

# Yellow Vests, Pessimistic Beliefs, and Carbon Tax Aversion

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## Are French people ecologist?



Figure: Some Yellow Vests

## 1 Perceptions

2 Are beliefs persistent?

3 Motives for acceptance

4 Conclusion

## Tax & Dividend: *ex ante*

- Description of our Tax & Dividend reform:
  - ▶ +13% on gas (resp. +15% on domestic fuel) redistributed
  - ▶ +0.11€/L on gasoline (resp. +0.13€/L on diesel)
  - ▶ Revenues from households redistributed lump-sum: 110€/year by adult
  - ▶ Tax incidence: borne at 80% by consumers
  - ▶ Elasticities: -0.4 for transport, -0.2 for housing
- Would you lose, win or be unaffected by the reform?
- Expected loss (or gain) among 6 (or 5) intervals?
- Would you approve this reform?

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- Would you lose, win or be unaffected by the reform?
- Expected loss (or gain) among 6 (or 5) intervals?
- Would you approve this reform?
  - ▶ 10% 'Yes': approval
  - ▶ 19% 'PNR (I don't know, I don't want to answer)': acceptance
  - ▶ 70% 'No': disapproval

## Pessimistic perception of net gain

PDF of **subjective** vs. **objective** net gains from Tax & Dividend (in € per year per consumption unit).

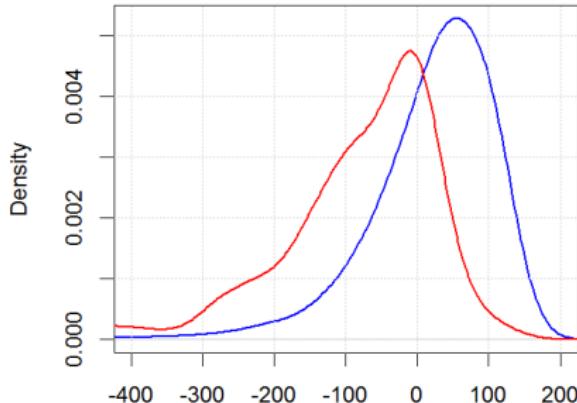


Figure: Net gain. Mean: -89/+24

- 64% think they lose; only 14% think they win
- Objectively, 70% win
- 89% underestimate their gain, 53% by more than 110€.
- Median gap of 116€.

## Beliefs over environmental effectiveness

Reform effective to “reduce pollution and fight climate change”?  
17% ‘Yes’, 66% ‘No’ and 18% ‘PNR’.

Those can be due to low objective impact of the reform: –0.8% of *French* GhG emissions, vs. official goal of *carbon neutrality* in 2050.

## Beliefs over progressivity

Reform would benefit poorer households? 19% 'Yes', 60% 'No', 21% 'PNR'.

Yet, the tax is progressive:

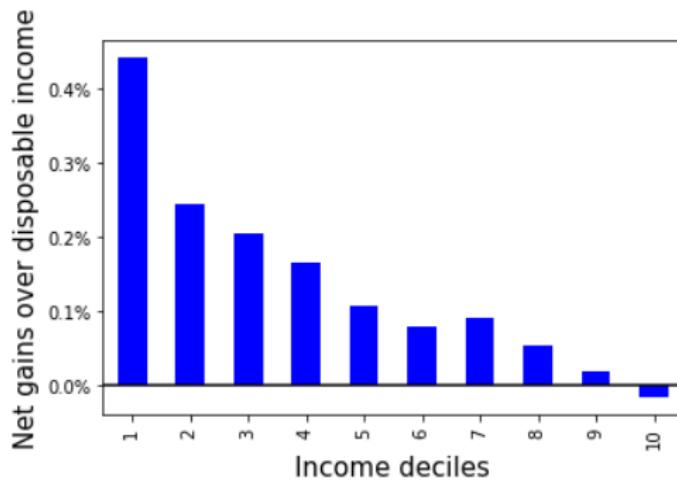


Figure: Average gain of Tax & Dividend by income decile as a share of disposable income

**1** Perceptions

**2** Are beliefs persistent?

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## Tax & Dividend: after feedback

- Feedback: “In five cases over six, a household with your characteristics would [win/lose] through the reform. (The characteristics taken into account are: heating using [energy source] for an accommodation of [surface] m<sup>2</sup>; [distance] km traveled with an average consumption of [fuel economy] L for 100 km.)”
- Would you lose, win or be unaffected by the reform?
- Would you approve this reform?

## Conservatism and pessimism

Two main results:

- ➊ Losers update correctly (on average): 86% align with feedback
- ➋ Winners do not update enough: only 25% align

▶ See regressions

Possible interpretations:

- Respondents do not **trust** what we present to them.
- Respondents are **uncertain** and loss-averse: they don't report the expected outcome but something more pessimistic.
- **Motivated reasoning**: respondents revise less their beliefs when new information is in favor of the tax, due to their skeptical prior attitude against it.
- Respondents intentionally **mis-report** their beliefs, due to uncertainty or to justify their opposition to the tax.

