A Carbon Tax That Constrains Government

By Michael L. Marlow

MAY 2018

Michael L. Marlow is a professor of economics at California Polytechnic State University, San Luis Obispo.
This paper was funded by a grant from the Alliance for Market Solutions.

Introduction

Climate change is a controversial topic guaranteed to evoke strong emotions and impassioned debate. Whether our climate is in fact changing, the urgency of the issue, if changes are man-made, and which government policies might mitigate harm are questions that typify this polarizing subject.

This debate is commonly perceived as liberals versus conservatives as supported by a 2017 Gallup Poll reporting that 66 percent of Democrats, but only 18 percent of Republicans, were concerned "a great deal" about global warning.[1] Liberals are commonly portrayed as advocates for urgent government action based on scientific evidence that clearly indicates that climate change poses a serious threat to our planet. Conservatives are depicted as sceptics that remain unconvinced of the need or urgency for government action. This narrative is also consistent with a 2017 poll that reported that, while more than 60 percent of Americans believe that government should address climate change, 80 percent of Democrats and 43 percent of Republicans agree with that sentiment.[2] Unsurprisingly, a 2016 survey revealed that Republicans, Independents, and those without party affiliation were significantly less likely than Democrats to support a carbon tax, with magnitudes of 11, 20, and 18 percentage points less, respectively (*Kotchen et al. 2017*).

Despite stereotypes, conservatives are not of one mind on carbon taxation. Various conservatives support carbon taxes when coupled with deregulation and tax neutrality. Other conservatives remain skeptical about climate change and predict that carbon tax revenues will fuel government expansion with little to no deregulation. These are valid concerns. Federal revenues have been estimated to increase by $977 billion between 2017 and 2026 under a tax of $25 per metric ton on most emissions of greenhouse gases (*CBO 2016*). Using a carbon tax to improve government policy without expanding government is a tall order.

This paper develops a harm-reduction strategy given growing pressure for government to do more about climate change. This paper does not take an absolute stand on whether climate change exists and, if so, whether it is an urgent matter requiring government action. Removing this political "litmus test" opens discussion. Most conservatives believe current tax and regulatory policies are suboptimal, so true believers and skeptics of climate change should have plenty to discuss when it comes to devising a more efficient government.

This paper also aims to steer debate toward which tax and regulatory policies advocates are willing to forgo to prove their commitment to mitigating harm from climate change. Carbon taxation, in effect, represents a "destructive technology" to the liberal status quo that prefers to introduce carbon taxes without tax reform or deregulation. This paper argues that it is prudent for conservatives — climate change skeptics and believers — to carefully devise harm-reduction strategies that steer government toward greater efficiency. Trades are a necessary part of the policy process and refusing to negotiate with the non-conservative opposition makes deregulation and tax reform less likely. Refusing to negotiate may be a winning strategy when there is weak opposition to making government more efficient. But fierce opposition to deregulation and tax reform is more likely and reinforces why it is important to reduce the potential harm that carbon tax policies may inflict on our economy when used to expand government.

Conservatives for Carbon Taxes

Conservative policy groups have produced carbon tax proposals that make similar arguments.

Proposals call for taxing at the first point where fossil fuels enter the economy such as at the mine for coal, well for natural gas or port/refinery for petroleum. Details of plans vary according to assumptions on initial carbon tax rates, carbon tax revenue collection, discount rates and numerous other modeling and policy preference issues. Given the similarity, this paper does not present a detailed analysis of differences regarding tax rates, deregulation, border adjustments, and aid to those suffering economic harm and other factors.

The main difference lies in whether these proposals are revenue-neutral. This is an essential feature of all proposals except for one group that proposes using carbon tax revenues to fund a "dividend" program for U.S. citizens. This topic is discussed later as it pertains to the central question of this paper regarding whether carbon taxes will expand government.

Key provisions of carbon tax proposals of four major conservative group are now briefly listed in alphabetical order. Interested readers should read the cited works for full details.

ALLIANCE FOR MARKET SOLUTIONS[3]

The Alliance for Market Solutions (AMS) states that it is "Building the conservative case for a clean-energy future." Major themes include:

- A revenue-neutral carbon tax that pre-empts regulations. New revenues must be used in a tax swap to eliminate or reduce other taxes that harm economic growth and job creation.
- Specific and ironclad mechanisms to eliminate existing and planned regulations that needlessly weaken our economy and hurt job creation.
- Ensure American competitiveness in the global marketplace and incentivize other countries to move in a similar direction.
- Roll back special tax breaks for corporations and other inefficient subsidies that currently let Washington pick winners and losers in the marketplace.

CLIMATE LEADERSHIP COUNCIL[4]

The Climate Leadership Council (CLC) states: "The Council's carbon dividends solution embodies the conservative principles of free markets and limited government." Major themes include:

- An initial carbon tax of $40 per ton on carbon dioxide emissions.
- All carbon tax revenues sent to American citizens on an equal and monthly basis as "dividends" administered by the Social Security Administration. A tax of $40/ton is estimated to generate $2,000 in the first year for a family of four.
- Carbon dividends would reduce inequality by increasing the disposable income of all citizens, but disproportionately help those of lower income.
- Removal of regulations that are no longer necessary, such as the Obama-era carbon dioxide regulations, including repeal of the Clean Power Plan.

NISKANEN CENTER[5]

The Niskanen Center's blueprint is titled: "The Conservative Case for a Carbon Tax" (*Taylor 2015*). Its thesis posits that "Conservatives should embrace a carbon tax (a much less costly means of reducing greenhouse gas emissions) in return for elimination of EPA regulatory authority over

greenhouse gas emissions, abolition of green energy subsidies and regulatory mandates, and offsetting tax cuts to provide for revenue neutrality." Major themes include:

- Use tax proceeds to reduce or eliminate other taxes to ensure revenue neutrality.
- Rebate some portion of tax to poor households to mitigate against the regressivity of the tax.
- Eliminate the EPA's regulatory authority over greenhouse gas emissions.
- Eliminate green energy subsidies and tax preferences.
- Eliminate energy efficiency standards; repeal the Corporate Average Fuel Economy Standards (CAFE); and preempt state renewable energy portfolio standards.

R STREET[6]

Though the R Street's proposal does not directly use the word "conservative," its related paper, "A Carbon Bargain for Conservatives,"[7] makes clear it is a conservative group. Its thesis is that "A well-designed carbon price is crucial to avoid the political manipulations of tax-avoidance lobbying, to build the justification for rollback of redundant environmental regulations and, crucially, to justify a border tax adjustment that would strengthen the policy and insulate domestic companies from 'carbon dumping' by foreign competitors." Their proposal discusses carbon prices, but discussion here refers to it as a carbon tax. Major themes include:

- Create a carbon tax adjustable at the border, imposed on imports and removed from exports.
- Set the carbon tax to fill the expected $1.66 trillion 10-year revenue gap caused by eliminating the corporate income tax.[8]
- Eliminate the EPA's Clean Power Plan and all assorted regulations the EPA has issued to reduce carbon emissions from any source covered by the carbon tax.
- Eliminate special tax preferences that have been justified by climate concerns—such as the investment and production tax credits for renewable energy.
- Eliminate grant programs for "clean" energy sources, even loan and loan guarantee programs.

Conservatives Against Carbon Taxes

This section summarizes criticisms by two major conservative think tanks of carbon tax proposals that go beyond the debate over whether climate change is an urgent issue (discussed alphabetically).[9] Critics share overall skepticism that climate change is man-made, that it poses an urgent problem, and that carbon taxes in practice are likely to do more good than harm. Interested readers should read the cited works for full details.

CATO INSTITUTE[10]

"The Cato Institute is a public policy research organization — a think tank — dedicated to the principles of individual liberty, limited government, free markets and peace." Major themes of "The Case Against a U.S. Carbon Tax" (*Murphy et al. 2016*) include:

- The case for a carbon tax is weaker than the public has been led to believe.
- The consensus in the literature is that carbon taxes cause more economic damage than generic taxes do on labor or capital, so that in general, even a revenue-neutral carbon tax swap would probably reduce economic growth.

- Real-world carbon tax experiences in Australia and British Columbia show that the promises of a market-friendly U.S. carbon tax were violated in both scenarios.

HERITAGE FOUNDATION[11]

Heritage Foundation states that it is the most influential conservative group in America and, for the past 42 years, has led the conservative movement.[12] Heritage Foundation lists four critical flaws associated with implementing a carbon tax:

- A carbon tax would damage the economy since an overwhelming majority of America's energy needs are met by carbon-emitting fossil fuels. Regulations of these fuels directly raise the cost of electricity, gasoline, diesel fuel and home heating oil.
- Low-income families spend a larger proportion of their income on energy and, thus, a tax increase on energy prices would disproportionately affect the poorest American families.
- A carbon tax would not make a dent in global emissions.
- Revenue neutrality or a regulations swap is unrealistic given the history of spending new tax revenues with little deregulation.

