The Economic Impact of Economic News

Andrew C. Eggers[†]
Alexander B. Fouirnaies[‡]

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Abstract

By convention, a recession is announced following two consecutive quarters of negative growth. We exploit the arbitrary cutoff implied by this convention to show that news of a recession reduces consumer confidence and private consumption in OECD countries, conditional on actual economic fundamentals. We find that the effect is concentrated in countries with smaller social safety nets, which suggests that social spending reduces output volatility in part by making consumer expectations less pro-cyclical. Economic news can be at least partially self-fulfilling when it causes inattentive economic actors to update their information in a coordinated manner.

[†]University of Oxford and Nuffield College. email: `andrew.eggers@nuffield.ox.ac.uk`
[‡]University of Oxford and Nuffield College.

1. Introduction

Is the macroeconomy suggestible? That is, does good or bad economic news have an effect on economic outcomes, independent of actual fundamentals? Keynes (1936)'s invocation of "animal spirits" would suggest so, as would more recent macro models with multiple equilibria (Howitt and McAfee, 1992; Farmer and Guo, 1994; Benhabib and Farmer, 1999; Farmer, 1999). News shocks could also have economic effects if agents only imperfectly observe economic fundamentals and change their plans based on the information they encounter. A number of empirical studies have attempted to measure the effect of news on economic outcomes,[1] but the challenges of credibly measuring the effect of news shocks are substantial. We obviously cannot run an experiment in which we randomly vary the type of news to which whole economies are exposed, and in observational data it is difficult to isolate exogenous variation in news (i.e., situations in which the economic fundamentals are similar but the economic news differs).[2]

In this paper we focus on a natural experiment that gives us leverage in assessing the effect of economic news on economic outcomes. We start from the observation that news media pay considerable attention to a binary distinction between recession and non-recession: by a convention observed in essentially every industrialized country, a recession is announced when an economy contracts for two consecutive quarters.[3] In cases where growth is essentially zero, the distinction between a recession and a non-recession becomes highly arbitrary. Nevertheless (as we confirm below), the media treat fundamentally comparable situations quite differently, producing anxious headlines announcing a recession if growth is barely negative for two consecutive quarters but not if growth is even slightly positive. This discontinuous relationship between recession announcements and underlying economic fundamentals offers an unusual opportunity to study the effect of economic news on economic outcomes (for the set of cases with near-zero growth) using a regression discontinuity design (Thistlethwaite and Campbell, 1960; Hahn, Todd and Van der Klaauw, 2001; Imbens and Lemieux, 2008).

We find that the announcement of a recession reduces both consumer confidence and

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[1]See references in the next section.

[2]Put differently, it is difficult to know how news affects the economy when we lack the correct model of how the economy shapes the news.

[3]Sims (2003) (at 686-7) provides a rationale for such coarse codings of macroeconomic information and notes that the media is likely to propagate "coding errors" in its attempt to efficiently summarize macroeconomic facts.

growth in private consumption (the latter by as much as 1 percentage point) in the quarter during which the recession is announced.[4] We also find that these effects are concentrated in countries characterized by lower social spending and weaker employment protections, which suggests that recession announcements reduce confidence and spending by increasing the perceived risk of negative income shocks.

These findings most clearly speak to the question of how news affects the economy, but they also relate to two other questions of broad interest. The first of these involves the role of information imperfections in understanding macroeconomic outcomes and the transmission of economic shocks. In a classical rational expectations view of macroeconomics, agents are assumed to possess correct beliefs that incorporate all available information, which of course is unrealistic. In recent years, macroeconomists have shown how models that incorporate noisy, costly, or delayed information can provide alternative accounts of core phenomena such as unemployment, the Phillips curve, and aggregate volatility across the business cycle (e.g. Akerlof, 2002; Mankiw and Reis, 2002; Sims, 2003; Veldkamp, 2011; De Grauwe, 2011; Maćkowiak and Wiederholt, 2012). Although these approaches are gaining wider acceptance, it remains unclear how important it is for macroeconomists to incorporate information imperfections into their models and which imperfections in particular deserve attention (Coibion and Gorodnichenko, 2012). This paper contributes to this literature by providing evidence that consumers are inattentive to easily available information about economic fundamentals and that this inattentiveness affects the transmission of economic shocks. If economic agents understood the definition of recession and were even vaguely aware of recent quarterly growth estimates, the announcement of a recession would not affect consumer confidence in the way we document here. The fact that it does, and that private spending is also affected, suggests that routine inattention to economic fundamentals (which Reis (2006) argues helps to smooth consumption) may in some circumstances exacerbate volatility instead.

Second, our findings contribute to research examining the relationship between the welfare state and output volatility. A substantial literature highlights the role of progressive taxation and social transfers as "automatic stabilizers" that tend to reduce business cycle fluctuations by producing lower effective tax rates and higher social spending during re-

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[4]That is, we find lower confidence and spending growth in quarter t when growth is barely negative in quarters $t - 2$ and $t - 1$ (provoking a recession announcement in quarter t) than in cases when growth is barely positive in one of those preceding quarters, controlling for previous growth and other covariates.

cessions and the reverse during booms (DeLong and Summers, 1986; Galí, 1994; Auerbach and Feenberg, 2000). We find that the announcement of a recession has larger effects on consumer confidence and private spending in countries like the U.S. that have lower social spending and fewer employment protections. We view this finding as significant in two ways. First, it provides insight into the mechanism that explains our overall results: recession announcements seem to affect the economy by changing consumers' expectations about their own economic security; the effect of recession announcements varies across types of countries because individual economic outcomes are less dependent on macroeconomic fluctuations in countries with more social spending and stronger employment protections. Second, this finding suggests that social spending may stabilize output not just by stabilizing income (as indicated by previous work) but also by stabilizing *expectations* about income.

We are unaware of other research exploiting media conventions to measure the impact of economic expectations, but a few studies similarly focus on the effect of economic announcements on macroeconomic outcomes. Oh and Waldman (1990) examine the effect of "expectational shocks" on subsequent industrial production by studying revisions to estimates of leading indicators; they find that an overly optimistic forecast of industrial production (i.e., one that is later revised downward) tends to lead to higher actual industrial production.[5] Rodríguez Mora and Schulstad (2007) show that overly optimistic early estimates of *past* GDP growth tend to lead to higher *subsequent* GDP growth. Like these studies, this paper measures the effect of expectations on macroeconomic outcomes by exploiting specific sources of expectational shocks rather than using structural time series methods. We depart from these studies in relying on expectational shocks that derive not from estimation errors made by U.S. government officials but rather from economic actors' ignorance of publicly available information. Our approach is valuable in part because it highlights the role of imperfect information (as noted above) but also because the source of these shocks is arguably more transparent and thus less subject to alternative interpretations.

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[5]The authors interpret this as evidence in favor of macroeconomic models featuring strategic complementarities. Oh and Waldman (2005) show the corresponding effect of revisions on expectations.

2. News Effects in the Economy

Consider a hypothetical experiment in which the same economy is exposed to either bad economic news (e.g. "there is a recession") or good economic news (e.g. "there is not a recession"). Why should we expect the nature of the news announcement to affect the economy, holding fixed the actual underlying economic fundamentals?

One type of explanation is that there may be multiple equilibria in the macroeconomy; economic news can act as a self-fulfilling prophesy by coordinating expectations (e.g. Azariadis, 1981; Howitt and McAfee, 1992; Farmer and Guo, 1994; Benhabib and Farmer, 1999; Farmer, 1999). These models typically feature strong strategic complementarities (e.g. consumers rationally spend less when other consumers are spending less) such that agents' behavior depend strongly on public signals (Morris and Shin, 2003). If the indeterminacy in the economy is extreme, news announcements may affect behavior even if they are "sunspots" that are understood to convey no information about actual economic fundamentals (Duffy and Fisher, 2005).

A more straightforward, "partial equilibrium" explanation is that economic actors may be influenced (in the short run, at least) by arbitrary news shocks because they do not know enough about actual economic fundamentals to be able to evaluate the news they are receiving. Someone who perfectly understands the economy learns nothing about economic fundamentals from an announcement that there is or is not a recession; a fully informed agent already knows the data used to produce recession announcements, so such an announcement cannot possibly change their view of the economy's fundamentals.[6] More generally, a fully informed agent can easily identify whether the information being provided accurately reflects reality or not. Of course, real economic agents have a more modest understanding of macroeconomic developments. Their information about economic conditions is likely to be imprecise and outdated (Mankiw and Reis, 2010); their ability to interpret information they are given (e.g. the meaning of "recession") may be poor. Imperfectly informed agents will therefore try to incorporate news about the health of the economy into their imperfect understanding of the economy. To the extent that news affects people's perceptions of their own economic prospects, it may also affect their actual economic behavior (Attanasio and Weber, 2010; Carroll, 1992, 1997; Carroll and Samwick, 1998).

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[6]If there are incentives to coordinate behavior with others, of course, such an announcement could affect behavior (as discussed in the previous paragraph).

As noted above, numerous studies have attempted to measure the economic effects of news shocks, where news shocks are defined as variation in news coverage holding fixed the underlying fundamentals. Doms and Morin (2004) measure the number of mentions of "recession" in news archives, and show that their recession index predicts consumer sentiment, controlling for contemporary economic conditions. Several studies in political science similarly measure the mood of news coverage over a given period and assess the extent to which the nature of news coverage predicts voters' assessments of the economy and ultimately their support for incumbent politicians (e.g. MacKuen, Erikson and Stimson, 1992; Blood and Phillips, 1995; Nadeau et al., 1999; De Boef and Kellstedt, 2004; Soroka, 2006). Starr (2012) finds that the degree to which consumers report having heard unfavorable news (controlling for actual economic conditions) predicts aggregate measures of sentiment, spending, and unemployment. While all of these studies offer suggestive evidence of a role for media in shaping perceptions and behavior independent of economic fundamentals, it is difficult to rule out an alternative explanation that the models they employ suffer from omitted variable bias: perhaps these models find an independent effect of media because the media report important features of economic reality that are improperly omitted from their set of control variables.

3. Research design

The fundamental challenge in measuring the effect of news on the economy is identifying similar situations in which different economic news is released. We take advantage of a widely used convention by which a recession is announced when GDP has contracted for two consecutive quarters. Whether a recession is declared, according to this definition, is a discontinuous function of economic performance; as a result, in the subset of cases where growth is basically zero we have some cases with a recession announcement and some similar cases without a recession announcement. This is the exogenous variation in economic news on which we focus, using a regression discontinuity design.

