

DIRECTIONS IN DEVELOPMENT

Tax Expenditures—
Shedding Light on
Government Spending
through the Tax System
*Lessons from Developed and
Transition Economies*

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A Framework for Evaluating Tax Measures and Some Methodological Issues

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Governments use tax measures, including tax expenditures, to raise revenue for financing spending priorities and to achieve economic, social, environmental, and other policy objectives. This chapter outlines an approach for evaluating tax measures and determining how well they are meeting policy objectives.

In the discussion, the term *tax evaluation* refers to a policy review that assesses the performance of tax measures according to the following three criteria.¹

- *Relevance.* Is the tax measure consistent with policy priorities, and does it realistically address an actual need?
- *Effectiveness.* Is the tax measure meeting its objectives effectively, within budget, and without unwanted outcomes?
- *Efficiency.* Is the tax measure the most appropriate and efficient means to achieve objectives, relative to alternative design and delivery approaches?

Tax evaluations seek to provide objective, fact-based assessments of the effects of tax measures on resource allocation and income distribution by using economic theory and quantitative methods to analyze economy-wide benefits and costs from tax measures. The following sections describe how tax measures can be evaluated in terms of relevance, effectiveness, and efficiency; highlight how different policy objectives can influence the

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manner in which evaluation criteria are addressed; and discuss some methodological issues and challenges prevalent in tax evaluations.

Relevance

Is the tax measure consistent with policy priorities, and does it realistically address an actual need? Careful consideration of the nature, specific objectives, and design of individual tax measures is critical for identifying evaluation methodologies appropriate to a given set of circumstances.

Typically, consideration of the circumstances that led to the implementation of a tax measure is essential for determining if the measure continues to address a real need in a manner consistent with present social and economic conditions, as well as current policy priorities. Objectives of tax measures are set out in policy documents such as budget papers, discussion papers, and news releases; other sources of information, such as the minutes of legislative committee meetings and debates, can assist in delineating their full intent.

Moreover, it is important to determine whether other policy instruments are being used to achieve the same—or similar—objectives. In addressing policy issues, tax and nontax mechanisms may be used simultaneously to achieve different, but complementary, objectives.² Alternatively, the nature of the economic or social goals and specific policy objectives may favor one form of instrument over another. To the extent that alternatives exist, it is necessary to ascertain whether the tax measure uniquely achieves some outcome that the alternatives cannot.

Analysis of the basic design of a tax measure, the key elements of its structure, and its operation also permit comments on how effective it could reasonably be expected to be in influencing economic behavior or conditions and in achieving policy objectives as efficiently as possible. Furthermore, design considerations may provide insights into how the tax measure might complement other policy instruments being used for similar purposes. Key design issues include the form of the tax measure, who can access it and under what conditions, the ability of third parties to facilitate its use,³ its relative generosity and duration, the timing of its benefits, its interaction with other elements of the tax system, and the compliance and administration requirements.

Effectiveness

Is the tax measure meeting objectives effectively, within budget, and without unwanted outcomes? A wide range of questions can be considered when determining what a tax measure is actually achieving. These ques-

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tions relate to (a) the target population (for example, characteristics and actual recipients compared with intended recipients); (b) changes in economic behavior or conditions (for example, the extent to which the tax measure is directly responsible for these changes, or whether other factors are responsible); and (c) the cost of the tax measure (for example, the amount of federal tax assistance being provided and its actual cost relative to its expected cost). Unintended or unforeseen effects, either positive or negative, may be important considerations in assessing effectiveness.

Given the varying types and goals of tax measures, a number of methodologies may be used, often in combination, to address questions of effectiveness. These methodologies include analyses of taxation, financial, and economic data; case studies, surveys, questionnaires, and interviews with affected parties (for example, taxpayers, taxpayer associations, tax professionals, and administrators); consultations with policy experts in universities, the private sector, and government; and literature reviews.

Efficiency

Is the tax measure the most appropriate and efficient means of achieving objectives, relative to alternative design and delivery approaches? Evaluation of the efficiency of a tax measure focuses on the allocation of resources in an economy (or the level and mix of goods and services produced). When an economy is operating efficiently, resources are fully employed and producing as much output as possible.⁴

The effects of tax measures on economic efficiency can, in principle, be quantified and summarized in terms of an overall change in real income. By influencing prices or costs, tax measures reallocate resources and real income among markets. They also impose compliance costs on taxpayers, as well as administration and financing costs on government. The net effect of these various influences on overall real income, which may be termed the *change in the excess burden of taxation*, signals an improvement or reduction in economic efficiency and can only be determined empirically.⁵

Cost-effectiveness calculations are often reported in research studies dealing with tax measures. The concept of cost-effectiveness and the concept of excess burden are discussed in the following two sections.