Mixed Views on Carbon Taxes

AMERICAN ENTERPRISE INSTITUTE[13]

American Enterprise Institute (AEI) is considered a conservative-leaning research institution, but AEI does not take institutional positions on any issues. AEI scholars include both critics (*see Zycher 2017A, Zycher 2017B*) and supporters of carbon taxes (*see Brill 2017B, Mathur and Morris 2017*) that generally support conservative groups previously discussed. This section summarizes Zycher's criticisms of carbon taxes.

- It is incorrect to argue that a consensus of economists supporting a carbon tax is sufficient evidence that a carbon tax will efficiently correct environmental harm. The case for an emissions tax is a theoretical one and, even if economists knew the "correct" tax, it is not likely it would be chosen by various parties (politicians, bureaucrats, special interests).
- The dividend proposal of CLC is naive because it ignores the coalition problem in Congress and the relative influence of pressure groups. The CLC proposal would increase the government allocation of resources and thus the size of government.
- Carbon tax revenues are likely to expand government since politicians are probably more interested in maximizing carbon tax revenues than efficiently reducing environmental harm.
- The border tax adjustment would be very complex given the international supply-chain system that will expand the attendant bureaucracy even if regulatory bureaucracy is reduced.
- Exchanging greenhouse gas regulation for a carbon tax may not hold over time given that industries that have powerful incentives to support a resurrection of the regulatory structure, if there are scale economies in regulatory compliance, could use regulation to restrict entry by smaller new competitors.
- Supporters of a carbon tax/corporation tax shift are far more interested in cutting corporate taxes than the environmental "benefits" of the former.

Major Disagreements

WILL CARBON TAXES CORRECT EXTERNALITIES?

Climate change policies focus on carbon pollution as a negative externality. Carbon pollution imposes external costs on people who did not create the pollution. The social cost of carbon (SCC) refers to the cost of an additional ton of carbon-dioxide pollution. Taxes would be set at a point in time equal to the present value of the sum of all marginal external costs over future periods.[14] Pricing the correct SCC through a Pigouvian tax, named after British economist Arthur C. Pigou (1877-1959), internalizes the negative externality so that all costs are accounted for in market prices. Most taxes push resources away from efficient outcomes, but "correct" Pigouvian taxes push resources toward efficient market outcomes.

Most economists believe taxes are superior to regulation when it comes to efficiently dealing with externalities. In the context of carbon taxation, this is supported by a 2011 poll conducted by the Initiative on Global Markets (IGM) at the University of Chicago Booth School of Business of its Economics Experts Panel.[15] The panel was asked: "A tax on the carbon content of fuels would be a less expensive way to reduce carbon-dioxide emissions than would a collection of policies such as 'corporate average fuel economy' requirements for automobiles." Responses, weighted by each expert's confidence, were: strongly agree (60 percent), agree (35 percent), uncertain (4 percent), disagree (2 percent), and strongly disagree (0 percent).

Regulation offers very blunt methods that "command and control" all businesses identically. One-size-fits-all mandates ignore individual characteristics of firms and are inefficient, as some firms reduce emissions by reducing output. Others might alter production processes that reduce emissions without reducing output. Firms are also discouraged to reduce pollution through innovation because there are no incentives to reduce emissions beyond adopting mandated technology or meeting emissions mandates. CO2 regulations are often temporary and altered with new presidential administrations, thus introducing considerable uncertainty over production, investment, and abatement decisions of firms (*Brill 2017A*). Taxation, in contrast, creates incentives for firms to lower carbon tax bills that reduce environmental harm at the same time.

Critics are correct that a theoretical basis for carbon taxes does not necessarily imply that their implementation corrects externalities. The EPA offers a range of SCC estimates from $14 to $138 per metric ton (*EPA 2015*) and its wide range indicates considerable uncertainty on the part of policymakers. Garnering support for "correct" carbon taxes would be difficult since benefits are uncertain, they may take decades, and mitigation of climate change is a global public good with many free riders (*Michaelowa 1998*). Even if government knew the "correct" Pigouvian tax, political decisions are rarely based on efficiency grounds alone (*Marlow 2011*). Voters often oppose taxes that eliminate jobs. Businesses push against taxes because they decrease jobs and profit. Politicians may find campaign funding more difficult to secure as both businesses and workers voice opposition. Environmental groups also have a stake in this debate.

A study of 15 major pollution tax and fee programs across the world that replaced regulatory emissions policies demonstrates political decisions do not perfectly mimic "correct" tax solutions (*Tietenberg 2012*). These market-based policies produced significant cost savings, but the study found that the predominant effect has been to reduce emissions. Policies also promoted clean technology with gains less than theory predicts. The same author summarized the evidence as:

"The old adage 'If it seems too good to be true, it probably is' certainly could apply to some descriptions of carbon pricing. Although the experience reviewed here clearly does not reveal perfection, it does suggest that when used appropriately, carbon pricing does the job and does it reasonably well." (*Tietenberg 2013*).

Transforming economic theory into practice is clearly imperfect. But it is also naïve to believe that perfection is on offer. Regulatory policies exhibit a wide divide between theory and practice, making comparisons of a politically-chosen carbon tax to its textbook rendition something of a misplaced debate. Taxation is also more likely to evolve toward "perfection" since it is easier to understand, monitor, alter and is less subject to "crony capitalism" than regulation. Again, perfection is not on offer, but carbon taxation offers more promise of evolving toward textbook solutions than regulation.

DO TAX SWAPS INCREASE WELFARE?

Conservative carbon tax proponents anchor their proposals to revenue neutrality so that it does not fuel government expansion. The economic literature clearly indicates that economic growth is inversely related to government size (*Cameron 1982, Landau 1983, Marlow 1986, Scully 1989, Barro 1990, Bergh and Henrekson 2011, Facchini and Seghezza 2018*). This inverse relationship is consistent with distortions to resource allocations stemming from over-regulation and excessive taxation that reinforce commitment to constrained government.

Tax swaps focus on substituting taxes with high excess burdens (i.e., deadweight loss or welfare cost) for those with lower excess burdens. Excess burdens are additional costs that arise when tax policies (beyond simple tax collections) cause resources to be allocated inefficiently. Taxes raise prices and decrease consumption away from efficient allocations. Unlike "correct" Pigouvian taxes that push markets toward efficient outcomes, most taxes push markets away from efficient outcomes as government pursues revenues to fund its programs.

An important consequence of excess burden is that tax collection underestimates true tax burdens and thus distorts the relationship between tax collection and government spending. A dollar of tax revenue requires more than one dollar to be drawn out of the economy. For example, funding a $500 million program through a tax with an excess burden of 30 cents per additional dollar of taxation requires $650 million — an excess burden of $150 million. But, suppose another tax source carries an excess burden of 10 cents per tax dollar collected. A $500 million spending program then costs $550 million — a $100 million savings over the previous scenario. Reducing excess burden raises citizen welfare as it reduces the resources used to fund government programs.

Tax reform exploits the fact that tax sources do not carry identical excess burdens. Ramsey pricing, or the inverse-elasticity rule, minimizes excess burden for a given level of tax revenue because excess burdens are higher for elastic than inelastic demands (*Ramsey 1927*).[16] This rule states that tax rates on goods should be inversely related to their elasticity of demand. When demand is less responsive to changes in prices, then the imposition of a tax results in a smaller excess burden. Tax reform that reduces tax rates in markets with elastic demands thus reduces excess burden. Standard analysis indicates that excess burden is proportional to the square of the tax rate.

Empirical evidence indicates that excess burden constitutes a sizable magnitude. The fact that there is a wide range of estimates is consistent with the fact that studies use different methodologies, data sets and time periods. An early study by Arnold Harberger found that excess burden was less than 5 percent of income tax revenue (*Harberger 1964*). A study that built upon this work concluded that excess burden was 12 times higher than Harberger's estimate (*Feldstein 1999*). Later studies estimate the extent of excess burden associated with an additional dollar of tax collection; Edgar K. Browning estimated that for every additional dollar of tax collected on labor earnings, an additional 32 cents to 47 cents of excess burden occurred (*Browning 1987*). Another study found

an excess burden of roughly 24 cents on an additional dollar of tax collected from labor earnings (Stuart 1984). And yet another study estimated an excess burden of roughly 33 cents on an additional dollar of tax collection (*Ballard et al. 1985*).

More recent studies estimate that substituting carbon taxes for other tax sources (recycling tax revenue) yields significant reductions in excess burdens. A recent paper (*Marron et al. 2015*) summarizes the evidence from five separate modeling exercises (*Jorgenson et al. 2015; McKibbin et al. 2015; Rausch and Reilly 2015; Tuladhar et al. 2015; Williams et al. 2015*). Estimates differ due to different methodologies (especially regarding behavioral responses to policy changes), data sets and time periods. These studies found that reducing tax rates on capital income was the best choice for reducing (net) excess burden of our tax system.[17] This result is consistent with standard predictions that lowering taxes on capital income, either through tax rate reductions on all investment or specifically to the corporation tax, raises savings that eventually raise worker productivity and wages as businesses fund more capital investment.