# Determinants of correct updating

▶ See prediction's precision

Table: Asymmetric updating of winning category

	Correct updating ( $U$ )	
	(1)	(2) )
Constant	0.120*** (0.012)	-0.150 (0.189)
Winner, before feedback ( $\dot{G}$ )	0.685*** (0.078)	0.646*** (0.080)
Initial tax: PNR (I don't know)		0.163*** (0.031)
Initial tax: Approves		0.158*** (0.046)
Retired		0.146* (0.079)
Active		0.175*** (0.054)
Student		0.234*** (0.075)
Yellow Vests: PNR		-0.043 (0.047)
Yellow Vests: understands		-0.063* (0.034)
Yellow Vests: supports		-0.059* (0.036)
Yellow Vests: is part		-0.137** (0.062)
Among invalidated	✓	✓
Controls: Socio-demo, politics, estimated gains		✓
Observations	1,365	1,365
R <sup>2</sup>	0.055	0.133

\* p<0.1; \*\* p<0.05; \*\*\* p<0.01

## Beliefs over environmental effectiveness

**Table:** Effect of primings on beliefs about environmental effectiveness

	Environmental effectiveness
Info on Environmental Effectiveness ( $Z_E$ )	0.043** (0.017)
Info on Climate Change ( $Z_{CC}$ )	0.044* (0.024)
Info on Particulate Matter ( $Z_{PM}$ )	0.039 (0.024)
$Z_{CC} \times Z_{PM}$	-0.040 (0.035)
Controls: Socio-demographics	✓
Observations	3,002
R <sup>2</sup>	0.003

\* p<0.1; \*\* p<0.05; \*\*\* p<0.01

⇒ Primings do increase beliefs about effectiveness.

## Beliefs over progressivity

- Random information on Progressivity: "this reform would increase the purchasing power of the poorest households and decrease that of the richest, who consume more energy" (1/2 of respondents)
- Is the reform beneficial to the poorest?
- No effect of the info (correlation:  $-0.006$ )

▶ More on this

1 Perceptions

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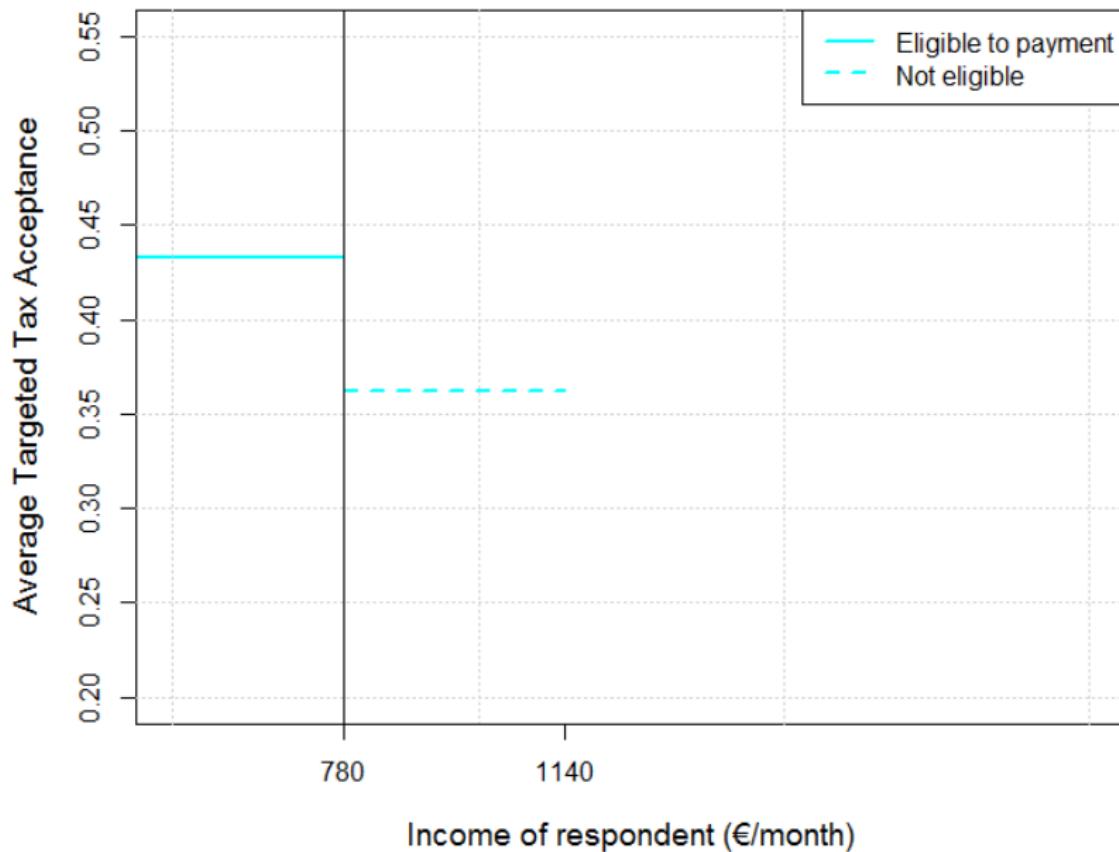
4 Conclusion