Cost-Effectiveness

Cost-effectiveness calculations are a first step in evaluating economic efficiency, because they provide a perspective on the ability of a tax measure to enhance overall real income.⁶ Cost-effectiveness is determined as the value of the change in economic behavior that is directly attributable to the tax measure (that is, its incrementality) per dollar of federal tax revenue forgone.

Cost

A tax measure may be considered to be cost-effective if one dollar of tax revenue forgone generates at least one dollar of incremental spending in the targeted activity. In other words, the cost-benefit ratio must be greater than or equal to unity.⁷ If this is the case, a gain in economic efficiency is possible, because the value of the activity being targeted increases by more than the loss in government tax revenue.⁸ However, to determine whether an efficiency gain actually does result, further analysis is needed of real income change in the market directly affected, the size of any market failure (or potential economic benefit from correcting it), policy-induced spillover effects on other markets, economic and social costs associated with raising revenues to finance the tax measure, and administration and compliance costs.⁹ In other words, cost-effectiveness is, in and of itself, not a sufficient indicator of efficiency, because it does not account for all of the benefits and costs associated with providing a tax measure.

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But not all tax measures are implemented primarily to improve economic efficiency. The principal objective of some, for example, is to obtain a more equitable distribution of resources.¹⁰ Unfortunately, although changes in the distribution of income can be measured, there is no objective way to value such changes. This fact influences the orientation of tax evaluations, the methodologies used to address the efficiency criterion, and the choice of performance indicators to encapsulate key evaluation findings. Efficiency remains important in the recognition that there may be more efficient and less efficient ways of redistributing real income. Tax measures that are designed to improve equity also affect economic efficiency, in that they influence behavior, they must be financed and administered, and it is costly for recipients to access them.

Instead of assigning a value to the change in equity in these situations, tax evaluations focus (a) on the cost of the tax measure in attaining the desired income redistribution and (b) on how design improvements and alternative delivery mechanisms might either enhance income redistribution for the same cost or achieve the same income distribution at a reduced cost, to better achieve the specific objectives of the tax measure being considered. The issue then becomes how to design the policy instrument to achieve the desired outcome with the smallest possible loss in economic efficiency. Key evaluation findings may be expressed using summary indicators of the distributional effects per dollar of cost.¹¹

Excess Burden of Taxation

Evaluations of efficiency-related tax measures assess performance by quantifying the change in real income

- In the market targeted by the tax measure

- From correcting a market failure, if applicable
- From spillover effects on other markets caused by the tax measure, if these effects are significant
- From costs of financing and administering the tax measure
- From costs of complying with it

Because the effects of the separate components are offsetting, it is important to adopt evaluation methodologies that can take account of each type of benefit and cost while recognizing the specific objectives of the tax measure being considered. The net effect is a monetary measure of the overall change in economic efficiency induced by a tax measure.

A negative change in excess burden signifies a net economic benefit, an improvement in efficiency, and a particular income distribution. Examination of the income distribution provides perspective on potential equity issues associated with the tax measure. A positive change in excess burden, signifying a net economic loss, would increase the importance of examining alternative ways to achieve the objectives specific to the tax measure. A positive change also could raise the profile of the equity aspects of the tax measure. For example, a tax measure could be found to be inefficient but also to have redistributed income in a desirable manner. In such a situation, the effects on income distribution would be weighed against the net loss in economic efficiency, and the tax measure would be evaluated in terms of its ability to achieve its objective at the lowest cost possible.

Whether the net effect is positive or negative, the design of the delivery vehicle is crucial. Evaluations must produce answers to two questions:

- Is the delivery vehicle as efficient as possible? Design improvements may, for example, reduce compliance and administration costs, spillover costs in other markets, and the excess burden of taxation.
- Are there alternative delivery vehicles, existing or theoretical, that could provide the same level of benefits at a lower cost?¹²

Methodological Issues

Some common methodological issues and difficulties that arise in evaluating the performance of tax measures are discussed in this section.