One reason for the high excess burdens of the corporation tax stems from its double-tax nature of taxing income at both corporate and personal levels. Dollar-for-dollar, more resources are drawn out of the economy through the corporation tax than, for example, consumption or personal income taxes. Corporation taxes are thus a more expensive method of funding government and, as a result, the economy produces fewer jobs, higher prices and less income for citizens than other tax sources; in fact, the U.S. Treasury estimates that 73 percent of the corporation tax is borne by workers (*Gentry 2007*).

The Tax Cuts and Jobs Act of 2017 decreased the top corporate tax rate from 35 percent to one rate of 21 percent and became effective on January 1, 2018.[18] The Council of Economic Advisers (*CEA 2017B*) predicted that reducing the statutory federal corporate tax rate from 35 to 20 percent would increase average household income in the United States by at least $4,000 annually. The CEA reviewed the sizable empirical literature on the relationship between wages and corporate taxes, controlling for other variables that may affect wage growth across countries and over time. Their literature review indicated a very broad range of results in the literature that suggested that over a decade, this effect could be much larger.

Carbon taxes may also reduce excess burden if they are more difficult to evade than taxes on labor or income. The United States has an estimated tax evasion rate of 16 percent (*Slemrod 2007*). One study concludes that introducing carbon taxes in a revenue-neutral manner offers a net reduction in the amount of tax evasion and thus can sharply reduce excess burdens by as much as 28 percent as U.S. taxpayers use fewer resources to avoid taxes (*Liu 2013*). Excess burden also falls when carbon taxes are substituted for taxes with higher evasion rates since effective tax rates of all tax sources are pushed closer together.

Eliminating or greatly reducing tax expenditures that include tax credits on wind and solar energy and other favored treatments given to "green" industries is another path to reducing excess burden. Tax expenditures are policies that lower, eliminate or defer tax bills for various activities through reduced tax rates and/or narrowing of the tax base. Energy-related tax expenditures accounted for 42 percent (about $12.4 billion) of all financial interventions and subsidies in energy markets in 2013 (*Energy Information Administration 2015*). The three largest tax expenditures represent roughly 90 percent of nearly $5 billion in annual tax reductions and are unrelated to correcting negative externalities or promoting new technology (*Aldy 2014*).[19]

Tax expenditures "waste" resources by raising the profitability of favored activities over what an efficient allocation would be, thus pushing resources into favored markets and away from non-favored markets. Tax expenditures direct resources toward inefficient market outcomes. Carbon taxation can reduce excess burdens when coupled with tax reform that reduces tax expenditures. This is a good trade when carbon taxes encourage firms to invest and innovate in technology that reduces energy bills and

produces less environmental harm. Most tax expenditures, in contrast, reflect political favors toward certain industries and enhance employment opportunities for lobbyists and tax accountants. Revenue-neutral carbon taxes coupled with fewer tax expenditures make it harder to "hide" these political favors associated with environmental regulation and complex personal and corporate tax codes. The carbon tax base would comprise fewer than 3,000 points that include 146 oil refineries, 1,438 coal mines, and 500 natural gas fields and would cover 80 percent of greenhouse gas emissions (*Metcalf and Weisbach 2009*). Few collection points offer not only greater administrative simplicity but also greater transparency, unlike our current complex and often individualized tax and regulatory codes.

Revenue-neutral carbon taxes may also reduce tax compliance costs and thus reduce excess burdens when swapped for taxes with higher compliance costs. One study estimates that Americans spent over 3.24 billion hours preparing and filing tax returns in 2012 and spent $37 billion in complying with the federal individual, business and employment taxes (*McCaherty 2014*). Tax complexity raises compliance costs, needlessly drains resources, and often serves little purpose other than to create jobs in tax compliance and collection.

In sum, tax reform that reduces excess burden raises welfare. Fewer resources are drained from the economy to fund the government, more jobs are created, and workers gain higher wages. Taxing a "bad" (too much carbon) rather than a "good" (income and capital) is a recipe for reducing excess burden of our tax system that pays dividends to most citizens. The theory is clear and there is ample empirical evidence to support this prediction. The key is a revenue-neutral introduction of carbon taxes with deregulation that keeps the government in check.

WILL CARBON TAXATION BE TRULY REVENUE-NEUTRAL?

The U.S. Treasury estimated that a carbon tax that started at $49 per metric ton of carbon dioxide equivalent in 2019 and increased to $70 in 2028 would generate net revenues of $194 billion in the first year of the tax and $2.2 trillion over the 10-year window from 2019 through 2028 (*Horowitz et al. 2017*). Conservatives continue to be concerned that politicians will simply use carbon taxation as a new revenue source to fund more government programs. To be sure, many carbon tax supporters can't wait to get their hands on the tax revenues and spend them on favored programs. Washington Governor Jay Inslee recently admitted that his support for a state carbon tax was partially based on raising $2.1 billion over two years to help fund the state budget (*Orenstein 2017*).

The budget constraint view predicts spending rises whenever taxes are increased — the "tax-spend hypothesis" often associated with Milton Friedman (*Friedman 1978*). Milton Friedman succinctly stated this view as: "governments spend what governments receive plus whatever they can get away with" (*Friedman 1978:5*). This prediction follows from the view that there always exists a government program someone wishes to expand or create. Causality between taxes and spending is the primary issue. Four causal directions are possible: taxes cause spending; spending causes taxes; taxes and spending cause one another; and taxes and spending are unrelated to one another. Empirical studies support the view that taxes cause spending (*Manage and Marlow 1986, Marlow and Manage 1987, Blackley 1986, Ram 1988*), though others find no support (*von Furstenberg et al. 1986, Anderson et al. 1986*).

A reasonable assessment of the empirical evidence is that a carbon tax exerts an ambiguous effect on government spending if doubts remain over the viability of the revenue-neutral promise. Major uncertainty would exist if politicians were not legally constrained to act in one way or another when carbon taxes are added to the list of tax sources, especially given the view that constraining government expansion is much easier through tax reduction than through tax increases (*Marlow and Orzechowski 1988*). Ensuring that carbon tax revenues are entirely swapped for other tax revenue remains essential.

Convincing voters that carbon tax revenues should not be used to fund more government could be challenging. Spending proponents are likely encouraged by various surveys of voter attitudes on this issue. A survey of Swiss adults found that a carbon tax could find substantial support in a ballot, but it may not reach the majority without explicit earmarking for environmental spending or climate change spending (*Baranzini and Carattini 2014*). Another survey finds that Americans oppose a carbon tax when the use of carbon tax revenue is left unspecified, but 60 percent were in support when used to fund research and development for renewable energy programs, with majorities of Democrats, Republicans, and Independents each expressing support for these earmarks (*Amdur 2014*). This survey also found that 34 percent supported a carbon tax when the question did not state how the revenues would be used, but support rose to 56 percent when respondents were told the revenues would fund rebate checks to citizens.

A more recent survey of Americans found that most respondents supported using the money to fund clean energy and infrastructure (*Kotchen et al. 2017*). The highest support was associated with using tax revenues to fund clean energy (80 percent) and infrastructure (77 percent) and relatively less support for reducing income taxes (59 percent), returning dividends to households (46 percent), or reducing payroll taxes (44 percent). The same study found that Americans support using the carbon tax revenues to compensate displaced coal industry workers almost $146,000.

Spending proponents can also be expected to support carbon tax "trust funds" to earmark revenues for favored projects. One study calls for a carbon tax "trust fund" that completely earmarks revenues for energy research and development (Stram 2014). Special interests can be expected to clamor for energy subsidies and regulatory exceptions that provide immediate concentrated benefits in what has been referred to as a "green pork barrel" (*Hepburn 2010*). However, such trust funds are unlikely to reduce excess burden and be revenue neutral (*Oates 1995*). While funding environmental projects through trust funds may be an effective way of winning support of voters, trust funds fail to reduce excess burden when carbon tax revenues are not swapped out for other taxes. Environmental projects without strong justification from a cost-benefit analysis would be more likely to be undertaken simply because new tax revenues are available.

Experience with carbon taxes in British Columbia and Australia offer insights on these issues. While the tax continues in British Columbia, Australia ended its carbon tax after only two years. Reports vary as to why the tax was ended, but Prime Minister Abbot stated: "Today the tax that you voted to get rid of is finally gone, a useless destructive tax which damaged jobs, which hurt families' cost of living and which didn't actually help the environment is finally gone" (*Taylor and Hoyle 2014*).

Anecdotal evidence indicates the critical importance of an effective strategy for ensuring that carbon taxation does not expand government. British Columbia adopted a revenue-neutral carbon tax with few tax expenditures in 2008 that directly recycled 100 percent of revenues. It also included a legal requirement to demonstrate how carbon tax revenues are returned to taxpayers in the form of reductions in personal and corporate income tax rates supplemented by annual payments to low-income households. The first year provided a one-time "climate action dividend" of $100 for every resident (*Antweiler and Gulati, 2012*). The rate rose from CAD $10 to CAD $30 per ton of CO2 equivalent (tCO2e) over the first five years. The nominal net tax refund in the first four years of the program exceeded CAD $500 million thus making it slightly revenue-negative, mostly due to difficulties in perfectly synching carbon tax increases with income tax reductions (*Carl and Fedor 2012*). Tax expenditures were also introduced in the third year to compensate for high energy consumption in heating homes that amounted to 2.6 percent of collected third-year carbon tax revenue and 7.8 percent of fourth-year tax revenue (*Carl and Fedor 2012*). Tax credits for films and interactive digital media and an R&D

tax credit were also introduced over various years (*Metcalf 2016*).