## Tax & Targeted Dividend: questions

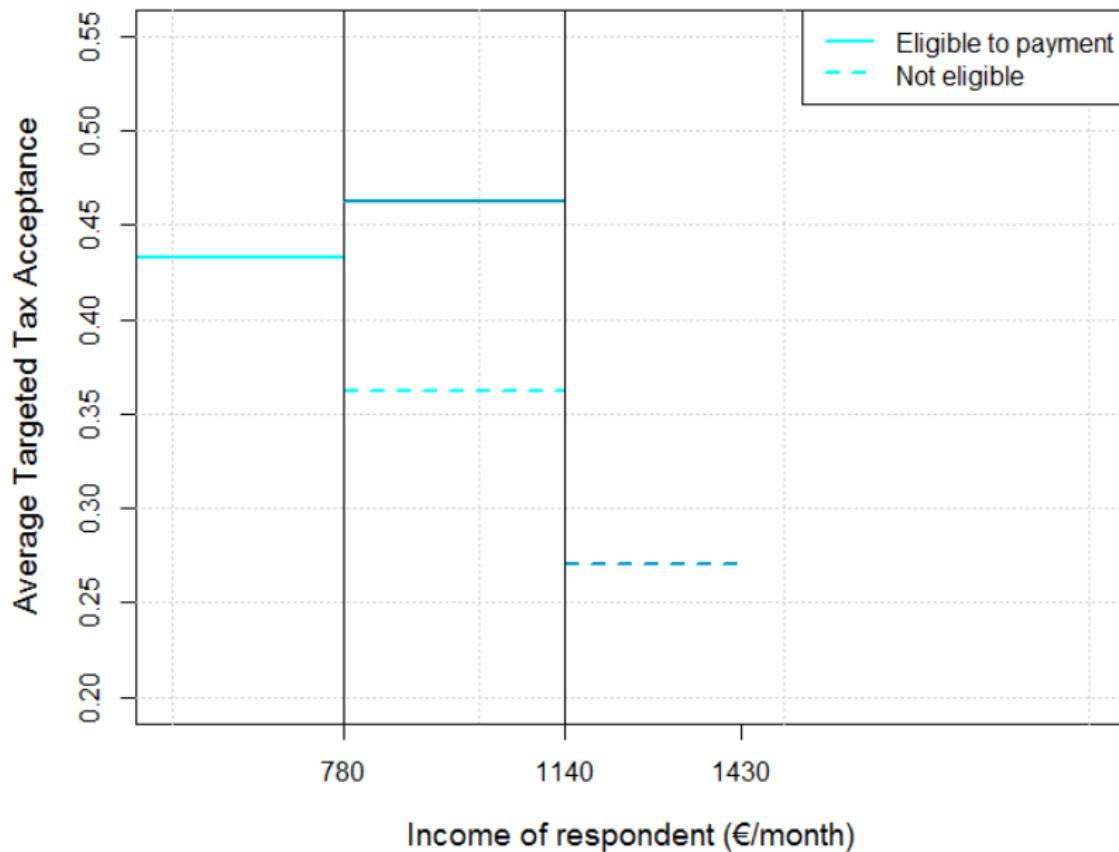
- +50€/tCO<sub>2</sub>
- Revenues distributed equally among adults below some income threshold
- Respondents allocated to different thresholds: bottom 20, 30, 40 and 50%
  - ▶ Randomly between two thresholds if respondent's income is within them
  - ▶ When income close to only one threshold (i.e. percentile < 20 or in [50; 70]), allocated to that one
  - ▶ When percentile is > 70, threshold determined by spouse's income
  - ▶ If no spouse or if both have high incomes, threshold allocated randomly
- Would you lose, win or be unaffected by the reform?
- Would you approve this reform?

