15

PSYCHOLOGICAL BARRIERS TO GASOLINE TAXATION

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A. Introduction

Economists are in almost universal agreement that, in concept, pollution taxes are the most cost-effective means of reducing pollution.[2] Despite near unanimity **15.01**

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[2] The literature is far too vast to list, but three important basic texts in environmental and natural resource economics serve as examples. WJ Baumol and WE Oates, *The Theory of Environmental Policy* (2nd edn, Cambridge, 1988) 23 ('In sum. . . the proper corrective device is a Pigouvian tax equal to marginal social damage levied on the generator of the externality with no supplementary incentives for victims'); PS Dasgupta and GM Heal, *Economic Theory and Exhaustible Resources* (Cambridge, 1979) 52–4 ('Strictly from a *formal* point of view our example suggests that, as long as all costs in running an institution are nil, a tax equilibrium and a competitive equilibrium with markets for externalities are equivalent'); T Tietenberg, *Environmental and Natural Resource Economics* (3rd edn, Harper-Collins, 1992) 373 ('We have shown as long as the control authority imposes the same emission charge on all sources, the resulting reduction allocation *automatically* minimizes the costs of control'). Regular microeconomics textbooks also generally assert this principle. Again, the examples are much too numerous to list, but several of the most important texts are illustrative. See, eg A Mas-Collell, MD Whinston, and JR Green, *Microeconomic Theory* (Oxford, 1995) 354–5 (figure 11.b, illustrating optimality of Pigouvian tax); P Samuelson, *Economics* (11th edn, McGraw-Hill, 1980) 744 ('Economists propose that greater use be made of pricing mechanisms. Taxes are to be put on firms and industries that put out effluents into the air and ground. . .'); and 'Economists Favor Fossil Fuels Tax to Spur Alternatives—Survey', E&E News PM, (8 February 2007).

among economists, however, pollution taxes remain widely unpopular among almost everyone else. While they are most unpopular in the United States and Canada,[3] various other countries have also experienced varying degrees of political resistance towards pollution taxes.[4] Some resistance is cultural, deriving from suspicion that government would waste the tax proceeds, or at least spend them in a way inconsistent with the stated purposes.[5] However, most resistance is based on the notion that those polluters paying taxes would face extreme economic hardships, raising fairness issues.[6] Despite the fact that many redistributive

[3] Not only do taxes generally make up a smaller percentage of GDP in North America, but environmental taxes make up a smaller percentage of tax revenue. For example, in the United States, Canada, and Mexico, respectively, gasoline taxes are 10, 11 and 25 cents (US) per litre, respectively, less than any of the 26 other countries surveyed by the International Energy Administration in 2000. Environmental tax revenues in the United States, Canada, and Mexico constitute approximately 0.9%, 1.45%, and 1.5% as a percentage of GDP (source: T Sterner and G Köhlun, *Environmental Taxes in Europe* (2003) 3 *Public Finance & Management* 117, 125 figure1, 129 table 2. In a 2004 report, the OECD noted Canada's reluctance to embrace economic instruments generally:

> Despite the introduction of a number of economic instruments for environmental policy purposes, mainly at the provincial level, limited use has been made of economic instruments for environmental management at any level of government. A number of constraints affect greater uptake of economic instruments. Industry is concerned about day-to-day competitiveness pressures, especially in relation to cost competitiveness with the US. It has difficulty understanding how to implement new instruments such as trading. Within governments, economic agencies have supported economic instruments in principle, but resisted specific proposals for targeted incentives on allocative efficiency grounds. The public is wary of new fees and charges, and of the allocation of the 'right to pollute'. There is general resistance to external pressure to change consumption patterns. Small but influential groups have blocked some proposals.
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> (Organisation for Economic Co-operation and Development (OECD), *Environmental Performance Review of Canada* (2004)).

[4] While opposition to gasoline taxes is commonly believed to be most virulent in North America, European governments seeking to impose pollution taxes have also encountered political opposition. Gasoline taxes have been more successfully implemented in European countries, but more often for reasons of national security, trade protectionism, and revenue raising, rather than pollution abatement or energy conservation. PS Nivola and RW Crandall, *The Extra Mile, Rethinking Energy Policy for Automotive Transportation* (Brookings, 1994) 59–79.

[5] In Canada, gasoline tax proceeds even play into provincial rivalries and rent-seeking. W Boei and P O'Niel, 'British Columbia's Gasoline Taxes Helping Out Quebec [BC Transportation Minister], Falcon Says', Vancouver Sun (21 March 2007) A3.

Studies from Germany, Denmark, Ireland, France, and the UK have demonstrated that the public does not trust politicians to spend environmental taxes solely on environmental measures; rather, people worry that funds will end up supplementing general government revenues. See C Beuermann and T Santarius, 'Ecological Tax Reform in Germany: handling two hot potatoes at the same time' (2006) 34 *Energy Policy* 917; J Klok, A Larsen, A Dahl, and K Hansen, 'Ecological Tax Reform in Denmark: History and Social Acceptability' (2006) 34 Energy Policy 905; JP Clinch and L Dunne, 'Environmental Tax Reform: an assessment of social responses in Ireland' (2006) 34 Energy Policy 950; J-F Deroubaix and F Lévèque, 'The Rise and Fall of French Ecological Tax Reform: Social Acceptability versus Political Feasibility in the Energy Tax Implementation Process' (2006) 34 *Energy Policy* 940; and S Dresner, T Jackson and N Gilbert, 'History and Social Responses to Environmental Tax Reform in the UK' (2006) 34 *Energy Policy* 930.

