Online Appendix
Finseraas & Nyhus: The Political Consequences of Technological Change That Benefits Low-Skilled Workers

Data sources

We combine data from several data sources. Data on salmon fish farming is from the Directorate of Fisheries' Aquaculture register, which contains information on salmon fish farming concessions.[10] The register includes information on the location of the concession, when it was given, and the allowed biomass production. From this information, we derive the $SALMON_i$ indicator. We leverage the concession data to construct two alternative measures of salmon fish production; $CONCESSIONS_i$, which is the average biomass concessions granted to the municipality over the period, and $\Delta CONCESSIONS_i$, which is the t_2 to t_1 difference in the size of concessions.

Data on labour market outcomes are derived from administrative register data produced and delivered by Statistics Norway. We construct municipal level variables on employment, earnings, and earnings inequality from the individual-level administrative data.

Data on political outcomes and most of the controls are derived from Fiva, Halse, and Natvik (2020), which includes municipal level vote shares in parliamentary and local elections.[11] In addition, we use data from the Comparative Manifesto Project (Budge et al. 2001) to measure party positions on different relevant policy dimensions. We then use these policy positions to calculate voter sentiment measures along the economic and cultural dimension of political competition (see below for details). These sentiment scores have the benefit of summarising voter movements between parties using a single variable rather than studying each party's vote share in isolation, and makes it possible to study along what dimension political preferences change.

[10] `https://www.fiskeridir.no/Akvakultur/Registre-og-skjema/akvakulturregisteret`.

[11] The geographic controls and the share of oil workers are constructed from NSD's database on municipalities: `kdb.nsd.no/kdbbin/kdb_start.exe`.

Descriptive statistics

Table A1: Descriptive statistics by sample in 1993.

	Not in sample			In sample		
	N	Mean	SD	N	Mean	SD
Population	230	12,979	36,983	209	6,287	7,160
Share above 65 years of age	230	0.172	0.043	209	0.166	0.037
Unemployment rate	230	0.040	0.012	209	0.040	0.014
Vote share Socialist Left Party	230	0.076	0.032	209	0.089	0.046
Vote share Labour Party	230	0.364	0.097	209	0.314	0.088
Vote share Liberal Party	230	0.029	0.016	209	0.042	0.024
Vote share Centre Party	230	0.262	0.121	209	0.282	0.096
Vote share Christian Democratic Party	230	0.084	0.059	209	0.106	0.062
Vote share Conservative Party	230	0.116	0.067	209	0.109	0.039
Vote share Progress Party	230	0.049	0.029	209	0.039	0.022
Turnout	225	0.769	0.034	209	0.741	0.044

Table A2: Descriptive statistics by salmon production in 1993.

	Salmon=0			Salmon=1		
	N	Mean	SD	N	Mean	SD
Population	101	6,716	6,039	108	5,885	8,076
Share above 65 years of age	101	0.159	0.036	108	0.173	0.036
Unemployment rate	101	0.039	0.013	108	0.041	0.014
Vote share Socialist Left Party	101	0.087	0.046	108	0.092	0.046
Vote share Labour Party	101	0.331	0.091	108	0.298	0.083
Vote share Liberal Party	101	0.045	0.028	108	0.039	0.020
Vote share Centre Party	101	0.268	0.090	108	0.295	0.099
Vote share Christian Democratic Party	101	0.099	0.062	108	0.113	0.062
Vote share Conservative Party	101	0.109	0.039	108	0.108	0.038
Vote share Progress Party	101	0.042	0.024	108	0.036	0.019
Turnout	101	0.745	0.041	108	0.738	0.046

OLS estimates

Table A3: OLS estimates. Dependent variables are changes over the period 1993-2015.

	Progress party	Conservative party	Center party	Labour party	Non-socialist	Turnout
Salmon	0.014***	0.005	-0.014*	-0.005	0.002	0.007*
	(0.005)	(0.006)	(0.007)	(0.007)	(0.008)	(0.004)
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
N	209	209	209	209	209	209
Mean of Y	0.14	0.11	-0.17	-0.01	0.04	0.02

Note: Standard errors in parentheses. *** p<.01; ** p<.05; * p<.10.

