and Stanig, 2018). Economic insecurity is proposed in these contributions as an alternative explanation of populist preferences to a cultural backlash against progressive values, such as cosmopolitanism and multiculturalism (as in Inglehart and Norris, 2016; Halla *et al.*, 2017; Dustmann *et al.*, 2019) or status threat, following Mutz (2018).

Economic insecurity is an *a priori* plausible explanation for recent shifts in political preferences, as it has arguably risen for a number of reasons: automation and the fear of job loss, the Chinese import shock, and aging populations and migration, to take some examples. There is no doubt that economic insecurity has appeared with increasing frequency in policy debates and academic research following the Great Recession, with its associated job instability and job losses, the marked decline of the middle class, and numerous home foreclosures (along with stagnant housing markets) that have had a profound effect on the lives of many. As a result, household optimism scores with respect to their financial situation, savings, the threat of future unemployment, and the economic outlook in general have all dropped sharply, as reflected, for example, in the Consumer Confidence Indicator of the European Commission (https://ec.europa.eu/info/business-economy-euro/indicators-statistics/economic-databases/business-and-consumer-surveys/latest-business-and-consumer-surveys).

Economic insecurity reaches beyond politics. Existing work has also proposed links between economic insecurity and obesity (Smith *et al.*, 2013), suicide rates (Reeves *et al.*, 2014), mental health (Rohde *et al.*, 2016), and gun violence in US schools (Pah *et al.*, 2017). A related strand of literature has considered the potential intergenerational transmission of parents' insecurity to the future outcomes of their children (Kalil, 2013; Clark *et al.*, 2021).

Despite the depth of interest, there is no established definition or measure of economic insecurity. In the recent work on political outcomes noted above, economic insecurity has been measured in a number of arguably *ad hoc* ways; this in itself may be behind the lack of consensus regarding the drivers of the shift in preferences. Algan *et al.* (2017) and Foster and Frieden (2017) measure insecurity as the change in the unemployment rate; Inglehart and Norris (2016) by the Goldthorpe class measure, the experience of unemployment, living on benefits, urbanization, and self-reported difficulty in living on the current household income; Dustmann *et al.* (2017) as per capita income and the unemployment rate; Foster and Frieden (2017) by current unemployment; Guiso *et al.* (2020) as the first principal component of the experience of unemployment over the past five years, self-reported difficulty in living on the current household income, and exposure to globalization (approximated by the type of employment, industry, and the worker's skill level); and last the change in family income between 2012 and 2016, looking for work, and the subjective perception of family finances in Mutz (2018).

A small number of proposed economic-insecurity indices have appeared in the more general literature, including: (i) the Economic Security Index of Hacker *et al.* (2010); (ii) proposals by the International Labour Organization (2004) and Osberg and Sharpe (2009); and (iii) the index in Rohde *et al.* (2014). These are, respectively, based on: (i) the fraction of the population who experience a drop in disposable family income of at least 25% from the previous year and lack an adequate financial safety net; (ii) a weighted average of the 'scores' of different attributes as a percentage of the population; and (iii) the volatility arising from incomes dropping below the household's overall trend. The Business Dictionary (www.businessdictionary.com) defines economic security as 'A situation of having a stable source of financial income that allows for the on-going maintenance of one's standard of living currently and in the near future.' See Osberg (2015, 2018) and Rohde and Tang (2018) for a thorough discussion and excellent surveys of these measures.

Our contribution to the literature is two-fold. We first propose and characterize a class of objective individual measures of insecurity, as opposed to measures that are self-reported or based on aggregate economic phenomena. We then show that this notion of individual economic insecurity is related to political preferences in a number of well-known datasets.

The individual economic-insecurity indices that we suggest measure the confidence with which individuals can face any potential future economic changes. This confidence is argued to depend on their past experiences of gains and losses in resources. The principle here is an old one. For instance, Knight (1921, p. 199) states that, 'all reasoning rests on the principle of analogy. We know the absent from the present, the future from the now, by assuming that connections or associations among phenomena which have been valid will be so; we judge the future by the past.' The influence of memories of the past on current individual behavior is also central to some of the fundamental contributions of Allais (1966, 1972, 1974); see also Munier (1991) for a thorough discussion. The domain of our economic-insecurity measure is then given by resource streams of varying lengths. The length of these streams is not assumed to be fixed, as individuals are of different (economic) ages in a given time period. We also allow resources to be negative, which is a realistic assumption.

We believe that our indices provide a link between the two main explanations above of recent political preferences—status threat versus economic insecurity. Insecurity does not refer to the levels of resources but rather to their changes; an individual may be rich, and belong to the dominant cultural population group, but still be insecure due to their experience of income changes. Our insecurity index is then one particular way of looking at past variations in economic resources in order to measure individual anxiety about, and hence the threat of, what the future may bring.

The first two properties of our class are fundamental in the sense that we consider them essential for a mapping that assigns numerical economic-insecurity values to resource streams. The first is that a gain (loss) from the earliest period under consideration to the following period is associated with a lower (higher) level of insecurity when compared with the situation where no such change occurs, provided that the resource levels remain the same from the next-to-earliest to the current period. This restriction to equal resource values serves to ensure that our conclusions are reached without using unnecessarily strong assumptions. We note that the resulting measures do, however, satisfy a stronger property the scope of which is not limited to the case of equal resources. The second basic property ensures that specific movements within a stream have a larger impact the closer they are to the current period: more-recent experiences carry a greater weight in determining insecurity than those further in the past. Again, we limit the scope of the requirement so as to avoid overly demanding conditions. We think of the conjunction of these two properties as a suitable set of minimal requirements to be met by an individual insecurity index. This is analogous to the standard definition of an inequality measure as an S-convex function—that is, a symmetric function that respects the Pigou–Dalton principle of progressive transfers.

As with the measurement of income inequality, the defining postulates are compatible with a wide range of possible indices. Further properties are thus needed in order to produce more-concrete proposals. Again, as is the case for essentially all social index numbers, it would be too much to hope for a single measure that is universally accepted as being the 'best' and, therefore, some additional properties are bound to be more controversial than the fundamental requirements. The main theoretical result of this article is the characterization of a class of individual insecurity measures, the members of which are based on geometrically discounted resource differences. Only three parameters need to be chosen: a discount factor that is common to past gains and losses, and two parameters that express the relative importance of aggregate discounted losses and aggregate discounted gains.

We apply our individual insecurity measure to one of the vibrant areas of research in the social sciences: the analysis of political preferences. We first examine two of the longest running large-scale panel datasets, and show that economic insecurity significantly increases the probability of supporting *some* political party in both the UK and Germany. This result is not in line with the predictions from the theoretical model in Guiso *et al.* (2020), where insecurity is argued to increase incentives to abstain. However, our results can be read through the lenses of evidence coming from Psychology. Economic insecurity may develop the need for security which is, in turn, associated with a greater adherence to conservative values (Jost *et al.*, 2003, 2007; Malka *et al.*, 2014). The (perceived) ability of conservative parties to manage uncertainty may then change political preferences.

Note that our main dependent variable reflects the intention to vote. As shown in Arcuri *et al.* (2008), intentions to vote are very good predictors of actual voting behavior. As such, we will use both the terms 'intention to vote' and 'voting' in the remainder of the article.

We then demonstrate that this greater participation is not equally shared across the political spectrum: in line with what the literature in Psychology would predict, economic insecurity increases support for right-leaning parties (the Conservatives in the UK and the CDU/CSU in Germany) and to a lesser extent center parties (the FDP in Germany). In contrast, support for left-leaning parties falls with economic insecurity (especially in West Germany). These results hold in regressions that control for current income, homeownership, and current and past unemployment, and are independent of the nature of the incumbent government. They are stronger for the married and those with children.

Our empirical results on insecurity and voting survive a number of robustness tests, including estimating a value-added model controlling for past political preferences, controlling for perceived changes in financial situation over the past year, and a wide variety of parameter values of our economic-insecurity index. We show that life satisfaction does not mediate our results. We also carry out a beauty contest to show that our index predicts political outcomes better than do a number of common ways of summarizing income movements, such as a recent large fall, the variance, and the trend growth rate.