[6] Some research suggests that people are extremely reluctant to take or support any action that affirmatively harms people, even if the benefits to others far exceed the harm. J Baron, 'Blind Justice: Fairness to Groups and the Do-no-harm Principle' (1995) 8 J of Behavioral Decision-making 71.

schemes have been put forth that would ameliorate the distributional consequences of a tax,[7] concerns are both persistent and widespread that such taxes would unfairly visit unacceptable hardships upon certain individuals, groups, or industries.

15.02 Numerous occasions have arisen in the past several decades for serious consideration of pollution taxes, or some consumption-keyed tax that would be reasonably Pigouvian in nature.[8] Since the oil embargo of the 1970s, American politics has featured much hand-wringing over the dual problems of energy efficiency and energy independence, but apart from some fairly modest steps—such as the formation of the Strategic Petroleum Reserve—it would be delusional to say that the United States has made any progress on either front. Since 1981, fuel efficiency of US motor vehicles has remained roughly the same, and US oil imports have risen threefold.[9] The vehicle fuel efficiency standards adopted in 1981 have had only a modest effect,[10] and in the meantime, Americans have vigorously resisted increases in gasoline taxes, which could have addressed both fuel efficiency and energy independence needs.

15.03 In 1994, as part of a plan to reduce what was then considered a dangerously high deficit and high energy consumption, US President Bill Clinton proposed a 'Btu tax'[11] to be levied on consumer energy bills.[12] Initially supported by

Energy-intensive industries fear that they would bear the brunt of any pollution taxes (see Klok *et al* (n 5 above); Deroubaix and Lévèque (n 5 above); and Clinch and Dunne (n 5 above). In addition, there is concern that poorer members of society will be disproportionately affected by pollution taxes (Klok *et al*; Clinch and Dunne; and Dresner *et al* (n 5 above)) or that such a tax burden will be unfairly distributed (Beuermann and Santarius (n 5 above).

7 Various 'revenue recycling' programmes impose a per-pollutant tax, but return the tax proceeds to the polluters either via lump sum or in some way that does not relate to the amount of pollution. For example, a NOx tax in Sweden imposed upon energy producers is rebated in proportion to energy output. Swedish Environmental Protection Agency, 'The Swedish Charge on Nitrous Oxides' <http://www.internat.naturvardsverket.se/documents/pollutants/nox/nox.htm> (last accessed 19 July 2007).

8 'Pigouvian' is meant to describe a tax that would be consistent with Pigou's prescription that a tax equal to the marginal social harm from pollution should be imposed to provide just the right amount of disincentive for pollution.

9 The fuel efficiency of motor vehicles in the United States was approximately 24.5 miles per gallon in 1981, where it remains today (US Department of Transportation, 'Summary of Fuel Economy Performance' (March 2004) 5). The United States imported 5 billion barrels of oil in 2005, up from 1.87 billion in 1982, a jump from 33% of total consumption to 66%. Petroleum import figures derived from US Energy Information Administration, 'Basic Petroleum Statistics, U.S. Net Petroleum Imports' <http://tonto.eia.doe.gov/dnav/pet/hist/mttimus2a.htm>. Petroleum consumption figures derived from US Energy Information Administration, 'Basic Petroleum Statistics, U.S. Petroleum Consumption' <http://tonto.eia.doe.gov/dnav/pet/hist/mttupus2a.htm>.

10 Nivola and Crandall (n 4 above) 27–32.

11 The Btu tax is a tax on the heat content of fossil fuels, proposed to be levied on energy consumption. Nivola and Crandall, 66.

12 Omnibus Budget Reconciliation Act of 1993, HR 2141, introduced 18 May 1993, s 4446.

most environmentalists,[13] economists,[14] and a wide spectrum of interests,[15] the Btu tax fell victim to a coalition of energy providers, energy consumers,[16] and even members of the Congressional Black Caucus, concerned about the supposedly regressive nature of the tax.[17] The Btu tax was presented as a revenue-raising alternative to a gasoline tax, which was viewed as being unfair toward automobile-dependent rural populations,[18] and to a carbon tax, which was viewed as being unfair to coal-miners and coal-mining interests.[19] It is thus slightly ironic and very illuminating that the Btu tax failed because of distributional concerns.

15.04 Canada has fared little better than the United States in either reducing energy use or introducing pollution taxes.[20] Its status as the largest oil exporter to the

[13] eg DA Lashof, 'The Btu Tax: A Revenue Source That Fights Pollution' (1993) 59 *Tax Notes* 1271; and D Erlandson, 'The Btu Tax Experience: What Happened and Why it Happened' (1994) 12 *Pace Environmental L Rev* 173, 175 (describing the Btu tax as 'brilliantly conceived in every way').

[14] H Lee, 'The Political Economy of Energy Taxes: An Assessment of the Opportunities and Obstacles' (1994) 12 *Pace Environmental L Rev* 77, 77. A Btu tax, however, is not a purely Pigouvian tax, in that it taxes electricity, not the emissions resulting from electricity; energy generated from renewable energy sources would be taxed just as energy generated from coal-fired power plants.

[15] Nivola and Crandall (n 4 above) 104.

[16] Ibid 78.

[17] Editorial, 'The Bouncing Tax Burden', Washington Post (14 June 1993) A18; and J Calmes, 'Doing the Deal: The Deficit-Reduction Conference: White House, Democrats Seek to Boost Support for Compromise Economic Plan', The Wall Street Journal (16 July 1993) A10. A more sober look at the regressivity of the Btu tax would have involved some inquiry as to whether it was more regressive than the alternatives to raising revenues.

