

# ***How To Create a Tax Burden Where No Tax Burden Exists: A Critical Examination of Grady's "An Analysis of the Distributional Impact of the Goods and Services Tax"***

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## **PRÉCIS**

Dans un article du numéro de mai-juin 1990 de la *Revue fiscale canadienne*, Patrick Grady avance que, contrairement aux prévisions du ministère des Finances, plusieurs ménages verront leur situation financière se détériorer, à court terme, à la suite de l'introduction de la Taxe sur les produits et services (TPS). Dans notre article nous procéderons à un examen critique des vues de Grady. Nous avons identifié plusieurs problèmes analytiques qui permettent de réfuter les estimations empiriques de Grady. Tout particulièrement, son traitement des 4 milliards \$ de revenus provenant de la taxe sur les ventes des fabricants applicable aux biens d'investissement est inapproprié car il crée un fardeau fiscal là où celui-ci n'existe pas. Ce fardeau fiscal fictif représente 4,5 milliards \$ des 4,6 milliards \$ que, selon les estimations de Grady, la TPS prélèvera sur le revenu disponible des Canadiens en 1991, et pratiquement la totalité des 406 \$ que, également selon ses estimations, la TPS prélèvera sur le revenu disponible moyen par famille.

Plusieurs problèmes théoriques liés à l'analyse des effets des changements de politique fiscale sur la répartition du revenu méritent d'être examinés d'une manière plus approfondie qu'ils ne le sont dans l'article de Grady. Ces problèmes sont (1) la distinction entre les effets d'impact, les effets de l'exercice financier total, et les effets d'équilibre à plus long terme d'un changement de politique, (2) l'utilisation d'une analyse de sensibilité pour vérifier d'autres hypothèses sur l'incidence de l'impôt et (3) le choix d'un concept de revenu approprié pour estimer les effets d'un changement de politique considérable sur la répartition du revenu. Ces problèmes ont des

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implications pratiques pour ceux qui établissent de nouvelles politiques et leurs conseillers.

### ABSTRACT

In an article in the May-June 1990 *Canadian Tax Journal*, Patrick Grady claims that, contrary to the projections of the Department of Finance, many people will be worse off in the short run as a result of the introduction of the goods and services tax (GST). The present article is a critical examination of the Grady article. It identifies several analytical problems that invalidate Grady's empirical estimates. In particular, Grady's treatment of \$4 billion in revenue from the manufacturers' sales tax on investment goods is inappropriate, since it creates a tax burden where no tax burden exists. This fictitious tax burden accounts for \$4.5 billion of the \$4.6 billion by which Grady estimates the GST will reduce the consumable income of Canadians in 1991 and virtually all of the estimated \$406 by which he estimates the GST will reduce average consumable income per family.

Several theoretical issues associated with the analysis of the effects of policy changes on the distribution of income merit more consideration than they receive in Grady's article. These issues are (1) the distinction between the impact effects, full fiscal year effects, and longer-run equilibrium effects of a policy change; (2) the use of sensitivity analysis in testing alternative tax incidence theories; and (3) the choice of an appropriate income base in estimating the effects of a major policy change on the distribution of income. These issues have practical implications for policy advisers and policy makers.

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### INTRODUCTION

The last year for which we have empirical evidence on how taxes affect the distribution of income in Canada is 1972.<sup>1</sup> Our lack of more recent information on a policy variable that is important for Canadians and their elected representatives may soon be remedied, however, thanks to the dissemination of Statistics Canada's Social Policy Simulation Database and Model (SPSD/M).<sup>2</sup> This model allows an analyst to estimate the effects of taxes and transfers on the distribution of income, and it has already been used in several published studies that measure the distributive effects of specific tax reforms.<sup>3</sup> These hors d'oeuvres break a long fast and will likely

<sup>1</sup> See John Whalley, "Regression or Progression: The Taxing Question of Incidence Analysis" (November 1984), 17 *Canadian Journal of Economics* 654-82.