The empirical part of the article concludes with the examination of two recent notable political events: the 2016 Presidential election in the USA and the 2016 UK European-Union membership ('Brexit') referendum. Using data from the Understanding American Society (UAS) and the UK Understanding Society surveys, higher values of our economic-insecurity measure predict more support for Donald Trump and Brexit. Overall, our results are consistent with the literature in Economic History showing that episodes of economic recession favored the rise of populism in the 19th and 20th centuries (de Bromhead *et al.*, 2013; Funke *et al.*, 2016). They are also in line with contributions regarding more-recent periods, such as Dustmann *et al.* (2017), where economic insecurity is considered as a driver for populism.

The remainder of the article is organized as follows. Section 2 introduces and axiomatically characterizes our measures of economic insecurity. The empirical relationship between insecurity and voting behavior then appears in Section 3. Section 4 is devoted to some concluding remarks. The proof of our theoretical result (including examples that establish the independence of the axioms employed) can be found in Appendix A, and Appendix B contains additional tables illustrating the empirical findings.

2. Measuring economic insecurity

To provide a formal definition of an individual measure of insecurity, we need to introduce some notational conventions. We use 1_m to denote the vector consisting of $m \in \mathbb{N} \setminus \{1\}$ ones. For any $T \in \mathbb{N}$, let $\mathbb{R}^{(T)}$ be the $(T+1)$-dimensional Euclidean space with components labeled $(-T, \ldots, 0)$. Zero is interpreted as the current period and T is the number of past periods taken into consideration. We allow T to vary as people alive in the current period may have been born (or have become economic agents) in different periods. A measure of individual insecurity is a sequence of functions $I = \langle I^T \rangle_{T \in \mathbb{N}}$ where, for each $T \in \mathbb{N}$, $I^T : \mathbb{R}^{(T)} \to \mathbb{R}$. This index assigns a degree of insecurity to each individual resource stream $x = (x_{-T}, \ldots, x_0) \in \mathbb{R}^{(T)}$. We allow resources to be negative. As can be seen from these definitions, we restrict attention to streams that involve at least one past period in addition to the current period; this is because our indices are based on pairwise differences.

In an earlier contribution, Bossert and D'Ambrosio (2013) proposed and characterized classes of linear measures of insecurity that bear a formal resemblance to the single-series Gini and single-parameter Gini inequality measures (see, for instance, Donaldson and Weymark, 1980; Weymark, 1981; Bossert, 1990). The application of these Gini-type measures requires the choice of numerous parameter values. In particular, the main result in Bossert and D'Ambrosio (2013) involves two sequences of parameters—with one parameter each for past gains and past losses in each time period under consideration. Even restricting our attention to a finite number of periods, this requires a rather formidable number of parameter values. Thus, the flexibility afforded by this large class comes at a price: without further systematic restrictions, it may be difficult to make a sound choice of what may be considered 'suitable' parameter values. Moreover, the measures characterized in Bossert and D'Ambrosio (2013) fail to satisfy stationarity, a standard property in intertemporal economic models. Stationarity implies that no significance is attached to the way in which time periods are numbered, and it is necessary to avoid behavior where, with the mere passage of time, plans that were optimal yesterday may no longer be optimal today.

We begin by introducing two axioms that we consider essential for a measure of individual insecurity. The first of these ensures that a gain in resources from the earliest period under consideration to the next is associated with a lower level of insecurity than a situation in which no change occurs between these two periods. Likewise, a loss in resources that occurs from the earliest period to the following produces greater insecurity than no change. As alluded to in Section 1, we limit the scope of the property in order to avoid the use of unnecessarily demanding conditions. In particular, we assume that a resource level p is obtained in all but the earliest period and require insecurity to be highest (lowest) if a loss (gain) q is observed when moving from the earliest period to the next.

Gain-loss monotonicity

For all $t \in \mathbb{N}$, for all $p \in \mathbb{R}$, and for all $q \in \mathbb{R}_{++}$,

$$I^t(p+q, p1_t) > I^t(p, p1_t) > I^t(p-q, p1_t).$$

The second fundamental axiom addresses the timing of specific variations in a resource stream. Suppose that there is an increase from a resource level of p to a resource level $p+q$ in one period, followed by a drop from $p+q$ back to p in the following period. We think that, *ceteris paribus*, this first-up-then-down move generates insecurity because the individual is discouraged by the immediate loss of a previous gain. To reflect the hypothesis that more recent experiences are more influential the closer they occur to the present, our property requires that a first-up-then-down move is associated with more insecurity if it occurs closer to the current period. The same argument applies to a first-down-then-up move in which the resource level drops from p to $p-q$ in one period and then immediately goes back up to p in the following period: the individual is encouraged by the immediate recovery from a loss and, therefore, such a move is insecurity-reducing. With the maxim of assigning greater significance to more recent experiences in mind, it is natural to assume that a first-down-then-up move is associated with less insecurity the closer it occurs to the present. Again, we limit the scope of the axiom to a relatively small class of cases.

Proximity monotonicity

For all $t \in \mathbb{N}$, for all $p \in \mathbb{R}$, and for all $q \in \mathbb{R}_{++}$,

$$I^{t+2}(p,p,p+q,p1_t) > I^{t+2}(p,p+q,p,p1_t) > I^{t+2}(p,p,p,p1_t) >$$
$$I^{t+2}(p,p-q,p,p1_t) > I^{t+2}(p,p,p-q,p1_t).$$

In addition to these two fundamental properties, we introduce some further axioms that are of considerable intuitive appeal in our setting.

Linear homogeneity is a standard requirement in the theory of economic index numbers. Under linear homogeneity, a resource stream that is multiplied by a positive constant produces insecurity that is multiplied by the same constant.

Linear homogeneity

For all $T \in \mathbb{N}$, for all $x \in \mathbb{R}^{(T)}$, and for all $b \in \mathbb{R}_{++}$,

$$I^T(bx) = bI^T(x).$$

Our next property is that of translation invariance. This requires that the value of the insecurity measure remains unchanged when the same amount of the resource under consideration is added to the existing levels of the resource available in each period. As for linear homogeneity, translation invariance is well-established in the literature.

Translation invariance

For all $T \in \mathbb{N}$, for all $x \in \mathbb{R}^{(T)}$, and for all $c \in \mathbb{R}$,

$$I^T(x + c1_{T+1}) = I^T(x).$$

Quasilinearity establishes a link between insecurity comparisons involving resource streams of different lengths. We use this term because of the structural similarity with quasilinear utility functions in consumer-demand theory; see, for example, Varian (1992, p. 154). In the insecurity context, under quasilinearity the insecurity $I^T(x)$ associated with a resource stream $x \in \mathbb{R}^{(T)}$ can be expressed as a quasilinear function involving the insecurity generated by the T most recent resource levels $(x_{-(T-1)}, \ldots, x_0)$ and a function of the resource levels x_{-T} and $x_{-(T-1)}$ of the most remote past. This property is a variant of a well-known axiom phrased in the context of economic insecurity.

Quasilinearity

For all $T \in \mathbb{N} \setminus \{1\}$, there exists a function $F^T : \mathbb{R}^2 \to \mathbb{R}$ such that, for all $x \in \mathbb{R}^{(T)}$,

$$I^T(x) = I^{T-1}(x_{-(T-1)}, \ldots, x_0) + F^T(x_{-T}, x_{-(T-1)}).$$

To obtain a class of measures the members of which employ geometric discounting, the following stationarity property is essential. Stationarity applies to situations in which a specific stream is shifted a number r of periods into the past. The formulation employed here differs slightly from the one that is familiar in traditional intertemporal models. This is because, in our setting, the current period cannot be moved forwards or backwards. As a result, some resource levels are repeated in the additional periods.