The convention of equating a recession with two quarters of negative growth can be traced to Arthur Okun, who reportedly introduced this definition of recession while he was an economic adviser to President Lyndon Johnson.[7] Okun's heuristic was quickly adopted

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[7]Okun reportedly realized that if the Council of Economic Advisers adopted the now-conventional def-

by the global financial press: in 1970, the *Financial Times* referred to it as "the official definition" of recession;[8] by 1980, it was "the classical definition."[9] In the U.S. the NBER has become accepted as the arbiter of business cycle dating, but even there the media tend to announce a recession based on the conventional definition, and when the NBER eventually makes a judgment it typically aligns closely with that definition. In the rest of the developed world the two-quarters definition has become the standard one employed by journalists and even government officials, as indicated by our systematic review of business cycle reporting in 17 countries.[10]

According to the conventional definition, the recession signal at time t can be thought of as a deterministic function of the growth rates in the previous two quarters, $\hat{y}_{t-1}$ and $\hat{y}_{t-2}$:

$$R_t = \begin{cases} 1 & \text{if } \max(\hat{y}_{t-1}, \hat{y}_{t-2}) < 0 \\ 0 & \text{otherwise.} \end{cases} \tag{1}$$

At time t the media reports $\hat{y}_{t-1}$ and $\hat{y}_{t-2}$ (the current estimates of the previous two quarters' growth) and $R_t \in \{0, 1\}$. Figure 1 depicts the assignment mechanism graphically.

The announcement of a recession thus depends on two discontinuities. One could carry out RDD analysis based on either of the two elements in the growth pair $\{\hat{y}_{t-1}, \hat{y}_{t-2}\}$; that is, one could condition on a negative value of $\hat{y}_{t-2}$ and estimate the effect of having $\hat{y}_{t-1}$ be below 0 or vice versa.[11] To increase the statistical power of our analysis, we treat this as a single discontinuity in two dimensions and measure the smallest distance between each growth pair and the "border" between recession and non-recession; this running variable allows us to exploit both dimensions of the discontinuity in Figure 1 at once. In particular,

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inition of recession, it could deny that a recession was taking place at the time, thus protecting President Johnson from criticism for economic mismanagement (Jon Swaine, "Definition of a recession 'drawn up on back of an envelope'", *The Telegraph*, Dec. 23, 2008). See also Edward Cowan, "Recession By Any Other Name Is Still Bad Times", *The New York Times*, Dec. 24, 1978, pg. 4E, which also credits Okun but quotes him as saying that he developed the two-quarter definition in the early 1960's as an "empirical characterization rather than a definition."

[8] "A U.S. mini-recession", *Financial Times*, Jan. 21, 1970.

[9] "U.S. economy grows by 1.1%", *Financial Times*, April 19, 1980, page 2.

[10] For recent examples of government agencies or officials recognizing the two-quarters rule, see (from U.K.) "Glossary of Treasury Terms", 2010 budget of HM Treasury; (from Denmark) Seneste okonomiske og monetaere udvikling, 2002 memo from the Danish National Bank; (for Sweden), Sveriges ekonomi: Statistiskt perspektiv, 2013 report by Statistics Sweden; (for Luxembourg) "Central banker warns of recession", *Delano*, Nov. 4, 2011.

[11] We have carried out this analysis; not surprisingly, the results look broadly similar but are noisier.

Figure 1: Assignment mechanism: Recession as a function of economic growth
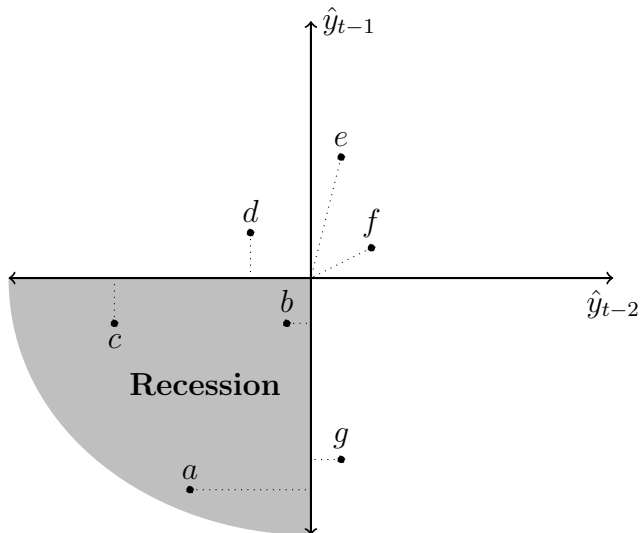
NOTE: By convention, a recession is announced in period t if growth in the previous two quarters was negative, i.e. if the economy is in the lower left quadrant of the figure. For hypothetical scenarios $\{a, b, \ldots, g\}$, the dotted line indicates the "distance to recession", which we use as the running variable in RD analysis.

we define the running variable x_t as follows:

$$
x_t = \begin{cases} \sqrt{\hat{y}_{t-1}^2 + \hat{y}_{t-2}^2} & \text{if} \quad \hat{y}_{t-1} > 0, \hat{y}_{t-2} > 0 \\ \max\{\hat{y}_{t-1}, \hat{y}_{t-2}\} & \text{otherwise.} \end{cases}
$$

Conceptually, this running variable measures the minimum change in GDP growth over the previous two quarters that would reverse the type of recession announcement that is made at time t. The magnitude of the running variable is illustrated in Figure 1 via dotted lines connecting each point to the closest point on the "border." A recession is declared in period t if and only if $x_t < 0$.

We can then estimate the average effect of the treatment (the recession announcement) on a given outcome Y (e.g. consumer spending) conditional on $x_{it} = 0$ as

$$
\tau_{RD} = \lim_{x \uparrow 0} \mathbb{E}[Y_{it} | x_{it=0}] - \lim_{x \downarrow 0} \mathbb{E}[Y_{it} | x_{it=0}],
$$

which can be interpreted as the average effect of the treatment at the threshold

$$\tau_{RD} = \mathbb{E}\big[Y_{it}(1) - Y_{it}(0)\big],$$

where i indexes countries.

Note that our application differs slightly from the conventional RDD setup in that the treatment (recession announcement) is applied when the running variable is *below* the threshold; it would be possible to redefine the treatment or the running variable to adhere more closely to convention, but we view the current setup as more intuitive: our running variable is a (weakly) increasing function of the past two quarters of economic growth and our treatment is being "officially" in recession.

4. Data

Recession announcements are based on early growth estimates, which by nature contain estimation error; the fact that this error could lead to a recession announcement being issued in one case and not in another similar case is one of the advantages of our identification strategy. Because the growth figures underlying recession announcements are often subsequently revised, it is important to obtain the initial, unrevised estimates.[12] We therefore collected "realtime" GDP estimates from a variety of sources for as many country-quarters as possible and rely entirely on these data in the construction of our running variable in the analysis below.

We construct our running variable based on quarter-on-quarter GDP growth (measured in constant prices and adjusted for seasonality and working days) because conventionally these are the data used to classify whether a country is in recession or not. We use five different realtime sources:

(a) datasets and press releases containing the first preliminary GDP estimates published by

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[12]In some cases the early growth figures indicated a recession but revisions indicated no recession, or vice versa. In the U.K., for example, a recession announcement was made in April 2012 based on initial estimates showing barely-negative growth in the last quarter of 2011 and the first quarter of 2012; over a year later it was announced based on revised figures that the recession actually did not occur. See Julia Kollewe, "UK Sinks Into Double-Dip Recession", *The Guardian*, 25 April 2012; Phillip Inman, "UK avoided double-dip recession in 2011, revised official data shows", *The Guardian*, 27 June 2013.

the relevant authority in a given country;

(b) preliminary GDP growth rates submitted to the OECD by member countries and compiled by the OECD;[13]

(c) growth rates calculated based on the first preliminary GDP level estimates obtained from the OECD's revision triangles;[14]

(d) growth rates calculated based on the first preliminary GDP level estimates published according to the revision triangles available from the Federal Reserve Bank of Dallas;[15]

(e) growth rates reported in the *Economist* magazine's "Output, Demand, and Jobs" tables.

For each source we are able to identify when the estimate was published by the underlying source (i.e. when it was released by the statistical agency in the case of a, when it was published by the OECD in the case of b, c, and d, and when it first appeared in the *Economist* in the case of e). In general, we take the earliest published estimate for each country-quarter, thus getting as close as possible to what would have been available to journalists during the quarter in question.[16] In the results reported here, we restrict attention to cases where we can obtain a growth estimate for a given quarter that was certainly published in the next quarter (e.g. by the end of June, for Q1 growth); this minimizes measurement error and also ensures that our analysis is based only on data that would have been available to the public at the time in question.[17] Note that although the running variable is always based on these "realtime" estimates of GDP growth, our outcome variables are based on the "true" final estimates of GDP growth and other indicators; we are interested in the effect of what people thought at the time to what subsequently happened in reality.

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[13]http://goo.gl/F1HyGG

[14]http://goo.gl/lxkUxL

[15]http://www.dallasfed.org/institute/oecd/index.cfm

[16]Our exact protocol is the following. Starting with empty vectors for $\hat{y}_{t-1}$ and $\hat{y}_{t-2}$, we fill in with a whenever it is available, followed by b whenever that is available (and a is not). In cases where these sources are missing, we fill in from c and d depending on which estimate was published earliest. Finally, in any case where the estimate is missing or the estimate is available but was published more than 3 months after the end of the quarter, we fill in from e.

[17]Note that to construct our running variable at time t, we generally use $\hat{y}_{t-1}$ and $\hat{y}_{t-2}$ *as they were estimated in period t*; typically, this means that we use the first estimate of $\hat{y}_{t-1}$ and the first revision of $\hat{y}_{t-2}$, and thus that $\hat{y}_{t-2}$ is not simply the lagged version of $\hat{y}_{t-1}$. The exceptions are cases where we use data from the *Economist*, which provides only the most recent quarter's growth estimates.

To give an idea of the data coverage, Table 1 reports the first year of available realtime data for each country, as well as the number of "near-recession" quarters (those with a running variable between 0 and .5) and recession quarters (those with a running variable below 0). Note that although we construct our running variable based on realtime data, our outcome variables are based on the "true" final estimates released by the OECD; our interest is in how the presence or absence of recession announcements at a given point in time (which depended on early estimates of economic growth at that point) affected subsequent actual economic outcomes, which are best measured by the official revised measures.

Table 1: Descriptive statistics by country

Country	First year of data	Near-recession quarters	Recession quarters	Country	First year of data	Near-recession quarters	Recession quarters
Australia	1984	10	3	Japan	1983	11	15
Austria	2005	6	2	Korea	1998	4	1
Belgium	2000	13	4	Mexico	2006	3	2
Brazil	1998	2	3	Netherlands	1991	19	13
Canada	1983	18	5	Norway	2000	8	2
Czech Rep.	2008	2	7	Poland	2006	1	0
Denmark	1997	14	7	Portugal	2004	4	9
Estonia	2008	0	4	Slovakia	2005	0	0
Finland	2000	3	4	Slovenia	2005	2	6
France	1983	27	4	South Africa	1998	4	2
Germany	1991	20	14	Spain	1994	10	10
Hungary	2005	2	2	Sweden	1992	4	5
Iceland	2006	1	6	Switzerland	1989	16	15
India	1998	1	0	Turkey	1999	2	0
Indonesia	1998	0	1	U.K.	1990	13	10
Ireland	2004	0	5	U.S.A.	1970	20	11
Italy	1996	23	13				

NOTE: Table reports the first year for which we have realtime data for each country, along with the number of near-recession quarters and recession quarters in each country (where "near-recession" means that the running variable is between 0 and .5). We restrict attention to quarters where we are able to obtain an estimate that is published before the end of the subsequent quarter.