► Descriptive stats

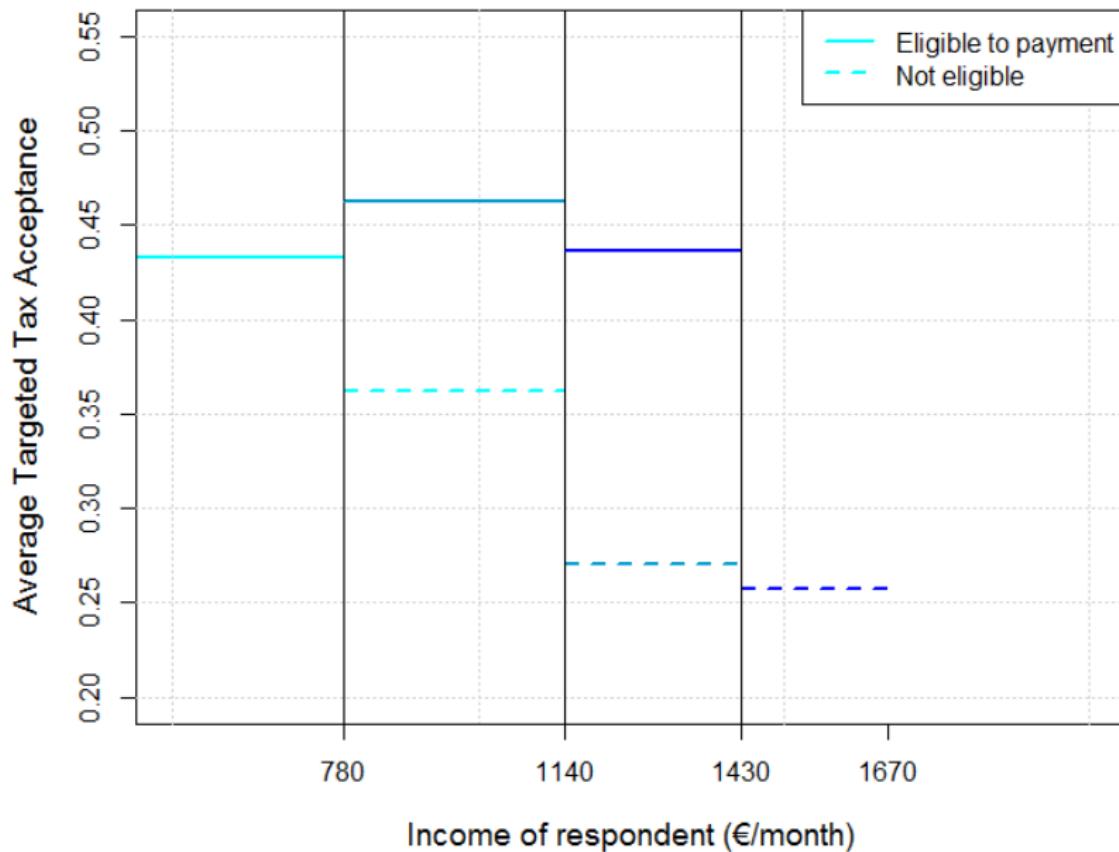
## Tax & Targeted Dividend: a primer



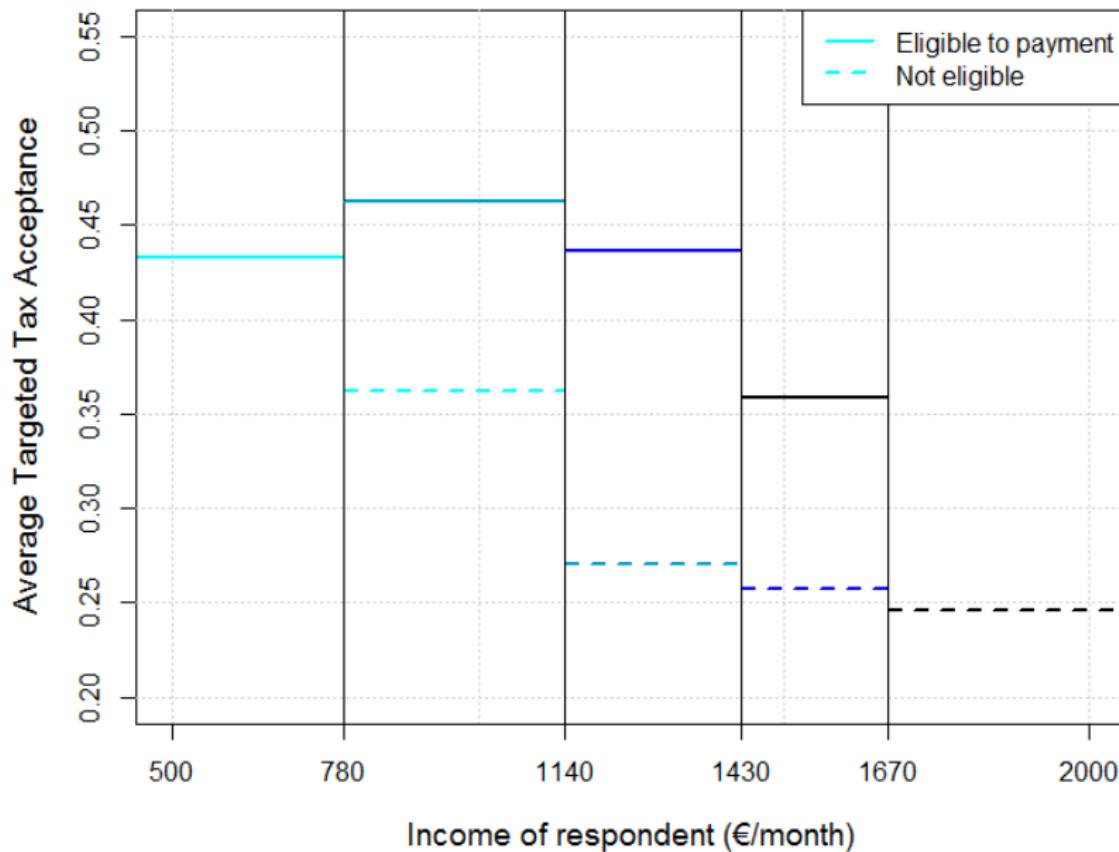
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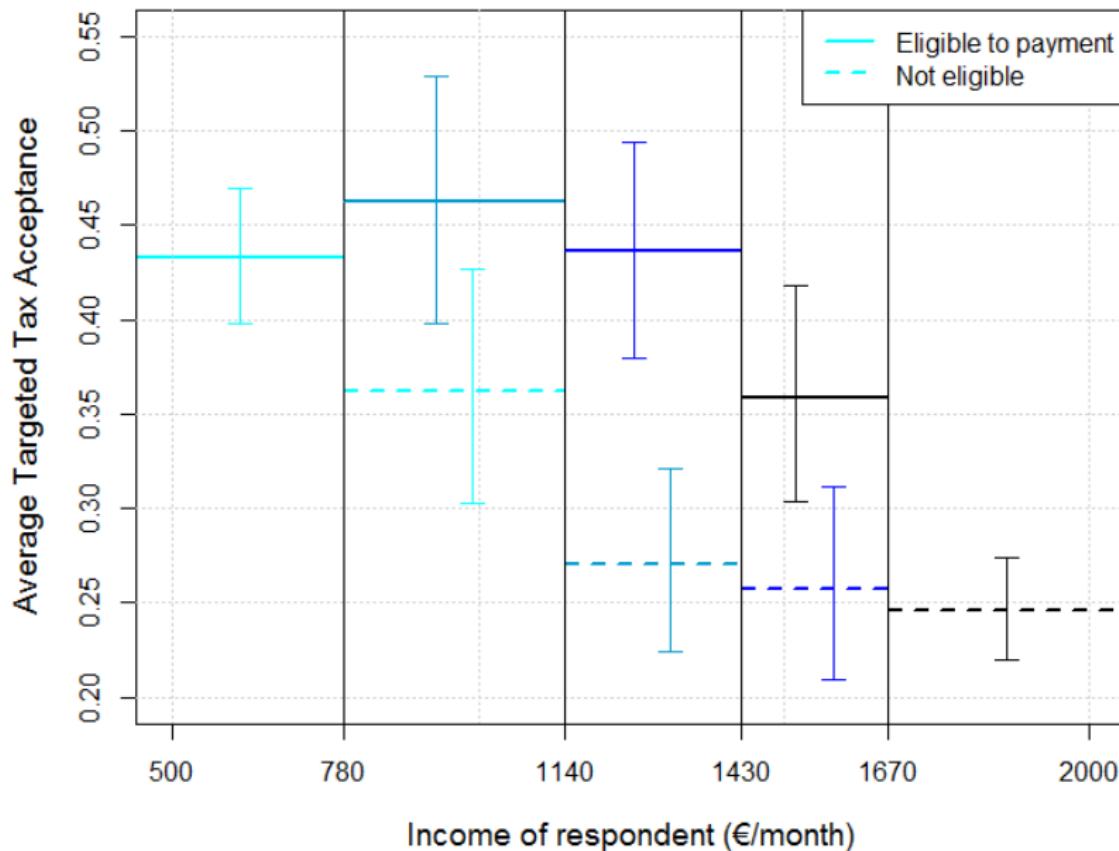
## Tax & Targeted Dividend: a primer