Stationarity

For all $r \in \mathbb{N}_0$, there exists an increasing function $G^r : \mathbb{R} \to \mathbb{R}$ such that, for all $t \in \mathbb{N}_0$ and for all $p, p', s \in \mathbb{R}$,

$$I^{t+2+r}(p, p', s1_{t+1}, s1_r) = G^r\Big(I^{t+2}(p, p', s1_{t+1})\Big).$$

For instance, if $t = 1$ and $s = 1$, the property requires that

$$I^{3+r}(p, p', 1_2, 1_r)$$

can be expressed as an (r-dependent) increasing transformation G^r of

$$I^3(p, p', 1_2).$$

Clearly, the axiom could be strengthened to include more complex streams but, as before, we state the above weak version which suffices for our purposes.

We now identify the insecurity measures that satisfy our axioms. As stated in the following theorem, these indices employ geometric discounting—which, not surprisingly, follows from stationarity. The relative weights of aggregate losses and gains are expressed by means of the positive parameters ℓ_0 and g_0. However, it is worth emphasizing that the discount factor δ that applies to losses must be the same as that attached to gains. Furthermore, the possible values of δ must be below the smaller of the two ratios ℓ_0/g_0 and g_0/ℓ_0, the other two parameters of the class of insecurity measures characterized below. These parameter restrictions result from proximity monotonicity. Clearly, higher values of δ correspond to greater importance being attached to previous experiences.

Theorem 1 A measure of individual economic insecurity I satisfies gain–loss monotonicity, proximity monotonicity, linear homogeneity, translation invariance, quasilinearity, and stationarity if and only if there exist $\ell_0, g_0 \in \mathbb{R}_{++}$ and $\delta \in (0, \min\{\ell_0/g_0, g_0/\ell_0\})$ such that, for all $T \in \mathbb{N}$ and for all $x \in \mathbb{R}^{(T)}$,

$$I^T(x) = \ell_0 \sum_{\substack{t \in \{1,\ldots,T\}: \\ x_{-t} > x_{-(t-1)}}} \delta^{t-1}\Big(x_{-t} - x_{-(t-1)}\Big) + g_0 \sum_{\substack{t \in \{1,\ldots,T\}: \\ x_{-t} < x_{-(t-1)}}} \delta^{t-1}\Big(x_{-t} - x_{-(t-1)}\Big).$$

It is immediate that if losses are to be given higher weight than equivalent gains, then ℓ_0 (the weight on aggregate discounted losses) must exceed g_0 (that on aggregate discounted gains). This implies that

$$\frac{g_0}{\ell_0} < 1 < \frac{\ell_0}{g_0}$$

and the minimum of the two ratios is g_0/ℓ_0. Therefore, the subclass of the measures characterized in the previous theorem that respects such a loss-priority condition must be such that $\ell_0 > g_0$ and the discount factor δ be in the open interval $(0, g_0/\ell_0)$. Loss priority is akin to the notion of risk aversion in decision theory and appears to adequately capture the attitude of individuals who are concerned with their ability to absorb an adverse event. We will therefore use parameter values that respect this condition in the applied part of the article.

We emphasize that our measures do not capture the notion of volatility; a more adequate analogy is that of (dis)utility in a setting of choice under uncertainty. The dual theory of choice under risk pioneered by Yaari (1987) is of particular relevance in this regard. In his seminal contribution, Yaari (1987) reverses the roles of probabilities and payments, thereby allowing for the expression of risk aversion in a setting that uses linear utility. Most notably, Guriev (2001) employs utilities based on the dual model that closely resemble our measures. His (and Yaari's) axioms are based on standard principles of expected-utility theory, with the exception of an independence condition that postulates linearity in payments rather than in probabilities. Another important contribution is that of Röell (1987) who also examines the notion of risk aversion and provides an axiomatic foundation of the dual theory. Again, the axioms are motivated by the properties familiar from the theory of choice under risk. We note that, in spite of the family resemblance, our axioms are of a very different nature because they are tailored toward the specific issue of insecurity addressed here.

The following example illustrates the class of measures characterized in our theorem.

Example 1 Throughout the example, suppose that $T = 3$ and the weights assigned to aggregate losses and gains are $\ell_0 = 1$ and $g_0 = 15/16$.

a. Consider the stream $x^1 = (4, 12, 12, 16)$. We obtain

$$I^3(x^1) = g_0\Big(\delta^2(4-12) + \delta^0(12-16)\Big) = -\frac{15}{2}\delta^2 - \frac{15}{4} < 0.$$

As resources never fall from one period to the next, the agent never experiences any losses and, as a result, the resulting insecurity value is negative for any choice of the discount factor $\delta \in (0, 15/16)$. In general, any stream without losses and at least one gain has a negative insecurity value and, thus, produces less insecurity than any constant resource stream.

b. Now consider the reverse stream $x^2 = (16, 12, 12, 4)$. It follows that

$$I^3(x^2) = \ell_0\Big(\delta^2(16-12) + \delta^0(12-4)\Big) = 4\delta^2 + 8 > 0.$$

The agent never experiences any gains and, thus, the resulting insecurity value is always positive. Clearly, any stream without gains and at least one loss has a positive insecurity value and therefore is more insecure than any constant resource stream.

c. Let $x^3 = (16, 4, 4, 12) \in \mathbb{R}^{(3)}$. In this stream, the individual experiences a loss of 12 when moving from three periods ago to two periods ago, no change in the period that follows and, finally, a gain of 8 in the move from the previous period to today. For any discount factor $\delta \in (0, 15/16)$, the corresponding value of the insecurity index is

$$I^3(x^3) = \ell_0\delta^2(16-4) + g_0\delta^0(4-12) = 12\delta^2 - 15/2.$$

For any value of δ above $(1/2)\sqrt{5/2}$, the index value is positive (so that x^3 is associated with more insecurity than that from a constant resource stream); if δ is below $(1/2)\sqrt{5/2}$ insecurity is lower than that from a constant resource stream. Lower values of δ (a higher discount rate) put more weight on the recent gain relative to the more distant initial loss.

d. Finally, consider the stream $x^4 = (4, 16, 16, 8)$. It follows that

$$I^3(x^4) = g_0\delta^2(4-16) + \ell_0\delta^0(16-8) = -\frac{45}{4}\delta^2 + 8.$$

For any value of δ below $(4/3)\sqrt{2/5}$, the index value is positive and x^4 is associated with more insecurity than the insecurity of a constant stream.

In our empirical analysis, we set $\ell_0 = 1$, $g_0 = 15/16$, and $\delta = 0.9$. We use the stream of annual household disposable equivalent incomes over the previous five years as the empirical counterpart of x above. As we will discuss in the section on empirical results below, our qualitative conclusions are not affected by any reasonable changes in the values of the ℓ_0, g_0, and δ parameters or in the number of periods in the stream of past income.

3. The rise of conservatism

3.1 A long-run panel data analysis

As noted in Section 1, social science has paid a great deal of attention in recent years to individual political preferences in general, and the recent success of more-conservative political parties. We now consider the role of individual-level economic-insecurity, using the index developed above. As our index requires panel information on individual incomes, we analyze data from two of the best-known long-run panel surveys: the British Household Panel Survey (BHPS) and the German Socio-Economic Panel (SOEP).

The BHPS was launched in 1991, with annual surveys being carried out up to 2008. It was then incorporated into Understanding Society, but only starting with the second wave of interviews of the latter. The BHPS is a general survey that includes a random sample initially covering approximately 10,000 individuals in 5,500 British households. Later waves of this survey included new population groups and refresher samples that increased the number of individual interviews toward 15,000 per year. It provides a wide range of information on individual and household demographics, income, attitudes, and political preferences. There is no information about support for the UK Independence Party (UKIP) in the BHPS: although the party has existed since 1993, it only achieved electoral standing in the early 2010s. Our main variable of interest here is voting intentions, measured as follows.