First stage

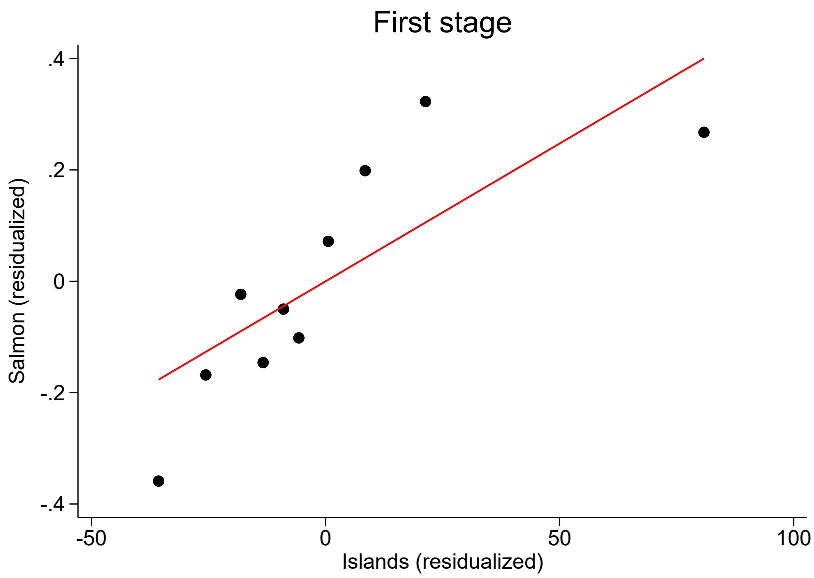
The two main assumptions for $ISLANDS_i$ to identify the effect of salmon fish farming are $\beta^1 \neq 0$ (non-zero first stage) and $C(ISLANDS, \epsilon) = 0$ (exclusion restriction). The assumption of a non-zero first stage is tested in Table A4. We find that β^1 is, as expected, positive and significant ($p < .001$). Municipalities with more island coastline are more likely to have salmon fish farms. Moreover, the relationship between the instrument and salmon fish farming appears to be sufficiently strong to not suffer from weak instrument bias. The F-statistic is 34, which is above the Stock-Yogo and the Montiel-Pfluger bias values. Furthermore, we report the Anderson-Rubin confidence interval in all estimations since it has correct coverage also if instruments are weak (Andrews, Stock, and Sun 2019). In addition, we report two sensitivity statistics (Cinelli and Hazlett 2020, 2021). The partial R-square statistic says that an unobserved variable that explains all of the residual variance in the probability of salmon fish farming will result in a zero first stage if it also explains 15 percent of the residual variance in the instrument. Such a variable has to be more than twice as strong as the coefficient for kilometres of mainland coastline for this to be the case. The second statistic is the Robustness Value, which says that an unobserved variable needs to explain 34 percent of the variation in both the instrument and the probability of salmon fish farming for the first stage to be zero. Again this is a high value compared to the coefficient for kilometres of mainland coastline. Figure A1 shows the variation that drives the first stage relationship.

Table A4: OLS regression. First stage estimates.

	Salmon
Islands	0.005***
	(0.001)
Log(population)	0.041
	(0.047)
Share 65+	6.015***
	(1.558)
Share below 21	6.266***
	(2.020)
Share oil workers	6.364
	(12.686)
Size	-0.000*
	(0.000)
Coastline	0.012***
	(0.003)
County FE	Yes
Cragg-Donald Wald F statistic	34
Stock-Yogo 10% critical value	16
Montiel-Pflueger 10% bias	23
Partial R-sq Islands	0.15
Robustness Value	0.34
N	209

Note: Standard errors in parentheses. *** p<.01; ** p<.05; * p<.10.

Figure A1: First stage relationship between $ISLAND_i$ and $SALMON_i$.



Note: The figure shows the relationship between salmon and the instrument. The variables are residualized so that they reflect the variation that drives the first stage estimate in Table A4. Each dot represents ten percent of the observations, while the red line is the estimated regression line based on all observations.

Labour market outcomes

We estimate that salmon fish farming increased average earnings in the municipality by 12 percent over the period 1993-2015, i.e. an annual growth of about .5 percent (see first column, Table A5). The next columns show that the income growth is not equal across the wage distribution but much larger in the bottom of the distribution. Earnings at the 25th percentile increased three times more than at the 75th percentile, which results in a significant decline in earnings inequality. Our earnings estimates are for all employed workers and the decrease in earnings inequality is slightly smaller for the electorate, because (lower paid) labour immigration increased more in the salmon fish farming municipalities (see Table A6).[12] In Figure A2 we display the variation that drives the estimates for inequality and earnings at the bottom of the earnings distribution. The figures show some variation around the regression line, but the estimates are not driven by a subset of observations. There is no effect on the unemployment rate, see the final column in Table A5, as unemployment is generally low across the sample and does not change much over this period.

Table A5: 2SLS estimates. Dependent variables are changes over the period 1993-2015.

	Earnings	p25	p50	p75	Inequality	Unemp.
Second stage						
Salmon	0.121***	0.263***	0.164***	0.084***	-0.024**	0.001
	(0.028)	(0.097)	(0.048)	(0.020)	(0.010)	(0.005)
AR CI lb	0.074	0.090	0.078	0.050	-0.048	-0.009
AR CI ub	0.193	0.499	0.281	0.133	-0.006	0.012
Cragg-Donald F	34	34	34	34	34	34
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
N	209	209	209	209	209	209
Mean of Y	1.08	1.44	1.16	0.99	-0.06	-0.02

Note: Standard errors in parentheses. *** p<.01; ** p<.05; * p<.10. Earnings: Log of average labour earnings. p25, p50, p75: Log of earnings at the 25th, 50th, 75th percentile of the earnings distribution. Inequality: Ratio of the (log) p75 and (log) p25 earnings. Unemployment rate: Unemployment as share of working-age population. AR CL lb (ub): Anderson-Rubin confidence interval, lower (upper) bound.