Data Availability

Informational deficiencies are a fairly common problem. They affect not only the ability to assess performance but also the consideration of alternative delivery mechanisms.

Administrative databases are an important source of tax data. However, information necessary for the effective administration of a tax measure

is typically, and understandably, not entirely the same as that required for an evaluation of all aspects of the measure's performance (see, for example, the discussion below of the incrementality of the tax measure). Furthermore, administrative tax data are, at times, limited in their usefulness because of the type and scope of information collected, its timeliness, and changes made over time to what is collected.

Consequently, complementary or additional information must be obtained. Publicly available financial and tax information may be used to supplement administrative data. So too may information collected through case studies, surveys, questionnaires, and interviews. The latter, more direct forms of information gathering can provide insights (a) on the degree to which a tax measure is meeting its specific objectives (for example, incrementality in terms of investment or labor force participation or poverty reduction); (b) on the target population (for example, characteristics and the decision criteria and key factors affecting choices); and (c) on the design and use of the tax measure (for example, experience with compliance and administration authorities or how the measure is perceived, operates, and might be improved). The information obtained may be of relevance to all three aspects of performance—relevance, effectiveness, and efficiency. Studies published by experts in universities and in public and private sector institutions may also help address these issues and provide a useful perspective for comparing and explaining results.

Incrementality

Because government tax policies are designed to affect the economic behavior or conditions of individuals and firms, determining the incrementality of a tax measure—the extent to which it is directly responsible for these changes—is a central evaluation objective. For tax measures that are aimed primarily at improving efficiency, methodologies used to estimate incrementality can be grouped into three categories: econometric analyses, surveys, and case studies.¹³ Each has its advantages and disadvantages. The choice of one methodology over another depends (a) on the questions subject to investigation and the desired depth and detail of the answers required; (b) on feasibility, given data quality and availability; and (c) on timing.

Econometric analyses use economic theory and statistical techniques to attempt to isolate the effects of a tax measure from other key influences on economic behavior. Depending on how the measure is structured, information exogenous to the econometric model may be required in order to determine incremental effects. This additional information may not be readily available, or alternative possibilities may exist. A range of possible behavioral effects that are generated by altering underlying key assumptions may be reported to address these problems. However, these

sensitivity analyses can provide only indications of potential effects. Other approaches seek to obtain the missing information from, for example, surveys or case studies and to incorporate it into the economic framework to enhance the credibility of the incrementality results.¹⁴

It is becoming increasingly popular to undertake econometric analyses in the context of a quasi experiment. Quasi experiments compare the economic behavior of one group that receives a tax measure with that of another group that closely resembles the recipient group in available observed characteristics but does not receive the tax measure. The similarity between the two groups allows econometric analysis to distinguish between the behavioral effects of shared influences that are not explicitly modeled and the behavioral effects of the tax measure. However, selection of an appropriate comparison group can be difficult, and the results depend on the magnitude of the tax measure being considered. The choice of the econometric estimation technique also can lead to different results.

Surveys and interviews with key decisionmakers may be used in conjunction with econometric analysis. By contacting the individuals directly involved, surveys provide direct insights into decisionmaking processes and policy-induced behavioral changes that are due to the tax measure. The use of statistical tools, in contrast, allows evaluators only to draw inferences. The main advantage of surveys over econometric analyses is the greater level of detail and understanding that can be obtained. Their main disadvantages are their relatively high cost and the difficulty of distinguishing random from nonrandom patterns of behavior. The identification of behavioral trends and their causes is of key importance from a policy perspective; econometric analysis of survey results can help assess their validity.¹⁵ Another disadvantage of the survey methodology, especially with respect to questions of a more qualitative nature, is the natural tendency of respondents to overestimate the effect of policies that are beneficial to them. The inclusion of questions that can be corroborated with objective data (for example, from administrative sources) can enhance the overall credibility of all responses. Another disadvantage is that substantial resources must be dedicated to preparing the survey questionnaire, identifying a representative survey sample, and choosing a survey instrument.

Case studies can provide substantial detail on specific target groups or subpopulations, specific economic activities, or specific aspects of policy. They are often complemented by interviews with key decisionmakers within the target population. Because of their detailed nature, case studies are more appropriate for analyzing, for example, a policy through which benefits are provided to a relatively small number of taxpayers in similar circumstances. The main drawback of case studies is that they cannot identify patterns of behavior that are representative of the population as a whole. As such, case studies are not particularly well suited for evaluating

the effectiveness of broadly based tax measures that provide assistance to relatively large numbers of taxpayers in different situations. Another disadvantage is that case studies, like surveys, are costly to undertake. Thus, case studies are generally narrower in focus than surveys and econometric analyses. The latter methodologies are better suited to examining broader issues, such as the overall responsiveness of demand to tax changes (elasticities) or the overall increase in spending induced by a tax incentive.