Lower income drivers are more likely to reduce driving when faced with measures that increase the cost of driving and are thus more likely to perceive such measures as unfair. C Jakobsson, S Fujii, and T Gärling, 'Determinants of Private Car Users' Acceptance of Road Pricing' (2000) 7 *Transport Policy* 153. Although economic theory would predict low income groups are expected to be more opposed to road pricing because of their higher marginal utility of money, and their decreased willingness to pay to reduce externalities, empirical evidence contradicts these predictions: low income individuals are more likely to perceive pricing measures as effective and income level had no significant effect on support for such measures. SA Rienstra, P Rietveld, and ET Verhoef, 'The Social Support for Policy Measures in Passenger Transport. A Statistical Analysis for the Netherlands' (1999) 4 *Transportation Research Part D* 181.

[18] White House Budget Director Leon Panetta remarked that the President was attempting to introduce a 'broad-based' energy tax, 'in contrast to a gasoline tax that would tend to hit rural areas harder'. S Fullwood, 'Budget Bill May Bypass Panel, Bentson Says', Los Angeles Times (7 June 1993) 1.

[19] AC Christian, 'Designing a Carbon Tax: the Introduction of a Carbon-Burned Tax' (1992) 10 *UCLA J Environmental L & Policy* 221, 277.

[20] Between 1990 and 2004, per capita primary energy consumption increased 1.2% in the United States (338.5 to 342.7 million Btu per person), whereas per capita energy consumption rose 4.4% in Canada (400.7 to 418.4 Million Btu per person). By 2004, this translated to Canadian per capita primary energy consumption exceeding that of America by 22% (source: US Department Of Energy, Energy Information Administration, <http://www.eia.doe.gov/emeu/international/energyconsumption.html>). Note: available data spans 1980–2004, thus calculations can be done for other periods.

United States[21] seems to have deprived Canada of the urgency to improve energy efficiency. And in a vast, sparsely populated country, the pollution effects of profligate energy use seem somehow less urgent than in the United States, where over almost three-quarters of the population live in air pollution non-attainment areas.[22] Recent developments in climate change, including the increasing certainty with which the UN Intergovernmental Panel on Climate Change is projecting increasingly severe climate effects,[23] seems to have at least captured the attention of Canadians,[24] but Canadian politicians are still wary of using the word 'tax' in association with any plans to reduce Canadian greenhouse gas emissions.[25]

B. The Gasoline Tax

15.05 There is no pollution tax more pathologically hated than gasoline tax, despite even stronger unanimity in favour of their introduction from economists.[26] This is unfortunate, since there are few pollution taxes that are easier to implement. First, gasoline taxes are already routinely collected at the pump, so no additional administrative or monitoring costs need to be absorbed. Secondly, a per-quantity-of-gasoline tax is roughly proportional to the amount of pollution emitted during motor vehicle operation, something that is not necessarily true for other forms of pollution and methods of combustion. The reason for this

Automotive Efficiency Standards: American and Canadian automobile efficiency standards are roughly equivalent. American CAFE standards for passenger cars is 27.5mpg (since 1990), whereas the Canadian Company Average Fuel Consumption (CAFC) standard is 27.7 mpg (since 1985). For 2007, American CAFE and Canadian CAFC standards are 22.2 mpg for light trucks. (Sources: National Highway Traffic Safety Administration, US Department of Transportation, <http://www.nhtsa.dot.gov> (last accessed 19 July 2007); and Transport Canada, Fuel Consumption Program, <http://www.tc.gc.ca/programs/environment/fuelpgm/cafcsub.htm>.)

21 US Energy Information Administration, Crude Oil and Total Petroleum Imports, Top 15 Countries, <http://www.eia.doe.gov/pub/oil_gas/petroleum/data_publications/company_level_imports/current/import.html>.

22 US Environmental Protection Agency, AirData, <http://www.epa.gov/air/data/reports.html>.

23 Intergovernmental Panel on Climate Change, Climate Change 2007: The Physical Science Basis, Summary for Policymakers 6 (2007) ('Fourth Assessment'), <http://www.ipcc.ch/ipccreports/ar4-wg1.htm>.

24 CTV.ca, 'Most Willing to Sacrifice for Environment: poll' (26 January 2007), <http://www.ctv.ca/servlet/ArticleNews/story/CTVNews/20070126/enviro_poll_070126/20070126/>.

25 Once-Liberal Party front-runner Michael Ignatieff proposed a carbon tax to reduce greenhouse gas emissions, before being pilloried by other Liberal hopefuls, including eventual winner Stephane Dion, a former Environment Minister. CBC.ca, 'The Carbon Tax: the Pros and Cons of a Tax on Fossil Fuels' (16 June 2006), <http://www.cbc.ca/news/background/kyoto/carbon-tax.html>.

