

Tax Reform and the Environment: *Paying for Fundamental Tax Reform*

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It is a pleasure to participate in this forum on tax reform and the environment. Craig has introduced the idea of tax shifts as part of his broader message that taxes and the environment have much to do with each other. I'd like to focus more specifically on revenue neutral tax shifts where environmental taxes are used to finance tax reductions. I have two points to make in my presentation. First, the United States lags behind most other developed countries in its use of environmental taxes and charges as a component of its fiscal system. Second, our failure to avail ourselves of environmental taxes and charges means we are missing revenue opportunities which could help us tackle important fiscal issues in our federal budget. My overall message is that green tax shifts can provide considerable flexibility to policy makers to achieve difficult political and economic goals while contributing to a cleaner environment.

Environmental Charges: an Underutilized Resource

The first point to make is that the United States collects little in the way of revenue from environmental charges (including taxes) and what little we do collect is collected in an inefficient manner.¹ Even if we include taxes on motor fuels (which are – strictly speaking – not an environmental tax), environmental tax collections are trivial in the federal budget. Less than 4 percent of federal revenues came from excise taxes in 2004 roughly two-thirds of which could loosely be described as environmental in nature. Granted \$45 billion in excise tax revenues of a broadly environmental nature are not to be dismissed out of hand, we are far from maximizing our potential to tax activities that are detrimental to health and the environment here in the United States.

How does the United States compare with other developed nations? Here are a few comparison statistics. Considering environmental taxes at all levels (federal, state, and local), environmental taxes in the United States comprised 3.3 percent of total tax revenues in 2001.² By contrast, OECD countries as a whole collected 4.9 percent of taxes through environmental taxes. Denmark's environmental tax share, for example, was 10 percent in 2002; Germany's was 7.1 percent; the United Kingdom's was 7.5 percent. No country's environmental tax share in 2001 was lower than the United States' share.

In short, the United States is at the very bottom of the distribution in terms of the fraction of government revenue collected through environmental taxes and charges. Let me next turn to how we might use a green tax shift in the United States.

¹ See Fullerton (1996) for an overview of environmental tax policy and the high costs of collection. Francis (1999) notes the decreased use of some environmental taxes in the 1990s.

² The source for these and subsequent tax share numbers is the OECD Economic Instruments Database.

Green Tax Shifts: Some Possibilities

I'd like to discuss three examples of green tax shifts to illustrate how we might use environmental tax revenues to help us achieve important fiscal policy goals.

1. Carbon tax to finance corporate tax integration

A study that Kevin Hassett of the American Enterprise Institute and I did a few years ago explored instituting a carbon tax to finance corporate tax integration (Hassett and Metcalf (2001)). Based on our analysis using 1996 data, full corporate tax integration would cost just under \$50 billion in 1996 dollars.

The idea of a carbon tax combined with a reduction in existing taxes has been extensively studied.³ The focus on a carbon tax is a natural one given rising concerns about global warming. Emissions of carbon dioxide (CO₂) in 1990 totaled 1,365 million metric tons of carbon and increased to 1,581 million metric tons in 2002, according to the most recent report on greenhouse gas emissions from the Energy Information Administration (2004). A carbon tax is an obvious policy tool to help reduce carbon emissions. A natural question is what to do with the carbon tax revenue. Research by a number of economists has indicated that reducing the tax on capital income financed by environmental tax revenues would provide the greatest efficiency gains relative to other uses of the tax revenue. Corporate tax integration is a way to reduce the tax on capital income.

Corporate tax integration is an effort to subject all income to a single income tax. The United States, like many countries, has a personal income tax and a corporate income tax and treats these two taxes as separate and distinct. Thus, income earned in the corporate sector can be subject to a tax first through the corporate income tax and then through the personal income tax. Such a system leads to a number of tax induced behaviors which can have significant efficiency impacts:

- Payout Behavior: the corporate income tax affects the decision to pay out after-tax profits in the form of dividends or to retain earnings within the corporation.
- Financing Behavior: the corporate income tax influences the decision to finance new investments with equity or debt.
- Corporate Organization: the corporate income tax affects the decision to organize businesses as corporations or partnerships.

A 1992 Treasury study on tax integration estimated annual efficiency losses from the current tax system (relative to an integrated system) ranging from \$2.5 to \$25 billion (in 1991 dollars).