The Cost of Tax Measures

The reporting of tax expenditures has become a common practice among governments. A tax expenditure is the cost of a tax measure that is intended to advance economic, social, environmental, or other policy objectives. Although differentiating these tax measures from the normal parts of a tax system can be controversial, the cost is typically calculated as the difference between total tax revenue in the presence and absence of the particular tax measure, assuming everything else remains unchanged.¹⁶ No allowance is made for behavioral responses by taxpayers, consequential government policy changes, or changes in tax collections due to altered levels of aggregate economic activity that might result from the measure's elimination.

Precise methodologies used to determine the costs of individual tax measures vary according to the measure being considered. No single methodology is appropriate in all situations, and some methodologies can be quite complex and subject to debate.¹⁷ Approaches used in evaluations of individual tax measures often include behavioral effects in order to enhance the precision of the cost estimates.

The Excess Burden of Taxation

Empirical estimates of each of the components of the change in the excess burden of taxation are needed to determine the overall net effect of the tax measure on real income.

Ease of administration and compliance are important considerations that can affect the efficiency and success of any tax measure. It may be possible to obtain estimates of compliance burden and costs through direct communication with taxpayers and accounting professionals. Information on administrative burden and costs may be available from tax administrators. However, in neither case is success certain. Although taxpayers and accounting professionals may track the total time they spend preparing tax returns, it is very difficult to allocate that time to individual tax items. Similarly, tax administrators tend to have broader responsibilities, thereby making it difficult to separately identify and partition costs among items.

Tax measures must be financed. The necessary revenues can come from reduced spending, increased debt, or higher taxes. Regardless of how the measure is financed, there will be implications for the economy as a whole. Much work has been done in examining how different types of taxes affect behavior, efficient use of resources, and economic growth. Results are often presented in terms of the marginal efficiency cost of alternative tax bases per dollar of tax revenue raised, but the cost varies significantly, depending on the tax base used. Consumption taxes (broadly based sales taxes) are generally found to have the least distortionary effects on economic efficiency and growth; taxes on capital income (savings) have the most distortionary impacts. A broadly based tax change (including consumption, payroll, income, and capital taxes) will have an intermediate effect. This work and these findings can be useful in determining the effect on real income associated with the financing component of the change in excess burden. However, the exact manner in which tax revenues are raised remains a crucial consideration. Tax evaluations typically assume revenue-neutral tax financing through a general increase in all taxes.

Estimating the gain in real income for society as a whole in cases where a tax measure corrects a market failure is no less difficult. The nature of the market failure must first be identified. Alternative viewpoints on what is or is not a market failure can generate considerable debate. If agreement is reached on this issue, the size of the market failure then must be determined.¹⁸ The availability of data to make this determination is often a problem. Literature estimates of market failure of a particular type—or the extent of the distortion in a particular market—often do not exist. Even when estimates are available, as in the case of research and development, they have been calculated only for certain sectors of an economy, and the methodology used may be controversial.

Two approaches can be used to estimate the net effect on real income of the two remaining components of the change in the excess burden of taxation: the net improvement in real income in the market directly affected (essentially equal to the gain in consumer's surplus minus the loss in tax revenues), and the loss in real income from altered economic activity in other markets. One approach seeks to approximate the change in excess burden from these sources, per dollar of tax expenditure, using what might be termed a *partial general-equilibrium methodology*; the second approach uses computable general-equilibrium (CGE) modeling.

APPROXIMATING THE NET CHANGE IN REAL INCOME AMONG MARKETS

An individual tax measure typically will have a negligible effect on overall prices and nominal income. Appendix A outlines an approach for approximating the net change in excess burden caused by tax-induced changes in real income among markets in such a situation. The net effect

is expressed per dollar of tax expenditure. The approach is relatively simple to use, provides a consistent framework for capturing market interactions in analyzing how the tax changes affect real income, and highlights the importance of doing so when cross-price effects are significant.