[12]Labour immigrants mainly arrived after the 2004 enlargement of the EU, and few of them had the right to vote in 2013 as it requires Norwegian citizenship.

Compositional changes

In Table A6 we examine how the industry growth influenced the composition of the population, studying three outcomes: The share of the population (above 16 years of age) without higher education (university/university college), the share of the population in working age (ages 21-65), and the share of the population that is born in another European country[13] (as a proxy for labour immigration).[14]

The results show that the low educated share of the population declined to the same degree in treatment and control municipalities. At the same time, there is only about 1 percentage point increase in the share of the working-age population in salmon fish farming municipalities. However, the most notable result is that the share of labour immigrants increased much more in the treated municipalities. The positive effect reflects that, after the EU enlargement in 2004, the salmon industry has gradually increased its reliance on labour immigrants from, in particular, Poland and the Baltic countries. Few of these labour immigrants had the right the vote in the parliamentary election in 2013 since that requires Norwegian citizenship. Thus, the earnings effects we observe in Table A5 are probably lower bound estimates of the earnings effects for the electorate, as labour immigration will typically reduce relative earnings growth.

[13]Except Turkey.

[14]The data is from NSD's database on municipalities.

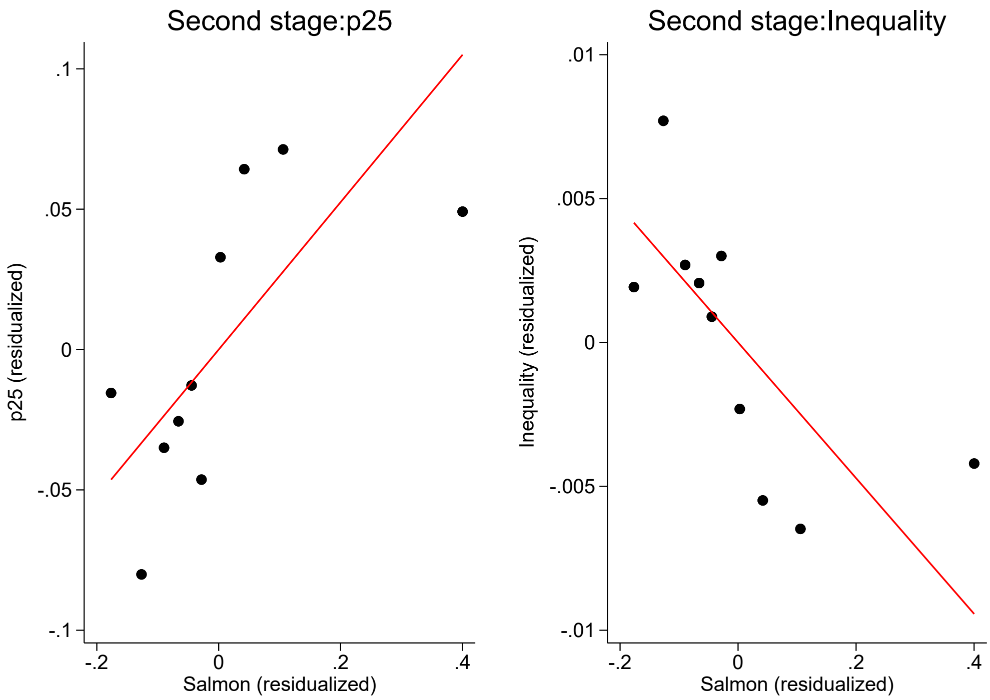
Table A6: 2SLS estimates. Dependent variables are changes over the period 1993-2015.

	Education level	Working age	Foreign born
Second stage			
Salmon	0.001	0.012*	0.040***
	(0.008)	(0.007)	(0.014)
AR CI lb	-0.015	-0.000	0.014
AR CI ub	0.019	0.031	0.074
Cragg-Donald F	34	34	34
County FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes
N	209	209	209
Mean of Y	-0.11	0.02	0.08

Note: Standard errors in parentheses. *** p<.01; ** p<.05; * p<.10. Education level: The share of the population (above 16 years of age) without higher education (university/university college). Working age: The share of the population in working age (ages 21-65). Foreign born: The share of the population that is born in another European country (except Turkey). AR CL lb (ub): Anderson-Rubin confidence interval, lower (upper) bound.