5. Assessing validity of the RDD

The validity of our identification strategy would be endangered if governments or statistical agencies systematically manipulated output data in order to minimize the potential adverse economic and political effects of announcing a recession. If some countries are able to manipulate growth figures to narrowly avoid recession and others are not, then close calls on either side of the threshold would likely differ not just in whether a recession was announced but also in the type of countries being considered.

One standard test, due to McCrary (2008), checks for a discontinuity in the density of the running variable at the threshold. The fact that our running variable passes the McCrary test (p-value = .41) indicates that we do not see a disproportionate number of growth pairs that narrowly avoid qualifying as a recession. We also fail to find evidence of sorting in the components of the running variable ($\hat{y}_{t-1}$ and $\hat{y}_{t-2}$) when we focus on the cases where we might expect sorting to be most likely – when one of the components is negative. Conditioning on $\hat{y}_{t-2}$ being negative we fail to reject the null hypothesis for $\hat{y}_{t-1}$ (p-value = .68) and conditioning on $\hat{y}_{t-1}$ being negative we fail to reject the null hypothesis for $\hat{y}_{t-2}$ (p-value = .28).

Another way to assess sorting in this case is to compare the realtime data on which we focus with revised figures ultimately released by the OECD. If governments manipulate growth estimates to avoid having to announce a recession, and if revisions tend to undo political manipulation, we might expect there to be fewer recessions in the realtime data than in the revised data. In fact we do not see a higher count of recessions in the realtime data. Revisions do lead to reclassifying some quarters from non-recession to recession, but they seem to just as often do the reverse; we cannot reject the null hypothesis of an equal proportion of recessions in the two datasets (p-value = .87 from a χ^2 test).

Ultimately the concern with sorting is the non-comparability of covariates (and, most importantly, potential outcomes) across the threshold. In the online appendix we report the results of placebo tests in which we measure the "effect" of two quarters of negative growth on various pre-treatment outcomes using the same procedures we use to estimate the effects for actual outcome variables (see Tables 7, 8, and 9). Some of these tests reveal imbalances (suggesting the value of checking robustness of the main results to the inclusion of covariates), but the imbalances are not generally robust to different specifications and do

not suggest systematic differences between treated and untreated country-quarters.

A final note on sorting is that, if governments do manipulate growth figures to avoid reporting recessions, it is likely that the RDD analysis would indicate a *positive* effect of recession announcements on subsequent economic growth. One reason is that, if such manipulation were taking place, the real economy in cases just above the threshold would be weaker on average than the value of the running variable would suggest, with the expectation that subsequent growth would also be lower than predicted by the running variable. Another reason is that if manipulation involves "borrowing" output from future quarters (e.g. through "creative accounting" or accelerating government spending programs) then future growth should be pulled down by the same amount. This suggests that our findings of a negative effect of recession on spending would understate the true effect if manipulation is taking place.

6. Results

We begin by assessing whether media coverage of the economy in fact depends on whether the economy has contracted for two quarters. We then move on to assess effects on confidence and components of economic growth.

6.1. Media effects

We used two approaches to measure the media's response to two quarters of negative growth. First, we carried out a survey of news coverage in 17 economically developed countries, asking research assistants to determine for each country-quarter whether a careful reader of the country's major newspapers would conclude that a recession was taking place. They were instructed to focus particularly on announcements of recession that appeared in headlines and on front page articles. The research assistants were native speakers (or nearly so) of the major language of each of the countries to which they were assigned. We also asked our research assistants to pay attention to the way recession was defined in each country and time period.

Next, we carried out a more objective search counting articles in a news database. For

each country and quarter covered by the archive,[18] we counted the number of economics-themed articles mentioning the word "recession." We think of this search as a test of both whether the media follows the two-quarters convention and whether they emphasize bad economic news during an official recession. If stories mentioning recession appear more frequently in recessions, this may be partly because articles announcing a recession must mention the word "recession" and partly because journalists tend to frame articles around economic malaise during recessions.

Figure 2 reports the RDD results of our media analysis graphically; Table 2 reports additional robustness checks. Each pair of plots reports results for a different outcome variable, using a presentation format that will recur throughout the paper. In the left plot the black dots indicate the proportion of cases within a fixed interval of the running variable in which the research assistants judged that a recession was definitely taking place; the dot immediately to the left of the vertical line at 0 reports the average outcome in cases where the running variable was between -.15 and 0, while the dot to the right of the vertical line reports the average outcome in cases where the running variable was between 0 and .15. The line shows the local linear regression fit on each side of the threshold, with the bandwidth chosen by the procedure introduced by Calonico, Cattaneo and Titiunik (2012).[19] The right plot shows the estimated effect of recession, measured as the gap between the local linear regression lines from the left side of the threshold to the right side in the RDD plot, at each possible bandwidth of the local linear regression line; the optimal bandwidth (and corresponding point estimate and confidence interval) is highlighted with a black point and gray vertical line.

Panel A of Figure 2 reports the effect of a recession on our research assistants' judgment of whether a recession was definitely taking place (based on news archives). The left plot indicates that when the economy was comfortably out of recession or deeply in recession, research assistants almost always gave the 'correct" answer we would expect; in close calls, there was more disagreement, with the research assistants being sure of a recession in only 60% of narrow recessions and as many of 10% of narrowly-avoided recessions. Accordingly, in the right plot we see that the effect of recession on the probability that our RA will

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[18]We used Factiva, which allowed us to search economic news for 21 countries: Argentina, Australia, Austria, Brazil, Canada, Chile, Denmark, France, Germany, Ireland, Italy, Luxembourg, Mexico, New Zealand, Norway, Portugal, Spain, Sweden, Turkey, United Kingdom, and United States.

[19]To give a sense of the bandwidth, the regression line is depicted only within the bandwidth used.

Figure 2: Effect of official recession on media outcomes

A. Subjective assessment: Recession definitely taking place

B. Articles containing "recession"
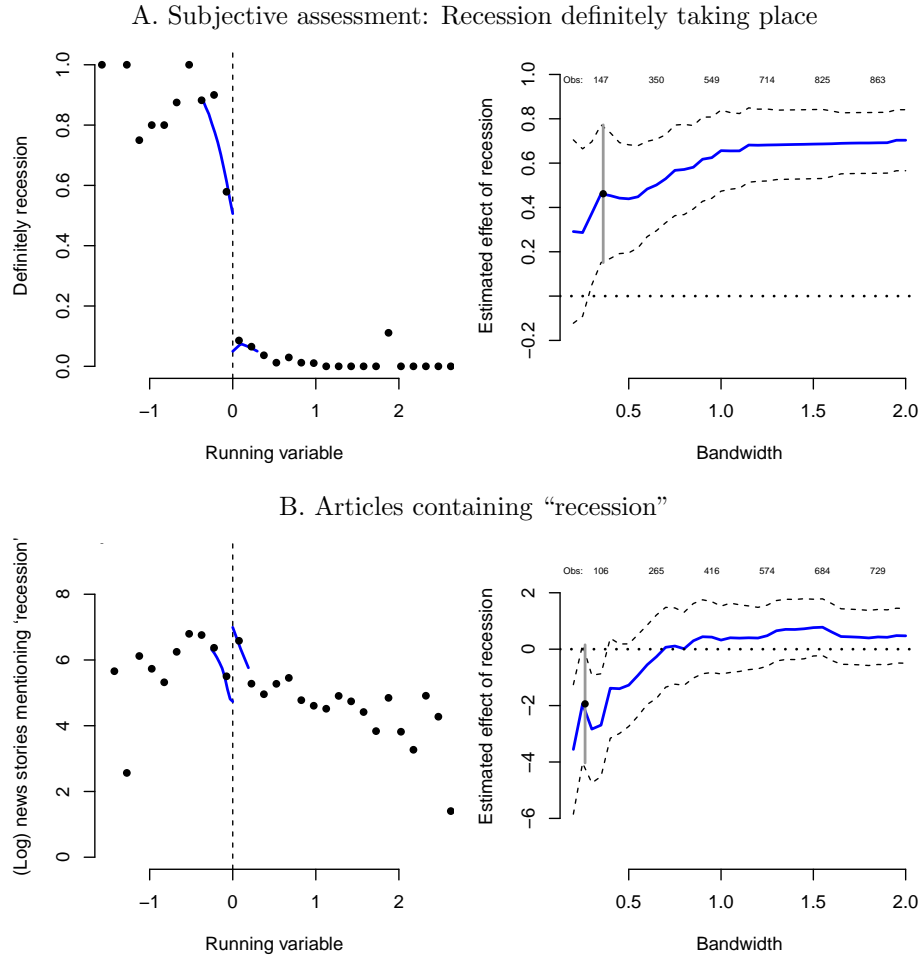
NOTE: For each outcome, the left plot shows the outcome as a function of the running variable; the right plot shows the estimated effect of recession on the outcome as a function of the bandwidth of the local linear regression. See text for more details.

detect a recession is about .5, with the estimate growing larger at larger bandwidths. Table 2 indicates the estimated effect under alternative specifications, including the inclusion of fixed effects and covariates. We ascribe the lack of perfect agreement between our RAs and the official definition to several factors. One factor is that our RAs were asked to focus on economic reporting during the middle of the quarter, but in many cases the previous quarter's growth rate is not announced until the last month of the quarter. Another factor is that, even though the two-quarters definition is the most widely used definition, in many cases alternative definitions circulate and mingle with forecasts, making it difficult to determine

14

whether in fact a recession is taking place.

Panel B of Figure 2 shows the same graphical results for the (log) count of articles mentioning "recession" in each country-quarter; Table 2 reports estimates using various specifications. The results are mixed, suggesting no clear effect. The figures indicates that at the specified bandwidth the estimated effect of recession is negative, but they also indicate that the estimate is sensitive to the bandwidth chosen and (given the shape of the curves in in the left plot) the negative effect at narrow bandwidths seems spurious. Table 2 reports a statistically significant and negative effect in the first specification (no fixed effects, no covariates) but a statistically significant and positive effect when we include covariates and fixed effects for country and year. The fact that we fail to find more articles mentioning recession during actual recessions (conditional on growth near 0) may reflect the fact that the economic news is fairly grim in either case. It also highlights the difficulty of extracting the content of news reports from simple word counts: our RAs were much better able to distinguish between recessions and near-recessions, in part because (unlike a simple count of articles mentioning "recession") they could distinguish articles confirming a recession from articles that noted a near-recession or the end of a recession.