26 M Wachs, 'A Dozen Reasons for Raising Gasoline Taxes', UBC-ITS-RR-2003-1 (Institute for Transportation Studies, University of California at Berkeley, 2003) 2 ('A survey of 40 leading US economists in 1998 found that there is little agreement among them as to which of thirteen national tax and regulatory reform programs are desirable public policies, with the exception that all support a proposed 25¢ per gallon fuel tax increase').

rough proportionality is that motor vehicles may vary in the rate at which they spew pollution, but the greatest determinant of motor vehicle pollution is the inexorable increase in vehicle miles travelled.[27] For carbon dioxide, in particular, the correlation between emissions and gasoline quantity is very strong, regardless of the age or type of motor vehicle.[28]

15.06 Most economists and policy analysts would probably say that Americans and Canadians drive too much and in motor vehicles that consume too much gasoline, and that a gasoline tax is called for to reduce both of these amounts. Advocates for an increased gasoline tax span the political spectrum, from Gregory Mankiw,[29] George W Bush's former chief economic advisor, to Paul Krugman,[30] the New York Times columnist, who has spent the last six years pillorying the Bush Administration. Even über-libertarian Grover Norquist[31] reputedly supports a gasoline tax if the revenues are returned in the form of reduced income taxes.[32]

15.07 However, for reasons that this chapter sets out, the gasoline tax remains a political third-rail for North American politics.[33] Even in wake of the Arab Oil Embargo, the frantic American effort to reduce reliance on imported oil did not include a gasoline tax. In arguing against a 1975 gasoline tax proposal, Congressman Bill Alexander, Democrat of Arkansas, railed:

> [i]f this tax is enacted, we will be requiring the people of the heartland of America to carry this burden on both shoulders. It is unfair; it is inequitable; it is grossly discriminatory against the people of this country who do not have access to public transportation.[34]

15.08 In the 2006 leadership race for the Liberal Party of Canada, candidate Michael Ignatieff proposed a carbon tax that would have returned the carbon tax revenues to the provinces that generated them. Despite this effort to preserve provincial sovereignty, and despite receiving praise from economists, Canadian

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27 Nivola and Crandall (n 4 above) 15 (figure 1.7).

28 Carbon Dioxide Information Analysis Centre (CDIAC), 'Frequently asked global climate change questions', <http://cdiac.ornl.gov/pns/faq.html> (no date).

29 EL Andrews, 'Economic Adviser Learns the Principles of Politics', NY Times (26 February 2004) B3.

30 P Krugman, 'Gasoline Tax Follies', NY Times (15 March 2000) A27.

31 Grover Norquist is the founder and president of the anti-tax lobbying group Americans for Tax Reform, which lobbies for lower taxes and lower governmental spending. See <http://www.atr.org/home/about/staff.html>.

32 RH Frank, 'A Way to Cut Fuel Consumption That Everyone Likes, Except the Politicians', NY Times (16 February 2006) C3.

33 Canadian politicians, too, have suffered the political consequences of hiking gasoline taxes, even when used to paying for transportation infrastructure. D Meissner, 'B.C. Premier Target of Public Anger Over 3.5-cents-a-litre Fuel Tax Hike', Canadian Press (13 February 2003).

34 Congressional Record 11 June 1975, at 18435.

columnist Jeffrey Simpson joked that Ignatieff's move was the political equivalent of affixing a 'Kick Me' sign on his back.[35] An astute political adviser might have told Ignatieff to follow one of Canada's other party leaders, Jack Layton, head of the leftist NDP party. Layton, on record as being a strong supporter of the Kyoto Protocol, has been sharply critical of the other Canadian parties' attempts to reduce greenhouse gas emissions.[36] However, when gasoline prices spiked in the aftermath of Hurricane Katrina in 2005, Layton called for gasoline price regulation, arguing that high gasoline prices are 'affecting people in their daily lives… [and] affecting small businesses', and that it 'isn't fair to Canadians who have to budget around gas prices or cannot rely on adequate public transit systems'.[37] Whereas most economists were arguing that taxes were needed to nudge gasoline prices *higher*, here was a leading Canadian politician arguing for *lower* gasoline prices.

15.09 Why, in the face of so much support from economists and so much policy analysis showing the superiority of taxing instruments, is the gasoline tax such a piñata for politicians?

C. Tax Psychology

15.10 The yawning divide between economists and almost everyone else on the subject of taxes is fairly compelling evidence that economics precepts alone do not determine how people generally view the desirability of taxation. Cognitive psychology, including the so-called behavioral economics field, has dramatically changed how social scientists view and model human decision-making. Beginning with Herbert Simon's pioneering work on bounded rationality,[38] cognitive psychologists have discovered a myriad of systemic and consistent deviations from rational economic behaviour. Several areas of study in cognitive psychology bear on the problem of how people view proposals to increase gasoline taxes,

[35] J Simpson, 'For real green ideas, Mr. Dion, talk to Iggy', The Globe and Mail (17 January 2007) A19.

[36] Layton has criticized the current Administration of Prime Minister Stephen Harper for its refusal to act on climate change, boasting that his party 'forced' Harper's flawed "Clean Air Act" into an all committee for a full re-write. The NDP has tabled 15 tough amendments, challenging Parliament to adopt a plan for immediate action to combat global warming and to meet Canada's Kyoto targets'. See, eg 'Jack Layton on Climate Change Accountability Act', New Democratic Party Press Releases, <http://www.ndp.ca/page/4892> (5 February 2007) accessed 28 January 2008. Also, when current Liberal Party leader Stephane Dion Layton was Environment Minister, Layton wrote an open letter to Dion criticizing the then-governing Liberal government for its weak plan to reduce greenhouse gas emissions. Printed in Ottawa Citizen, < http://www.ndp.ca/page/1307> (16 February 2005).

[37] M Adler, 'Layton Seeks Gas Price Probe', Inside Toronto.com, <http://www.insidetoronto.ca/to/beaches/story/2996097p-3473080c.html> (26 August 2005) accessed 21 September 2007.

[38] HA Simon, 'A Behavioral Model of Rational Choice' (1955) 69 *QJ Economics* 99.

but in essence, all of these areas attempt to explain how the individual process of *framing* problems biases decisions in ways that traditional economics cannot explain.