BHPS respondents are asked the following two questions. 'Now I have a few questions about your views on politics. Generally speaking do you think of yourself as a supporter of any one political party?' and 'Do you think of yourself as a little closer to one political party than to the others?' If the respondent replies 'Yes' to either of these two questions, they are then asked which political party they support. On the contrary, respondents who reply 'No' to both questions are then asked, 'If there were to be a general election tomorrow, which political party do you think you would be most likely to support?' Our measure of political preference is based on the combination of the answers to these three questions, and individuals are considered as having no political preferences if they reply 'No' to the first two questions and 'None' or 'Don't know' to the hypothetical-election question. We exclude individuals who answered 'Can't vote.' We then create a categorical political-preference variable, 'Party', with the five categories 'Conservative Party', 'Liberal Party', 'Labour Party', 'Other parties', and 'No political preferences', where the named parties are ordered from right to left.

The SOEP is an ongoing panel survey with yearly re-interviews. The starting sample in 1984 contained close to 6,000 households based on a random multistage sampling design. A sample of about 2,200 East German households was added in June 1990, half a year after the fall of the Berlin wall, and since then new samples have been added either for particular population groups or as refresher samples. As in the BHPS, the SOEP contains information about individual and household demographics, attitudes, and income. Political preferences are elicited by means of the following set of questions. 'Many people in Germany lean toward one party in the long term, even if they occasionally vote for another party. Do you lean towards a particular party?' If respondents answered 'Yes' they were then asked, 'Toward which party do you lean?' Our political-preference variable in Germany has the five categories 'CDU/CSU', 'FDP', 'SPD', 'Other parties', and 'No political preferences;' again, the named parties are ordered from right to left. Later in the article, we will explicitly distinguish 'The Greens' and 'Die Linke' from the parties appearing in 'Other parties' (we cannot do the same for 'AfD' support as this is under 0.7% of our analysis sample).

Our measure of individual economic resources in both samples is household disposable equivalent income, calculated by dividing household income by the square root of household size. It is an open question whether individuals are more sensitive to movements in nominal income or real income. We carry out our analysis using nominal income but will later check that using real income does not change the empirical results.

The estimation samples for both surveys cover individuals aged between 18 and 65 years who are not retired and who have valid information on economic insecurity, household equivalent income, and political preferences (we will add older respondents as a robustness check in Section 3.1.2). We do not use the first 1984 SOEP wave due to income-measurement errors. Household income is also only available from 1992 onwards in East Germany. This leaves us with data from 1985 to 2018 in West Germany and from 1992 to 2018 in East Germany. There are 67,844 observations in the estimation sample in the BHPS and 230,934 in the SOEP. We provide descriptive statistics on these samples in Online Appendix Tables B2 and B3. The two samples are notably similar with respect to mean age (around 41), percentage female (just over 50), percentage married (two-thirds), and percentage employed (just over three-quarters); in contrast, the share of individuals reporting 'No political preferences' in the UK is only just under half that in Germany. The share of individuals supporting the Labour Party is notably higher than that of the Conservatives in the BHPS sample. This mostly reflects our exclusion of the over-65s from our estimation sample (who are on average Conservative supporters). We might expect political preferences to be relatively stable over time at the individual level. Online Appendix Tables B4 and B5 present the transition matrices for political preferences between $t-1$ and t. In both countries, the diagonal is indeed heavily populated, reflecting stable individual political preferences over time. This in particular implies that it will be difficult to run panel analyses of political preferences.

Regarding our key explanatory variable in the political-preference regressions, Fig. 1 depicts the evolution of mean economic insecurity in the UK (on the left) and Germany (on the right), where the 2,000 value of the insecurity index in each country is set to 100. These are plotted together with the national unemployment rates (taken from the OECD), revealing as expected a positive correlation between the two. There is a serial correlation in economic insecurity, as the $t-1$ and t values share three out of four of the changes in income that are used to calculate the index; even so, in the data an individual's economic-insecurity score always changes from one wave to the next, so that this is not synonymous with an individual-fixed effect. Economic insecurity is negatively correlated with current household equivalized income, but not particularly strongly so, with the correlation coefficients being –0.4 in both the BHPS and the SOEP. The correlation between economic insecurity and the average household equivalized income over the previous five years is even lower (−0.18 in BHPS and −0.07 in SOEP). In terms of the four income changes that serve as the basis for the index, around 60% are positive and just under 40% negative (with very few zeros). Only 10% of economic-insecurity observations do not include a loss among the four income changes.

Online Appendix Table B1 lists the correlations between our economic-insecurity index and a number of plausible alternative measures of economic insecurity (the Hacker index, income variance over the past five years, the change in income between t and $t-1$, the income trend over five years, and a dummy for respondents considering that their financial situation has recently deteriorated). Our economic-insecurity index is significantly correlated with all of the other indices in a consistent manner; however, the correlation is not perfect, as all of the correlation figures are significantly below one in absolute value. The numbers in Online Appendix Table B1 then confirm that our index partially captures existing concepts of economic insecurity, but is not redundant as it does add new information. In the robustness checks, we will show that our economic-insecurity index provides the best fit for political preferences in the context of a beauty contest.

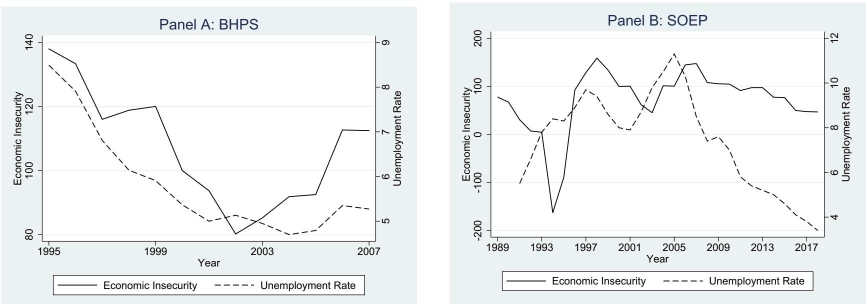

Fig. 1. Economic insecurity and unemployment over time—BHPS and SOEP.

The general models of economic insecurity and political preferences we estimate are as follows:

$$\text{Support}_{i,R,t} = \beta_1 \text{HHincome}_{i,R,t-1} + \beta_2 I^5_{i,R,t-1} + \beta_3 X_{i,R,t-1} + \lambda_t + \theta_R + \epsilon_{i,R,t} \quad (1)$$

$$\text{Party}_{i,R,t} = \beta_1 \text{HHincome}_{i,R,t-1} + \beta_2 I^5_{i,R,t-1} + \beta_3 X_{i,R,t-1} + \lambda_t + \theta_R + \epsilon_{i,R,t}, \quad (2)$$

where $\text{Support}_{i,R,t}$ is a dummy for individual i living in region R supporting any party and $\text{Party}_{i,R,t}$ the party supported, both measured at time t, $\text{HHincome}_{i,R,t-1}$ represents the equivalent annual household income of i at time $t-1$, and $I^5_{i,R,t-1}$ is the value of economic insecurity of i at time $t-1$. We use lagged values to attenuate endogeneity concerns. As economic insecurity is calculated using information on household equivalent income, the standard errors will be clustered at the household level. We standardize both economic insecurity and equivalent household income in the regressions, so that their estimated coefficients refer to the effect of a one-standard-deviation change. The vector $X_{i,R,t-1}$ includes a set of individual covariates measured at time $t-1$: age, gender, education, marital status, number of children, labor-force status, home-ownership, and region-fixed effects. Home-ownership here acts as a measure of wealth. Figure 1 suggests that we should also take into account a possible confounding influence of unemployment (and Algan *et al.*, 2017, suggest unemployment as a determinant of populist preferences). To do so, the vector $X_{i,R,t-1}$ includes dummies for individual recent unemployment (over the past four years). As we require income information over a five-year period to calculate our insecurity index at time $t-1$ (which is then related to political preferences at time t), our first observation on the dependent political variable in these regressions comes from 1996 in the BHPS and 1990 in the SOEP. Our requirement of five consecutive observations for income and unemployment explains why there are only few observations on those aged under 21 in our estimation sample. Last, λ_t and θ_R are, respectively, year and region fixed effects to control for the macroeconomic environment (so that our estimates do not capture the influence of the national unemployment rate or episodes of recession or economic growth). Using year*region fixed effects produces similar estimates.