Table 2: RDD results: News Media

Outcome	Estimates				Bandwidth	N
Definitely Recession	0.457**	0.491**	0.520**	0.767**	0.36	162
	(0.156)	(0.167)	(0.185)	(0.145)		
Recession News Articles	-2.257*	-0.369	0.380	1.047*	0.26	71
	(1.054)	(0.571)	(0.473)	(0.511)		
Country FE		✓	✓	✓		
Year FE			✓	✓		
Controls				✓		

NOTE: All models are estimated using local linear regression. The bandwidth is calculated using the optimal bandwidth selection method proposed by Calonico, Cattaneo and Titiunik (2012). The vector of control variables consists of the three pre-treatment variables that appear to be unbalanced in some specifications: Government Consumption, $t-3$; (log) Recession News Articles, $t-2$; and Recession, $t-3$. Robust standard errors are reported in parentheses.

6.2. Effects on confidence

Figure 3 shows graphs comparable to those in Figure 2 but focusing on the attitudes of consumers, businesses, and citizens as a whole. Panel A reports our graphical results for consumer confidence indicators, which measure households' expectations about their own economic situation and the more general economic situation over the coming year.[20] The RDD plot at left indicates a clear drop in consumer confidence associated with the announcement of a recession. The figure indicates that the announcement of a recession reduces consumer confidence by about half a point on average (controlling for economic fundamentals); this effect is substantively large considering that the within-country standard deviation of consumer confidence near the threshold is about 1.2. When we add fixed effects and covariates to the regression (Table 3) the estimated effect gets stronger.

As might be expected given our research design, we find less clear evidence of an effect on business confidence[21]: the binned averages in the RD plot on the left of Figure 3 (panel B) suggests that recession lowers business confidence, but at the optimal bandwidth the effect is about zero, and the effect never approaches significance in Table 3. This suggests that the business managers who respond to business confidence surveys have a better understanding of macroeconomic context than consumers who respond to consumer confidence surveys; for a more informed economic actor, the recession signal conveys less information. Consistent with this interpretation, not only is there less evidence of a discontinuity in business confidence, we also find that business confidence is more correlated with the running variable on both sides of the threshold than is consumer confidence.

6.3. Economic effects

We now turn to assessing how recession announcements affect economic growth. In Figure 4 we use the same approach as above to report the effect of two quarters of negative growth on the subsequent growth in private consumption (Panel A) and, for comparison, gross private investment and government consumption (Panels B and C).

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[20]The measures are compiled initially by national statistical agencies and private organizations and then harmonized by the OECD.

[21]Business confidence indicators are intended to summarize manufacturers' expectations about production in the next three months and their views about current stocks of finished goods and current order levels.

Figure 3: Effect of recession on confidence

A. Consumer confidence

B. Business confidence
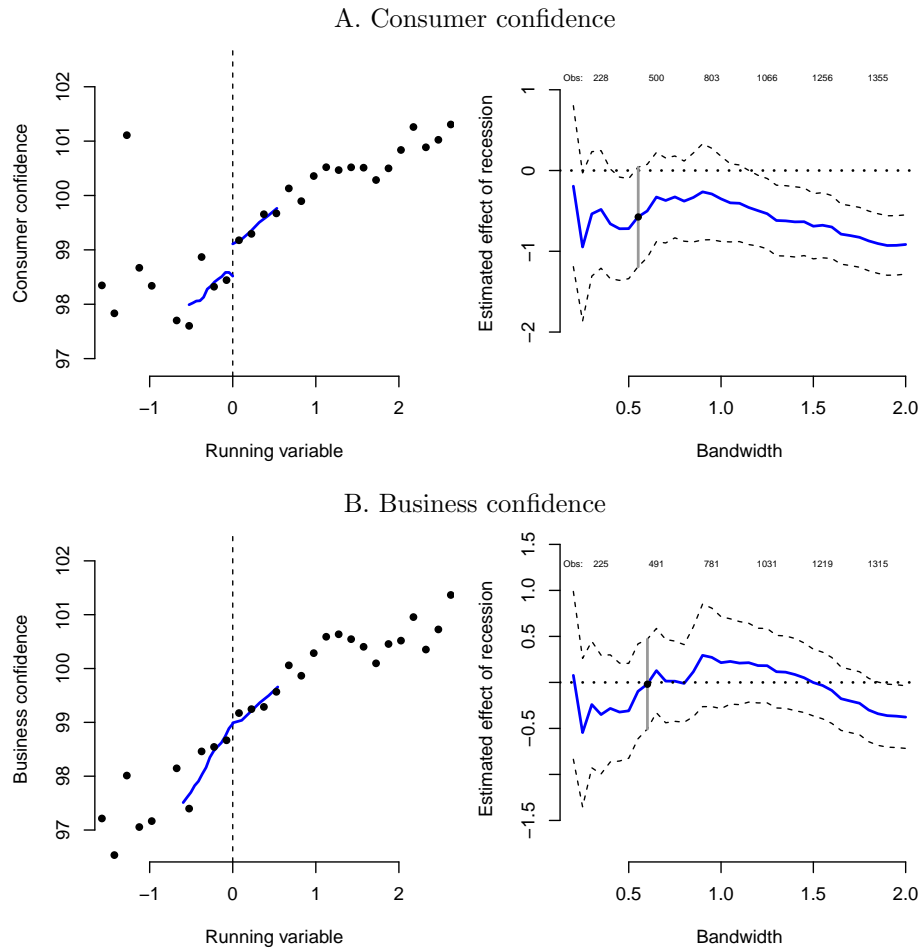
NOTE: See note to Figure 2.

The figures in Panel A indicate that growth in private consumption is about .4% following a narrow recession than it is following a narrow non-recession. The drop is clearly visible in the RD plot and is borderline significant at the optimal bandwidth; the point estimate is negative at all bandwidths. Table 4 indicates that the effect is significant when country fixed effects are included and robust to the inclusion of year fixed effects and covariates; the estimate varies from about -.4% to about -1% depending on the specification. Given that private consumption typically constitutes about two-thirds of overall GDP, this effect is of clear substantive importance.

Table 3: RDD results: Confidence

Outcome	Estimates				Bandwidth	N
Consumer Confidence	-0.591†	-0.687*	-0.730**	-0.926**	0.55	402
	(0.312)	(0.293)	(0.244)	(0.317)		
Business Confidence	-0.019	0.090	-0.001	-0.392	0.60	440
	(0.250)	(0.244)	(0.195)	(0.306)		
Country FE		✓	✓	✓		
Year FE			✓	✓		
Controls				✓		

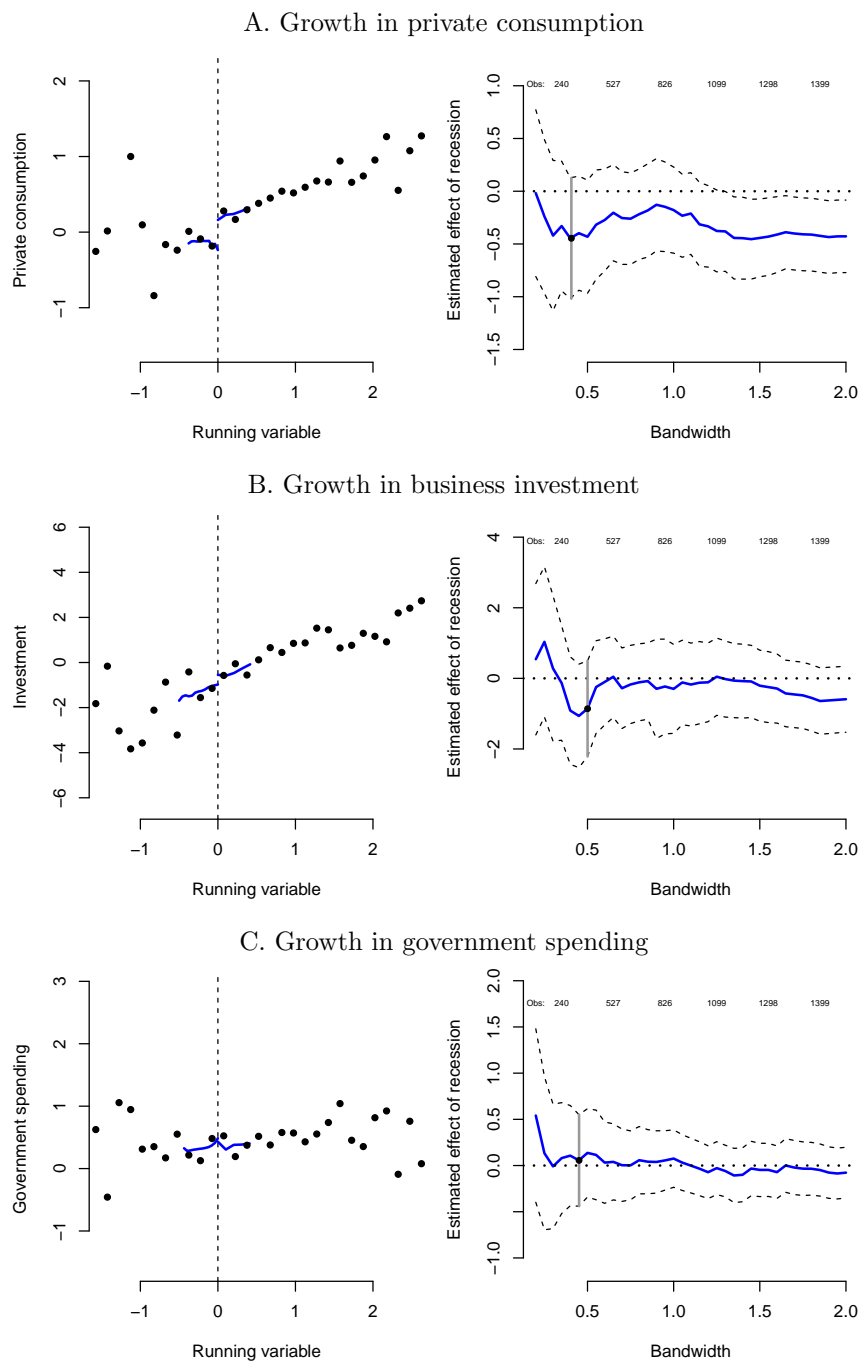Note: See note to Table 2

By contrast, we do not find a robust effect of official recession on growth in business investment (i.e. private capital formation) or government spending. In neither case does visual inspection of the RDD plot indicate a drop at the threshold, and (although the point estimates for business investment are substantial in magnitude) we are unable to reject the null of no effect for most specifications in Table 4. The null result for investment is consistent with the idea that decisions made by private firms are not sensitive to the announcement of a recession, which is in turn consistent with the idea that business managers have a more sophisticated understanding of macroeconomic conditions.[22] It is also consistent with the fact that business investments, although volatile and heavily procyclical, cannot be changed on short notice in the way that consumer spending can.[23] The absence of an effect of official recession on government spending is also unsurprising: even those aspects of government spending that are countercyclical by design would not be expected to respond immediately to changes in consumer confidence or private spending. We thus take both null results as evidence of the soundness of our design.