Endowment effect

15.11 Perhaps the best-known of the framing effects is the endowment effect, which refers to the reluctance to part with objects within their possession, relative to their willingness to obtain the same objects not in their possession.[39] Whereas traditional neoclassical economics would assume that a particular object has a certain objective value to an individual, the endowment effect suggests that the valuation is different depending upon whether or not the individual has possession over the object. Experimental simulations have provided strong evidence of the existence of this effect for a wide variety of goods.[40] Even after controlling for income effects, willingness to accept values is significantly higher than willingness to pay values for the same object.[41] The disparity has been observed, however, to diminish and even disappear after repeated trials,[42] suggesting that education can counter the endowment effect.[43]

15.12 Given the importance and prevalence of motor vehicle use for most people, the idea of paying more for gasoline presents itself very clearly as a certain loss. In fact, the periodic routine of filling up at the gas station is so familiar that virtually everyone knows how much they spend at the pump and how often they spend it. When a gasoline tax is proposed or discussed, it is a manageable calculation for even the most innumerate driver to figure out the rough magnitude of their increased gasoline bill. And given the commonness with which drivers fill up with gas, this is a calculation that virtually everyone makes.

15.13 Compare the loss that drivers acutely feel with the stated benefits of higher gasoline taxes. The proposition that curtailing driving by making it more expensive will yield environmental benefits is subject to a number of pitfalls. First, there is the uncertainty that raising gasoline prices through taxation will actually curtail driving.

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39 A Tversky and D Kahneman, 'The Framing of Decisions and the Psychology of Choice' [1981] Science 453; and EJ McCaffrey and J Baron, 'Thinking About Tax' (2006) 12 *Psychology, Public Policy & Law* 106, 108.

40 For a review of the many various experiments in this area, see JK Horowitz and KE McConnell, 'A Review of WTA / WTP Studies' (2002) 44 *J of Environmental Economics and Management* 426.

41 D Kahneman and A Tversky, 'Choices, Values, and Frames' (1984) 39 *American Psychologist* 341, 347.

42 JA List, 'Neoclassical Theory Versus Prospect Theory: Evidence from the Marketplace' (2004) 72 *Econometrica* 615, 616; and Ian Bateman *et al*, 'A Test of the Theory of Reference-Dependent Preferences' (1997) 112 *QJ of Economics* 479, 491-2, 503.

43 C Plott and K Zeiler, 'The Willingness to Pay / Willingness to Accept Gap, the Endowment Effect, and Experimental Procedures for Eliciting Valuations' (2005) 95 *American Economic Review* 530.

Transportation studies seem to have demonstrated that people have the perception that 'push' measures that impose costs upon undesirable behaviour are less effective than 'pull' measures that encourage desirable behaviour.[44] Of course, the opposite is demonstrably true—taxing undesirable behaviour is generally more effective than subsidizing desirable behaviour.[45] Secondly, there is the uncertainty that the environmental benefits will materialize. Doubts that the environmental benefits would actually flow from a personal sacrifice[46] tips the scales against the benefit side, and accounts for some of the hostility towards gasoline taxes.

15.14 A hypothesized gasoline tax increase essentially proposes a trade-off to survey respondents: pay more for gasoline, and get back some environmental or energy security benefits. Even if these were comparable commodities (of equal certainty), the endowment effect would tilt people against making such a trade. For small trades such as coffee mugs for chocolate bars, the endowment effect is a strong one; for large trades involving the gasoline bill, the effect is likely to be greater. The gasoline tax, by proposing an exchange to nudge drivers off the status quo, and in a fairly intrusive way, is a victim of the endowment effect.

The do-no-harm effect

15.15 Experimental simulations have shown an interesting propensity of humans to favour inaction over action when it comes to harm. People would rather allow harm to take place through omission than take an affirmative action that causes harm. For example, one study told respondents that a flu epidemic would kill 10 children out of 10,000, and that a vaccine could prevent the flu, but that

[44] L Steg, L Driejerink, and W Abrahamse, 'Why are energy policies acceptable and effective?' (2006) 38 *Environment and Behavior* 92; see, eg W Holzer, 'Which role does the objective play? Empirical findings from Germany' in J Schade and B Schlag (eds), *Acceptability of Transport Pricing Strategies* (Elsevier, 2003) 219–33 (hereinafter, 'Acceptability of Transport Pricing'); L Eriksson, J Garvill, and A Nordlund, 'Acceptability of Travel Demand Measures: The Importance of Problem Awareness, Personal Norm, freedom, and fairness' (2006) *26 J of Environmental Psychology* 15; Rienstra *et al* (n 17 above); L Steg and C Vlek, 'The Role of Problem Awareness in Willingness-to-Change Car Use and in Evaluating Relevant Policy Measures' in JA Rothengatter and E Carbonell Vaya (eds), *Traffic and Transport Psychology: Theory and Application* (Pergamon, 1997) 465; J Schade, 'European Research Results on Transport Pricing Acceptability' in J Schade and B Schlag (eds), *Acceptability of Transport Pricing Strategies* (Elsevier Science, 2003) 109; L Steg, 'Factors Influencing the Acceptability and Effectiveness of Transport Pricing' in J Schade and B Schlag (eds), *Acceptability of Transport Pricing Strategies* (Elsevier Science, 2003) 187; and SG Stradling, ML Meadows, and S Beatty, *Factors Affecting Car Use Choices* (Napier University, 1999).