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## Self-interest - Results

**Table:** Effect of self-interest on acceptance

	Acceptance ("Yes" or "Don't know" to policy support)			
	Targeted Dividend		After Feedback	
	<i>IV: random target/eligibility</i>	<i>OLS</i>	<i>IV: discontinuity in feedback</i>	(4)
Believes does not lose	0.534*** (0.132)	0.462*** (0.097)	0.440*** (0.014)	0.644*** (0.170)
Initial tax Acceptance	0.356*** (0.041)	0.386*** (0.037)	0.361*** (0.026)	0.420*** (0.074)
Controls: Incomes (piecewise continuous) Estimated gain, socio-demo, other motives	✓	✓	✓	✓
Controls: Policy assigned	✓	✓	✓	
Sub-sample	[p10; p60]			gain <50
Effective F-Statistic	15.6	28.1		21.3
Observations	1,969	3,002	3,002	757
R <sup>2</sup>	0.320	0.270	0.471	0.541

NOTE: Standard errors are reported in parentheses.

\* p<0.1; \*\* p<0.05; \*\*\* p<0.01

▶ First stage results

## Environmental effectiveness - Results

Table: Effect of believing in environmental effectiveness on approval

	Initial Tax & Dividend		
	Approval ("Yes")		Acceptance (not "No")
	<i>IV</i>	<i>OLS</i>	<i>LIML</i>
(1)	(2)	(3)	
Believes in effectiveness	0.416 (0.168)	0.374 (0.013)	0.508 (0.230)
Instruments: info E.E. & C.C.	✓		✓
Controls: Socio-demo, other motives	✓	✓	✓
Effective F-Statistic	11.2		
Observations	3,002	3,002	3,002
R <sup>2</sup>	0.161	0.342	0.295

NOTE: Standard errors are reported in parentheses.