Note that we do not use individual fixed-effects here, for two reasons. First, the lack of within-variance at the individual level (political preferences being stable) drastically limits the statistical power used in panel regressions. Second, including individual fixed-effects in non-linear models is technically feasible but is computationally very demanding, and the calculation of marginal effects is carried out at the cost of assuming that the individual fixed-effects have zero effect. We can alternatively run linear probability models that include individual fixed-effects, but when we do so most of the coefficients on the variables are insignificant. This confirms that panel regressions when the dependent variable exhibits little variation over time suffer from a lack of statistical power.

As noted above, the BHPS was incorporated into Understanding Society starting with the second wave of interviews of the latter in 2010. The BHPS respondents in Understanding Society thus have missing equivalent household incomes in 2009, so that we can only extend our analysis (of political preferences in t to economic insecurity measured over the five-year window between $t-5$ and $t-1$) to Understanding Society starting in 2014. Our main analysis of general UK political preferences will thus refer to the 18 waves of the BHPS (we will use cross-section Understanding Society data below when we consider the Brexit vote), although we will provide supporting Understanding Society evidence in the robustness checks.

Equation (1) is estimated using a logit model while, as in much of the economic-voting literature, we estimate Equation (2) via a multinomial logit model. In the context of voting decisions, it can be argued that multinomial probit models are more appropriate. Dow and Endersby (2004) discuss the strengths and weaknesses of the multinomial logit and multinomial probit models in the economic-voting literature. They conclude that while the multinomial probit model does not rely on the independence-of-irrelevant-alternatives assumption, its relatively difficult maximum-likelihood optimization procedure may fail to converge and produce imprecise estimates.

3.1.1 Empirical results Table 1 asks whether economic insecurity at time $t-1$ predicts support for any political party at time t. We show the marginal effects for economic insecurity, income, and home-ownership (wealth) from Equation (1). The estimated coefficients on economic insecurity are thus conditional on both income flow and stock, so that we do not confound insecurity with low income. In the first row, economic insecurity is associated with significantly higher political support at the 1% level in both the BHPS and the SOEP: all else equal, a one-standard-deviation rise in economic insecurity at $t-1$ increases the probability of supporting any party at t by 0.8%age points in the UK and 0.9%age points in Germany, corresponding to one-third of the marginal effects of equivalized household income and home-ownership in both countries. This figure also corresponds to one-quarter of the standard deviation of UK General-Election turnout rates between 2001 and 2019. The full set of results, including the estimated coefficients on all of the control variables, appears in Online Appendix Table B6.

In Table 2, we show which parties benefit from this greater political engagement. The estimates in the last column of both panels of this table, on the probability of not supporting any party, are of course the mirror images of those for any party support in Table 1. The results in Table 2 are similar for the BHPS and the SOEP: economic insecurity mainly benefits right-leaning parties (the Conservatives and the CDU/CSU) and, to a lesser extent, centers parties (the Liberals/FDP). Economic insecurity is not correlated with support for

Table 1. Economic insecurity and the probability of supporting any party: Logit results—BHPS and SOEP

	(1) BHPS	(2) SOEP
Economic insecurity (std)	0.008***	0.009***
	(0.002)	(0.002)
Log(Eq. HH income) (std)	0.025***	0.031***
	(0.002)	(0.004)
Home-owner (dummy)	0.025***	0.026***
	(0.005)	(0.006)
Observations	67,844	230,943
Log likelihood	−38,563	−146,284

Notes: The standard errors in parentheses are clustered at the household level. The figures are marginal effects. The control variables include age, gender, education, marital status, the number of children, wave dummies, region dummies, labor-force status, and dummies for unemployment over the past four years. *, **, and *** stand for $p < 0.1$, $p < 0.05$, and $p < 0.01$.
Source: Authors' calculations.

Table 2. Economic insecurity and political-party preferences: Multinomial logit results—BHPS and SOEP

	BHPS				
	Conserv.	Liberal	Labour	Other	No Pol. Pref.
Economic insecurity (std)	0.011***	0.002	−0.002	−0.002	−0.008***
	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)
Log(Eq. HH income) (std)	0.024***	0.000	0.006**	−0.005***	−0.025***
	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)
Home-owner (dummy)	0.051***	0.016***	−0.047***	0.002	−0.025***
	(0.004)	(0.003)	(0.006)	(0.003)	(0.005)
Observations			67,844		
Log likelihood			−89,876		
	SOEP				
	CDU/CSU	FDP	SPD	Other	No Pol. Pref.
Economic insecurity (std)	0.011***	0.001***	−0.001	−0.003***	−0.009***
	(0.001)	(0.000)	(0.001)	(0.001)	(0.002)
Log(Eq. HH income) (std)	0.035***	0.007***	−0.001	−0.008***	−0.031***
	(0.003)	(0.001)	(0.003)	(0.002)	(0.004)
Home-owner (dummy)	0.064***	0.001	−0.022***	−0.014***	−0.026***
	(0.005)	(0.001)	(0.005)	(0.004)	(0.006)
Observations			230,943		
Log likelihood			−254,167		

Notes: The standard errors in parentheses are clustered at the household level. The figures are marginal effects. The control variables include age, gender, education, marital status, the number of children, wave dummies, region dummies, labor-force status, and dummies for unemployment over the past four years. *, **, and *** stand for $p < 0.1$, $p < 0.05$, and $p < 0.01$.
Source: Authors' calculations.

the SPD in Germany, the Labour Party in the UK, or the other parties in both countries. In most cases, the economic-insecurity coefficient for support for a specific party is of the same sign as the coefficients on equivalent household income and home-ownership. The estimates of all other control variables can be found in Online Appendix Tables B7 and B8.

Economic insecurity therefore increases support at the right side of the political spectrum. Recent research in psychology and political science (see Jost *et al.*, 2003, 2007; Inglehart and Norris, 2016; Walley, 2017) has underlined that individuals who value security and stability are more likely to support conservative parties. The economic-insecurity index that we propose using panel data on individuals' past incomes thus appears to at least partly capture this shift in political support toward the right.

We replicate our analysis using more-recent data from the UK Household Longitudinal Study (UKHLS), also known as Understanding Society, which started in 2009. UKHLS is the largest panel survey in the world devoted to social and economic research, covering around 100,000 individuals in 40,000 households in the UK. The same sample restrictions as above yield an estimation sample of 34,504 observations from 2014 to 2018: the descriptive statistics appear in Online Appendix Table B2. Online Appendix Table B9 lists the marginal effects from Equation (2), which are similar to those in Table 2: greater economic insecurity is associated with more Conservative support (and to a lesser extent Liberal support) and a lower probability of having no political preferences. There are two noticeable differences: first, Labour party support is now significantly lower as economic insecurity rises; and second, the marginal effect of economic insecurity for Conservative support is twice as large as in the BHPS and the SOEP. We do not here have sufficient statistical power to consider UKIP as an independent category in our multinomial logit, as only 2.2% of the estimation sample identify as UKIP supporters. We also explored the longer-term effects of economic insecurity by using lagged values of the index in our empirical model. The results, available on request, are consistent with the main findings: an increase in economic insecurity is always accompanied by greater support for right-wing parties.

To simplify the comparison between the BHPS and the SOEP, we reduced the spectrum of German political parties in Table 2. Online Appendix Table B10 separates 'Alliance 90/The Greens' and 'Die Linke' (both of which attract about 5% support in our German sample) from the other-parties category. The full-sample results appear in Panel A, and separate results for West and East Germany in Panels B and C. Economic insecurity never affects Green support, but does reduce Die Linke support in Panel A and, with West Germans representing 75% of the total estimation sample, also in Panel B. The results in East Germany are a little different, as economic insecurity still benefits right-leaning parties but also to a lesser extent the SPD.