[45] JA Gomez-Ibanez and KA Small, 'NCHRP Synthesis 210: Road Pricing and Congestion Management: A Survey of International Practice' (Transport Research Board, National Research Council, 1994); and see E Verhoef, C Koopmans, M Bliemer, P Bovy, L Steg, and B Van Wee, *Vormgeving en effecten van prijsbeleid op de weg: Effectiviteit, efficiëntie en acceptatie vanuit een multi-disciplinair perspectief* (Design and effects of road pricing: Effectiveness, efficiency and acceptability from a multidisciplinary perspective) (Vrije Universiteit/Strichting Economisch Onderzoek, Technische Universiteit Delft, Rijksuniversiteit Groningen, 2004).

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[46] J Rachlinski, 'The Psychology of Global Climate Change' [2000] *U of Illinois L Rev* 299, 318.

vaccine could kill some children. When asked what was the maximum tolerable death rate for the vaccine, respondents typically stated a number lower than 9, which would represent a barely-better-than-even trade-off.[47] The reason that respondents required the vaccine to be safer than the flu itself is what Baron has called the 'o no harm' principle: an aversion to causing harm, to the point that people would prefer a greater harm to occur by omission.[48] Significantly, this principle has been extended to groups, so that causing harm to certain identifiable groups is as uncomfortable for people as it is to cause harm to individuals.[49]

15.16 The gasoline tax suffers from this heuristic as well. A gasoline tax can be readily seen as affirmatively causing harm to certain groups, such as low-income individuals who rely on their cars for transportation. The other side of the ledger—the harm that would be avoided by improving environmental quality—is clearly an outcome that falls under the category of 'harm by omission', to which individuals assign less weight. And the do-no-harm effect on gasoline taxes is particularly powerful because these frames—the harm to certain groups, and the benefit to others—are so deeply embedded in the popular discourse about gasoline taxes and environmental benefit.

15.17 The do-no-harm effect may explain a persistent perception that gasoline taxes are regressive. In reality, they are considerably less regressive than many road-financing alternatives, such as sales taxes.[50] It is true that gasoline taxes consume a larger proportion of a poor driver's paycheck than that of a rich driver. But many, many poor people do not drive at all, creating the super-regressive effect of forcing ultra-poor transit users to subsidize (through already regressive sales taxes) a road infrastructure that they never use.[51]

15.18 It is thus a myth that gasoline taxes are regressive, at least in comparison to the most common alternatives. The do-no-harm effect enforces this myth. Because the do-no-harm effect causes people to blanche at the prospect of harming some persons, the benefits of gasoline taxes are overlooked. The do-no-harm effect is causing people to subconsciously substitute bias for fact.

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47 I Ritov and J Baron, 'Reluctance to Vaccinate: Omission Bias and Ambiguity' (1990) 3 *J Behavioral Decision Making* 263, 275–7.

48 Ibid.

49 J Baron, 'Heuristics and Biases in Equity Judgments: a Utilitarian Approach' in BA Mellers and J Baron (eds), *Psychological Perspectives on Justice: Theory and Applications* (1993) 135–6.

50 Wachs (n 26 above) 7–8.

51 Ibid.

The identifiability bias

15.19 Psychological researchers have found that people tend to have stronger emotions about people whom they can better identify than for people they cannot.[52] Thus, we are more inclined to help or favour people who can be readily seen or heard than we are for more abstract, statistical victims. As psychological researchers have pointed out,[53] while 'Baby Jessica' McClure was trapped in a well for several days, sympathetic media-watchers sent her family over $700,000 to assist with rescue efforts—enough money to save hundreds of children's lives if spent on preventative health care;[54] also, the North American Free Trade Agreement was met with fierce resistance (and continues to be the subject of criticism) because opponents could point to individuals in specific industries that were likely to lose their jobs, while proponents could only argue that the additional economic prosperity would create *some* unidentifiable jobs, *somewhere*.[55]

15.20 This identifiability 'bias' works systemically against the cause of greater environmental protection, because the trade-offs involved with questions of environmental protection usually involve the economic benefits of identifiable individuals—those who may lose jobs because of an environmental measure—and the environmental benefits of the general populace, who are considerably less specific and less identifiable.[56] Consider, for example, the numerous people that are believed to die from air pollution every year;[57] how much weight are they

52 DA Small and G Loewenstein describe and study the phenomenon in more specificity in their article 'The Devil You Know: The Effects of Identifiability on Punishment' (2005) 18 *J Behavioral Decision Making* 311; and R Nisbett and L Ross, *Human Inference: Strategies and Shortcomings of Social Judgment* (1980) 43–62.

53 K Jenni and G Loewenstein, 'Explaining the "Identifiable Victim Effect"' (1997) 14 *J Risk & Uncertainty* 235, 237.

54 Ibid, 236.

55 W Goodman, 'Critics Notebook; TV, by Its Very Nature, Can Stack the Deck', NY Times (13 September 1993) C20.

56 Shi-Ling Hsu, 'The Identifiability Bias in Environmental Law' (2008) 35 *Florida Sttate UL Rev* 433.

57 Air pollution from coal-fired power plants alone is estimated to cause 30,000 premature deaths in the United States every year, as estimated by a consulting firm, Abt Associates, which contracted in 2000 with the EPA and a number of environmental organisations to study the effects of coal-fired power plants. Abt Associates, The Particulate-Related Health Benefits of Reducing Power Plant Emissions, Exhibit 6-3, Estimated PM-Related Health and Welfare Benefits Associated with Air Quality Changes Resulting from the REMSAD-Based 'All Power Plant' Scenario 6-4 (2000). This figure has been cited on numerous occasions, and over time, seems to have withstood the barrage of electricity industry attacks on Abt Associates and the study. See, eg 150 Congressional Record S1515 (24 February 2004) (statement of Rep. Jeffords), available at <http://frwebgate.access.gpo.gov/cgi-bin/getpage.cgi?dbname=2004_record&page=S1515&position=all>; American Lung Association, 'State of the Air: 2004, Protecting the Nation from Air Pollution', <http://lungaction.org/reports/sota04_protecting2.html>; FY 2006 Budget of the US Environmental Protection Agency, Before the S. Appropriations Subcommittee on Interior & Related Agencies, 109th Cong (2005) (statement of SW Becker, Executive Director, State & Territorial