<sup>2</sup> Michael Bordt, Grant J. Cameron, Stephen F. Gribble, Brian B. Murphy, Geoff T. Rowe, and Michael C. Wolfson, "The Social Policy Simulation Database and Model: An Integrated Tool for Tax/Transfer Policy Analysis" (1990), vol. 38, no. 1 *Canadian Tax Journal* 48-65.

<sup>3</sup> See, for example, Allan M. Maslove, *Tax Reform in Canada: The Process and Impact* (Halifax: Institute For Research on Public Policy, 1989); Neil Brooks, *Searching for an Alternative to the GST*, Discussion Paper 90.C.1 (Halifax: Institute for Research on Public Policy, February 1990); and Patrick Grady, "The Distributional Impact of the Federal Tax and Transfer Changes Introduced Since 1984" (1990), vol. 38, no. 2 *Canadian Tax Journal* 286-97.

**Table 1 The Goods and Services Tax Package**

Item	Revenue impact <i>billions of 1991 dollars</i>
<i>Uses of funds</i>	
MST removal .....	18.5*
Enhanced GST credit .....	1.2
Indexation offsets .....	0.9
Administration costs .....	0.2*
Housing rebates .....	0.5*
<i>Total</i> .....	21.3
<i>Sources of funds</i>	
GST at 7 percent .....	19.5
Increased high-income surtax .....	0.2
Increased excises on alcohol, tobacco, and motive fuels .....	0.7
Increased large corporations tax .....	0.2*
Reduced government expenditures .....	0.7*
Adjustments to tax base .....	0.1
<i>Total</i> .....	21.4

Note: Details do not add because of rounding.

\*Items that are sources of analytical problems in the Grady article.

Source: See footnote 5, *infra*.

lead to a substantial entrée—a measure of total tax incidence in the Canadian economy.

An article by Patrick Grady in the May-June 1990 *Canadian Tax Journal* is an interesting attempt to use the SPSPD/M to estimate the distributional impact of the goods and services tax (GST) package.<sup>4</sup> Unfortunately, Grady's analysis is flawed by omissions that invalidate his empirical estimates and, a fortiori, his policy conclusions as well.

The purpose of the present article is to discuss the analytical problems in the Grady article and to raise some general issues that should be kept in mind at the forthcoming feast of distribution of income studies. The argument is developed in three stages. First, I describe the government's GST package in terms of a sources and uses of funds analysis. I then discuss the analytical problems that arise in Grady's attempt to estimate the distributional impact of the GST package in 1991. Finally, I discuss several general theoretical issues that do not receive adequate consideration in Grady's article but that any future attempts to estimate the income distribution effects of individual tax or transfer reforms, or the incidence of the tax system as a whole, should take into account.

#### THE GOVERNMENT'S GST PACKAGE

Table 1 shows the components of the sales tax reform package that substitutes the GST for the manufacturers' sales tax (MST). The table is based on

<sup>4</sup> Patrick Grady, "An Analysis of the Distributional Impact of the Goods And Services Tax" (1990), vol. 38, no. 3 *Canadian Tax Journal* 632-43.

the December 1989 revision of the GST package as announced in August 1989. As the table shows, the package consists of various sources of funds that sum to the total of various uses of funds.<sup>5</sup> These sources and uses of funds represent the full fiscal year effects of the sales tax reform package in its mature form—that is, when it no longer involves any transitional costs. Grady's GST package is neither the government's GST package in 1991 nor the government's GST package on a full fiscal year basis. Table 1 designates with an asterisk the components of the GST package that Grady either overlooks or treats incorrectly. The next section discusses these components in turn.