By contrast, in 2012, the Australian government implemented a broad-based tax on greenhouse gas (GHG) emissions from about 350 of the country's largest GHG emitters as part of its climate change strategy. The tax was set at AUD $23.00 per metric ton carbon dioxide-equivalent in 2012–13, rising to AUD $24.15 in 2013–14 and AUD $25.40 in 2014–2015 before a scheduled transition to a market-based floating carbon price in 2015. The tax, however, was not explicitly revenue-neutral, and it stipulated that over 50 percent of carbon revenues would be directly returned to individual households through a combination of income tax breaks and direct payments, with the remaining 40 percent funding assistance to hard-hit business sectors (*Carl and Fedor 2012*). Tax expenditures were also extensive, with the coal-fired power and metallurgic industries receiving a significant share of total benefits.

The fact that British Columbia specifically required revenue neutrality does not guarantee that carbon taxation does not somehow evolve into spending expansion. Assessment of revenue neutrality requires knowledge of what government would have done in the absence of the tax since tax cuts made concurrently with the carbon tax may have occurred even in the absence of the carbon tax (*Murray and Rivers 2015*). Policymakers have also inserted new tax expenditures over time that introduce additional excess burdens into their tax system and muddied up the meaning of a revenue-neutral carbon tax.

Experience with countries introducing value-added taxes (VAT) also fail to mitigate concerns that carbon taxes will fuel government spending. One study examines its impact in OECD countries and finds that both adopter and nonadopter governments grow over time, with no differential effect on growth (*Stockfisch 1985*). Other studies find that the adoption of a VAT significantly increased the size of government as measured by the tax-to-GDP ratio, suggesting that the VAT is a "money machine" (*Nellor 1987 and Ebrill et al. 2001*). Another study finds broadly persuasive evidence for a "weak form" of the "money machine" hypothesis: that countries with a VAT raise more revenue than those without (*Keen and Lockwood 2006*). The authors believe the effect may not be large, but the evidence also supports a "strong form" of the hypothesis: that this association reflects not increased demand for government, but rather the ease by which the VAT raises revenue (*Keen and Lockwood 2006*). Still another study finds it raises revenues more in developed countries and the least in sub-Saharan Africa (*Ebeke and Ehrhart 2012*). More recent studies find very limited evidence of increases in tax revenue from introduction of VAT taxes (*Lee et al. 2013, Ufier 2017*).

Valid concerns remain that carbon tax revenues will fuel government expansion. In fact, our experience with the Tax Reform Act of 1986 (TRA) that flattened income tax rates and removed numerous tax expenditures within an agreement of tax neutrality indicates extreme caution. Politicians quickly began raising rates again, creating more tax brackets and introducing new tax expenditures, in what has been described as the resetting of a rent-seeking clock that seeks to maximize revenue of government (*Buchanan 1987, McChesney 1988*). Concerns remain that a similar fate awaits a carbon tax swap for other taxes and politicians would be encouraged to introduce new government programs given voter support for earmarking carbon revenues for new government programs. Politicians would surely understand that hiking tax rates on those sources whose rates were reduced in the tax swap, as well as on carbon, would deliver more revenue for expanding government.

WILL CARBON TAXATION BE TRADED FOR ENVIRONMENTAL DEREGULATION?

Deregulation is tied to support for carbon taxation in all proposals put forth by conservatives. Reduction or elimination of tax incentives for clean energy and regulation, such as the EPAs Corporate Average Fuel Economy (CAFE) rules and the EPA's Clean Power Plan (CPP), are commonly supported. The CPP imposes state-specific limits on carbon emissions from power plants.

Economists don't need convincing; the previously discussed 2011 poll[20] of "economics experts" found 95 percent supporting the statement "A tax on the carbon content of fuels would be a less expensive way to reduce carbon-dioxide emissions than would a collection of policies such as 'corporate average fuel economy' requirements for automobiles." History also demonstrates that regulatory environmental policies are rarely similar in practice to the optimal solutions in theory (Anthoff and Hahn 2010). Environmental regulations have also been found to exert adverse effects on trade, employment, and the location of industry (*Dechezleprêtre and Sato 2017*).

On the brighter side, a study for the Alliance for Market Solutions (AMS) estimates that a carbon tax substituted for expanding regulations, and used for a corporate rate cut, would produce an economic benefit of $2,940 per household annually (*EY 2017*). Support for de-regulation in general is also supported by the current Council of Economic Advisers (*CEA 2017A*) that argues that deregulation will stimulate U.S. GDP growth (*CEA 2017A*). The CEA also estimates that excessive regulation costs the U.S. an average of 0.8 percent of GDP growth per year since 1980 (*CEA 2017A*).

Disagreements by conservatives focus on whether carbon taxation will in fact be traded for deregulation. The public is unlikely to be entirely enthusiastic about deregulating in return for carbon taxes when many lack awareness of the fact that taxation is more efficient than regulation. Citizens may suffer from a cognitive bias, known as opportunity cost neglect, that makes them more receptive to regulation than corrective taxation because they ignore or are unaware of the hidden costs of regulation (*Lucas 2017*). Unlike taxation, the opportunity costs of regulation are implicit and thus may be viewed as something of a "free lunch" by citizens.

Still, a recent Gallup poll indicates that more Americans believe there is "too much" (45 percent) regulation versus "too little" (23 percent) or "the right amount" (29 percent) (*Swift 2017*). While somewhat supportive of deregulation in general, citizens appear unenthusiastic about environmental deregulation as suggested by another Gallup poll that finds that about two-thirds of Americans favor increased enforcement of environmental regulations and setting higher emissions standards for business and energy (*Newport 2017*). This view is also consistent with my earlier discussion about voters becoming more enthusiastic only when carbon taxes are coupled with new spending on environmental programs.

Many people, economists included, are skeptical of the roughly 500 new economically significant (annual costs exceeding $100 million) regulations created over the last eight years (*CEA 2017A*), but there are few to no cases of environmental deregulation. A large bureaucracy and special interests supporting environmental regulation would also be formidable foes of deregulation. Some firms also prefer regulation over taxation because it is easier for them to "capture" regulators than tax authorities and because they want to use regulation to erect entry barriers on potential competitors (*Stigler 1971, Buchanan and Tullock 1975, Dietz and Franhuser 2010*).

Given all these obstacles, deregulation in return for carbon taxes is a tall order and simply adding carbon taxes to existing regulations will not be successful. One encouraging sign is Executive Order 13771 that directs agencies to eliminate two rules for each new rule, impose no net regulatory costs in FY 2017, and continue to adhere to a regulatory cost cap in FY 2018.[21] While President Trump has yet to fully meet this pledge, his Administration has succeeded in slowing the growth of regulations to the slowest pace of the previous six Administrations during his first year in office (McLaughlin and Reese 2018). Of course, this progress did not hinge on carbon taxation and can also be undermined in the future by new Administrations.

REVENUE NEUTRALITY OR CARBON TAX DIVIDENDS?

The CLC promotes a carbon dividends framework and believes that disbursing carbon tax revenues directly to citizens is the best solution for winning popular and political support for carbon taxes. Previous discussion indicated that other conservative groups in favor of carbon taxation tied their support to revenue neutrality.

The CLC sees their proposal as an effective means of redirecting populism whereby voters feel that political and economic systems are rigged against their interests by the wealthy and powerful. A carbon dividends plan is believed to offer an intuitive plan whereby the more you pollute, the more you pay; the less you pollute, the more you come out ahead. The CLC believes this would tip the economic scales towards the interests of the "little guy" at the expense of the wealthy who will typically pay more. The CLC suggests that this could inspire a new constituency of climate advocates. The CLC also believes that their dividends program serves to protect carbon tax revenues from funding more government. A tax of $40/ton is estimated to generate $2,000 in the first year for a family of four and rebates would rise with tax rates.

The dividend program is likely to win over some voters who need convincing that carbon taxation is good policy. My previous discussion indicated that one study found that 34 percent supported a carbon tax when the question did not state how the revenue would be used, but support rose to 56 percent when respondents were told the revenue would fund rebate checks to citizens (*Amdur 2014*). Another study found that 46 percent of respondents were in favor of a carbon tax that returned taxes as dividends to households (*Kotchen et al. 2017*).