One of the objections to tax integration is its cost. The impetus behind the analysis that Hassett and I did is that the cost of tax integration can be paid for by

³ See, for example, Bovenberg and Goulder (1996) who consider cuts in the personal income tax financed by a carbon tax.

revenues from a carbon tax. Such a "green tax reform" would be desirable both on environmental and efficiency grounds. We considered two forms of tax integration. First, we considered full integration where corporate income is allocated to individual shareholders and subject to tax at the personal level, what the U.S. Treasury in its report on corporate tax integration referred to as the Shareholder Allocation Prototype. Second, we considered excluding dividend income from taxation at the personal level, what the Treasury referred to as the Dividend Exclusion Prototype.⁴

We focused in that paper on the industry impacts of this green tax shift. Industries will be differentially affected by integration of the corporate and personal income tax. We would expect that industries which have high corporate pay-out rates would benefit from integration while industries that are dominated by a non-corporate organizational form would least benefit. The carbon tax, meanwhile, would most impact carbon intensive industries. We would expect that a green tax shift using a carbon tax to finance tax integration would lead to considerable variation across industries in benefits and costs.

Parsing out the impact is a bit complicated. The conventional view of the incidence of carbon taxes is that they will be passed forward in the form of higher product prices to consumers. Our analysis follows this approach and translates the intermediate goods taxes into higher industry prices as energy intensive inputs (now more expensive) are used in the production of downstream goods. Corporate tax integration, by reducing the double taxation of capital income should increase the income of owners of all capital (corporate and non-corporate).⁵ It is possible that in the context of a package reform where corporate tax integration is combined with a carbon tax, the entire package of taxes is passed forward in changes in prices of industry products. This follows as the higher prices of goods (due to the carbon tax) put domestic goods at a competitive disadvantage relative to imported goods. This competitive force makes it difficult for owners of capital to appropriate the gains from corporate tax reductions.

If this argument is correct, then the price changes we report in that research can be viewed as a measure of the industry incidence impact of the tax reform. Alternatively, it may be that the conventional story continues to hold and that the carbon tax is passed forward into higher prices while the corporate tax integration tax reductions accrue to owners of capital (are passed backward). Rather than attempt to determine the ultimate incidence of this complex reform, we took a different tack. We constructed a statistic that we call the Breakeven Incidence Share (BIS). The BIS represents what fraction of the carbon tax must be shifted back to shareholders to offset the gains from corporate tax integration. For example, if an industry experiences a price increase of 4 percent due to the carbon tax and the equivalent of a 0.4 percent decrease due to corporate tax integration, then the BIS is 10 percent. In other words, so long as no more than 10 percent of the carbon tax is shifted back to capital owners, the benefits of corporate tax integration exceed the costs of the carbon tax from the perspective of capital owners.

⁴ See U.S. Department of the Treasury (1992) for a comprehensive discussion of integration issues.

⁵ This result was first shown by Harberger (1962) and this incidence assumption is frequently used (see, for example, Pechman (1985)).

I'll simply note some of the results from our analysis of full integration. First, if all tax impacts were passed forward in the form of industry product prices, there is considerable variation in the price changes. Of the fifty industries we tracked in our 2001 paper, twenty nine industries faced price increases and twenty one faced price decreases if a carbon tax were used to finance complete corporate tax integration. Petroleum, coal mining, and utilities are disproportionately impacted by a carbon tax with price changes of 6 to 12 percent. Beyond those industries, price increases ranged from .02 to 1.21 percent while price decreases ranged from .02 to 1.84 percent.

Comparing the two price changes is only appropriate if the reduction in capital income taxation is passed forward to consumers in the form of lower prices (or if the carbon tax is passed back to capital owners in the form of lower returns). As an alternative approach to understanding industry impacts, we reported our measure of the required amount of pass-back in the carbon tax possible before equity holders are adversely affected by this reform. For the three industries most heavily impacted by a carbon tax we found that so long as no more than 5 percent of the carbon tax was passed back to equity holders in the form of lower returns, returns to shareholders would not fall following this green tax reform.