### GRADY'S GST PACKAGE

The major analytical problem in the Grady article arises in Grady's treatment of the \$4 billion in revenue from the MST on investment goods. Grady assumes that the tax is borne by business and comes out of profits. Yet he fails to allocate the \$4 billion as a benefit to those families whose welfare is increased by the increase in profits that occurs when the MST is removed. He argues that

[t]he increase in profits that will result from the removal of the tax on investment will provide business with an incentive to expand capacity, but the analysis makes no allowance for the increase in output and income that will result in the longer run. . . . This omission is appropriate, given that the analysis deals only with the initial impact of the shift to the GST.<sup>6</sup>

The omission is inappropriate. The increase in profits will occur in 1991, and it will benefit the owners of businesses in 1991. Whether the increase in after-tax profits is paid out as dividends or retained by businesses for future expansion, it increases the welfare of families that own businesses relative to the welfare of families that are not owners. The fact that many businesses will retain the increased profits does not negate the fact that the economic position of the owners of these businesses will improve.

The point is important enough to bear repeating. People pay taxes and people experience a decrease in income when a tax is increased. The tax

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<sup>5</sup> Canada, Department of Finance, *Goods and Services Tax: An Overview* (Ottawa: the department, August 1989); Canada, Department of Finance, *Goods and Services Tax: Technical Paper* (Ottawa: the department, August 1989); and Canada, Department of Finance, *Goods and Services Tax* (Ottawa: the department, December 19, 1989). The August estimate of GST revenues of \$24 billion includes the replacement MST revenues and \$5.4 billion in fiscal offsets, but it is net of \$0.9 billion in revenues that would be raised to finance housing rebates, the small business compensation fee of \$0.6 billion, and rebates of an unspecified amount in respect of public sector purchases.

The Department of Finance records the revenue loss from reducing the GST rate from 9 to 7 percent as \$5.9 billion. Since this is a reduction in gross revenues, I have recorded it as such in calculating the revenues generated by the 7 percent tax (though I have omitted the unknown amount generated in order to provide rebates for public sector purchases).

<sup>6</sup> *Supra* footnote 4, at 636.

increase may reduce the income of a person in his or her capacity as an employee, as an owner of capital, as a consumer of goods and services, as a homeowner, as a renter, and so forth. Institutions, such as corporations and businesses, may act as collectors of taxes, but it is the individuals associated with the institutions that suffer the pain of tax extraction. Likewise, it is individuals, not institutions, that enjoy increased well-being when a tax is repealed.

The owners of businesses suffer a decrease in welfare when profits are reduced by the MST on investment goods. Likewise, these owners experience an increase in welfare when profits rise because the MST is repealed. This \$4 billion increase in welfare should be allocated to families in their capacity as profit earners.

Grady's methodology, which channels \$4 billion of MST revenues into retained earnings, does not allow these increased retained earnings to make any person better off. This is inappropriate. The result is that in Grady's GST package the uses of funds are less than the sources of funds, whereas in the government's GST package the uses and sources of funds are equal. The practical effect of Grady's methodology is that his GST package increases the aggregate tax burden, whereas the government's GST package has a neutral effect on the aggregate tax burden.

Grady's methodology also omits six other components of the GST package. All of these omissions affect the levels of the uses and sources of funds and probably affect Grady's distributive findings as well. The study excludes, on the ground of insufficient data, the GST levied on residential construction and the housing rebate. The omission of these items is unfortunate, all the more so because the \$0.5 billion in housing rebates to families is one of the components of the GST package that contains elements of both regression and progression.<sup>7</sup> It would have been interesting to know the actual distributive impact of this component. By excluding the distributive effect of the housing rebates, Grady distorts the overall income distribution effects by an unknown amount.<sup>8</sup>

Grady does not even mention, much less incorporate into his empirical estimates, the following components of the GST package: an increase in administration costs of \$0.2 billion, the small business transitional credit of unknown amount, an increase in large corporations tax revenue of \$0.2 billion, and a reduction in government spending of \$0.7 billion. The \$0.2 billion increase in administration costs is a use of funds in the GST package. It is a permanent annual addition to government spending that will increase the incomes of some families by an equivalent amount during 1991

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<sup>7</sup> The full housing rebate of 2.5 percent of the price of a newly constructed house will benefit families that purchase houses, which are likely to be concentrated in the middle and upper income groups. At the same time, the declining (to zero) rebate rate for expensive homes will reduce and eventually eliminate this benefit for families in the highest income groups.