Critics are right to be skeptical of the dividend program, as there are several problems with it:

- The dividend program strips the revenue neutrality requirement out of the carbon tax policy. As previously mentioned, swapping out taxes with high excess burdens, such as taxes on capital and income for carbon taxes, provides many benefits to our citizens that include more jobs and higher incomes as it steers resources toward more efficient market outcomes. This effect thus negates one of the best reasons to support a carbon tax.
- The dividend program creates an incentive for voters to push for carbon tax hikes as they correctly understand this effort increases rebate checks. This incentive is not aligned with finding the "correct" Pigouvian tax rate and may promote excessive tax rates that result in inefficient market outcomes.
- The dividend program enlarges the size of government as demonstrated by how it raises aggregate tax revenue. The dividend program is essentially a new government program that taxes businesses to fund a spending program aimed at sending government checks to citizens. Carbon tax revenues fund a new government entitlement spending program that drains economic resources and then re-shuffles dollars to citizens.
- A new pool of tax dollars always draws the notice of those interested in funding new government programs and, as previously discussed, many citizens want carbon tax revenues to fund environmental projects. As was noted about carbon taxes in Australia and British Columbia, various tax expenditures followed (*Metcalf 2016, Carl and Fedor 2012*). If there were a reduction in dividend checks in order to fund new programs, citizens might push for carbon tax hikes, creating incentives for policymakers to introduce unnecessary programs.
- The dividend program may appear to be "free" to voters, thus ramping up their demands for new sources of tax revenue that will further expand government. Voters may also be more inclined to tax capital, which has a very high excess burden and greatly lowers welfare. Removing revenue neutrality from carbon tax proposals makes it more difficult to constrain the many citizens and groups interested in expanding the scope and size of government.

In sum, the dividend program overturns the many benefits to citizens from tax reform, is likely to foster carbon tax rates above optimal externality corrections and encourages citizens to (incorrectly) believe they bear little to no costs themselves for checks from the U.S. government. This provision thus creates a "fiscal illusion" that may encourage voters to push for more government programs (especially entitlements) simply because they mistakenly believe programs are "free" to society (*Buchanan and Wagner 1977*).

IS CARBON TAXATION REGRESSIVE?

The incidence of a carbon tax on the poor appears to be a simple matter when viewed as a stand-alone policy without substitution for other taxes and deregulation. Lower-income citizens spend a greater share of their income on energy than higher-income families and thus shoulder larger burdens than higher-income families. Jobs, especially in energy sectors, may also be adversely affected and hurt the poor as well. These concerns are exacerbated when carbon taxes are simply added on to the existing structure of regulation and the corporate tax code.

Carbon tax proposals by conservatives are more complex than that. Most conservative groups tie revenue neutrality with carbon taxation, and how those tax swaps are implemented influences how they affect lower-income households. Reductions in personal and corporate income taxes, as well as payroll taxes, will lessen burdens, so they must be compared to burdens on the poor that follow from taxing carbon.

Conservative groups have dealt with tax regressivity in various ways. As discussed, the CLC proposes equal tax dividends to all citizens as a way of providing larger payments to lower-income households, in relative terms. The Niskanen Center proposes to rebate some portion of carbon tax revenues to poor households. R Street and the AMS focus on tax neutrality that swaps carbon taxes for other taxes that raise job opportunities and income for all citizens.

In sum, a carbon tax with tax neutrality or tax rebates mitigates concerns of carbon tax regressivity. Specifics depend on how tax swaps are implemented and whether there are tax rebates. Of course, there are always unknowns in the political process. Regulation has also been shown to promote higher consumer prices that exert disproportionately negative effects on low-income households (*Chambers et al. 2017*). Thus, the effects of deregulation should also be considered in the greater picture of whether carbon taxes are regressive. A carbon tax is likely to be regressive in the absence of tax neutrality, a tax rebate program or deregulation.

Carbon Tax Harm Reduction

Various disagreements amongst conservatives focus on the difference between the theory and expected application of carbon taxes. Wide agreement exists that, in theory, taxation is preferable to regulation, tax reform should lower excess burden, carbon taxation should not expand government, and that the poor should not shoulder undue carbon tax burdens. Valid differences exist on how well the theory will be transformed into carbon tax laws.

Allaying concerns that carbon taxation will simply expand government without deregulation requires a clear commitment to a constrained government. A major obstacle are policy advocates that singularly focus on a narrow range of issues such as poverty, obesity, and education. A recent study, for example, indicates that economists have increasingly become specialized in their research as indicated by a significant decline in the average probability of researchers changing research fields (*Brendel and Schweitzer 2017*). Greater specialization would appear to translate into more narrowly-focused policy advocates becoming increasingly disengaged from holistic debates on the proper role of government. It is not surprising that

policy advocates are more interested in expanding their policies than exploring how to constrain government growth.

Advocates can safely prescribe new extensions that promote their narrow policy focus when they believe they do not compete for resources with other advocates. Government programs are rarely eliminated or improved under this scenario because proposals receive little scrutiny. This situation is ripe for logrolling, whereby politicians support programs that do not directly benefit their constituents in return for support for their favored programs (*Tullock 1959*). Trading partners have little reason to view each other as competitors for taxpayer funds. This is a recipe for government growth that goes well beyond allocating scarce public resources to their highest-value uses.

Climate change appears to fit this profile and explains why conservatives are concerned that carbon taxation will fuel more government. Why would policy advocates be interested in trading their preferred policy (e.g., carbon taxation) for an existing policy (e.g., corporate taxation, payroll taxation or environmental regulation) when gaining their policy does not require reduction of a program they promote? Previous discussion of the budget constraint hypothesis predicts that policy advocates would prefer to use new carbon tax revenues to fund more programs rather than be exchanged for other taxes. The expanding regulatory state also stokes valid fears that deregulatory promises will not come to fruition.

Steering debate toward improving overall government efficiency lies in insisting that carbon taxation proceed with commitment to constrained government. This bargain requires economic sacrifices from carbon tax advocates seeking to mitigate harm from climate change. This carbon tax deal jeopardizes the political order that seeks government expansion funded by a "free lunch" to themselves. Non-conservatives typically fear dismantling of the regulatory state and are committed to expanding tax revenues to fund their narrow policy interests. Carbon taxation, in effect, represents a "destructive technology" to the status quo when revenue neutrality and deregulation are non-negotiable.

Carbon taxation coupled with revenue neutrality and deregulation represents a potential opportunity to capitalize on a high-profile public issue that promotes a more efficient government. It is safe to say that conservatives exhibiting the spectrum of views on climate change believe that regulatory and tax policies are sub-optimal. So, whether a carbon tax can be used to deregulate and reform our tax code is worth exploring when climate change policies are likely to happen. Trades are a necessary part of the policy process and refusing to negotiate with an opposition that prefers expanding government makes deregulation and tax reform less likely. Refusing to negotiate and pursuing tax reform and deregulation on their own merits are sensible when facing weak opposition. But fierce opposition to tax reform and deregulation is more likely and reason to design an effective harm reduction strategy for carbon tax legislation.

The non-negotiable nature of tax neutrality and deregulation also "tests" the convictions of carbon tax advocates. Proponents unwilling to accept these commitments are probably more interested in growing tax revenue and the regulatory state than decreasing greenhouse gas emissions. These commitments provide a "quid pro quo" whereby trading "good" policy (carbon tax) for "bad" policy (regulation and high excess-burden taxes) makes government more efficient (*Marlow and Orzechowski 1988, Orzechowski 1991*). Bunching the benefits from deregulation and tax reform in one package compensates the public for introducing a carbon tax. Climate change believers may view this as a "win-win" since it produces a better economy with less carbon in what is often referred to as a "double dividend." Climate change skeptics are more likely to view it as a "win-loss" that evolves into a net gain in the best-case scenario.

Revenue neutrality corrals traders into understanding that carbon tax revenues cannot fund new government programs without spending less on current programs. This constraint ideally unleashes greater scrutiny of all government programs as policy advocates realize that increased funding of their programs necessitates "raiding" funds from other programs. This

constraint raises incentives for policy advocates to search for misused public funds as a funding source for their own programs. One recent paper demonstrates how wasteful federal government spending can be (*Liebman and Mahoney 2017*). The author examines whether government agencies face incentives to rush through spending at year's end because most organizations have budgets that expire at the end of the fiscal year. The authors estimate that spending in the last week of the year is 4.9 times higher than the weekly average for the rest of the year, and year-end information technology projects have substantially lower quality ratings.

Other studies report that congressional hearings provide mostly one-sided views of government programs. One study of the list of witnesses before 14 hearings revealed that, of 1,060 witnesses, 96 percent, or 1,104, spoke in favor of programs (and usually higher spending); 39, or 3.7 percent, were neutral or mixed and 7, or less than 1 percent, opposed programs or spending (*Payne 1991*). The same study found that most congressional witnesses are federal administrators (47 percent), followed by lobbyists (13 percent), state and local government officials (10 percent), and representatives of business firms and consultants (4 percent). Another study of the 104th Congress tallied that over half the witnesses during the 104th Congress were funded directly by the federal taxpayer (Weinstein 1996). In 1995, 35 percent of witnesses were federal employees; of the remaining "public" witnesses, one of every three was a government grant recipient. Grant recipients testified during the 104th Congress roughly 6,000 times: 3,000 times a year, or an average of a dozen times every working day.