Turning from regional to period heterogeneity, Online Appendix Tables B11 and B12 compare pre-2000 to post-2000 in the BHPS and SOEP, respectively. The last column of each table shows how economic insecurity at $t-1$ affects the probability of not supporting any party at t. In both tables, this estimated coefficient is significantly negative only after 2000, with the difference from the pre-2000 effect being significant at least at the 5% level. Equally, the economic insecurity benefits right-leaning parties to a significantly (at the 10% level) greater extent post-2000 in both countries (in line with the larger marginal effect of economic insecurity in the first column of Online Appendix Table B9 for the more-recent UKHLS data).

Online Appendix Table B13 explores potential heterogeneity by gender, marital status, parenthood, and age in political participation; the analogous results for right-leaning parties appear in Online Appendix Table B14 (the full multinomial results by party are available upon request). The relationship between insecurity and political support is somewhat larger for women, but only significantly so in Germany, and is larger for the married and parents in both countries (at the 1% level, except for parenthood in the SOEP), reflecting perhaps the greater vulnerability of those with a family. Last, insecurity only affects political support for the under-40s in the BHPS. In Online Appendix Table B14, the shift to the right (from economic insecurity) is larger for the married and (in the BHPS) for younger respondents and those with children. We also looked for possible moderating effects of income, splitting the sample into those above and below median income and education, and considering renters versus home-owners, but found no significant differences in any of these cases.

Finally, we ask whether the effect of economic security on political support depends on the nature of the party in power. We first re-estimate Equation (1) separately for the periods when Labour and the Conservatives were in power in the UK for the BHPS, and when the Chancellor was from the SPD or CDU for the SOEP. We also look at the parties that were in power during the calculation period for our economic-insecurity index (between $t-1$ and $t-5$). In both cases, although the estimated coefficient on economic insecurity is often larger in absolute size when a left-leaning party is/was in power, none of the coefficient differences are statistically significant.

3.1.2 Robustness checks Our main results relate political preferences at t to economic insecurity at $t-1$. This relationship will not be causal if there is an omitted variable that simultaneously predicts both past economic insecurity and current political preferences. We thus estimate a value-added model controlling for political preferences at $t-2$. The intuition here is that any time-invariant omitted variable that predicts both economic insecurity at $t-1$ and political preferences at t will be picked up by political preferences at $t-2$. The equation estimated is

$$\text{Party}_{i,R,t} = \alpha_1\text{HHincome}_{i,R,t-1} + \alpha_2 I^5_{i,R,t-1} + \alpha_3\text{Party}_{i,R,t-2} + \alpha_4 X_{i,R,t-1} + \lambda_t + \theta_R + \epsilon_{i,R,t}.$$

The value-added results appear in Columns (1) and (2) of Online Appendix Table B15. The marginal effects of economic insecurity (as well as those of household income and home-ownership) fall by about 50% from the baseline figures in Table 1, but remain significantly different from zero. As economic insecurity is defined over the period $t-1$ to $t-5$ we have also estimated a value-added model controlling for political preferences at $t-6$. The estimated economic-insecurity coefficients remain significant at the 1% level, and are somewhat larger than those in the first two columns of Online Appendix Table B15.

Liberini *et al.* (2017) and Ward (2020) have recently shown that subjective well-being predicts support for the incumbent, and Algan *et al.* (2018) find in French data that low well-being predicts support for the Front National. If insecurity affects satisfaction (as shown in Clark, 2018) and satisfaction affects voting, how much of our political-participation effect is mediated by life satisfaction? Columns (3) and (4) in Online Appendix Table B15 re-estimate our main regression controlling for life satisfaction (note that the BHPS sample size is smaller here, as life satisfaction only appears in Waves 6–10 and 12–18). This does not change the estimated coefficients, so that life satisfaction does not mediate the relationship between economic insecurity and political preferences. This is not at odds with the extant literature, as we have a different type of political outcome: while Liberini *et al.* (2017) and Ward (2020) focus on support for the incumbent party, we here rather look at the determinants of support for a number of specific named political parties over the whole time period (whether they were incumbent or not).

Columns (5) and (6) of Online Appendix Table B15 check the convergent validity of our results by considering a different dependent variable. Respondents in both the BHPS and the SOEP are asked about their interest in politics (both on a four-point scale), and we re-estimate Equation (2) by OLS with the dependent variable being interest in politics at t (the results from ordered-logit estimation are the same). Economic insecurity increases interest in politics in both samples (as do equivalent household income and home-ownership), similar to the results for any political-party support in Table 1.

Subjective evaluations of economic insecurity may play a role in our analysis. To address this issue, the BHPS includes the question ‘Would you say that you yourself are better off or worse off financially than you were a year ago?’ with the response categories being ‘Better off’ (30.2%), ‘Worse off’ (21.0%), and ‘About the same’ (48.8%). We add a dummy variable for major financial worsening over the past year to our baseline specifications in Tables 1 and 2 (the results are available upon request). This results in a significant positive estimated coefficient in both tables: those who say that they have become worse off are both more likely to support any political party and to support right-leaning parties. The coefficient is sizeable, being about half of that on standardized equivalized household income. However, the inclusion of this subjective variable has almost no impact on the size of the estimated coefficient on (objective) economic insecurity, which remains at the level seen in Tables 1 and 2.

Our main results consider the sample of individuals who are aged between 18 and 65. The rationale for doing so is that the income streams of the retired are different in nature from those of individuals of working age. We can re-estimate the regressions in Tables 1 and 2 including respondents of all ages, which produce very similar results (available upon request).

The last three specification checks refer to the measure of income and the parameters of the economic-insecurity index. We first check that our results continue to hold when we use real equivalent household income in the construction of the index and as a control variable: this is indeed the case. Next, the economic-insecurity index has three key parameters: the discount factor and the weights on aggregate losses and gains. These were above set to 0.9, 1, and 15/16. To see how sensitive our results are to these parameter values, we carried out a grid search, varying the discount factor δ from 0.9 to 0.01 and the value of the gains parameter g_0 from 0.9 to $\delta + 0.01$ (so that g_0 is always strictly greater than δ), keeping the value of the losses parameter ℓ_0 at 1. The estimated coefficient on economic insecurity in the SOEP remained at its baseline level across the grid; that in the BHPS became insignificant when the discount factor dropped below one-quarter for any g_0 between δ and ℓ_0 or when gains were valued 40% or less than losses when the discount factor was between 0.25 and 0.5, both of which may be considered as fairly extreme parameterizations. Last, we ask whether our results depend on the length of the streams of annual household disposable equivalent incomes used to construct our economic-insecurity index. We find that the shorter the stream of past incomes, the smaller is the effect of economic insecurity. However, this always remains positive and significantly different from zero at conventional levels.

3.1.3 Comparing different indices We now ask whether the insecurity index we propose outperforms other measures such as that in Hacker *et al.* (2010) of a sharp (over 25%) drop in available income over the past year, and the variance in household equivalent income over 5 years. Note that the Hacker index also includes the lack of an adequate financial safety net, but data constraints prevent us from including this dimension in the index. As our index is based on movements in income, it might be thought that it is similar to a variance. However, gains and losses can potentially cancel each other out in our index, making it different in nature to the variance of resources (it is easy to construct profiles with positive variance but an economic-insecurity index of zero). As shown in Online Appendix Table B1, the correlation between income variance and the $t-5$ to $t-1$ economic-insecurity index is under 0.05 in both the BHPS and the SOEP. We also consider the change in income between $t-2$ and $t-1$ as well as the trend growth rate in income between $t-5$ and $t-1$ as predictors of political preferences.

We apply the same approach as in Clark (2001), introducing all of the above measures in turn into a regression with the same sample and set of controls: the best model has the least-negative log-likelihood. The log-likelihood in Table 1 is –38,318 (–146,284) for the BHPS (SOEP) with our index: these figures are reproduced in Columns (1) and (6) of Online Appendix Table B16 for ease of comparison. Columns (2)–(5) and (7)–(10) in

Online Appendix Table B16 show the results for the other indices, all of which produce more-negative log-likelihoods. Our economic-insecurity index thus fits the data better than these alternatives. We can alternatively introduce these indices one by one into a regression including our economic-insecurity index: in no case do the new variables render our estimated economic-insecurity coefficient insignificant.