<sup>8</sup> The GST revenues in table 1 include the tax revenues from residential construction.

and thereafter. It is part of the GST package and should be taken into account in any attempt to determine the distributive effects of this revenue-neutral tax reform.

The one-time small business credit is a transitional cost and consequently does not appear in table 1. When the government reduced the GST rate from 9 to 7 percent, it eliminated the small business compensation fee (for an annual saving of \$0.6 billion) and substituted "in recognition of the transitional costs . . . a one-time credit of \$1,000 to small businesses at the start-up of the GST."<sup>9</sup> The cost of the small business credit is a use of funds in 1991 that will not occur in other years; therefore any study of the impact of the GST package in 1991 should take the credit into account and allocate it as a use of funds.<sup>10</sup>

The increase in the large corporations tax from 0.175 percent to 0.2 percent of corporate capital employed in Canada in excess of \$10 million is an additional source of funds that is part of both the GST package for 1991 and the full fiscal year package. This tax increase will reduce corporate profits, and whether the tax comes out of dividends or retained earnings the increase should be allocated to those families who experience such a reduction.

The reduction in government spending of \$0.7 billion is a source of funds in the GST package. It is not easy to estimate the distribution of the benefits from government spending and, a fortiori, the distribution of the reduction in those benefits when there is a cut in government spending. In a study that is attempting to estimate the income distribution effects of the GST package, this estimation is a necessary part of the methodology and should be carried out.

In total, the methodology adopted by Grady for estimating the distributional impact of the GST package in 1991 omits revenue uses of \$4.7 billion, plus an unknown amount for the transitional small business credit, and revenue sources of \$0.9 billion.<sup>11</sup> This substantial net omission of revenue uses is equivalent to a substantial increase in taxation. Grady's approach has resulted in the creation of a tax burden where no tax burden exists. These analytical problems also invalidate Grady's estimates of the GST package's impact on the distribution of income in 1991. Consequently Grady has not

<sup>9</sup> *Goods and Services Tax*, supra footnote 5, at 17.

<sup>10</sup> The GST documents (supra footnote 5) do not provide an estimate of the total cost of the one-time small business credit; it could be as much as \$1 billion (this is my own very rough estimate, which I base on the projection in the documents of a cost of \$0.6 billion for the annual small business compensation fee of \$600).

<sup>11</sup> Grady now attributes these omissions to data limitations and to the nature of the SPSPD/M. In the SPSPD/M simulation, changes in taxes on capital in the corporate sector do not change directly (in 1991) the economic well-being of the owners of corporate capital. See Patrick Grady, "The Distributional Impact of The Goods And Services Tax: A Reply To Gillespie," in this issue, at 937-46.

estimated the distributional impact in 1991 of the government's GST package.<sup>12</sup>

### THEORETICAL ISSUES

There are certain theoretical issues that any attempt to estimate the income distribution effects of tax or transfer programs should take into account. Grady's approach to these methodological issues affects his empirical findings and, accordingly, merits detailed examination.

The first issue is the distinction between impact effects, full fiscal year effects, and longer-run equilibrium effects. The composition of the sales tax reform package depends in two respects on whether one is studying the package's impact effects in 1991 or its full fiscal year effects. The one-time small business credit, which Grady should have included in his uses of funds, is a transitional cost and is therefore not included in the list of full fiscal year effects in table 1. On the other hand, the indexation offsets for the personal income tax, for transfers to persons (old age security/guaranteed income supplement [OAS/GIS] payments, family allowance payments), and transfers to provinces will come fully into effect only after 1991, at a cost of \$0.9 billion on a full fiscal year basis. Grady incorporates the indexation of OAS/GIS payments from the second quarter of 1991 (for a use of funds of approximately \$0.2 billion) and excludes the other indexation offsets, which will not take effect until 1992.