The basic intuition underlying the approach is as follows. A concessionary tax measure increases the demand for the favored commodity and real income in that market.¹⁹ However, reduced tax revenue caused by the tax preference partly offsets this increase. The resulting net gain reduces real income in all other markets by an equal amount and, consequently, reduces the demands for other commodities and the tax revenue derived from those commodities on the basis of compensated demands. The combination of these direct and spillover effects is captured in a summary indicator that measures the performance of the tax provision in enhancing efficiency per dollar of tax revenue forgone. To the extent that demand is diverted to the favored market from markets subject to lower levels of taxation, there will be a smaller reduction in overall tax revenue and a more favorable effect on economic efficiency.

CGE MODELING

Computable general-equilibrium tax models, which allow for both price and income changes, can be used to provide another perspective on how a tax measure that has significant effects on markets can affect overall real income.²⁰ In doing so, CGE tax models use the incrementality and cost-effectiveness results of a tax measure; the estimate of the size of the market failure; and other relevant information, including costs of financing, administration, and compliance.

A CGE tax model is simulated first in the absence of the tax measure. In this case, relative prices reflect the market failure and the loss in economic efficiency from a misallocation of resources among markets. The model is then simulated in the presence of the tax measure and modified to incorporate any spillover benefits associated with removing the externality. In this case, relative price changes shift the same overall supply of resources to a more efficient use. All things being equal, total factor productivity and real income rise as a result of this shift in resources. However, the tax measure imposes economic costs, because the overall level of taxation must increase to fund it. Broadly based tax changes can raise the revenues required in various ways; for example, all tax rates can be raised by either the same percentage-point amount or the same percentage to obtain an increase in tax revenues equal to the cost of the tax incentive. More narrowly based tax increases can lead to wide variations in cost estimates. More than one financing option may be used. If a comparison of simulation results reveals that the economic benefits exceed the economic costs, then the tax measure has succeeded in improving real income.

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Summary

This chapter presents an approach for assessing the performance of tax measures, including tax expenditures, in terms of relevance, effectiveness, and efficiency in meeting their stated policy objectives. Tax evaluations involve a rigorous analysis of economy-wide benefits and costs associated with tax measures, using economic theory and quantitative methods.

All tax measures affect both the allocation and the distribution of resources in an economy. They must also be financed and administered, and it is costly for recipients to access them. The overall nature of tax measures influences the orientation of the tax evaluation; the specific objectives of individual tax measures modify it further. Differences in the rationale and design of tax measures, informational deficiencies, and methodological questions associated with determining and summarizing effects combine to make each tax evaluation unique and challenging.

Notes

1. These criteria are consistent with the approach for evaluations in Treasury Board of Canada Secretariat 2001.

2. Tax measures may take a variety of forms, including accelerated or bonus deductions, refundable or nonrefundable tax credits, incremental tax deductions or tax credits, tax rate reductions, or subsidies provided through the tax system. Nontax instruments may take the form of information, regulation, grants, loans, government contracts, and direct government involvement in the market.

3. For example, a 1994 evaluation by the Department of Finance Canada, titled *Flow-Through Shares: An Evaluation Report*, found that the use of the tax-assisted flow-through share financing mechanism for exploration and development was facilitated significantly by the participation of limited partnerships in the transaction. (A portion of that evaluation appears in Jog and others 1996).

4. Such an allocation of resources is said to be *Pareto optimal*; the economy is operating efficiently, and there is no scope for further improvements in anyone's well-being without compromising the welfare of someone else. But many efficient allocations are possible, each one corresponding to a different distribution of real income.

5. This term is used to underscore the notion that, in general, taxes impose a burden both on the persons who must pay the tax and on society as a whole in the form of lower output.

6. Although differences in tax systems and economic circumstances will affect comparability, cost-effectiveness calculations relating to policy instruments used in subnational and foreign jurisdictions to achieve similar objectives may provide insights on relative efficiency effects and their potential as alternative delivery approaches.