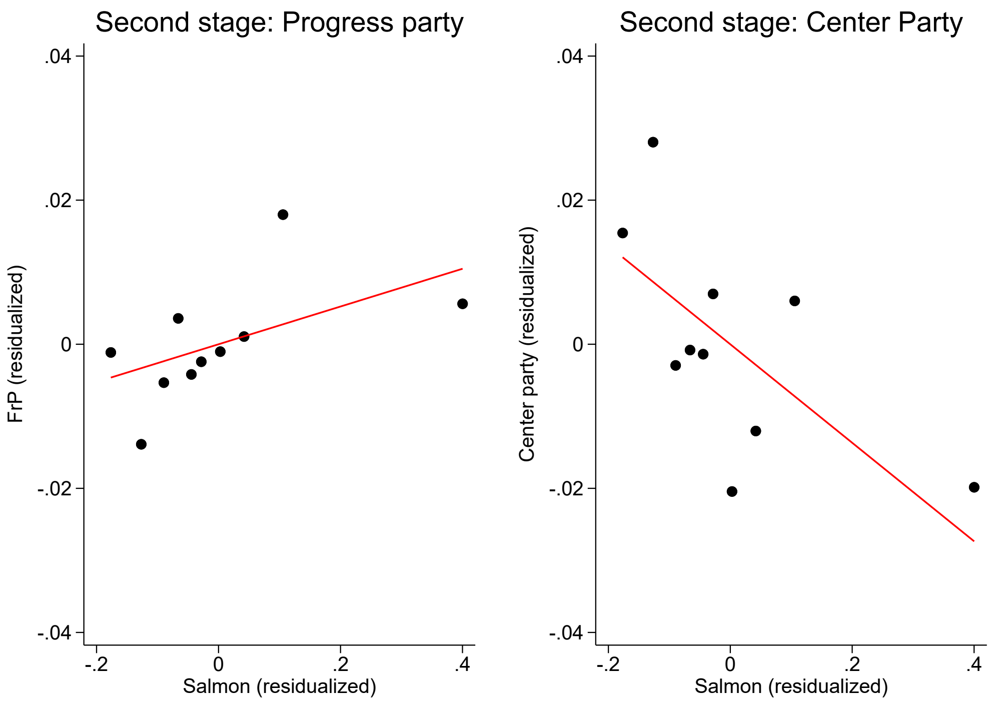
Visualizations of labour market and political effects

Figure A2: Labour market outcomes. Visualizations of second stage relationships.



Note: The figure shows the relationship between salmon and outcomes. The variables are residualized so that they reflect the variation that drives the second stage estimates in Table A5. Each dot represents ten percent of the observations, while the red line is the estimated regression line based on all observations.

Figure A3: Political outcomes. Visualizations of second stage relationships.



Note: The figure shows the relationship between salmon and outcomes. The variables are residualized so that they reflect the variation that drives the second stage estimates in Table 1. Each dot represents ten percent of the observations, while the red line is the estimated regression line based on all observations.

Results when averaging over two pre- and two post elections

Table A7: 2SLS estimates. Dependent variables are changes from the 1989/1993 elections to the 2013/2017 elections.

	Progress party	Conservative party	Center party	Labour party	Non-socialist	Turnout
Second stage						
Salmon	0.026**	-0.003	-0.036**	-0.002	-0.005	0.029***
	(0.013)	(0.011)	(0.016)	(0.014)	(0.017)	(0.010)
AR CI lb	0.002	-0.027	-0.073	-0.030	-0.040	0.011
AR CI ub	0.054	0.021	-0.008	0.029	0.029	0.053
Cragg-Donald F	34	34	34	34	34	34
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
N	209	209	209	209	209	209
Mean of Y	0.13	0.04	-0.08	-0.00	0.04	-0.01

Note: Standard errors in parentheses. *** p<.01; ** p<.05; * p<.10. Cragg-Donald Wald F statistic: 34. FrP, H, Sp, Ap: vote shares for FrP (Progress party), H (Conservative party), Sp (Center party), Ap (Labour party). Non-socialist: Total vote share for the non-socialist parties. Turnout: As a share of eligible voters. AR CL lb (ub): Anderson-Rubin confidence interval, lower (upper) bound.

Results using concessions to measure salmon fish farming

In Tables A8 and A9 we examine whether conclusions change if we use two alternative operationalisations of salmon fish farming. These operationalisations are based on either the averages or the changes in the size of salmon fish farming concessions granted to producers in each municipality. In Table A8, the variable concessions refers to the average maximum allowed salmon production over 1993-2015, scaled in 10 000 tons to ease interpretation. We find that 10 000 tons of salmon production is associated with a two percentage points higher support for the Progress Party and five percentage points lower support for the Center Party. In comparison, results in Table A8 imply that a mean change in production (2000 tons) amounts to one and three percentage points changes in vote shares. Thus, we find political effects irrespective of whether we measure the growth of the industry on the intensive or extensive margin.

Table A8: 2SLS estimates. Dependent variables are changes from the 1993 election to the 2013 election.