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## Key results

- ❶ French people would largely reject a carbon tax policy with uniform lump-sum transfer
- ❷ They have pessimistic perceptions of the properties of the scheme:
  - ▶ they over-estimate the negative impact on their purchasing power;
  - ▶ they do not think it is environmentally effective;
  - ▶ they wrongly perceive it as regressive.
- ❸ Providing information can hardly help correct these misperceptions:
  - ▶ people give little weight to these information;
  - ▶ they tend to trust more negative news about the tax than positive ones.
- ❹ Nonetheless: if one could convince them, the scheme would reach majority acceptance.
  - ▶ Self-interest and environmental effectiveness are critical motives of acceptance: each  $\simeq + 50$  p.p. in likelihood to accept.
  - ▶ Suggestive evidence shows motives are complementary: 90% approval among those who share the three beliefs, 65-75% for two beliefs

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Thank you !

[bit.ly/CarbonTaxAversion](http://bit.ly/CarbonTaxAversion)

## 5 Appendix

# Categories of winners and losers

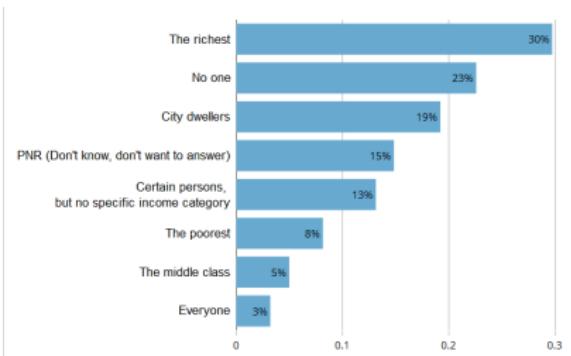


Figure: winners

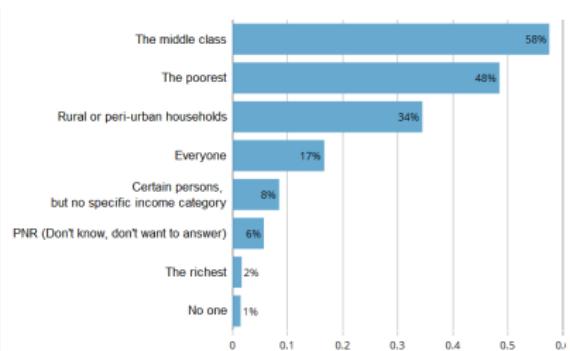


Figure: losers

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# Estimation of increase in housing energy expenditures

**Table:** Determinants of housing energy expenditures

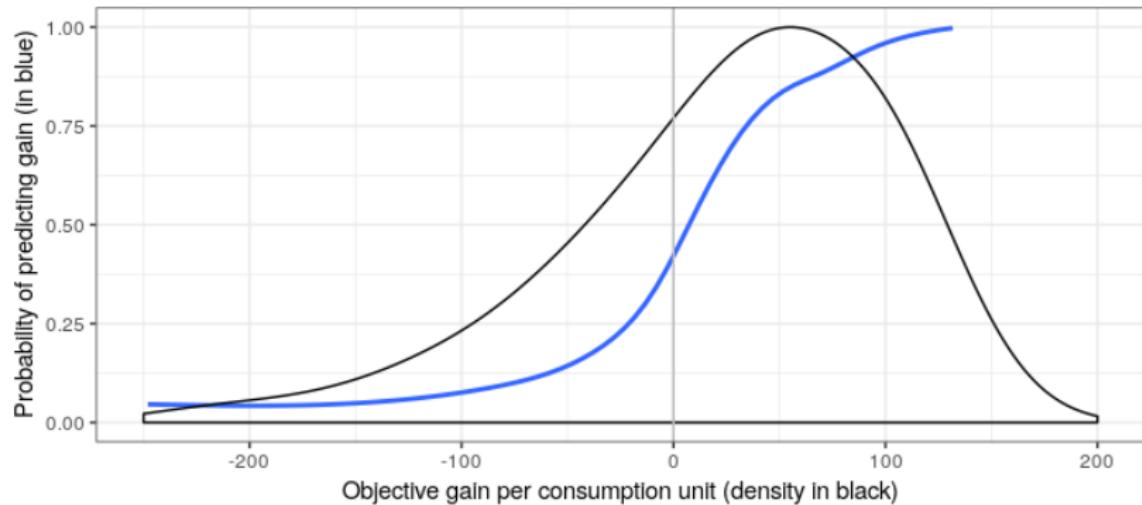
	Increase in housing energy expenditures (€/year)		
	(1)	(2)	(3)
Constant	-55.51*** (1.237)		-0.634 (1.489)
Housing energy: Gas	124.6*** (1.037)		1.173 (2.323)
Housing energy: Fuel oil	221.1*** (1.719)	129.8*** (3.752)	130.4*** (4.002)
Accommodation size (m <sup>2</sup> )	0.652*** (0.012)		0.024 (0.015)
Accommodation size × Gas		1.425*** (0.007)	1.397*** (0.024)
Accommodation size × Fuel oil		0.945*** (0.029)	0.922*** (0.032)
Observations	26,729	26,729	26,729
R <sup>2</sup>	0.545	0.716	0.599
Error rate	0.166	0.155	0.155

Note:

\* p<0.1; \*\* p<0.05; \*\*\* p<0.01

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## Prediction's precision



**Figure:** Probability that our estimation of net gains correctly predicts the winning category.

# First stage self-interest

**Table:** First stage regressions results for self-interest

	Believes does not lose			
	Targeted tax ( $G^T$ )		After feedback ( $G^F$ )	
	(1)	(2)	(5)	(6)
Transfer to respondent ( $T_1$ )	0.268*** (0.028)	0.227*** (0.027)		
Transfer to spouse ( $T_2$ )	0.180*** (0.031)	0.174*** (0.030)		
$T_1 \times T_2$	-0.190*** (0.038)	-0.161*** (0.037)		
Initial tax Acceptance ( $A^I$ )		0.163*** (0.033)		0.333*** (0.038)
Simulated winner ( $\widehat{\Gamma}$ )			0.217*** (0.036)	0.210*** (0.035)
Controls: Incomes	✓	✓		✓
Controls: Estimated gain		✓	✓	✓
Controls: Target of the tax, single	✓	✓		
Controls: Socio-demo, other motives		✓		✓
Effective F-Statistic (Montiel & Pflueger, 2013)	44.093	40.834	37.966	57.866
Observations	3,002	3,002	1,968	1,968
R <sup>2</sup>	0.082	0.177	0.131	0.319

\* p<0.1; \*\* p<0.05; \*\*\* p<0.01

Go back to second stage

# First stage environmental effectiveness

**Table:** First stage regressions results for environmental effectiveness

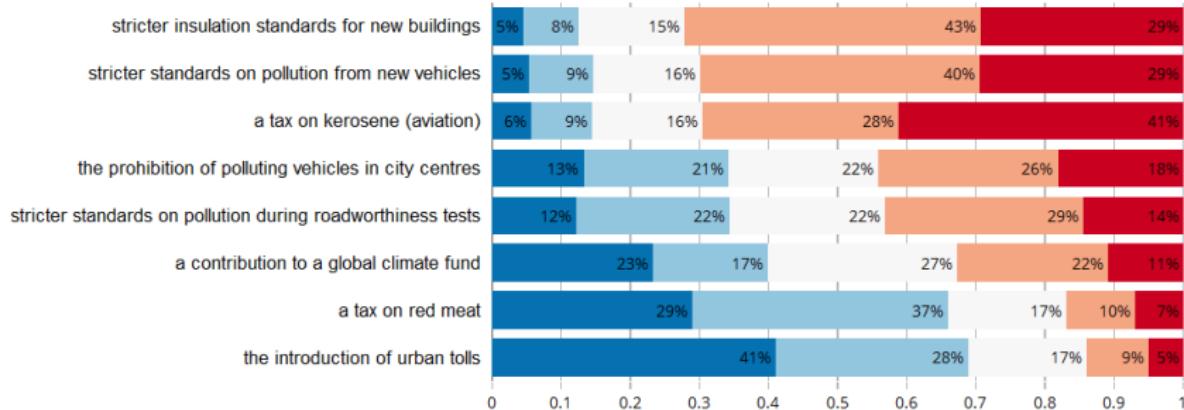
	Environmental effectiveness		
	(1)	not "No"	"Yes"
(5,6)			
Info on Environmental Effectiveness ( $Z_E$ )	0.062*** (0.017)	0.043** (0.017)	0.059*** (0.014)
Info on Climate Change ( $Z_{CC}$ )	0.030* (0.017)	0.024	0.028** (0.013)
Controls: Socio-demo, other motives, incomes, estimated gains	✓		✓
Effective F-Statistic (Montiel & Pflueger, 2013)	5.866	2.523	11.145
Observations	3,002	3,002	3,002
R <sup>2</sup>	0.121	0.003	0.123

\* p<0.1; \*\* p<0.05; \*\*\* p<0.01

[Go back to second stage](#)