Figure 5 graphically presents our estimates of the effect of recession on GDP growth; the bottom line of Table 4 reports estimates in various specifications. The point estimates are consistent with the idea that the announcement of a recession affects GDP growth by depressing private spending, but we are unable to reject the null hypothesis of no effect under

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[22]Even if business managers understand the likely effect of recession news on confidence and private spending, the announcement of a recession may not noticeably change production plans – especially if the effect is short-term and was likely to be felt sooner or later.

[23]Oh and Waldman (1990) note a substantial lag between "false announcements" and the effect of those announcements on industrial production.

Figure 4: Effect of recession on GDP growth components

A. Growth in private consumption

B. Growth in business investment

C. Growth in government spending

NOTE: See note to Figure 2.

19

Table 4: RDD results: Economic Outcomes

Outcome	Estimates				Bandwidth	N
Consumption	-0.398	-0.556†	-0.743**	-1.103**	0.41	298
	(0.291)	(0.308)	(0.280)	(0.385)		
Investment	-0.203	-0.541	-0.870	-1.408	0.54	417
	(0.676)	(0.752)	(0.659)	(0.964)		
Gov. Purchases	0.054	0.138	0.145	0.021	0.45	340
	(0.255)	(0.266)	(0.272)	(0.510)		
GDP	-0.208	-0.298	-0.406*	-0.431	0.54	417
	(0.240)	(0.264)	(0.201)	(0.353)		
Country FE		✓	✓	✓		
Year FE			✓	✓		
Controls				✓		

NOTE: See note to Table 2

most specifications.

Figure 5: Effect of recession on GDP growth

NOTE: See note to Figure 2.

20
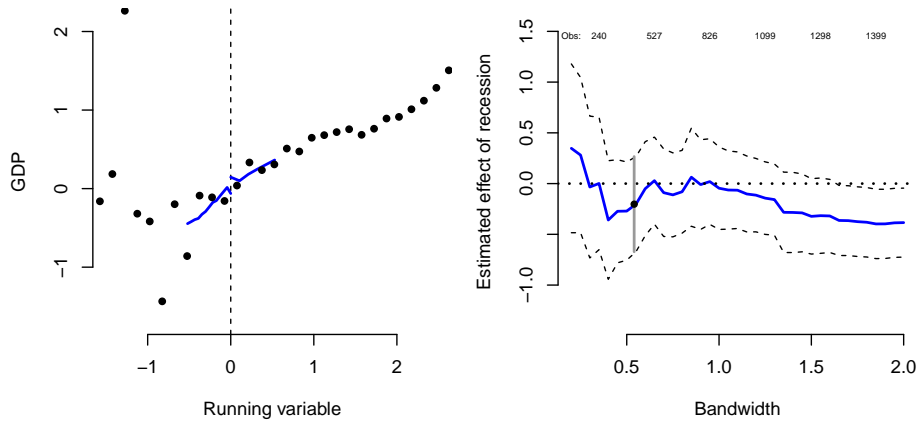
6.4.   Placebo treatments

We carry out two types of falsification tests to check the credibility of our results. First, we look for "effects" of crossing thresholds other than 0 in the running variable we defined above. Second, we look for "effects" of crossing 0 in a running variable defined as two quarters of growth below x for various x's.[24] The results for consumer confidence and private spending are depicted graphically in Figures 9 and 10 in the appendix. Both sets of results tend to support the above analysis. In both tests, the effect on consumer confidence is statistically significant only at the actual cutoff; the effect at the actual cutoff is also the largest or second-largest in magnitude among the cutoffs examined. The magnitude of the effect on private spending is largest in magnitude in both tests at the actual cutoff.

7.   The welfare state and the effects of recession

As discussed in Section 2 above, a straightforward interpretation of the effect of economic news on consumer behavior is that consumers make spending decisions in light of their understanding of the macroeconomic situation and its implications for their own future income. It follows that the effect of a recession announcement on consumer confidence and consumer spending should depend on the extent to which consumers are insulated from economic shocks. We therefore expect to find a larger effect of recession announcements on consumer expectations and consumer behavior in countries with a less robust social safety net and fewer employment protections. Such a finding would increase our confidence in the above results and provide evidence that the effect operates through the hypothesized channels, but (as we explain in more detail below) it may also highlight an under-appreciated channel through which the welfare state may tend to dampen output volatility.

The literature on social welfare systems has produced numerous categorizations of countries based on the nature of welfare state protections. One of the most influential of these, proposed by Esping-Andersen (1990), focuses on the extent to which the welfare state insulates individuals from labor market shocks. The relatively small social safety net in liberal

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[24]The second test thus effectively changes the borders of the recession quadrant in Figure 1 and tests the effect of being in those quadrants. The first test holds fixed the recession quadrant and measures the effect of being different distances from that quadrant.

welfare states such as the United States, Canada, and Australia (compared to those in continental Europe and Scandinavia) suggests that consumers in these countries may perceive recessions as a more serious threat to their future well-being. We adopt Esping-Andersen (1990)'s classification of liberal welfare states in our analysis; Table 12 in the online appendix shows that the results for consumer confidence are very similar if we use other classifications proposed in the comparative political economy literature.

Our results indicate that the effect of a recession announcement is indeed larger in liberal welfare states. Figure 6 indicates that 'recessions' tend to have a substantial negative impact on consumer confidence in liberal welfare states whereas there does not appear to be an effect in other economies. Figure 7 shows the same pattern for growth in private consumption. In Table 5 we test whether there is a significant difference between the treatment effect for these two outcomes (as well as growth in GDP) across the two groups. The overall pattern is the same across the different variables and econometric specifications: in the liberal welfare states, on average a recession announcement has a substantial negative impact on consumer confidence, private consumption and GDP, and the effect is statistically significantly different from zero for many of the specifications. In the other economies, the effects of recession announcements on consumer confidence, private consumption and GDP are never statistically significantly different from zero. Comparing across estimates, we see that on average recession announcements appear to "hurt" the economy more in liberal welfare states compared to other economies, and the difference is statistically significant for consumer confidence and GDP growth.

In our view, the fact that the effect of recession is concentrated in liberal welfare states is noteworthy in two respects. First and most straightforwardly, it provides a validation of the overall results: if the news of a recession affects consumers by increasing the perceived risk of unemployment or lowering expected income, then we would expect this effect to be strongest where the welfare state does the least to protect workers from unemployment and negative income shocks. Our confidence in the overall findings is bolstered by the fact that this is precisely what we find in the subgroup analysis.

In addition, this finding sheds new light on the role of social spending in moderating output volatility. The literature on automatic stabilizers suggests that progressive income taxes and social transfers stabilize private consumption over the course of the business cycle, and that this in turn reduces output volatility (DeLong and Summers, 1986). That hypothesis

22

Table 5: Estimated impact of recessions in liberal welfare states and other economies

Outcome	Liberal		Other		Difference	FE	Year FE	Contr.
Consumer Confidence	-1.027*	[0.840]	0.265	[0.374]	-1.292*			
	(0.408)	⟨ 224⟩	(0.503)	⟨ 121⟩	(0.592)			
Consumer Confidence	-1.149**	[0.840]	0.268	[0.374]	-1.418*	✓		
	(0.416)	⟨ 224⟩	(0.472)	⟨ 121⟩	(0.595)			
Consumer Confidence	-0.976**	[0.840]	-0.553	[0.374]	-0.423	✓	✓	
	(0.338)	⟨ 224⟩	(0.424)	⟨ 121⟩	(0.492)			
Consumer Confidence	-0.987**	[0.840]	-0.540	[0.374]	-0.446	✓	✓	✓
	(0.337)	⟨ 215⟩	(0.432)	⟨ 121⟩	(0.476)			
Consumption	-0.522†	[0.516]	-0.032	[0.620]	-0.490			
	(0.303)	⟨ 108⟩	(0.265)	⟨ 237⟩	(0.382)			
Consumption	-0.518	[0.516]	-0.009	[0.620]	-0.509	✓		
	(0.322)	⟨ 108⟩	(0.274)	⟨ 237⟩	(0.413)			
Consumption	-0.458	[0.516]	-0.322	[0.620]	-0.137	✓	✓	
	(0.360)	⟨ 108⟩	(0.255)	⟨ 237⟩	(0.357)			
Consumption	-0.495	[0.516]	-0.275	[0.620]	-0.220	✓	✓	✓
	(0.367)	⟨ 108⟩	(0.261)	⟨ 235⟩	(0.351)			
GDP	-0.662*	[0.731]	0.517	[0.560]	-1.179*			
	(0.304)	⟨ 176⟩	(0.341)	⟨ 211⟩	(0.471)			
GDP	-0.695*	[0.731]	0.496	[0.560]	-1.190*	✓		
	(0.318)	⟨ 176⟩	(0.349)	⟨ 211⟩	(0.481)			
GDP	-0.917**	[0.731]	-0.034	[0.560]	-0.884*	✓	✓	
	(0.303)	⟨ 176⟩	(0.275)	⟨ 211⟩	(0.384)			
GDP	-0.908**	[0.731]	-0.039	[0.560]	-0.869*	✓	✓	✓
	(0.306)	⟨ 176⟩	(0.284)	⟨ 210⟩	(0.385)			

NOTE: All models are estimated using local linear regression. Countries are classified as liberal welfare states or other types of economies according to Esping-Andersen (1990). Robust standard errors are reported in (parentheses). The optimal bandwidth calculated according to Calonico, Cattaneo and Titiunik (2012) is reported in [square brackets]. The number of observations are reported in the ⟨angle brackets⟩.