Revenue neutrality of course will not make government hyper-efficient, but it will provide a fixed pool of funds for policy advocates to draw from. Various think tanks have devoted much energy to proposing how best to cut wasteful government programs. These are excellent starting points for determining how best to trim government. Citizens Against Government Waste present many at **www.cagw.org/**. Cato Institute offers a department-by-department guide at **www.downsizinggovernment.org/**. Policy advocates will hopefully begin using these information sources to commandeer funds from wasteful programs toward more efficient uses of taxpayer dollars.

Tax reform can also play an important role in promoting more efficient government. This paper illustrates how excess burden leads to tax collections that underestimate the cost of government and suggests how easy it is for government to expand beyond an efficient size. Consider, for example, the case where voters believe that a $500 million spending program costs only $500 million, rather than its true cost of $500 million plus excess burdens of, say, $100 million. Voters and legislators are more likely to approve of a program that costs $500 million, rather than its true cost of $600 million, because the program appears to be a better "deal." Reducing excess burdens through tax reform thus reduces the bias toward underestimating costs of programs because government does not typically account for excess burdens in its cost-benefit analysis. Tax reform thus promotes more efficient government by reducing the amount of excess burden associated with its tax revenue and thus provides a truer measure of costs to compare to estimated benefits from government programs.

Conclusion

Economists always look for perfection. They can devise the perfect tax in theory, but it doesn't work the same way in the real world.

This explains much of the divide between conservatives on the carbon tax issue. Carbon tax proponents focus on the gains from a carbon tax deal that closely follows the script of economic theory and commitment to limited government. Carbon tax opponents are climate change skeptics that remain unconvinced that tax neutrality and deregulation will come to fruition. Both sides make valid points.

This paper presents the carbon tax within a harm reduction strategy in a world in which both climate change believers and skeptics face growing pressure to enact climate change policies. The non-negotiable nature of tax neutrality and deregulation is critical since, otherwise, carbon taxation will likely lead to a larger and more inefficient government. Much is at stake here and avoiding missteps is a tall order in the real world of how government usually works.

The growing focus on climate change offers a chance at steering government toward greater efficiency by forcing policy advocates to better acknowledge that government has an innate ability to over-regulate and waste money. Limiting the pool of funds via tax neutrality and deregulating redundant environmental regulations forces greater scrutiny over what government does and will be met with great resistance by the political status quo. Resistance is inevitable, but also signals that opponents understand that such a carbon tax constrains government.

The CLC's tax dividend program increases the role of government since it funds a new government entitlement program. This provision was considered essential for its passage but offers an unfortunate trade-off for those committed to limited government. This provision also may encourage similar policies whereby the government taxes a sector of the economy to fund checks to citizens. These promises quickly become entitlements, expand and are nearly impossible to unwind (*Cogan 2017*). Unfortunately, the tax dividend policy appeals to policymakers seeking to expand the pool of tax dollars that government collects.

The impending expected escalation of government debt will undoubtedly have policymakers attempting to siphon off carbon tax revenues. The Congressional Budget Office projects that federal deficits will average $1.2 trillion per year and total $12.4 trillion over the 2019–2028 period (*CBO 2018*). As a percentage of GDP, the deficit is projected to increase from 3.5 percent in 2017 to 5.4 percent in 2022 and then fluctuate between 4.6 percent and 5.2 percent of GDP from 2023 through 2028. Much of the spending growth reflects increases for Social Security, Medicare, and interest on the government's debt. Politicians, interest groups and many voters can be expected to seek additional tax revenues (or additional debt) rather than cut spending to fund this widening budgetary gap. Raising carbon tax revenues or creating new tax sources will be a solution favored by those believing government under-taxes rather than over-spends.

Spending, taxation, debt, tax expenditures, regulation and long-term unfunded liabilities must be considered in any discussion of limiting government. Spending is government's most visible metric, but history demonstrates that containment of one area such as on-budget spending often leads to growth in other areas (*Marlow and Joulfaian 1989, Joulfaian and Marlow 1991*). Debt is simply deferred taxation and it would be better to limit the sum of tax revenue and budget deficits, which equals spending in each budget year. Nonetheless, revenue neutrality at least represents a step in the direction of containing government size.

The next step is to develop the specifics of an ironclad plan for trading carbon taxation for tax neutrality and deregulation. Important decisions remain on the proper tax swap and deregulation that ultimately will be influenced by the bargaining abilities and strength of traders. Another critical component is to develop a credible means of tying the hands of future policymakers from overturning the terms of the deal (*Kydland and Prescott 1977*).

Climate change skeptics are correct to emphasize concerns that carbon taxation will lead to a larger and more inefficient government. Skeptics underscore the importance of designing a trade that meets the non-negotiable nature of tax neutrality and deregulation. Carbon tax proponents who truly believe it is essential for mitigating the effects of climate change should be willing to negotiate along these terms.

ENDNOTES

1 **(http://news.gallup.com/poll/206513/democrats-drive-rise-concern-global-warming.aspx)**

2 From the Energy Policy Institute at the University of Chicago and The Associated Press-NORC Center for Public Affairs Research. **https://epic.uchicago.edu/news-events/news/uchicago-poll-most-americans-want-government-address-climate-change**

3 All information obtained from their website, obtained January 13, 2018, **https://allianceformarketsolutions.org/**

4 All information obtained from their website, obtained January 13, 2018, **https://www.clcouncil.org/**

5 All information obtained from Jerry Taylor, "The Conservative Case for a Carbon Tax"; **https://niskanencenter.org/wp-content/uploads/2015/03/The-Conservative-Case-for-a-Carbon-Tax1.pdf**

6 Information obtained from Rorke, Catrina, Andrew Moylan and Daniel Semelsberger, "Swapping the Corporate Income Tax for a Price on Carbon," R Street Policy Study No. 79. December 2016. **https://www.rstreet.org/wp-content/uploads/2016/12/79.pdf**

7 Rorke (2016).

8 The corporate tax rate was reduced from 35 to 21 percent since this R Street report was issued and so the $1.66 billion would need to be revised.

9 The Heartland Institute is a free-market think tank that has published extensive criticisms of the climate change science. Interested readers should visit **https://www.heartland.org/Center-Climate-Environment/index.html**

10 **https://www.cato.org/about**

11 Kreutzer, David W. and Nicolas D. Loris, "Carbon Tax Would Raise Unemployment, Not Swap Revenue," Issue Brief No. 3819, January 14, 2013. **https://www.heritage.org/environment/report/carbon-tax-would-raise-unemployment-not-swap-revenue**

12 **https://secured.heritage.org/join-heritage-parallax/?utm_source=google&utm_medium=cpc&utm_campaign=donate**

13 **http://www.aei.org/about/**

14 Theory suggests that, because of tax interaction effects, the optimal tax rates on emissions are 20 percent or more below their social marginal costs (Bovenberg and Goulder 2002).

15 **http://www.igmchicago.org/surveys/carbon-tax**

16 Price elasticity of demand indicates the degree to which consumers are responsive to price changes. More elastic demands indicate more responsive consumers.

17 This is "net" because of the "tax interaction effect," in which a new carbon tax interacts with initial taxes on labor and capital that yields additional excess burden. For example, as carbon taxes raise prices of goods there will be a post-tax reduction in labor and capital earnings. So, it is appropriate to measure excess burden changes on a net basis due to the "tax interaction effect."

18 **https://www.congress.gov/bill/115th-congress/house-bill/1/text**

19 These are the expensing of intangible drilling costs, the domestic manufacturing tax deduction for oil and gas, and percentage depletion for oil and gas wells.

20 **http://www.igmchicago.org/surveys/carbon-tax**

21 **https://www.reginfo.gov/public/do/eAgendaEO13771**

REFERENCES

Aldy, Joseph. "Money for nothing: the case for eliminating US fossil fuel subsidies." *Resources for the Future* (2014).

Alesina, Alberto, Silvia Ardagna, Giuseppe Nicoletti, and Fabio Schiantarelli. "Regulation and Investment." *Journal of the European Economic Association* 3, no. 4 (2005): 791-825.

Amdur, David and Rabe, Barry G. and Borick, Christopher P., Public Views on a Carbon Tax Depend on the Proposed Use of Revenue (July 31, 2014). Issues in Energy and Environmental Policy, No. 13, July 2014. Available at SSRN: **https://ssrn.com/abstract=2652403**

Anderson, William, Myles S. Wallace, and John T. Warner. "Government Spending and Taxation: What Causes What?." *Southern Economic Journal* (1986): 630-639.

Antweiler, Werner, and Sumeet Gulati. "Policy Forum: Reducing the Environmental Impact of Transportation-British Columbia's Tax Policy Initiatives." *Canadian Tax Journal* 60, no. 4 (2012): 869-879.

Ballard, Charles L., John B. Shoven, and John Whalley. "General Equilibrium Computations of the Marginal Welfare Costs of Taxes in the United States." The *American Economic Review* 75, no. 1 (1985): 128-138.