Grady then compares his income distribution findings for an incomplete GST package in its transitional year with the income distribution findings of the Department of Finance for the complete package in a full fiscal year.<sup>13</sup> He concludes from this comparison that, "Canadian families will experience a net decrease of nearly \$4.6 billion in consumable income in 1991 as a result of the adoption of the GST package."<sup>14</sup> I have shown that it is Grady's

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<sup>12</sup> Grady presents the distributive impact of his GST package in table 3, *supra* footnote 4, at 640. There are two puzzling aspects to these findings. First, table 3, which provides the components of the estimated impact of the GST package by total income group, is incomplete. Unfortunately, for every income group except \$150,000 and above, the sum of the average increase in the sales tax credit, the average increase in income taxes, and the average increase in commodity taxes does not equal the average change in consumable income. Some non-trivial component has been left out.

Second, for the \$0-\$10,000 income group, the average *decrease* in consumable income of \$29 per family translates into an average percentage *increase* in consumable income of 0.6 percent per family. I initially thought that this counterintuitive result was a typographical slip, but apparently it is a "mathematical result" that occurs because of the way in which the statistical program calculates the average percentage change in consumable income per family (*supra* footnote 11, at 942). I do find it difficult to attach any policy relevance to the observations that (1) on average each family is *worse off* by \$29 and (2) on average each family is *better off* by a 0.6 percent increase in consumable income. One can make a stronger case to policy makers if one can explain one's empirical findings in an intuitively appealing way.

<sup>13</sup> *Goods and Services Tax*, *supra* footnote 5, at 33-35.

<sup>14</sup> *Supra* footnote 4, at 637.

methodology, not the GST package, that generates most of this reduction in consumable income.<sup>15</sup> Grady's comparison of the impact effects of the indexation offsets with their full fiscal year effects accounts for the fact that his uses of funds are less than the amount in table 1 by \$0.7 billion. Canadian families will not experience a net decrease in consumable income of \$4.6 billion in 1991; they may experience a decrease of \$0.7 billion, which will vanish in 1992.

The purpose of an impact study of the GST package's distributive effects for 1991 is different from the purpose of a study of the distributive effects of a fully mature sales tax reform on a full fiscal year basis. It is important to keep this point in mind in comparing the results obtained by Grady with those obtained by the Department of Finance.

Beyond Grady's attempt to estimate the GST package's 1991 impact effects on the distribution of income and the Department of Finance's estimate of the package's full fiscal year effects on the distribution of income is the question of the package's long-run equilibrium effect on both the level and the distribution of income.<sup>16</sup> The GST package will greatly increase the neutrality of the tax system as a whole, and the resulting efficiency gains to the economy will eventually increase GDP, per capita income, and per capita tax revenues for the given tax structure.<sup>17</sup> These long-run net gains will have some effect on the distribution of income as well. It is to be hoped that some analyst will take up the task of estimating these long-run equilibrium distributive effects.

The second issue, which is inextricably linked with the first, is tax incidence. What assumptions about tax incidence should one use in estimating the distributive effects of a policy change? There are different models of tax incidence, and a given model may produce different conclusions for short-run incidence and long-run incidence. Moreover, the behavioural adjustments that will lead to a long-run equilibrium may begin fairly early in the impact or short-run phase. For these reasons, I prefer to use a set of tax incidence assumptions that reflects a longer-run equilibrium solution. Even if one uses an impact set of tax incidence assumptions, it is useful to complement it with some discussion of tax shifting through a longer period.

<sup>15</sup> The omissions discussed above account for an underestimation of revenue uses of \$4.7 billion and an underestimation of revenue sources of \$0.9 billion. If one adds to the calculation the difference between the impact effects and the full fiscal year effects of the GST package, the result is a net underestimation of uses of funds of \$4.5 billion.