Figure 6: Effect of recession on consumer confidence

A. Liberal welfare states

B. Other economies
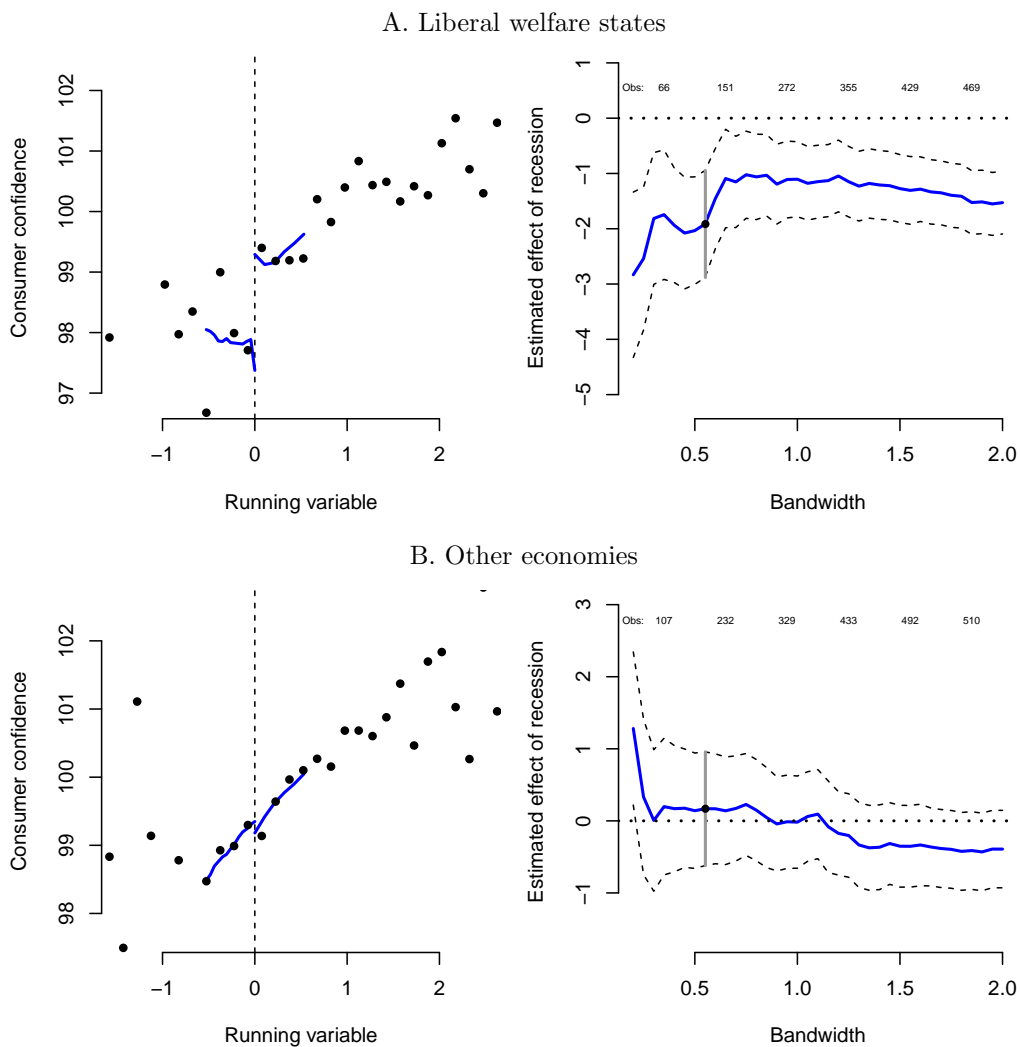
NOTE: See note to Figure 2.

is supported by studies based on aggregate level data (e.g. Auerbach and Feenberg, 2002; Fatás and Mihov, 2001; Galí, 1994) and micro data on households' taxes, transfers and consumption (e.g. Auerbach and Feenberg, 2000; Dolls, Fuest and Peichl, 2012; Kniesner and Ziliak, 2002). Our results indicate the effect of social spending levels on output volatility may operate in part through expectations: a strong social safety net seems to make consumer confidence less pro-cyclical, which in turn makes private spending less pro-cyclical and thus

Figure 7: Effect of recession on private consumption

A. Liberal welfare states

B. Other economies
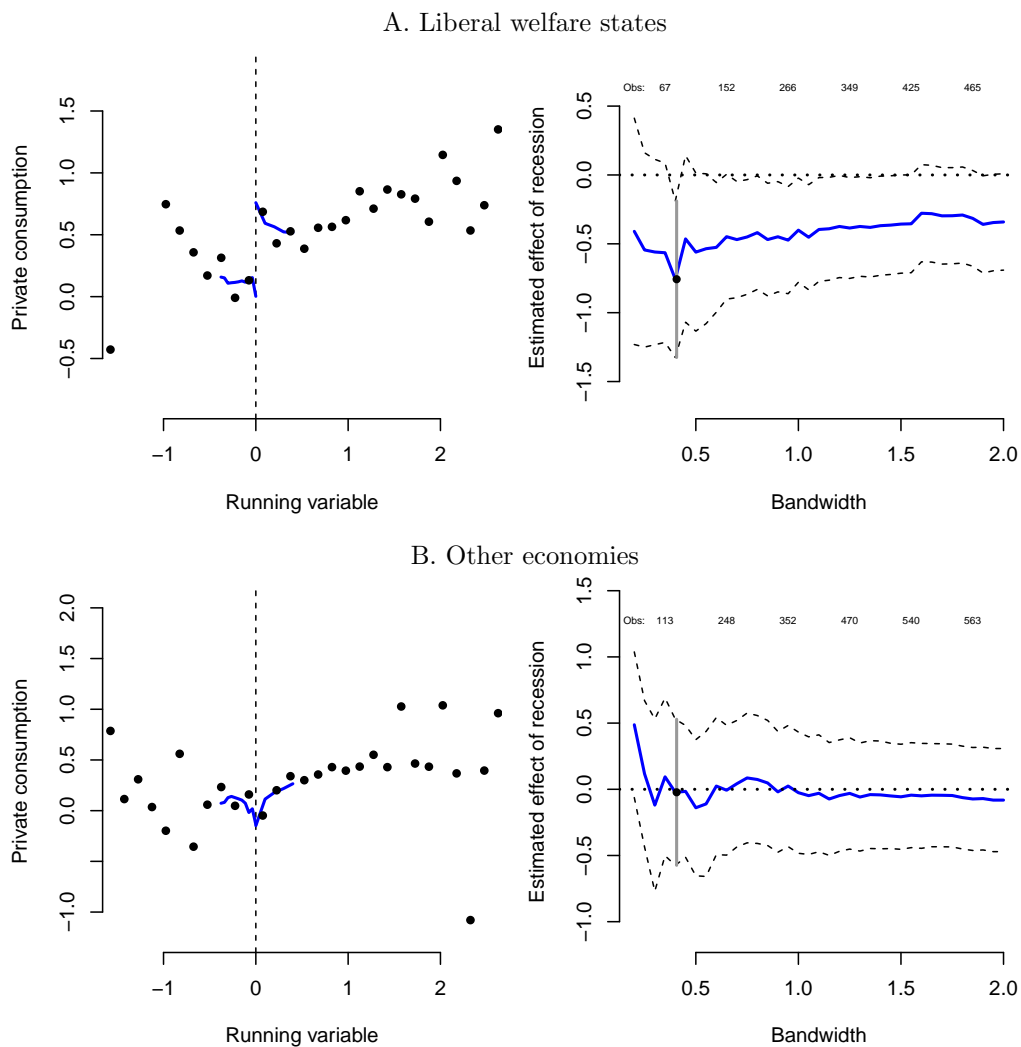
contributes to the stabilization of overall output. Put differently, the role of social spending is not simply to make post-transfer income less cyclical, but also to make consumers' spending plans less dependent on their perceptions of the business cycle.

We acknowledge that the stronger reaction to recession news in countries with smaller welfare states could have alternative explanations. Perhaps the most important alternative explanation is that countries with larger welfare states are also typically smaller and more

Figure 8: Effect of recession on GDP

A. Liberal welfare states

B. Other economies
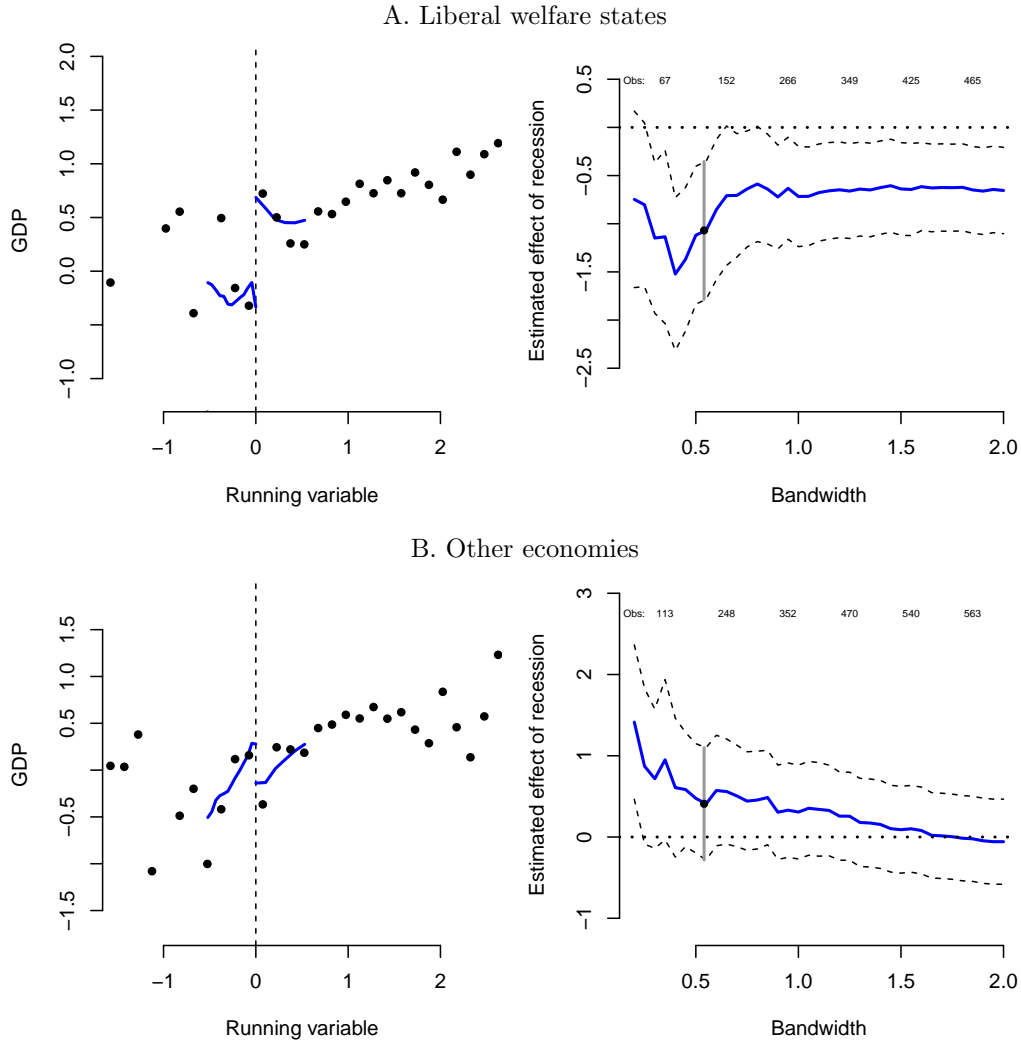
NOTE: See note to Figure 2.

open to the international economy (Rodrik, 1998); in such states, news of a domestic recession may be less salient not just because the government insulates citizens from domestic shocks but also because macroeconomic forecasting in an open economy depends more on events abroad. We should therefore be cautious about drawing strong conclusions about the role of social spending *per se* in moderating the effect of economic news. Either way, however, the fact that recession news matters less where we expect it to be less salient to consumers

26

strengthens our confidence in the overall finding that business cycle reporting affects the economy even conditional on economic fundamentals.