Baranzini, Andrea, and Stefano Carattini. "Paying enough taxes already? Testing the Acceptability of Carbon Taxes with Survey Data." (2014). **https://doc.rero.ch/record/210303/files/CR_2014_2_Baranzini.pdf**

Barro, Robert J. "Government Spending in a Simple Model of Endogenous growth." *Journal of Political Economy* 98, no. 5, Part 2 (1990): S103-S125.

Bergh, Andreas, and Magnus Henrekson. "Government Size and Growth: a Survey and Interpretation of the Evidence." *Journal of Economic Surveys* 25, no. 5 (2011): 872-897.

Blackley, Paul R. "Causality Between Revenues and Expenditures and the Size of the Federal Budget." *Public Finance Quarterly* 14, no. 2 (1986): 139-156.

Bovenberg, A. Lans, and Ruud A. de Mooij. "Environmental Levies and Distortionary taxation." *The American Economic Review* 84, no. 4, (1994): 1085-1089.

Brendel, Jan, and Sascha Schweitzer. "The Burden of Knowledge in Economics." (2017). **file:///C:/Users/mmarl/Downloads/SSRN-id2895685.pdf**

Brill, Alex M. (editor), Carbon Tax Policy: A Conservative Dialogue on Pro-Growth Opportunities. 2017A Alliance for Market Solutions.

Brill, Alex, "Let's Scrap Regulations in Favor of a Carbon Tax," CNBC, June 6, 2017B. **http://www.aei.org/publication/lets-scrap-regulations-in-favor-of-a-carbon-tax/**

Browning, Edgar K. "On the Marginal Welfare Cost of Taxation." *The American Economic Review* (1987): 11-23.

Buchanan, James M., and Gordon Tullock. "Polluters' Profits and Political Response: Direct Controls Versus Taxes." *The American Economic Review* 65, no. 1 (1975): 139-147.

Buchanan, James M., and Richard E. Wagner. "Democracy in Deficit: The Political Legacy of Lord Keynes." (1977).

Cameron, David R. "On the Limits of the Public Economy." *The Annals of the American Academy of Political and Social Science* 459, no. 1 (1982): 46-62.

Carl, Jeremy, and D. Fedor. "Revenue-neutral Carbon Taxes in the Real World: Insights from British Columbia and Australia." *Task Force on Energy Policy* (2012). **https://www.hoover.org/sites/default/files/research/docs/117649691-revenue-neutral-carbon-taxes-in-the-real-world-insights-from-british-columbia-and-australia.pdf**

Cogan, John F. *The High Cost of Good Intentions: A History of US Federal Entitlement Programs.* Stanford University Press, 2017.

Congressional Budget Office (CBO), "Option 42: Impose a Tax on Emissions of Greenhouse Gases" from Options for Reducing the Deficit: 2017 to 2016, December 8, 2016. **https://www.cbo.gov/budget-options/2016/52288**

Congressional Budget Office (CBO), "The Budget and Economic Outlook: 2018 to 2028," April 9, 2018. **https://www.cbo.gov/system/files/115th-congress-2017-2018/reports/53651-outlook.pdf**

Council of Economic Advisors (CEA), The Growth Potential of Deregulation (Oct. 2, 2017A), **https://www.whitehouse.gov/sites/whitehouse.gov/files/documents/The percent20Growth percent20 Potential percent20of percent20Deregulation_0.pdf.**

CEA (Council of Economic Advisers). Corporate Tax Reform and Wages: Theory and Evidence (October 2017B). Washington.

Dechezleprêtre, Antoine, and Misato Sato. "The Impacts of Environmental Regulations on Competitiveness." *Review of Environmental Economics and Policy* 11, no. 2 (2017): 183-206.

EY, "Comparing the Economic Impact of an Expansion of Regulatory CO2 Controls to a Revenue-Neutral, Emissions-Equivalent Carbon Tax," Prepared for the Alliance for Market Solutions, April 2017. **https://allianceformarketsolutions.org/wp-content/uploads/2017/05/EY-AMS-Report-Reg-controls-v-carbon-tax-to-abate-CO2-2017-04-21-FINAL.pdf**

Ebeke, Christian, and Helene Ehrhart. "Tax Revenue Instability in Sub-Saharan Africa: Consequences and Remedies." *Journal of African Economies* 21, no. 1 (2011): 1-27.

Energy Information Administration. 2015. "Direct Federal Financial Interventions and Subsidies in Energy in Fiscal Year 2013." March. **www.eia.gov/analysis/requests/subsidy/pdf/subsidy.pdf.**

Environmental Protection Agency (EPA). 2015. "Social Cost of Carbon." EPA Fact Sheet. December. **www3.epa.gov/climatechange/Downloads/EPAactivities/social-cost-carbon.pdf.**

Facchini, François, and Elena Seghezza. "Public Spending Structure, Minimal State and Economic Growth in France (1870–2010)." *Economic Modelling* (2018).

Feldstein, Martin. "Tax Avoidance and the Deadweight Loss of the Income Tax." *The Review of Economics and Statistics* 81, no. 4 (1999): 674-680.

Friedman, Milton. *Tax Limitation, Inflation and the Role of Government.* (Dallas, TX: The Fisher Institute, 1978.

Gentry, William A., "A Review of the Evidence on the Incidence of the Corporate Income Tax," Office of Tax Analysis Paper 101, U. S. Treasury, December 2007.

Greenstone, Michael. "The Impacts of Environmental Regulations on Industrial Activity: Evidence from the 1970 and 1977 Clean Air Act Amendments and the Census of Manufactures." *Journal of Political Economy* 110, no. 6 (2002): 1175-1219.

Harberger, Arnold C., "Taxation, Resource Allocation, and Welfare," in The Role of Direct and Indirect Taxes in the Federal Revenue System, ed. John F. Due (Princeton, NJ: Princeton University Press, 1964), pp. 25–70

Horowitz, John; Julie-Anne Cronin, Hannah Hawkins, Laura Konda, and Alex Yuskavage, "Methodology for Analyzing a Carbon Tax," Office of Tax Analysis Working Paper 115, U.S. Treasury, January 2017. **https://www.treasury.gov/resource-center/tax-policy/tax-analysis/Documents/WP-115.pdf**

Kreutzer, David W. and Nicolas D. Loris, "Carbon Tax Would Raise Unemployment, Not Swap Revenue," Issue Brief No. 3819, January 14, 2013. **https://www.heritage.org/environment/report/carbon-tax-would-raise-unemployment-not-swap-revenue**

Jaffe, Adam B., Steven R. Peterson, Paul R. Portney, and Robert N. Stavins. "Environmental Regulation and the Competitiveness of U.S. Manufacturing: What Does the Evidence Tell Us?." *Journal of Economic literature* 33, no. 1 (1995): 132-163.

Jorgenson, Dale W., Richard J. Goettle, Mun S. Ho, and Peter J. Wilcoxen. "Carbon Taxes and Fiscal Reform in the United States." *National Tax Journal* 68, no. 1 (2015): 121.

Joulfaian, David, and Michael L. Marlow. "The Relationship Between On-Budget and Off-Budget Government." *Economics Letters* 35, no. 3 (1991): 307-310.

Keen, Michael, and Ben Lockwood. "Is the VAT a Money Machine?" *National Tax Journal* (2006): 905-928.

Keen, Michael. "VAT attacks!" *International Tax and Public Finance* 14, no. 4 (2007): 365-381.

Keen, Michael, and Ben Lockwood. "The Value Added Tax: Its Causes and Consequences." *Journal of Development Economics* 92, no. 2 (2010): 138-151.

Kotchen, Matthew J., Zachary M. Turk, and Anthony A. Leiserowitz. "Public Willingness to Pay for a U.S. Carbon Tax and Preferences for Spending the Revenue." *Environmental Research Letters* 12, no. 9 (2017): 094012.

Kydland, Finn E., and Edward C. Prescott. "Rules Rather than Discretion: The Inconsistency of Optimal Plans." *Journal of Political Economy* 85, no. 3 (1977): 473-491.

Landau, Daniel. "Government Expenditure and Economic Growth: A Cross-Country Study." *Southern Economic Journal* (1983): 783-792.

Lee, Dongwon, Dongil Kim, and Thomas E. Borcherding. "Tax Structure and Government Spending: Does the Value Added Tax Increase the Size of Government?" *National Tax Journal* 66, no. 3 (2013): 541.

Liebman, Jeffrey B., and Neale Mahoney. "Do Expiring udgets Lead to Wasteful Year-End Spending? Evidence from Federal Procurement." *American Economic Review* 107, no. 11 (2017): 3510-49.

Liu, Antung Anthony. "Tax Evasion and Optimal Environmental Taxes." *Journal of Environmental Economics and Management* 66, no. 3 (2013): 656-670.

Lucas Jr, Gary M. "Behavioral Public Choice and the Carbon Tax." *Utah Law Review.* (2017): 115.

Manage, Neela, and Michael L. Marlow. "The Causal Relation Between Federal Expenditures and Receipts." *Southern Economic Journal* (1986): 617-629.

Marlow, Michael L. "Private Sector Shrinkage and the Growth of Industrialized Economies." *Public Choice* 49, no. 2 (1986): 143-154.