accorded when considering measures to reduce pollution from coal-fired power plants? The persistent existence of coal-fired power plants and the persistent levels of air pollution from such plants[58] suggest an answer. If the identity of 30,000 Americans prematurely dying from air pollution could somehow be known, the policy alternatives for energy provision would be dramatically different.

15.21 Following on the discussion of the do-no-harm principle, the stakeholder groups negatively impacted by gasoline taxes are very clearly more identifiable than those that benefit from environmental protection. Again, survey respondents can easily, immediately, and vividly imagine people whom could be hurt by a gasoline tax increase, including themselves! And by contrast, those that might benefit from the avoided environmental harm are less readily identifiable, and confined to a lesser status in the decision-making process. For gasoline taxes, then, the identifiability bias works to over-represent those economically injured, and under-represent those environmentally injured.

Metric effect

15.22 The metric effect is the propensity for respondents to perceive quantities expressed in percentage terms differently from those expressed in absolute dollar amounts.[59] In experimental simulations, subjects seemed to lose sight of the meaning of percentage figures, confusing percentage figures for absolute amounts. In a survey of attitudes towards income tax progressivity, for example, respondents were generally favourably inclined towards the idea of progressivity, but when asked to provide their numerical conceptions of what they considered an appropriate level of progressivity, respondents displayed strong and consistent internal (within-subject) inconsistencies. Respondents seemed to favour more steeply progressive tax rates when asked to provide them in percentage terms rather than absolute dollar terms.[60] In other words, respondents confuse percentages with absolute amounts, with the result that small percentages of large amounts seem smaller than they should.

15.23 The metric effect has indirectly damaged the popularity of gasoline taxes because of the way it is juxtaposed with alternatives. Gasoline taxes are always expressed

Air Pollution Program Administrators), available at <http://www.4cleanair.org/SenateTestimony0405.pdf>; and Current Environmental Issues Affecting the Readiness of the Department of Defense: Hearing Before the H. Comm. on Energy & Commerce, 108th Cong (2004).

58 S-L Hsu, 'Reducing Emissions from the Electricity Generating Sector: Can We Finally do it?' (2001) 14 *Tulane Evironmental LJ* 427.

59 EJ McCaffery and J Baron, 'Thinking About Tax' (2006) 12 *Psychology, Public Policy, and Law* 106, 113–14.

60 Ibid.

in absolute terms, as a cents-per-litre or cents-per-gallon quantity in Canada or the United States. By contrast, most sales taxes—which are often presented as the transportation financing alternative to gas taxes[61]—are always presented in percentage terms, because so many different goods are covered by sales taxes. If compared with one another, gas taxes present themselves as a very clear cost that people are able to calculate, whereas sales tax increases present themselves as a seemingly small and benign increase.[62] The metric effect thus biases respondents toward the more apparently benign sales tax. Even when not faced with the explicit choice, such as on a ballot, the implicit, built-in metric bias tilts the entire general populace towards taxes that they can less easily calculate and understand.

Isolation effect

15.24 The isolation effect, studied by McCaffery and Baron,[63] is the propensity to focus on one aspect of a decision environment, and to irrationally exclude other logically relevant information. This isolation effect can be further deconstructed into a number of other mental factors, including the explicitness of information and models,[64] perceived relevance,[65] and the existence of low-probability but extreme events.[66] As with experiments with the endowment effect, education and repeat trials can ameliorate the isolation effect.[67]

15.25 For all of the reasons that have been enumerated above, the gasoline tax is a highly salient matter to the vast majority of Americans and Canadians. Filling up a motor vehicle with gasoline is one of the most familiar and common experiences in American and Canadian life. Any proposal that affects the price of this experience is thus something that people are to understand very well, and hence *focus upon*, even if there are other important elements of a proposal. Again, in a proposed trade-off between a negative (increased gasoline bills) and a positive (some environmental benefits), respondents will systemically focus upon and assign more weight to the more familiar outcome, the gasoline tax increase.

61 R Hannay and M Wachs, 'Factors Influencing Support for Local Transportation Sales Tax Measures' (2007) 34 *Transportation* 17, 18; and Wachs (n 26 above) 4–5.

62 Hannay and Wachs (n 61 above) 19.

63 McCaffery and Baron (n 39 above) 106–7.

64 P Legrenzi, V Girotto, and PN Johnson-Laird, 'Focussing in Reasoning and Decision Making' (1993) 49 *Cognition* 37.

65 D Sperber and D Wilson, *Relevance: Communication and cognition* (2nd edn, BlackWell, 1995).

66 C Camerer, 'Prospect Theory in the Wild: Evidence from the Field' in D Kahneman and A Tversky (eds), *Choices, values, and frames* (Cambridge University Press, 2000) 288.