8. Discussion and conclusion

By exploiting the arbitrariness of the conventional definition of recession, this paper has shown that (conditional on economic fundamentals) the announcement of a recession affects consumer confidence and private spending. We showed that newspapers in a large set of wealthy countries report a recession following two quarters of negative growth. We used this feature of business cycle reporting to show that the announcement of a recession reduced consumer confidence and consumer spending; subgroup analysis showed that these effects were concentrated in countries with a weaker social safety net, where we expect consumers' income expectations to depend less on domestic macroeconomic conditions.

As noted in the introduction, one implication of our findings is that information imperfections among consumers are sizable and may be important in the transmission of economic shocks. Our analysis also has possible implications for the relationship between information imperfection and macroeconomic volatility. In the past decade or so, macroeconomists have explored the idea that deviations from full information may be able to explain the "excess smoothness" puzzle (Deaton, 1987; Campbell and Deaton, 1989), i.e. why aggregate consumption is less responsive to changes in permanent income than one would expect (Mankiw and Reis, 2010). This suggests that information imperfection would in some circumstances play a moderating role in the business cycle, as consumers and other imperfectly informed agents respond to exogenous shocks with delay and in uncoordinated ways. In contrast, our findings highlight a way in which imperfect information could exacerbate larger shocks: if agents' perceptions are out of step with reality due to information imperfections, then high-profile news (such as recession announcements) may trigger a coordinated revision of expectations and a resulting swing in output. This would be true not only for the special case of recession announcements (which convey no new information, conditional on growth data) but also for other large, attention-grabbing events that may affect economic fundamentals, such as a stock market crash, a political crisis, or a terrorist attack.

Although we are the first to quantify the effects of recession announcements, others have apparently suspected that the R-word had the power to affect economic perceptions. Most

famously, U.S. President Jimmy Carter's advisers once criticized Alfred Kahn, one of his economic advisers, for publicly using the word "recession" in discussing the economic outlook; Kahn responded by promising to replace the word "recession" with "banana" in subsequent press conferences.[25] Our results indicate that the Carter administration's sensitivity was well-founded, not just because of possible political consequences but also because of the real economic impact of consumers' economic perceptions.

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[25]William Safire, "The Meaning of Depression," *The New York Times*, April 11, 1982, page 9 of magazine section.

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29

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8.1. Appendix: placebo treatments

Figure 9: Placebo treatment: the effect of crossing various values of the running variable
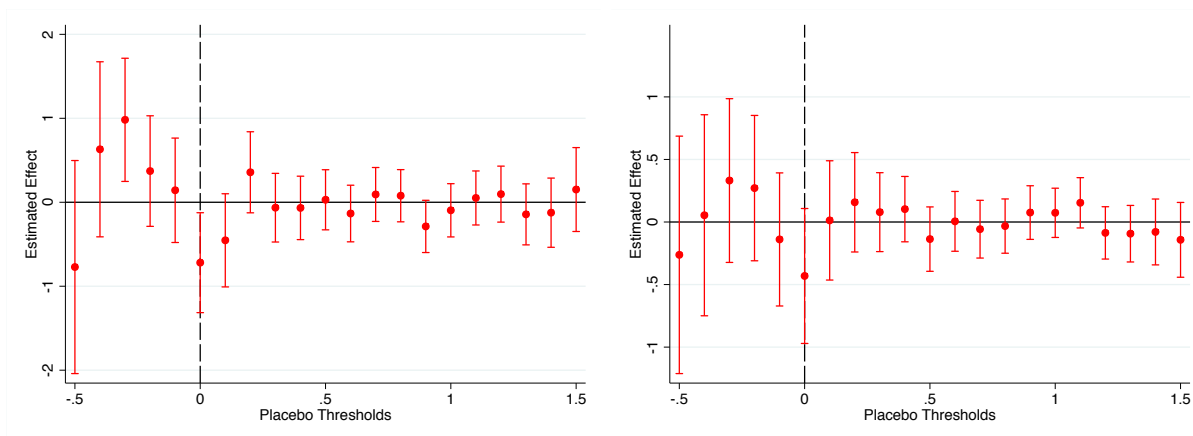
NOTE: Outcome in top left is consumer confidence, top right is growth in private consumption, bottom is GDP growth. The actual cutoff is indicated by a vertical dashed line.

Figure 10: Placebo treatment: the effect of two quarters of GDP growth below x
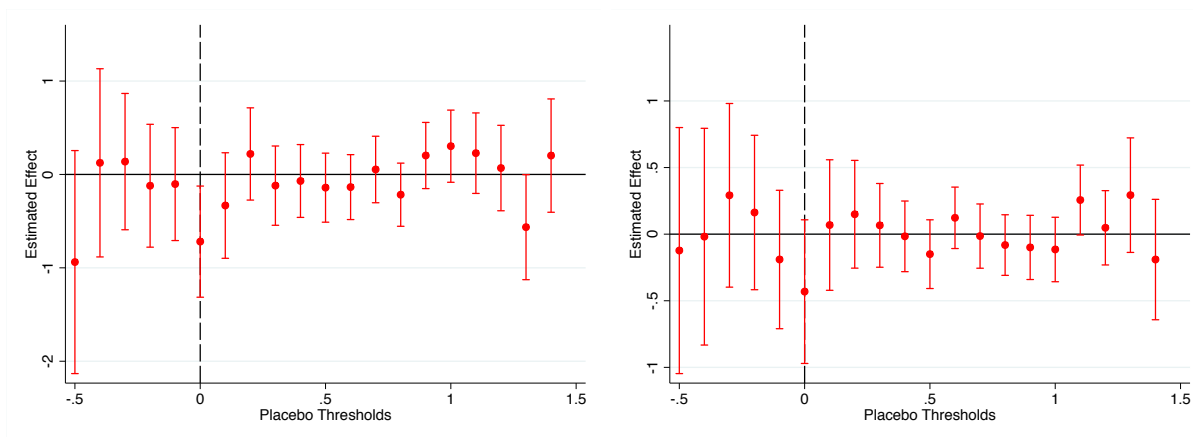
NOTE: Outcome in top left is consumer confidence, top right is growth in private consumption, bottom is GDP growth. The actual cutoff is indicated by a vertical dashed line.

9. Online Appendix

9.1. Data description

Table 6: Correlation between Growth Rate Data Series

	Published	OECD rates	OECD levels	Dallas Fed	Economist	Revised
Published	1.00					
	[247]					
OECD rates	1.00	1.00				
	[47]	[824]				
OECD levels	0.85	0.90	1.00			
	[122]	[822]	[2849]			
Dallas Fed	.	0.91	0.71	1.00		
	[0]	[146]	[287]	[294]		
Economist	0.94	0.96	0.77	0.86	1.00	
	[12]	[361]	[698]	[236]	[699]	
Revised	0.70	0.61	0.83	0.53	0.59	1.00
	[247]	[797]	[2472]	[268]	[623]	[3291]

NOTE: Each cell shows the correlation between two datasets, and the number of observations is shown in brackets. All calculations are based on post-1985 data.

Figure 11: Availability of realtime data by country
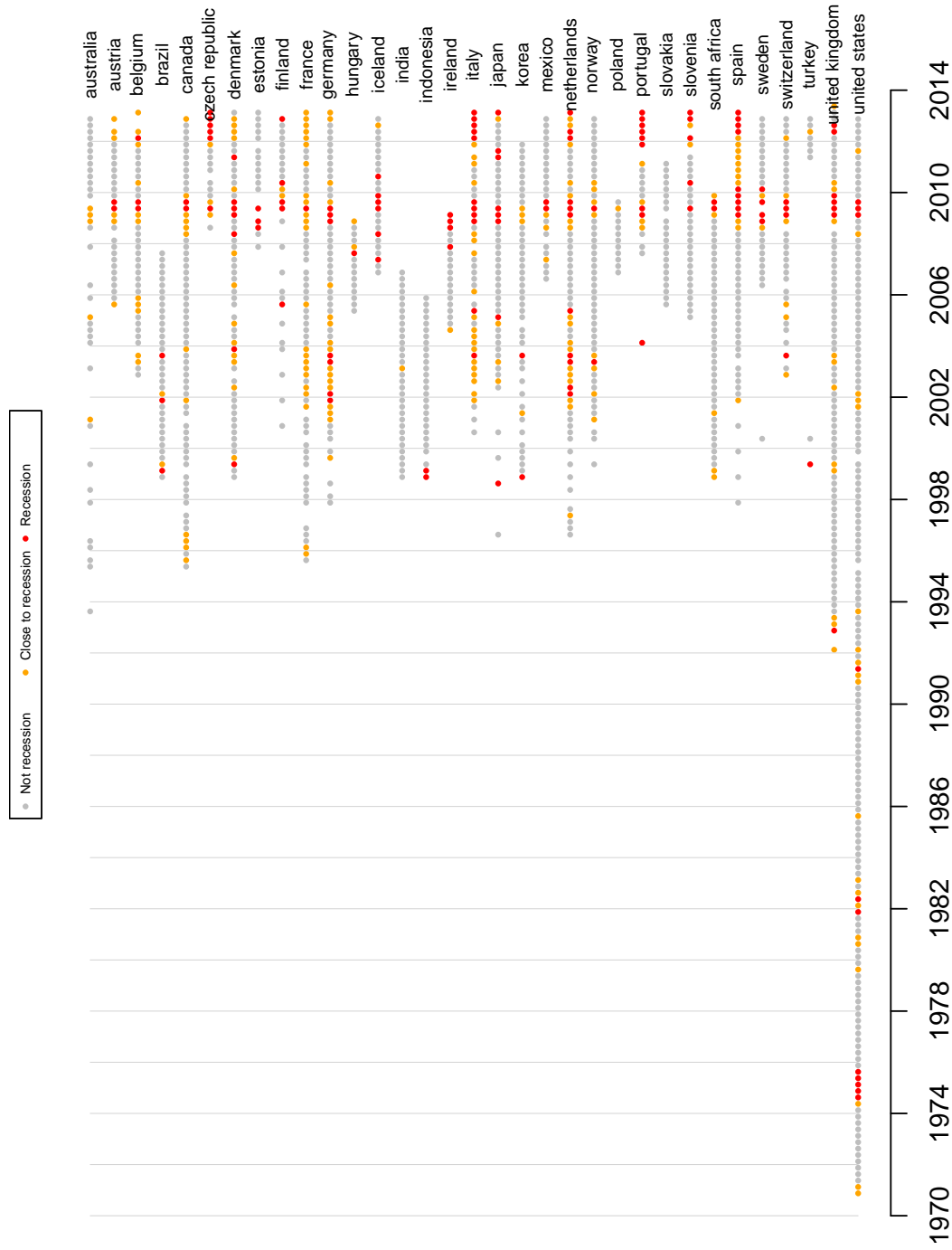
NOTE: Each dot indicates a quarter for which we are able to construct the running variable using real-time data published within three months of the relevant quarter. The color of the dot indicates whether the running variable is above .5 (gray), between 0 and .5 (orange), or below 0 (red).