Marlow, Michael L., and Neela Manage. "Expenditures and Receipts: Testing for Causality in state and local government finances." *Public Choice 53*, no. 3 (1987): 243-255.

Marlow, Michael L., and William Orzechowski. "Controlling Leviathan Through Tax Reduction." *Public Choice* 58, no. 3 (1988): 237-245.

Marlow, Michael L., and David Joulfaian. "The Determinants of Off-Budget Activity of State and Local Governments." *Public Choice* 63, no. 2 (1989): 113-123.

Marlow, Michael L. *The Myth of Fair and Efficient Government: Why the Government You Want is Not the One You Get.* ABC-CLIO, 2011.

Marron, Donald B., Eric J. Toder, and Lydia Austin. "Taxing Carbon: What, Why, and How." (2015). Tax Policy Center, Urban Institute and Brookings Institution.

Mathur, Aparna and Adele Morris, "Potential Linkages Between a U.S. Carbon Tax and the Earned Income Tax Credit," Tax Policy Center, American Enterprise Institute, August 1, 2017. **http://www.aei.org/publication/potential-linkages-between-a-u-s-carbon-tax-and-the-earned-income-tax-credit/**

McCaherty, Joshua D., "The Cost of Tax Compliance," Tax Foundation, September 11, 2014. **https://taxfoundation.org/cost-tax-compliance/**

McChesney, Fred, "The Cinderella School of Tax Reform: A Comment on Rabushka." *Contemporary Economic Policy* 6, no. 4 (1988): 65-69.

McKibbin, Warwick J., Adele C. Morris, Peter J. Wilcoxen, and Yiyong Cai. "Carbon Taxes and U.S. Fiscal Reform." *National Tax Journal* 68, no. 1 (2015): 139.

McLaughlin, Patrick and Chad Reese, "Is President Trump Dismantling the Regulatory State?" Mercatus Center, February 1, 2018. **https://www.mercatus.org/commentary/president-trump-dismantling-regulatory-state**

Metcalf, Gillbert E., and David Weisbach. "The Design of a Carbon Tax." *Harv. Envtl. L. Rev.* 33 (2009): 499.

Metcalf, Gilbert E. "A Conceptual Framework for Measuring the Effectiveness of Green Fiscal Reforms." *The International Journal on Green Growth and Development* 2, no. 2 (2016): 87.

Morgenstern, Richard D., William A. Pizer, and Jhih-Shyang Shih. "Jobs Versus the Environment: An Industry-Level Perspective." *Journal of Environmental Economics and Management* 43, no. 3 (2002): 412-436.

Murphy, Robert P., Patrick J. Michaels and Paul C. Knappenberger, "The Case Against a U.S. Carbon Tax," Policy Analysis Number 801, Cato Institute, October 17, 2016. **file:///C:/Users/mmarl/Dropbox/ongoing percent20research/carbon percent20tax/carbon percent20tax percent20opponents/murphy percent 20et percent20al percent202016 percent20CATO.pdf**

Murray, Brian, and Nicholas Rivers. "British Columbia's Revenue-Neutral Carbon Tax: A Review of the Latest "Grand Experiment" in Environmental Policy." *Energy Policy* 86 (2015): 674-683.

Nellor, David, 1987. "The Effect of the Value-Added Tax on the Tax Ratio." IMF Working Paper No. 87/47. International Monetary Fund, Washington, DC.

Newport, Frank, "Americans Tilt Toward Protecting Environment, Alternative Fuels," Gallup Poll, March 1-5, 2017. **http://news.gallup.com/poll/206159/americans-tilt-toward-protecting-environment-alternative-fuels.aspx?g_source=Social+Issues&g_medium=newsfeed&g_campaign=tiles**

Oates, Wallace E. "Green Taxes: Can We Protect the Environment and Improve the Tax System at the Same Time?" *Southern Economic Journal* (1995): 915-922.

Orenstein, Walker, "Inslee's Carbon Tax Gets Little Love from State Lawmakers," The News Tribune, March 28, 2017. **http://www.thenewstribune.com/news/politics-government/article141136248.html**

Orzechowski, William. "Reaganomics and the Use of Collective Rebates." *Public Choice* 69, no. 3 (1991): 311-322.

Payne, James L. *The Culture of Spending: Why Congress Lives Beyond Our Means.* (San Francisco: ICS Press, 1991).

Ram, Rati. "Additional Evidence on Causality Between Government Revenue and Government Expenditure." *Southern Economic Journal* (1988): 763-769.

Ramsey, Frank P. "A Contribution to the Theory of Taxation." *The Economic Journal* 37, no. 145 (1927): 47-61.

Rausch, Sebastian, and John Reilly. "Carbon Taxes, Deficits, and Energy Policy Interactions." *National Tax Journal* 68, no. 1 (2015): 157.

Rorke, Catrina, "A Carbon Bargain for Conservatives," R Street Institute, September 2016. **http://www.rstreet.org/policy-study/a-carbon-bargain-for-conservatives**

Rorke, Catrina, Andrew Moylan and Daniel Semelsberger, "Swapping the Corporate Income Tax for a Price on Carbon," R Street Policy Study No. 79. December 2016.

Scully, Gerald W. "The Size of the State, Economic Growth and the Efficient Utilization of National Resources." *Public Choice* 63, no. 2 (1989): 149-164.

Slemrod, Joel. "Cheating Ourselves: The Economics of Tax Evasion." *The Journal of Economic Perspectives* 21, no. 1 (2007): 25-48.

Stigler, George J. "The Theory of Economic Regulation." *The Bell Journal of Economics and Management Science* (1971): 3-21.

Stockfisch, Jacob A. "Value-Added Taxes and the Size of Government: Some Evidence." *National Tax Journal* 38, no. 4 (1985): 547-552.

Stram, Bruce Nels. "A New Strategic Plan for a Carbon Tax." *Energy Policy* 73 (2014): 519-523.

Stuart, Charles. "Welfare Costs Per Dollar of Additional Tax Revenue in the United States." *The American Economic Review* 74, no. 3 (1984): 352-362.

Swift, Art, "Americans' Views on Government Regulation Remain Steady," Gallup Poll, October 11, 2017. **http://news.gallup.com/poll/220400/americans-views-government-regulation-remain-steady.aspx-?version=print**

Taylor, Jerry, "The Conservative Case for a Carbon Tax," Niskanen Center, March 23, 2015.

Taylor, Rob and Rhiannon Hoyle, "Australia Becomes First Developed Nation to Repeal Carbon Tax," *Wall Street Journal,* July 17, 2014.

Tietenberg, Tom, "Carbon Pricing: Lessons Derived from Experience," in De Mooij, Ruud A., Mr Michael Keen, and Ian WH Parry. *Fiscal Policy to Mitigate Climate Change: A Guide for Policymakers.* International Monetary Fund, 2012.

Tietenberg, Tom H. "Reflections—Carbon Pricing in Practice." *Review of Environmental Economics and Policy* 7, no. 2 (2013): 313-329.

Tuladhar, Sugandha D., W. David Montgomery, and Noah Kaufman. "Environmental Policy for Fiscal Reform: Can a Carbon Tax Play a Role?." *National Tax Journal* 68, no. 1 (2015): 179.

Tullock, Gordon. "Problems of Majority Voting." *Journal of Political Economy* 67, no. 6 (1959): 571-579.

Ufier, Alex. "The Effect of VATs on Government Balance Sheets." *International Tax and Public Finance* 24, no. 6 (2017): 1141-1173.

Von Furstenberg, George M., R. Jeffery Green, and Jin-Ho Jeong. "Tax and Spend, or Spend and Tax?." *The Review of Economics and Statistics* (1986): 179-188.

Walker, W. Reed. "The Transitional Costs of Sectoral Reallocation: Evidence from the Clean Air Act and the Workforce." *The Quarterly Journal of Economics* 128, no. 4 (2013): 1787-1835.

Wang, Rong, Juan Moreno-Cruz, and Ken Caldeira. "Will the Use of a Carbon Tax for Revenue Generation Produce an Incentive to Continue Carbon Emissions?." *Environmental Research Letters* 12, no. 6 (2017): 064001.

Weinstein, Kenneth, "Congressional Hearings and the Culture of Spending", Report, Heritage Foundation, December 19, 1996. **https://www.heritage.org/report/congressional-hearings-and-the-culture-spending**

Williams III, Roberton C., and Casey J. Wichman. "Macroeconomic Effects of Carbon Taxes." *Implementing a US Carbon Tax: Challenges and Debates* 44 (2015): 83.

Zycher, Benjamin, "The Deeply Flawed Conservative Case for a Carbon Tax," March 2017A. **http://www.aei.org/publication/the-deeply-flawed-conservative-case-for-a-carbon-taxconservatives-endorse-the-broken-windows-fallacy-reject-evidence-and-rigor/**

Zycher, Benjamin, "Carbon Taxes: Et Tu, Alex Brill?" June 8, 2017B **http://www.aei.org/publication/carbon-taxes-et-tu-alex-brill/**