Summing up, tax integration financed by a carbon tax blunts to a modest degree the price increases that arise from the latter tax. If the carbon tax is fully passed forward to consumers, then the tax reform benefits the owners of equity in nearly all industry sectors. This is worth emphasizing. The standard incidence view is that a carbon tax would be passed forward to consumers in the form of higher product prices while capital tax reductions would be passed back to owners of capital. If this view is correct, business (or, more precisely, equity holders) would generally benefit from this environmental tax reform.

2. Environmental taxes to help achieve distributional objectives

The President's Advisory Panel on Federal Tax Reform is charged with thinking about ways to simplify tax collections and enhance efficiency in a revenue neutral context. The discussion above illustrates how environmental taxes could help us achieve considerable efficiency gains through capital income tax relief. My next example illustrates how environmental taxes can be used to achieve distributional objectives. Whether this is a goal of the Advisory Panel or not, the broader message in this example is that environmental taxes give lawmakers considerable flexibility to achieve a variety of goals given the fiscal constraints under which they operate.

A study I undertook a few years ago asked how we might carry out a revenue *and* distributionally neutral green tax reform. I hypothesized a green tax shift equal to ten percent of federal revenues in 1994.⁶ I modeled a new carbon tax, an increase in the motor fuels excise tax, new taxes on air pollution (or alternatively the federal sale of

⁶ This is an ambitious goal and would represent new environmental taxes of roughly \$200 billion in the current fiscal year. I am reporting the research in Metcalf (1999) here.

tradable permits giving firms the right to emit air pollution – as currently occurs under the SO₂ trading system for electric utilities and as proposed under the Bush Administration's Clear Skies Initiative. Finally I modeled a tax on unrecovered waste, a so called virgin materials tax.

The specific tax rates and amounts collected are not that important for our current consideration. Rather I'd like to emphasize that a common concern with environmental taxes is that they are regressive – that is they fall disproportionately on low-income individuals and households. My analysis confirmed this result when looking at the environmental taxes in isolation. I then modeled three tax reductions financed by the new (or increased) environmental taxes. First, I exempted from the OASDI payroll tax the first \$5,000 of tax base for each worker. For workers earning less than \$5,000 of covered wages, I exempted them entirely from the tax, both at the personal and business level. Next, I implemented a refundable \$150 tax credit for each exemption taken in the personal income tax. Finally, I modeled an across the board income tax cut of 4 percent.

The net result was an essentially distributionally neutral green tax shift. The point of this exercise was not to make a case for this particular reform. Rather it was to emphasize the key point that while environmental taxes may be regressive, an environmental tax reform can have whatever degree of progressivity policy makers choose. Any regressivity in the environmental tax can be offset by progressivity in the tax reductions financed by the new revenues.

The broader point in the context of the Advisory Panel's work on tax reform is that environmental taxes provide an additional instrument to help achieve whatever goals the panel has, whether they be related to efficiency, distribution, or some combination of the two.

3. Emission trading permit exercise tax

As my last example of an environmental tax, I turn to cap and trade programs like the SO₂ trading program for electric utilities implemented in the 1990 Clean Air Act Amendments or the various cap and trade programs such as proposed in the Clear Skies Initiative. Cap and trade programs such as the SO₂ program have a number of attractive features as recently documented in the 2004 *Economic Report of the President*. How permits are allocated is an important issue in their design. The SO₂ trading program grandfathered firms allocating permits to utilities on the basis of historic pollution levels. Grandfathering may make permit programs more palatable to affected industries but it means the government foregoes valuable revenue it could collect by selling permits to firms.

A cap and trade program effectively creates barriers to entry for new firms since permits are required in order to operate. Work I did with Don Fullerton at the University of Texas notes that these barriers create economic rents for firms in the industry. Economic rent is a technical economic term that – loosely speaking – refers to profits that

firms can obtain by restricting new entrants from competing with existing producers.⁷ A monopolist, for example, earns economic rents. The key point about economic rents is that they are a distortion free source of tax revenue, what economists refer to as a lump-sum tax. What Fullerton and I pointed out is that selling permits is functionally equivalent to levying a 100 percent tax on the economic rents that arise due to the barriers to entry created by the cap and trade system.