67 L Idson, D Chugh, Y Bereby-Meyer, S Moran, B Grosskopf, and M Bazerman, 'Overcoming Focusing Failures in Competitive Environments' (2004) 17 *J of Behavioral Decision Making* 159.

15.26 The isolation effect perhaps plays its most important and subtle role in sustaining the popularity of the policy alternative to gasoline taxes: vehicle fleet fuel efficiency standards. Regulations governing manufacturers on their 'corporate average fuel efficiency', or CAFÉ standards, require manufacturers to sell a mixture of vehicles that meet, on average, a fuel efficiency standard. CAFÉ standards have been ineffective in reducing fuel use.[68] In addition to some regulatory loopholes which have allowed large, gas-guzzling sport-utility vehicles to be regulated under more lenient standards,[69] CAFÉ standards do not create as many incentives for reducing gasoline usage. While they promote, through market signals, the purchase of more fuel-efficient cars, they do nothing to curb driving itself, which accounts for an enormous fraction of the increase in gasoline consumption.[70] In fact, when CAFÉ standards make cars more efficient and suppress the demand for gasoline, this creates a 'rebound effect' that lowers gasoline prices and, ironically, stimulates gasoline usage.[71] While the rebound effect is not as large as the CAFÉ-induced suppression of fuel usage, it reduces any fuel-efficiency gains achieved by CAFÉ.

15.27 CAFÉ is a suboptimal measure to reduce gasoline usage because the costs of reducing gasoline usage are hidden from the consumer in the price premiums that automakers must attach to gas-guzzling vehicles. Since automakers must *sell* a mixture of vehicles that meet an average standard, they must price their vehicles in such a way as to ensure the sale of a minimum number of fuel-efficient vehicles and maximum number of gas guzzlers. However, this cost is buried in the price of the vehicle and is opaque to the buyer. Contrast that with the price of gasoline as a measure to reduce gasoline usage, which is an obvious and transparent price signal to drivers. The isolation effect, in so far as it encourages people to focus on less obvious signals, tilts people towards favouring policies that impose *hidden costs*, rather than obvious ones.[72] In 2007, debates on Capitol Hill over reducing gasoline usage culminated in an increase in CAFÉ standards, over carbon tax

[68] Nivola and Crandall (n 4 above) 27–32.

[69] In the United States, CAFÉ standards required automakers to sell 'passenger' vehicles that averaged 27.5 miles per gallon, and 'light-duty trucks' that averaged 20.5 miles per gallon. 49 CFR § 553 (2004), available at <http://www.nhtsa.dot.gov/cars/rules/rulings/CAFE05-07/Index.html>. These standards were revised upward under the Energy Independence and Security Act of 2007, Publ. L. 110–140 (2007). Sport utility vehicles, which are much less fuel-efficient, are classified as 'light-duty trucks', throwing them into a pool of vehicles that are subject to a much less stringent standard. National Highway Transportation and Safety Administration, 'CAFÉ Overview—Frequently Asked Questions', <http://www.nhtsa.dot.gov/cars/rules/cafe/overview.htm>.

[70] Nivola and Crandall (n 4 above) 15 (figure 1.7).

[71] KA Small and K Van Dender, 'Fuel Efficiency and Motor Vehicle Travel: the Declining Rebound Effect' (2007) 28 *Energy Journal* 25; see also Nivola and Crandall (n 4 above) 22–42.

[72] McCaffery and Baron (n 39 above) 119–20.

proposals that would have included an increase in gasoline taxes.[73] Rather than overtly comparing a hidden cost with an obvious one, the isolation effect works in this case to alter the very nature of political discourse around energy conservation.

D. Conclusion

15.28 It would be an oversimplification to say that the gasoline tax, as a policy instrument, only suffers from optics. There are significant distribution issues that are implicated by an increase in gasoline prices brought on by an increase in gasoline taxes. However, these distributional issues are not necessarily the ones that people have in mind when they have viscerally negative reactions to gasoline tax increases. Ironically, the trade-offs involved with gasoline tax increases are *simpler* than people probably perceive them to be; for poor and working poor car-dependent drivers, relatively modest compensations, easily dispensed through a variety of mechanisms such as income tax relief, unemployment insurance, and simple rebate checks, would go a long way towards ameliorating the pain felt by the most vulnerable drivers who seem to cast the gasoline tax in an unfavorable light. For those who can afford higher gas prices, the non-compensable downsides to a gasoline tax begin to disappear relative to the potential, unappreciated benefits.

15.29 The political economy of gasoline taxes is thus more complex than the disapproving public opinion numbers would indicate. If one takes as a given the need to implement more gasoline taxes to reduce pollution and greenhouse gas emissions, then greater attention needs to be paid to the context in which gasoline taxes are proposed. Given the psychological evidence that repeat trials create some learning that may counter biases such as the endowment and isolation effects, it would seem that greater educative efforts are needed to present the real trade-offs involved when considering gasoline taxes as a policy instrument.

[73] It is true that the only constituency that favours gasoline taxes is the automaker industry, which would rather respond to consumer demands regarding fuel efficiency than governmental mandates. See, eg K Krolicki, 'Ford Says US Gas Tax an Option in Energy Debate', Reuters, < http://www.planetark.org/dailynewsstory.cfm?newsid=43562> (9 August 2007). Accordingly, Michigan Congressman John Dingell, long one of the primary obstructionsists when it comes to CAFÉ standards, has recently proposed a 'carbon tax' that would include a gasoline tax. Ibid. Congressman Dingell's standing as a defender of the American automobile industry no doubt hurt the perception of the otherwise meritorious carbon tax proposal.