	Progress party	Conservative party	Center party	Labour party	Non-socialist	Turnout
Second stage						
Avg. concessions	0.020**	0.008	-0.053***	0.017	-0.014	0.017*
	(0.010)	(0.012)	(0.016)	(0.014)	(0.016)	(0.008)
AR CI lb	0.001	-0.015	-0.088	-0.009	-0.046	0.000
AR CI ub	0.041	0.033	-0.023	0.047	0.016	0.034
Cragg-Donald F	104	104	104	104	104	104
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
N	209	209	209	209	209	209
Mean of Y	0.14	0.11	-0.17	-0.01	0.04	0.02

Note: Standard errors in parentheses. *** p<.01; ** p<.05; * p<.10. Cragg-Donald Wald F statistic: 34. FrP, H, Sp, Ap: vote shares for FrP (Progress party), H (Conservative party), Sp (Center party), Ap (Labour party). Non-socialist: Total vote share for the non-socialist parties. Turnout: As a share of eligible voters. AR CL lb (ub): Anderson-Rubin confidence interval, lower (upper) bound.

Table A9: 2SLS estimates. Dependent variables are changes from the 1993 election to the 2013 election.

	Progress party	Conservative party	Center party	Labour party	Non-socialist	Turnout
Second stage						
Δ Concessions	0.053**	0.022	-0.137***	0.045	-0.036	0.043*
	(0.026)	(0.031)	(0.044)	(0.036)	(0.040)	(0.022)
AR CI lb	0.002	-0.038	-0.240	-0.022	-0.123	0.001
AR CI ub	0.109	0.087	-0.059	0.125	0.042	0.092
Cragg-Donald F	55	55	55	55	55	55
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
N	209	209	209	209	209	209
Mean of Y	0.14	0.11	-0.17	-0.01	0.04	0.02

Note: Standard errors in parentheses. *** p<.01; ** p<.05; * p<.10. FrP, H, Sp, Ap: vote shares for FrP (Progress party), H (Conservative party), Sp (Center party), Ap (Labour party). Non-socialist: Total vote share for the non-socialist parties. Turnout: As a share of eligible voters. AR CL lb (ub): Anderson-Rubin confidence interval, lower (upper) bound.

Construction of the ideology sentiment and polarization scores

We use CMP to construct three measures. The first is the standard left-right scale constructed by Budge et al. (2001), which pools together economic left-right issues and social liberal-conservative issues. The second variable restricts the policy issues to economic issues and measures the economic leftism of parties as the log of the number of positive references to left-wing policies minus the same for right-wing economic policies (see Lowe et al. 2011, we use the topics in the State involvement in the economy index). The third variable is constructed by following the same approach for issues that tap "second dimension" value conflicts between liberals and conservatives (we use the topics Nationalism, Traditional morality, and Multiculturalism).

We derive the ideological sentiment across municipalities by weighting the vote shares with the ideological measures. Let g_{pt} be the party p's position on the ideological dimension in question, s_{ipt} be the vote share of party p in municipality i in election year t. We then calculate the sentiment score as the average score of g_{pt}, weighted by vote shares s_{ipt}:

$$[\text{Sentiment}]_{it} = \frac{\sum s_{ipt} g_{pt}}{\sum s_{ipt}}. \tag{A1}$$

Note that we divide by $\sum s_{ipt}$ because small parties without national representation do not appear in the Comparative Manifesto Project database, which means that the sum of vote shares does not always sum to unity.

To calculate ideological polarization we use the formula (Stanig 2011):

$$[\text{Polarization}]_{it} = \frac{A \sum s_{ipt} |p_{pt} - \hat{p_{pt}}|}{J \sum s_{ipt}^2}. \tag{A2}$$

where $\hat{p_{pt}}$ is the average position across parties, A is a parameter equal to $\frac{2}{r}$ where r is the range of the dimension, while J is the number of parties. The polarization score will increase if parties located away from the average position on the respective dimension increase their vote share. The results when using the polarization scores as the dependent variable are presented in Table A10.

Table A10: 2SLS estimates. Dependent variables are changes in ideological polarization scores from the 1993 election to the 2013 election.

	Left scale	Leftist economics	Value progressivism
Second stage			
Salmon	-0.009	-0.002	0.005
	(0.015)	(0.011)	(0.023)
AR CI lb	-0.041	-0.024	-0.041
AR CI ub	0.020	0.021	0.053
Cragg-Donald F	34	34	34
County FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes
N	209	209	209
Mean of Y	-0.17	0.00	-0.02

Note: Standard errors in parentheses. *** p<.01; ** p<.05; * p<.10. AR CL lb (ub): Anderson-Rubin confidence interval, lower (upper) bound.

Results using individual level data

To derive individual level estimates we pool survey data from four data sets that include municipality identifiers, level of education, and relevant political outcomes. These surveys are the 1993 survey on municipal services, the 1995 local elections study, the 2013 citizen survey, and the 2015 citizen survey. We pool these surveys to a repeated cross-sectional data set and estimate the following difference-in-differences (DD) regressions:

$$Y_{imt} = \beta_1 SALMON_m * POST_t + \beta_2 SALMON_m + \beta_3 POST_t + \alpha_s + \epsilon_{imt} \tag{A3}$$

where i indexes respondent, m indexes municipality, and t indexes whether the survey is from the pre (1993/1995) or post (2013/2015) period. Y refers to a set of outcomes described in the notes to Table A11, $SALMON_m$ is a binary indicator for municipalities with salmon fish farms, and $POST_t$ is a binary indicator for observations from 2013/2015. α_s is a set of survey fixed effects. β_1 is the DD estimate. We run these regressions for the full sample of respondents (first column in Table A11) and restricted to respondents without university education (second column).