Proponents of grandfathering argue that the electric utilities industry, for example, is burdened by the restrictions in SO₂ emissions that arise from setting caps lower than historic emission levels. But the analysis Hassett and I did that I discussed before suggests a flaw in this argument. To the extent that higher costs (due to the need to purchase SO₂ permits) are passed forward into higher product prices, shareholders are unaffected by the permit policy. In fact, research has shown that a cap and trade system in carbon emissions need require very little grandfathering to compensate firms for their losses due to the need to purchase carbon permits. In fact, a cap and trade system that curtails emissions sufficiently to set a \$25 per ton price on emissions (in year 2000 dollars) only requires grandfathering 15 percent of permits in the oil and gas industry and – perhaps remarkably – less than 5 percent in the coal industry.⁸ The reason is that supply is sufficiently more elastic than demand that the bulk of the cost is shifted forward to consumers in higher product prices. Little cost is borne by shareholders and 100 percent grandfathering as occurs with the SO₂ trading program overcompensates the industry.

These observations suggest that the vast majority of tradable permits in future cap and trade programs should be auctioned by the federal government to raise revenue. How should we treat the current SO₂ trading system (and other trading systems)? We could begin to auction permits henceforth. This might be complicated given the banking and forward purchase of permits that has occurred. Alternatively, Congress could enact a *permit exercise tax*. This would be a tax levied on any firm that used a permit in order to emit sulfur dioxide. In other words, this is a tax on the right to exercise the permit. In 2003 electric utilities emitted 10.6 million tons of SO₂ emissions.⁹ A permit exercise tax of \$250 per ton would raise \$2.6 billion annually. Such a tax would capture a significant fraction of the economic rents generated by giving the permits to utilities in the first place.

Conclusion

To conclude, I have tried to make two points. First, the United States relies to a much lower extent on environmental taxes than do other developed countries. We have considerable scope for green tax shifts before we put ourselves at a competitive disadvantage with other OECD countries. Second, a greater reliance on environmental taxes can provide considerable flexibility for policy makers to achieve difficult political and economic goals while contributing to a cleaner environment. Thank you very much.

⁷ Fullerton and Metcalf (2001)

⁸ I am reporting the work of Bovenberg and Goulder (2001) here.

⁹ Burtraw, Evans, Krupnick, Palmer and Toth (2005)

Bibliography

Bovenberg, A. Lans and Goulder, Laurence. "Neutralizing the Adverse Industry Impacts of Co2 Abatement Policies: What Does It Cost?," C. Carraro and G. E. Metcalf ed., *Distributional and Behavioral Effects of Environmental Policy*. Chicago: University of Chicago Press, 2001, 45-85.

Bovenberg, A. Lans and Goulder, Lawrence H. "Optimal Environmental Taxation in the Presence of Other Taxes: General Equilibrium Analyses." *American Economic Review*, 1996, 86, pp. 985-1000.

Burtraw, Dallas; Evans, David A.; Krupnick, Alan; Palmer, Karen and Toth, Russell. "Economics of Pollution Trading for So₂ and No_x," *RFF Discussion Paper*. Washington, DC: Resources for the Future, 2005.

Energy Information Administration. "Annual Energy Review 2003," Washington, DC: Energy Information Administration, 2004.

Francis, Brian. "Federal Excise Taxes, Including the Slow Death of Expired Taxes." *Statistics of Income Bulletin*, 1999, (Summer), pp. 185-89.

Fullerton, Don. "Why Have Separate Environmental Taxes?," J. M. Poterba ed., *Tax Policy and the Economy*. Volume 10. Cambridge: MIT Press for the National Bureau of Economic Research, 1996, 33-70.

Fullerton, Don and Metcalf, Gilbert E. "Environmental Controls, Scarcity Rents, and Pre-Existing Distortions." *Journal of Public Economics*, 2001, 80(2), pp. 249-67.

Harberger, Arnold C. "The Incidence of the Corporation Income Tax." *Journal of Political Economy*, 1962, 70(3), pp. 215-40.

Hassett, Kevin and Metcalf, Gilbert E. "Environmental Taxes to Finance Capital Tax Reform," *Accurate Prices Program*. Oakland, CA: Redefining Progress, 2001.

Metcalf, Gilbert E. "A Distributional Analysis of Green Tax Reforms." *National Tax Journal*, 1999, 52(4), pp. 655-81.

Pechman, J. *Who Paid the Taxes: 1966-85?* Washington DC: Brookings, 1985.

U.S. Department of the Treasury. *Integration of the Individual and Corporate Tax Systems: Taxing Business Income Once*. Washington, DC: U.S. Government Printing Office, 1992.