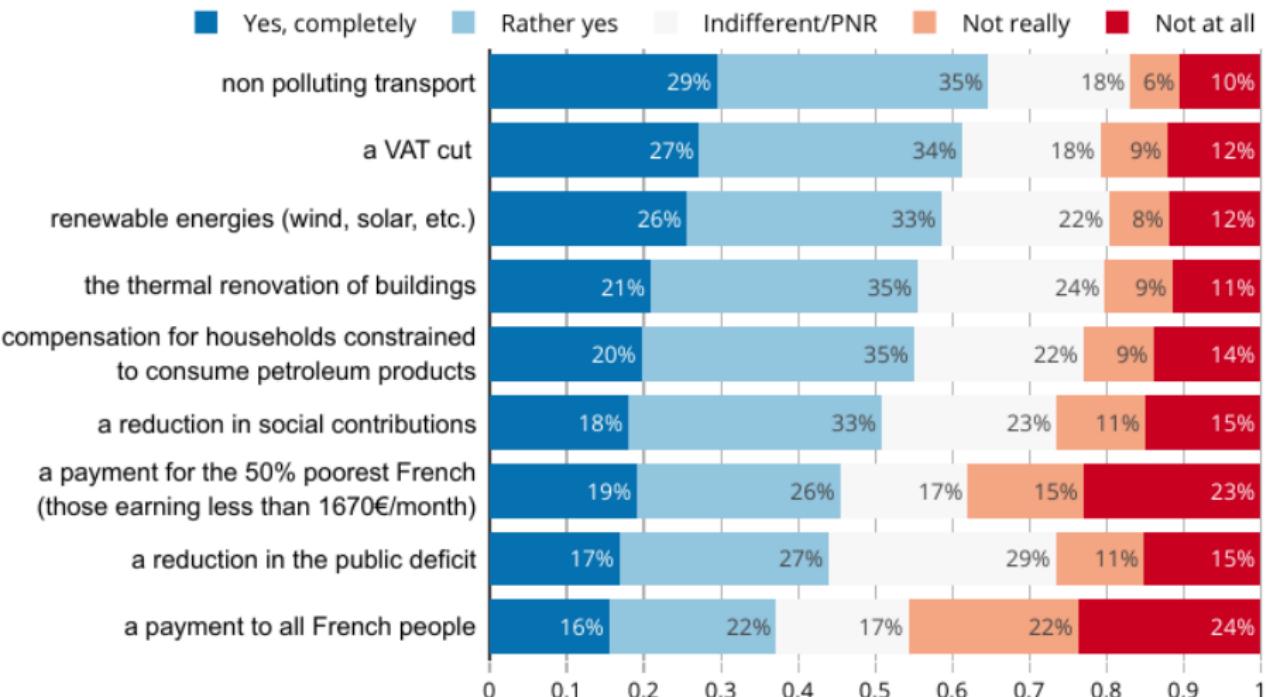
# French favored environmental policies

■ Not at all ■ Not really ■ Indifferent/PNR ■ Rather yes ■ Yes, completely



[Go back](#)

## French favored redistribution of tax carbon revenue



Go back

## Subjective elasticities

→ Tempting interpretation: people perceive aggregate consumption as inelastic  
(Kallbekken & Sælen, 2011; Carattini et al, 2018)

Table: Effect of subjective elasticities on perceived environmental effectiveness

	Environmental effectiveness: not 'No'			
	(1)	(2)	(3)	(4)
Price elasticity: Housing	-0.062*		-0.055*	
	(0.032)		(0.032)	
Price elasticity: Transports		-0.056*		-0.060 **
		(0.030)		(0.030)
Controls: Socio-demographics, energy			✓	✓
Observations	1,501	1,501	1,501	1,501
R <sup>2</sup>	0.003	0.002	0.089	0.090

Note:

\* p<0.1; \*\* p<0.05; \*\*\* p<0.01

Effect too small to explain the beliefs.

▶ Go back

**Table:** Share of respondents with new beliefs aligned with feedback

	<i>Aligned with feedback: <math>G^F = \hat{\Gamma}</math></i>	
	$\hat{\Gamma} > 0$ (75.8%)	$\hat{\Gamma} < 0$ (24.2%)
Initial belief: winner ( $G > 0$ ) (14.0%)	78.8% [73.2% ; 83.4%]	81.5% [65.0% ; 91.3%]
Initial belief: unaffected ( $G = 0$ ) (21.7%)	21.6% [17.6% ; 26.2%]	44.9% [33.5% ; 56.8%]
Initial belief: loser ( $G < 0$ ) (64.3%)	12.2% [10.3% ; 14.5%]	93.9% [90.9% ; 96.0%]
Initial belief: affected ( $G \neq 0$ ) (78.3%)	26.1% [23.7% ; 28.7%]	92.9% [89.8% ; 95.1%]
All (100%)	25.1% [23.0% ; 27.3%]	85.7% [82.2% ; 88.7%]

NOTE: The 95% confidence intervals for binomial probabilities is given in brackets.

## Bias persistence over progressivity

It seems we do not convince people at all here ! How come?

⇒ Evidences of psychological reactance from biased people (boomerang effect, see Hovland 1953):

**Table:** Effect of information on perceived progressivity

	Progressivity: not No ( $P$ )		
	(1)	(2)	(3)
Constant	0.419*** (0.022)	0.435*** (0.033)	0.386** (0.186)
Information on progressivity ( $Z_P$ )	-0.021 (0.027)	0.050 (0.040)	0.014 (0.239)
Large bias ( $ \hat{\gamma} - g  > 110$ )		-0.028 (0.045)	-0.019 (0.045)
Interaction $Z_P \times ( \hat{\gamma} - g  > 110)$		-0.130** (0.055)	-0.126** (0.055)
Controls: Socio-demo, politics			✓
Observations	1,444	1,444	1,444
R <sup>2</sup>	0.0004	0.018	0.100

\* p<0.1; \*\* p<0.05; \*\*\* p<0.01

▶ go back

## Descriptive statistics on income targets

**Table:** Characteristic of the targeted reform by target of the payment.

Targeted percentiles ( $c$ )	$\leq 20$	$\leq 30$	$\leq 40$	$\leq 50$
Income threshold (€/month)	780	1140	1430	1670
Payment to recipients (€/year)	550	360	270	220
Proportion of respondents	.356	.152	.163	.329
<i>Expected proportion of respondents</i>	.349	.156	.156	.339

▶ go back