Table A11: DD estimates. Individual level data

	All respondents	Respondents without university education
Progress party	.01	.02
Center Party	-.06**	-.05**
Labour Party	.04	.05
Conservative Party	.00	-.01
Tax discontent	.06**	.06*
Low trust national politicians	.00	.02
Low trust local politicians	-.04	-.01

Note: Robust standard errors clustered by municipality in parentheses. *** p<.01; ** p<.05; * p<.10. Progress party, Center party, Labour party, and Conservative party are binary indicators of whether the respondent voted for the respective party in the previous national election. Tax discontent: Binary indicator for respondents that answer that they do not think that public services have the quality one should expect in light of the tax level. Low trust national politicians: Binary indicator for respondents that express low trust in politicians in the national parliament. Low trust local politicians: Binary indicator for respondents that express low trust in politicians in the local council.

Reduced form robustness estimates

Table A12: Reduced form estimates.

	Progress party	Center party	Leftist Economics
Islands/100	0.013**	-0.034***	-0.007**
	(0.006)	(0.009)	(0.003)
Controls	Yes	Yes	Yes
County FE	Yes	Yes	Yes
Partial R-sq Islands	0.02	0.06	0.03
Robustness Value	0.14	0.23	0.15
N	209	209	209

Note: Standard errors in parentheses. *** p<.01; ** p<.05; * p<.10. The first stage estimate is .495 (.085) when Island is divided by 100 (see Table A4).

Assessing the exclusion restriction

Our research design builds on the assumption that the exclusion restriction holds, i.e that there is no direct channel from the instrument to the outcomes. We realise that this assumption is strong. Above we attempt to make the assumption plausible by modelling the outcomes in first differences and including controls for possibly confounding trends. We assess the assumption in two ways. First, we add a second instrument to conduct overidentification tests. Next, we conduct a sensitivity check to assess how estimates change if we allow violations of the exclusion restriction.

Two instruments. If one has more instruments than endogenous variables, one can assess instrument validity by conducting an overidentification test. This test examines whether the instruments are correlated with the error term from the IV regression. A rejection of the null hypothesis of valid instruments, i.e. no correlation between the error term and the instruments, means that at least one of the two instruments are invalid.

As mentioned above, one problematic side-effect of salmon fish farming is that salmon that escapes from the farms mix and breed with wild salmon populations. Such mixing is a serious threat to the genes of the wild salmon population. Mixing is more likely if farms are located close to rivers with wild salmon populations, which is an important consideration when concessions are granted. Since 1973, an increasing number of rivers have been granted protected status through legal regulation, which means that human activity that might affect the river and the life there needs to be approved by central authorities. Thus, one should expect that fish farming is less likely in fjords with protected rivers, which means that the existence of such rivers might serve as an additional geography-based type of instrument. This second instrument is also useful since it might predict fish farming in other areas (fjords) than the island instrument (closer to open sea), which means that the local average treatment effect will be less local.

To construct this second instrument, we identify the municipalities that were affected by the first round (1973) of river protections ("Verneplan 1 for vassdrag").[15] We base our

[15] This information is publicly available from the Norwegian Water Resources and Energy Directorate: `https://www.nve.no/vann-og-vassdrag/vassdragsforvaltning/verneplan-for-vassdrag/`.

instrument on decisions in 1973 since the salmon fish farming industry was in its very infancy at that time and thus had no leverage to influence the regulation process.

Table A13: 2SLS estimates. Dependent variables are changes from the 1989/1993 elections to the 2013/2017 elections.

	Progress party	Center party	Leftist economics
Second stage			
Salmon	0.033***	-0.068***	-0.016***
	(0.012)	(0.020)	(0.006)
AR CI lb	0.01	-0.13	-0.03
AR CI ub	0.07	-0.02	-0.00
Cragg-Donald F	21	21	21
Sargan p-value	0.23	0.96	0.31
County FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes
N	209	209	209
Mean of Y	0.14	-0.17	0.14

Note: Standard errors in parentheses. *** $p<.01$; ** $p<.05$; * $p<.10$. AR CL lb (ub): Anderson-Rubin confidence interval, lower (upper) bound.

We find that the river instrument has the expected negative relationship with salmon fish farming: The first stage coefficient is -.24 (SE=.09, p=.01) and the coefficient for the island instrument barely moves when the second instrument is added (.005, SE=.001, $p<.01$). However, the first stage F-test is smaller when using two instruments, as it drops from 34 to 21. The second stage estimates in Table A13 are very similar to those we get when using one instrument, which is reassuring from an external validity perspective since the compliers are different in the two models. Despite the weaker first stage, the second stage estimates are slightly more precise, presumably because they are based on additional relevant variation from the first stage. Importantly, the Sargan test fails to reject the null of valid instruments, i.e. the test does not provide evidence against the exclusion restriction (again, its validity cannot be proved).