7. This ratio can also be expressed in terms of the price elasticity for the targeted activity,

$$\eta \equiv -\frac{\partial x}{\partial p} \frac{p_1}{x_1}.$$

The increase in spending on the targeted activity is $p_1\Delta x \approx -\eta x_1\Delta t$, where $\Delta t = \Delta p$. Taking account of behavioral effects, the tax expenditure is

$$-(t_1\Delta x + x_0\Delta t) \approx -x_1\Delta t \left[1 - \eta \left(\frac{t_0}{1+t_1} \right) \right].$$

In this situation, a tax measure will be cost-effective if

$$\eta \geq \frac{1+t_1}{1+t_0+t_1}.$$

If behavioral effects are ignored, then the tax expenditure is $-x_1\Delta t$ and the tax measure will be cost-effective if

$$-\frac{p_1\Delta x}{x_1\Delta t} \approx \eta \geq 1.$$

8. If the cost-benefit ratio is less than unity, then the loss in government tax revenue exceeds the increase in the value of the activity being targeted, and a portion of the forgone tax revenue is being used for purposes other than intended.

9. Although competitive markets can produce an efficient allocation of resources through the workings of the price system, they do not always do so. Reasons for market failure may include the presence of externalities or imperfect information.

10. Regardless, all tax measures affect both the allocation and the distribution of resources. A Pareto-improving tax measure, for example, is one that enhances economic efficiency in a manner that makes someone better off without making anyone else worse off. Such an objective may command wide acceptance, but it also embodies a value judgment as to how income should be redistributed.

11. Such performance indicators for key evaluation findings typically need to be tailored to the methodologies chosen and may be neither straightforward nor simple to establish.

12. The 1994 evaluation of flow-through shares by the Department of Finance Canada (see note 3) considered a theoretical equity-based alternative for financing petroleum and mining exploration and development.

13. Randomized social experiments, which typically do not apply to tax measures, are another method that is sometimes used to gauge how economic behavior may change in response to a government policy. In essence, this methodology compares the behavioral responses of two randomized subsets of the eligible

population, one of which receives an incentive while the other serves as the control group. The difference between the behavioral responses of the two groups is attributed to the incentive.

14. This approach was used in a 1990 evaluation by the Department of Finance Canada, titled *Economic Effects of the Cape Breton Investment Tax Credit: An Evaluation Report*, and is also described in Daly and others 1993. In essence, estimates of the incrementality of the tax credit on capital investment in manufacturing were obtained from case studies of firms operating in the region. Econometric analysis and economic modeling produced a range of capital incrementality estimates for the entire industry, depending on how the demand for the region's manufactured products might respond to the tax-induced change in their price. The information needed to establish an overall incrementality result, and a benchmark for analysis, was obtained by using the demand response implicit in the incrementality estimates of the case studies.

15. A 1997 evaluation by the Department of Finance Canada, titled *The Federal System of Income Tax Incentives for Scientific Research and Experimental Development: Evaluation Report*, combined survey findings and econometric analysis in this way. Econometric analysis allowed comment on the statistical significance of the incrementality results from a survey of the types and characteristics of research and development performers.

16. A range of alternative approaches exists internationally; some are restrictive, others very broad. Each can be criticized as applying some degree of value judgment. The broadest of the available options identifies tax expenditures as all deviations from a narrowly defined benchmark tax system. This approach is used by the Department of Finance Canada in its annual tax expenditure publications, in an attempt to provide as much information as possible on the actual and projected costs of individual tax measures without getting into a controversy as to whether or not a particular item is, or is not, a tax expenditure. (See, for example, Department of Finance Canada 2002.)

17. For example, there has been considerable discussion of the appropriate method for calculating the cost of tax measures that contain a deferral component. (See Department of Finance Canada 2001 for a discussion of this issue with respect to tax-assisted retirement savings.) A review of the procedures and techniques used to estimate tax expenditures in Canada is provided in chapter 5 by Marc Seguin and Simon Gurr.

18. If the market failure is small, then the costs associated with the tax measure will likely exceed its benefits, so that the policy will not enhance overall real income.

19. Specifically, compensating variation or Hicksian consumer's surplus.

20. CGE tax models are a standard methodology for estimating the economic effects of a policy change once the economy has fully adjusted to the new policy environment. They capture the economic behavior of consumers and producers both within an economy and through trade with other countries, by focusing on

the allocation of an economy's limited resources among competing uses. A variety of taxes can be modeled, such as personal and corporate income taxes, payroll taxes, and commodity taxes. Taxes affect relative prices, which, in turn, affect (a) demands for labor and capital and (b) the production of all commodities. Resources are assumed to be fully used and all markets are assumed to be in equilibrium (that is, demands equal supplies) at all times. Economic impacts are assessed by simulating the models both with and without the policy change. Impacts on key economic variables, such as real income and real gross domestic product, are measured by comparing values generated with and without the tax incentive in place.

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