9.2. Placebo effects on pre-treatment outcomes

Table 7: **Placebo RDD: Effect on Pre-treatment Outcomes**

Outcome	Estimates				Bandwidth	N
Recession News Articles, $t-1$	-2.367*	-1.232	-0.762	0.210	0.27	77
	(1.146)	(0.767)	(0.563)	(0.466)		
Unemployment News Articles, $t-1$	-1.075	-0.865	0.004	0.211	0.24	71
	(0.885)	(0.544)	(0.322)	(0.345)		
Business Confidence, $t-2$	-0.007	0.142	0.379†	0.434	0.40	268
	(0.318)	(0.333)	(0.209)	(0.376)		
Consumer Confidence, $t-2$	-0.464	-0.402	-0.405	-0.371	0.45	325
	(0.322)	(0.307)	(0.273)	(0.422)		
GDP, $t-3$	-0.013	0.019	0.003	0.266	0.32	224
	(0.224)	(0.226)	(0.223)	(0.539)		
Consumption, $t-3$	0.343	0.292	0.326	0.454	0.34	235
	(0.214)	(0.235)	(0.257)	(0.536)		
Gov. Purchases, $t-3$	-0.672**	-0.602**	-0.702**	0.000	0.48	357
	(0.217)	(0.222)	(0.238)	(0.000)		
Investment, $t-3$	1.172	1.421	1.579	0.068	0.41	299
	(1.324)	(1.474)	(1.418)	(1.123)		
Exports, $t-3$	0.259	0.336	-0.001	0.825	0.51	396
	(0.621)	(0.605)	(0.626)	(0.999)		
Imports, $t-3$	0.257	0.017	-0.284	-0.512	0.54	410
	(0.606)	(0.610)	(0.598)	(0.985)		
Unemployment Rate, $t-2$	-0.586	0.672	0.390	0.308	0.51	356
	(0.886)	(0.421)	(0.372)	(0.512)		
Recession, $t-3$	-0.060	-0.179†	-0.207*	-0.000	0.47	353
	(0.088)	(0.094)	(0.083)	(0.000)		
Running Variable, $t-3$	0.055	0.088	-0.070	-0.211	0.54	407
	(0.163)	(0.159)	(0.140)	(0.163)		
Country FE		✓	✓	✓		
Year FE			✓	✓		
Controls				✓		

NOTE: See note to Table 2

9.3. Alternative bandwidth selection methods

Table 8: RDD results using Imbens-Lemieux Cross-Validation bandwidth selection

Outcome	Estimates				Bandwidth	N
Definitely Recession	0.448**	0.475**	0.475**	0.720**	0.55	281
	(0.118)	(0.118)	(0.127)	(0.129)		
Possibly Recession	0.561**	0.543**	0.534**	0.792**	0.86	490
	(0.092)	(0.094)	(0.095)	(0.091)		
Recession News Articles	0.426	0.759**	0.786**	0.586**	2.15	761
	(0.455)	(0.243)	(0.155)	(0.126)		
Business Confidence	-0.411	0.229	-0.067	-1.201†	0.25	141
	(0.433)	(0.468)	(0.311)	(0.641)		
Consumer Confidence	-0.411	-0.398†	-0.423*	-0.450†	0.87	708
	(0.278)	(0.241)	(0.213)	(0.253)		
Executive Approval	2.675	0.917	1.886	0.428	2.03	702
	(3.721)	(3.323)	(3.752)	(4.276)		
GDP	-0.375*	-0.369*	-0.324*	-0.505**	2.27	1505
	(0.156)	(0.159)	(0.139)	(0.191)		
Consumption	-0.395*	-0.334*	-0.300*	-0.327†	2.27	1505
	(0.157)	(0.155)	(0.145)	(0.170)		
Gov. Purchases	0.113	0.087	0.073	-0.105	4.07	1634
	(0.146)	(0.138)	(0.135)	(0.214)		
Investment	-0.152	-0.259	-0.494	-0.921	1.07	933
	(0.602)	(0.583)	(0.542)	(0.717)		
Exports	1.154	0.859	0.459	0.876	0.67	535
	(0.837)	(0.854)	(0.726)	(1.048)		
Imports	1.342†	1.025	0.384	-0.937	0.67	535
	(0.701)	(0.743)	(0.606)	(0.946)		
Unemployment Rate	0.917†	1.043**	0.968**	1.616**	3.87	1477
	(0.530)	(0.280)	(0.255)	(0.419)		
Country FE		✓	✓	✓		
Year FE			✓	✓		
Controls				✓		

NOTE: See note to Table 2

Table 9: RDD results using Imbens-Kalyanaraman bandwidth selection

Outcome	Estimates				Bandwidth	N
Definitely Recession	0.444**	0.495**	0.500**	0.722**	0.44	210
	(0.131)	(0.133)	(0.142)	(0.132)		
Possibly Recession	0.483**	0.473**	0.466**	0.759**	0.57	294
	(0.115)	(0.116)	(0.125)	(0.126)		
Recession News Articles	0.112	0.018	0.363†	0.439**	0.76	318
	(0.693)	(0.336)	(0.200)	(0.166)		
Business Confidence	0.100	0.191	0.074	-0.261	0.63	475
	(0.237)	(0.232)	(0.183)	(0.308)		
Consumer Confidence	-0.382	-0.431	-0.522*	-0.779*	0.62	472
	(0.287)	(0.268)	(0.235)	(0.318)		
Executive Approval	5.291	2.673	2.297	2.145	0.89	333
	(4.560)	(4.382)	(4.715)	(5.974)		
GDP	-0.388*	-0.420*	-0.353*	-0.431*	1.81	1387
	(0.175)	(0.170)	(0.145)	(0.211)		
Consumption	-0.171	-0.160	-0.247	-0.598*	0.81	686
	(0.228)	(0.194)	(0.183)	(0.242)		
Gov. Purchases	0.046	0.072	0.101	-0.070	0.85	706
	(0.178)	(0.182)	(0.182)	(0.313)		
Investment	-0.076	-0.274	-0.656	-1.277	0.85	715
	(0.553)	(0.580)	(0.529)	(0.795)		
Exports	0.995	0.729	0.496	1.031	0.61	495
	(0.862)	(0.880)	(0.754)	(1.081)		
Imports	1.370†	1.109	0.511	-0.903	0.65	527
	(0.705)	(0.754)	(0.606)	(0.951)		
Unemployment Rate	0.367	0.368	0.268	0.883†	1.05	842
	(0.719)	(0.328)	(0.307)	(0.458)		
Country FE		✓	✓	✓		
Year FE			✓	✓		
Controls				✓		

NOTE: See note to Table 2

9.4. Robustness of welfare state analysis

Table 10: Estimated impact of recessions on consumer confidence in liberal market economies and other economies

Liberal classification	Liberal		Other		Difference
Kangas (1994)	-3.307*	[0.485]	-0.220	[0.597]	-3.087**
	(1.469)	<41>	(0.386)	<216>	(0.726)
Ragin (1994)	-2.633**	[0.258]	0.144	[0.563]	-2.777**
	(0.659)	<41>	(0.557)	<133>	(0.982)
Obinger and Wagschal (1998)	-2.113**	[0.545]	-0.084	[0.442]	-2.029**
	(0.581)	<99>	(0.410)	<177>	(0.655)
Saint-Arnaud and Bernard (2003)	-2.850**	[0.473]	0.192	[0.431]	-3.042**
	(0.974)	<68>	(0.429)	<172>	(0.735)
Barrientos and Powell (2004)	-2.047*	[0.535]	0.767	[0.329]	-2.815**
	(0.846)	<95>	(0.554)	<100>	(0.795)
Bambra (2006)	-1.116	[0.501]	-0.877*	[0.444]	-0.239
	(0.830)	<73>	(0.384)	<193>	(1.058)
Allan and Scruggs (2006)	-1.921**	[0.480]	-0.381	[0.341]	-1.540†
	(0.670)	<89>	(0.474)	<127>	(0.864)
Castles and Obinger (2008)	-2.426**	[0.462]	0.303	[0.403]	-2.728**
	(0.530)	<110>	(0.558)	<133>	(0.715)

NOTE: See note to Table 5

Table 11: Estimated impact of recessions on private consumption growth in liberal market economies and other economies

Liberal classification	Liberal		Other		Difference
Kangas (1994)	-0.669	[0.558]	-0.205	[0.553]	-0.464
	(0.660)	<57>	(0.313)	<209>	(0.894)
Ragin (1994)	-0.388	[0.304]	0.122	[0.466]	-0.510
	(0.367)	<53>	(0.410)	<114>	(0.634)
Obinger and Wagschal (1998)	-0.564†	[0.514]	-0.102	[0.538]	-0.462
	(0.304)	<96>	(0.281)	<239>	(0.399)
Saint-Arnaud and Bernard (2003)	-1.437†	[0.571]	-0.084	[0.664]	-1.353
	(0.741)	<106>	(0.257)	<284>	(1.350)
Barrientos and Powell (2004)	1.979*	[0.254]	-0.117	[0.462]	2.097**
	(0.793)	<35>	(0.358)	<159>	(0.730)
Bambra (2006)	-0.577	[0.583]	-0.156	[0.502]	-0.421
	(0.452)	<88>	(0.245)	<243>	(0.505)
Allan and Scruggs (2006)	0.037	[0.600]	-0.165	[0.420]	0.202
	(0.355)	<140>	(0.281)	<174>	(0.452)
Castles and Obinger (2008)	-0.402	[0.535]	0.279	[0.424]	-0.682
	(0.316)	<136>	(0.387)	<148>	(0.477)

NOTE: See note to Table 5

Table 12: Estimated impact of recessions on GDP growth in liberal market economies and other economies

Liberal classification	Liberal		Other		Difference
Kangas (1994)	-0.769	[0.622]	0.122	[0.612]	-0.892
	(0.766)	<68>	(0.332)	<244>	(1.074)
Ragin (1994)	-0.875*	[0.490]	0.589	[0.646]	-1.464*
	(0.390)	<88>	(0.459)	<167>	(0.701)
Obinger and Wagschal (1998)	-1.052**	[0.531]	0.351	[0.411]	-1.403**
	(0.401)	<99>	(0.392)	<170>	(0.540)
Saint-Arnaud and Bernard (2003)	-0.449	[0.648]	0.292	[0.542]	-0.741
	(0.558)	<132>	(0.318)	<233>	(0.704)
Barrientos and Powell (2004)	1.432	[0.281]	0.278	[0.576]	1.153
	(0.949)	<40>	(0.362)	<191>	(1.044)
Bambra (2006)	-0.672	[0.588]	0.280	[0.384]	-0.951
	(0.570)	<90>	(0.357)	<170>	(0.836)
Allan and Scruggs (2006)	-0.895*	[0.530]	0.292	[0.391]	-1.187†
	(0.426)	<112>	(0.383)	<159>	(0.639)
Castles and Obinger (2008)	-0.906*	[0.549]	0.618†	[0.597]	-1.524**
	(0.352)	<142>	(0.354)	<225>	(0.532)

NOTE: See note to Table 5