Sensitivity check. Next we conduct a sensitivity check of the main specification. The logic of the sensitivity check is that if the exclusion criteria hold perfectly, the reduced form relationship between the instrument and the outcome should be zero in a sample where there is no first stage. If the only channel from the instrument to the outcome runs through the endogenous variable, then the reduced form will be zero when that channel does not exist.

Suppose one knows the reduced form estimate in a sample where the first stage estimate is zero. In that case, one can use that knowledge to correct the second stage estimate for violations of the exclusion criteria (Conley, Hansen, and Rossi 2012). Van Kippersluis and Rietveld (2018) propose that if one can identify a subgroup for which the first stage is zero or close to zero, one can use the reduced form estimate in this sub-sample as an estimate of to what extent the exclusion criteria is violated, using the estimation framework of Conley et al. (2012).

In our case, we can leverage that in Southern Norway, the water is too warm for salmon fish farming to be efficient. There are no salmon fish farms in this region, and there is no first stage relationship between islands and salmon fish farms. But since there are islands, we can derive reduced form estimates. However, these estimates are very noisy since we have only 30 municipalities with coastline in this region. The reduced form estimates are not zero, but, for all the three outcomes where salmon farms have significant effects (FrP, Sp, and leftist economics), the reduced form estimate has the opposite sign in this subsample. This implies that the second stage estimates above are biased towards zero (see Table A14) when we apply the Conley et al. (2012) framework to adjust the IV estimate.[16] Alternatively, one can view the DD/OLS estimate as a lower bound and the Conley et al. (2012) estimate as the upper bound of the true estimate.

Table A14: DD/OLS, IV, and "plausibly exogenous IV" estimates.

	OLS	IV	Plausibly exogenous IV
FrP	.011	.026	.119
Sp	-.011	-.068	-.099
Left econ	-.005	-.013	-.118

[16]We use Clark and Matta's (2018) implementation in Stata.

Results using a shift-share instrument

In our main analysis, we identify the effect of salmon production using the kilometres of island coastline as an instrument ($ISLAND$). Since we have information on expansions of salmon production (see Tables A8, A9, and A17), it is also possible to construct a so-called shift-share instrument as an alternative. Such instruments distribute the growth in the respective variable (here the salmon production concessions) across the units of analysis (here municipalities) based on the lagged shares of the respective variable (here the national share of salmon concessions in 1990). The idea is that industry growth would happen in those municipalities that already had investments in the industry. This constructed growth of the industry can be used as an instrument for actual growth. One concern with this approach is that the initial share (salmon concessions in 1990) is endogenous, which is essentially the same concern that led us to use $ISLAND$ as an instrument for $SALMON$ in the main analysis. We therefore believe that our IV approach is more likely to meet the exclusion restriction than the shift-share instrument. Still, we include the results since it is a possible alternative design.

Panel A in Table A15 reproduces the estimates in Table A9 when using our preferred $ISLAND$ instrument. Panel B presents the results using the shift-share instrument. We find that results for the Progress Party are quite similar in the two panels, while the estimate for the Center Party is substantively smaller. The effect on turnout is also smaller in the shift-share model. We are inclined to trust the estimates in Panel A since we believe endogeneity bias is more likely in the shift-share approach. Results might also differ if the compliers are different in the two models, but this is probably a less likely explanation since salmon concessions in 1990 are strongly correlated with kilometres of island coastline.

Table A15: 2SLS estimates. Dependent variables are changes from the 1993 election to the 2013 election.

	Progress party	Conservative party	Center party	Labour party	Non-socialist	Turnout
PANEL A: Results using $ISLAND$ instrument						
Second stage						
Δ Concessions	0.053**	0.022	-0.137***	0.045	-0.036	0.043*
	(0.026)	(0.031)	(0.044)	(0.036)	(0.040)	(0.022)
AR CI lb	0.002	-0.038	-0.240	-0.022	-0.123	0.001
AR CI ub	0.109	0.087	-0.059	0.125	0.042	0.092
Cragg-Donald F	55	55	55	55	55	55
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
N	209	209	209	209	209	209
Mean of Y	0.14	0.11	-0.17	-0.01	0.04	0.02
PANEL B: Results using $SHIFTSHARE$ instrument						
Second stage						
Δ Concessions	0.044**	0.006	-0.041	-0.016	0.013	0.024
	(0.020)	(0.024)	(0.031)	(0.027)	(0.031)	(0.017)
AR CI lb	0.004	-0.041	-0.105	-0.070	-0.049	-0.009
AR CI ub	0.085	0.054	0.020	0.038	0.075	0.059
Cragg-Donald F	110	110	110	110	110	110
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
N	209	209	209	209	209	209
Mean of Y	0.14	0.11	-0.17	-0.01	0.04	0.02

Note: Standard errors in parentheses. *** p<.01; ** p<.05; * p<.10. FrP, H, Sp, Ap: vote shares for FrP (Progress party), H (Conservative party), Sp (Center party), Ap (Labour party). Non-socialist: Total vote share for the non-socialist parties. Turnout: As a share of eligible voters. AR CL lb (ub): Anderson-Rubin confidence interval, lower (upper) bound.