3.1.4 Potential mechanisms Many income movements happen for a reason: for example, via a change in family size or marital status (these are especially important, as we use equivalent income in our analysis), unemployment, or ill health. We evaluate the role of four observable life events that may have occurred between $t-5$ and $t-1$, the time period of our economic-insecurity index: marital separation, unemployment, a change in the number of children, and health shocks. The latter is measured as a rise in the number of nights spent in hospital from 1 year to the next over $t-5$ to $t-1$: we obtain the same results using entry into disability (as in Oswald and Powdthavee, 2008) or changes in self-assessed health. We first re-estimate our main political-support equation, as in Table 1, separately according to whether each of these four events occurred in turn, and then separately for individuals who experienced at least one event versus those who experienced none of them.

The estimated coefficient on economic insecurity in Online Appendix Table B17 is never significantly different across these pairwise comparisons (i.e., event occurred versus event did not occur) in the SOEP, so that the political effect of economic insecurity in Germany does not reflect these life events. In the BHPS, the estimated economic-insecurity coefficient is significantly larger for those with a change in the number of children or a health shock (and those who experienced at least one event). It could then be that our main results in Table 1 actually reflect an omitted variable, with the number of children and health affecting both income and political support. This turns out not to be the case. Of the four events in Online Appendix Table B17, number of children and unemployment both actually reduce political support, and there is no correlation with health shocks or marital separation (the same pattern holds for support for right-leaning parties). Our preferred reading of Online Appendix Table B17 is that, in the British data, it is the economic insecurity that results from these two life events that helps shape political support.

Online Appendix Table B18 carries out the same analysis for the probability of supporting a right-leaning party, following on from Table 2. Probably the key finding in this table is that, in both datasets, economic insecurity increases the probability of right-leaning support for those who did not separate, experience unemployment, have more children, or suffer a health shock. These major life events do not then seem to lie behind the relationship between economic insecurity and support for the right.

3.2 The election of Donald Trump

Our results above come from European data. We now turn to US data, and in particular the 2016 Presidential election. To do so, we require data with both past household income and current political preferences. To the best of our knowledge, the only dataset with this information is the UAS (https://uasdata.usc.edu/index.php) survey conducted by the University of Southern California. UAS is a panel of households with approximately 6,500 respondents and is representative of the USA. It is an Internet panel, and respondents answer the surveys online at the time of their choosing. From the beginning of the study on 31 May 2014 up until August 2018, the University of Southern California carried out approximately 150 different UAS surveys on different topics such as politics, consumer behavior, financial literacy, and health. Individuals in the panel could reply to as many of these surveys as they wished (although in general only once to each one), and each survey questionnaire included a standard set of socio-demographic characteristics, including (banded) income. This therefore gives us theoretically up to 150 income observations per individual from 31 May 2014 to August 2018.

Political behavior was measured in the Election Poll Study wave of the UAS, run from 4 July 2016 to 7 November 2016, in which respondents were asked to report their probability (on a 0–100 scale) of voting in the Presidential election and their probability to vote for Donald Trump, Hillary Clinton, or any of the other candidates. Unlike most of the UAS questionnaires, respondents could reply as many times as they wanted during the period in which the poll was open (respondents replied on average 11.3 times). As for the other UAS questionnaires, every time the individual participated they provided information on their socio-demographic characteristics and income.

Overall, 4,295 UAS respondents participated in the Election Poll Study, of whom 2,367 were between 18 and 65 years old, not retired and had at least five observations on household income (either from the Election Poll Study or from previous UAS surveys on other topics): these 2,367 respondents had an average of 28.5 income observations up to their first participation in the Election Poll Study. Annual household income in the UAS is in bands; we assign values to each band from mean annual household pre-tax post-transfer income in each band in the Current Population Survey from the year of the observation. We retain individuals with at least five observations on household income from the UAS's inception to the close of the Election Poll (i.e., 31 May 2014 to 7 November 2016), and calculate economic insecurity using the last five equivalent income observations before the wave in which political preferences are reported. As observations are at the daily level, rather than annual as in the BHPS and SOEP, we apply a daily discount factor δ between observations such that the discount factor over 365 days is 0.9, as in our annual analyses above.

Our first OLS regression is

$$\text{Probability}_{i,R,t} = \beta_1 \text{HHincome}_{i,R,t-1} + \beta_2 I^5_{i,R,t-1} + \beta_3 X_{i,R,t-1} + \lambda_t + \theta_R + \epsilon_{i,R,t},$$

where $\text{Probability}_{i,R,t}$ refers successively to the probabilities of voting on election day, and then voting for Trump, Clinton, or any of the other candidates. These are two separate questions, with all four probabilities being reported on a 0–100 scale, and even individuals with a low or zero reported probability of voting give percentage figures for their support for the Presidential candidates. Respondents indicate three separate figures for Trump, Clinton, and Other, which (by the design of the questionnaire) have to sum to 100%.

Although individuals can reply multiple times to the Election Poll Study, we consider only the most recent political-preference observation to reflect their actual voting behavior in the Presidential election (our results do continue to hold using all of the individual observations, or the individual mean of political preferences). The periods t and $t-1$ refer to the ultimate and penultimate individual observations before the election. $\text{HHincome}_{i,R,t-1}$ is the equivalent annual household income of i at time $t-1$, while the vector $X_{i,R,t-1}$ includes a set of individual covariates similar to those in Equations (1) and (2). We cannot control for home-ownership, as this does not appear in the UAS. Both economic insecurity and equivalized household income are again standardized.

As in Section 3.1, we also estimate the following multinomial-logit regression

$$\text{Candidate}_{i,R,t} = \beta_1 \text{HHincome}_{i,R,t-1} + \beta_2 I^5_{i,R,t-1} + \beta_3 X_{i,R,t-1} + \lambda_t + \theta_R + \epsilon_{i,R,t},$$

where $\text{Candidate}_{i,R,t}$ is a categorical variable for the candidate to whom the survey respondent assigns the highest vote probability. We cannot identify this variable in the 327 cases where the respondent assigned either a probability of one half to each of two candidates or one-third to the three candidates. The complete descriptive statistics for the estimation sample are in Online Appendix Table B19.

Table 3 shows the estimated economic-insecurity and equivalent household income coefficients for voting intentions in the 2016 US Presidential election. The estimated coefficient in the first column is of the same size as that in the BHPS and SOEP: a one standard-deviation rise in economic insecurity predicts an increase of 0.68%age points in the probability of voting, although the estimate is not significant at conventional levels. The next three columns refer to the individual candidates. We weigh the percentage support of individuals by the probability that they will vote in the election (our rationale is that we should give less weight to the preferences of those who have only a low probability of voting). Economic insecurity predicts greater support for Donald Trump and reduces support for Hillary Clinton (with no effect for the other candidates). The same conclusion pertains in Columns 5–7 in a multinomial-logit analysis of the preferred candidate. All of these results are found if we do not use weights, or exclude those with a zero probability of voting. The full results with all of the controls for Table 3 can be found in Online Appendix Table B20.

We consider potential heterogeneity in the estimated coefficient on economic insecurity, as in Online Appendix Table B13. There is no evidence of any significant differences: economic insecurity increased support for Donald Trump for all of the demographic groups analyzed. Last, as noted above, the UAS is different in structure to the SOEP and the BHPS, with observations being much closer together: the median time elapsed between the $t-5$ and $t-1$ interviews is around five months. We re-estimated the analysis in Table 3 using

Table 3. Economic insecurity, voting behavior, and political preferences: OLS and multinomial logit results—UAS.