Assessing potential mechanisms

Table 2 identifies a right-wing shift on the economic dimension in salmon-producing municipalities, but no effect on the cultural dimension. In this section, we instead try to measure and study two specific plausible mechanisms, which are changes in support for immigration and in support for the European Union.

Immigration. Table A6 shows that the share of foreign-born increased (more) in the salmon-producing municipalities. Since the Progress Party supports restrictive immigration policies, increased support for the Progress Party may reflect a change in immigration preferences in salmon-producing municipalities. Ideally, we would have had repeated cross-sectional survey data on immigration attitudes to examine this mechanism, but such data does not exist. Instead, we leverage that municipalities decide in their local councils how many refugees they want to settle. In the Norwegian settlement program, the Directorate of Integration and Diversity (Imdi) makes annual requests to the municipalities, asking them to settle a specific number of refugees that have been granted permanent settlement. Next, the local council decides the number of refugees they accept to settle, which is often, but not always, lower than the requested number. Since the decision is a local political decision, the difference between requests and decisions will reflect local demand for immigration (and this difference is correlated with local vote shares). The data on requests and local decisions are available from Imdi. Using this data, we construct a variable which is the difference between the number accepted by the local council and the requested number, and then calculate a cumulative sum over the years 1995-2013 (data prior to 1995 is not available). A positive number thus means that the municipality has settled more refugees over this period than requested, while a negative number means they have settled less. On average, municipalities in our sample have settled 70 fewer refugees than requested. However, as the two first columns in Table A16 show, we find no effect of salmon production on this outcome, and point estimates are positive rather than negative. Whether we measure decisions in absolute numbers or as a share of the population, this holds.

Support for European Union. In the paper, we suggest that support for European

Union could have increased in salmon-producing municipalities because the industry is export-oriented. This could explain why support for the Center Party has declined and is not inconsistent with higher support for the Progress Party since they were not against EU membership during the period we study (this has recently changed, and they are now against EU membership). As above, we do not have repeated cross-sectional survey data on support for EU. Instead, we construct two variables measuring combined support for the parties that oppose EU membership during the period we study (The Red Party, The Socialist Left Party, The Center Party, The Liberal Party, and the Christian People's Party). The first is simply the total support for these parties, while the second is the support for these parties relative to those parties supporting EU membership (Labour Party, The Conservative Party, the Progress Party). We find negative effects of salmon production on both measures. Thus, the EU mechanism seems to be a more plausible channel than the immigration channel.

Table A16: 2SLS estimates. Dependent variables are changes in refugee settlement decisions and support for anti-EU parties.

	Refugee settlements (absolute)	Refugee settlements (per capita)	Oppose EU (absolute)	Oppose EU (relative)
Second stage				
Salmon	13.485	0.003	-0.128***	-0.068***
	(18.327)	(0.005)	(0.046)	(0.024)
AR CI lb	-23.102	-0.006	-0.241	-0.127
AR CI ub	53.268	0.012	-0.046	-0.026
Cragg-Donald F	34	34	34	34
County FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
N	209	209	209	209
Mean of Y	-70.61	-0.02	-0.49	-0.25

Note: Standard errors in parentheses. *** p<.01; ** p<.05; * p<.10. AR CL lb (ub): Anderson-Rubin confidence interval, lower (upper) bound.

Short run estimates

We argue that the effects of salmon production are likely to manifest over the long run, as it takes time for structural changes to influence preferences and world-views. However, we also estimate short-run effects for completeness, which are presented in Table A17. The models in Table A17 are first differences models where we regress changes in outcomes between the elections in 1993, 1997, 2001, 2005, 2009, and 2013 on changes in salmon fish farming concessions over the same years. Otherwise, the model specifications are the same as in the long-run models. The estimates go in the same direction as the long-run estimates but are not statistically significant. Thus, what we capture in this approach are the consequences of slow-moving structural changes.

Table A17: 2SLS estimates. Dependent variables are differences in outcomes between elections in 1993, 1997, 2001, 2005, 2009, and 2013.

	Progress party	Conservative party	Center party	Labour party	Non-socialist	Turnout
Second stage						
Δ Concessions	0.080	0.032	-0.221	0.052	-0.066	0.060
	(0.050)	(0.033)	(0.153)	(0.086)	(0.080)	(0.040)
Cragg-Donald F	11	11	11	11	11	11
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
N	418	418	418	418	418	418
Mean of Y	0.07	0.05	-0.08	-0.01	0.02	0.01

Note: Standard errors in parentheses. *** p<.01; ** p<.05; * p<.10. AR CL lb (ub): Anderson-Rubin confidence interval, lower (upper) bound.