	OLS				Multinomial logit		
	Probability to vote (0–100):				Preferred candidate:		
	Election (1)	Trump (2)	Clinton (3)	Other (4)	Trump (5)	Clinton (6)	Other (7)
Economic insecurity (std)	0.676	2.128**	−1.682*	−0.443	0.025**	−0.020*	−0.005
	(0.645)	(0.945)	(0.983)	(0.608)	(0.011)	(0.011)	(0.007)
Log(Eq. HH Inc.) (std)	1.532**	0.133	0.857	−1.025	−0.000	0.008	−0.008
	(0.728)	(1.009)	(1.070)	(0.742)	(0.011)	(0.011)	(0.008)
Observations	2,367	2,367	2,367	2,367		2,040	
Adjusted R^2	0.082	0.183	0.178	0.051			
Log likelihood	.	.	.	.		−1,527	

Notes: The standard errors in parentheses are clustered at the household level. The figures are marginal effects. The control variables include age, gender, education, marital status, a White dummy, wave dummies, region dummies, labor-force status. and dummies for unemployment over the past five observations. *, **, and *** stand for $p < 0.1$, $p < 0.05$, and $p < 0.01$.
Source: Authors' calculations.

only those with above-median values of this gap, producing estimated coefficients that are only slightly smaller in size (but which lose significance due to the smaller sample size of just over 1,000).

3.3 Support for Brexit

The last empirical application refers to Brexit, using UKHLS data. In Wave 8, UKHLS respondents were asked 'Should the United Kingdom remain a member of the European Union or leave the European Union?' Wave 8 was conducted between 2016 and 2018, so that this question was never asked more than a year and a half after the actual Brexit referendum on 23 June 2016. The Understanding Society question wording is the same as that used in the actual referendum and we consider this question as a reliable proxy for Brexit support (a related contribution by Powdthavee *et al.*, 2019, considers the relationship between the Brexit referendum outcome and subjective well-being in UKHLS data, as a function of the prior Brexit preferences that the individual expressed). We estimate the following equation via logit:

$$\text{Leave}_{i,R,t} = \beta_1 \text{HHincome}_{i,R,t-1} + \beta_2 I^5_{i,R,t-1} + \beta_3 X_{i,R,t-1} + \lambda_t + \theta_R + \epsilon_{i,R,t},$$

where $\text{Leave}_{i,R,t}$ is one if respondent i stated that the UK should leave the European Union and zero if it should remain a member. The independent variables are the same as those in Section 3.1 and the estimation sample has the same characteristics. Of the 13,381 individuals in the estimation sample, 41% replied 'Leave the EU'. The complete descriptive statistics of the UKHLS sample can be found in Online Appendix Table B21.

Table 4 shows the marginal effects for the economic insecurity, equivalent household income, and home-ownership variables; the full set of results is in Online Appendix Table B22. One standard deviation higher economic insecurity is associated with a one percentage-point higher probability of stating 'Leave the EU.' This represents roughly one quarter of the actual margin of victory for 'Leave' (51.9 versus 48.1). The effects of household income and wealth (as proxied by home-ownership) are both significant and are of the opposite sign: individuals with more resources were more likely to prefer 'Remain'. As for

Table 4. Economic insecurity and the probability of supporting Brexit: Logit results—UKHLS

	Leave the EU
Economic insecurity (std)	0.010**
	(0.005)
Log(Eq. HH income) (std)	−0.066***
	(0.006)
Home-owner (dummy)	−0.065***
	(0.012)
Observations	13,381
Log likelihood	−8,626

Notes: The standard errors in parentheses are clustered at the household level. The figures refer to marginal effects. The control variables include age, gender, education, marital status, the number of children, wave dummies, region dummies, labor-force status, and dummies for unemployment over the past four years. *, **, and *** stand for $p < 0.1$, $p < 0.05$, and $p < 0.01$.
Source: Authors' calculations.

all of our analyses, we considered heterogeneity but found only little evidence of any significant differences in the association between economic insecurity and Brexit support. Liberini *et al.* (2019) estimate the probability of supporting Brexit in Wave-8 UKHLS data, with interviews from January 2016 to December 2016. Their key explanatory variable of Brexit preferences is the response to the question 'How well would you say you yourself are managing financially these days?' They show that, conditional on income, more-negative responses to this question predict Brexit support. It would be of interest to correlate these type of subjective financial evaluations with our insecurity index set out above.

4. Concluding remarks

Economic insecurity appears to be on the rise, and is of obvious importance for social cohesion, the understanding of changing inequality, and the perceived and actual effects of public-policy choices. At the same time, there is no accepted standard economic-insecurity measure. The first contribution of this paper is to propose and characterize a class of individual measures of economic insecurity based on income streams (although the general principle can be applied to streams of any kind of resource). We hope that the measures presented here will be of use in future research in a variety of areas.

We then apply a member of this class of indices to data from long-running large-scale panel datasets in the UK and Germany to see how economic insecurity affects political preferences. The results are unambiguous: insecurity significantly increases political participation (in terms of the probability of supporting any political party), and mainly in favor of parties on the right (the Conservative Party in the UK and the CDU/CSU in Germany). Insecurity is not a proxy for individual-level resources, as the empirical analysis controls for individual income, home-ownership, current labor-force status, and past unemployment. These results are more pronounced for the married, those with children, and younger respondents, and have become notably stronger post-2000.

We use US panel data to show that economic insecurity affected political preferences before the 2016 Presidential election: the more insecure were significantly more likely to vote in the Presidential election and to vote for Donald Trump, and were less likely to vote for Hillary Clinton. Last, we employ recent UK panel data to show that our economic-insecurity measure predicts stronger support for Brexit. As above, these specific political preferences are conditional on the individual's current level of economic resources.

The insecurity that we characterize and empirically analyze is based on movements in resources over time, and we refer to it as economic insecurity. This is correlated with political attitudes in four different datasets. However, economic insecurity as we understand it does not seem to be a synonym for a more general or social variant of insecurity. Both the BHPS and the SOEP contain questions on the fear of crime, and the SOEP on worries about terrorism. None of these variables are correlated with our economic-insecurity index, suggesting that the latter is focussed on the economic domain. On the contrary, in the BHPS, the economic-insecurity index is correlated with right-leaning economic attitudes (increasing support for the private sector and reducing belief in the efficacy of trade unions).

We believe that these results are important. They first provide new evidence on political outcomes, showing that economic insecurity encourages political activism, but of a certain kind: support for more-conservative parties. Our work employs a fairly broad measure of political preferences, by considering the political party (or position) supported. Considering the relationship between economic insecurity and more specific economic and political attitudes would seem to be a promising research area.

One salient question is why the shift to the right has taken place in recent years, rather than earlier. In Fig. 1, German economic insecurity from 2005 onward is not notably higher than previously, and that in the UK has risen from the early 2000s but still remains below the figures seen in the late 1990s. It may be that insecurity matters more now (in terms of political preferences) than it did in the past, and indeed our Online Appendix Tables B11 and B12 reveal a stronger effect on support for the right post-2000. At the same time, our heterogeneity analysis in the UK and Germany highlighted a greater effect for younger respondents (40 or under). We called this an age effect but in fact cannot distinguish it from a cohort effect: it may well be the case that newer cohorts (and voters) coming onto the political scene are more insecurity-sensitive.

More generally, we show that the theoretical work on socio-economic index numbers can successfully be complemented by empirical research on large-scale panel datasets. This allows us to test the index's predictions and to compare the empirical performance of different indices. In this latter respect, we find that our index of economic insecurity predicts future political preferences better than a number of existing measures. Applying this same test to other indices and more general individual outcomes constitutes a useful project for the evaluation of the salience of different insecurity measures.

In conclusion, insecurity seems to provoke conservative responses. Our main finding is of the same nature as that in the research on terrorism and voting, which has mostly concluded that the former increases right-leaning support; see, for instance, Berrebi and Klor (2006), Bonanno and Jost (2006), Akay *et al.* (2020), and Giavazzi *et al.* (2020). Montalvo (2011) is an exception here, suggesting that the switch to left-leaning parties following the Madrid train bombings in 2004 was instead an indictment of the ruling (conservative) party's handling of the event. While terrorism thankfully remains relatively rare, our results here show that the widespread phenomenon of individual economic insecurity is also associated with a significant shift in political preferences towards the right.

Supplementary material

Supplementary material is available on the OEP website. These are the data and replication files and the online appendices A and B.

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