<sup>16</sup> The government's GST package will result in a long-run increase in real potential output of approximately \$9.0 billion. See, for example, Canada, Department of Finance, Budget Papers, *The Goods And Services Tax*, April 27, 1989, 16; and *Goods and Services Tax: Technical Paper*, supra footnote 5, at 33-37; *Goods and Services Tax*, supra footnote 5, at 4-6; and Bob Hamilton and Chun-Yan Kuo, *The Goods and Services Tax: A General Equilibrium Analysis*, Working Paper 89-3 (Ottawa: Department of Finance, Tax Policy and Legislation Branch, 1989).

<sup>17</sup> Given that the current federal tax structure is approximately 17 percent of GDP, the long-run increase in potential output would generate additional revenues of \$1.6 billion.



For example, consider the longer-run incidence of a tax on investment goods that is initially paid out of profits. If the supply of capital stock is inelastic, or if its response to tax changes is very slow, then the tax may fall on profits in the longer run as well (case 1). Alternatively, if capital mobility is greater than labour mobility, and if prices are determined on international markets, then the tax on investment goods may eventually result in a fall in the wage rate relative to the return on capital, in which case the tax will fall in the longer run on labour income (case 2). Finally, if capital and labour are both fairly mobile and prices are determined primarily in domestic markets, the tax may in the longer run result in an increase in product prices relative to factor incomes; that is, the tax may fall on consumption expenditures (case 3).

The income distribution effects of any one of these three models of tax incidence for a tax on investment goods would be very different from those of the other two. Thus the removal under sales tax reform of the MST on investment goods might benefit the owners of businesses in proportion to their profits earned (case 1, as Grady assumes), labour in proportion to labour income (case 2), or consumers in proportion to consumption expenditures (case 3, as the Department of Finance assumes<sup>18</sup>). Given the extent to which assumptions about tax incidence can vary, it is possible that the actual income distribution effects of the GST package are very different from Grady's precise estimates.

An important advantage of the SPSP/M is that it allows one to estimate, with relative ease, the distributive implications of alternative assumptions. One can then compare the results of this exercise with the results of studies that use different simulation models to estimate the distributive effects of the same policy proposal.

It is through a sensitivity analysis along these lines that one can determine if there are differences in the distribution of income effects, though the question of how to determine when the observed differences are significant for policy purposes is still unresolved.<sup>19</sup> Without some such sensitivity analysis, however, this question will not even be raised, and policy makers may be misled into believing that the distributive impact of a tax policy change is known with much greater certainty than it is.

A third theoretical issue with practical implications for policy makers who are concerned about the distribution of income is the definition of income and the choice of the appropriate income base. Income is the variable that is used to rank families and to group them into low, middle, and high income ranges. Income is the welfare measure that is used to compare the average

<sup>18</sup> This is my interpretation of the Department of Finance assumption for a fully implemented GST system. See *Goods and Services Tax: Technical Paper*, supra footnote 5, at 43-44 and *Goods and Services Tax*, supra footnote 5, at 21-22.

<sup>19</sup> For two contrasting views on this issue see supra footnote 1, at 671 and 680-81; and Denis Normand, Gilbert Hawley, and W. Irwin Gillespie, "In Search of the Changing Distribution of Income During the Post-War Period in Canada and the United States" (December 1983), 38 *Public Finance* 267-81.

family within each income range with the average family within each of the other income ranges.

Grady does not define income. He does define consumable income as "income, including transfer payments, less all direct and indirect taxes."<sup>20</sup> The direct and indirect taxes that are deducted from total income in the SPSPD/M account for just 50 percent of total Canadian taxes.<sup>21</sup>

Grady implicitly adopts the definition of total income in the SPSPD/M. This definition derives from *The Survey of Consumer Finances (SCF)*,<sup>22</sup> Statistics Canada's major source of data on the distribution of income for families and individuals. The *Survey* includes most sources of money income, such as, wages and salaries, net income from self-employment, dividends, interest, rental income, net farm income, and government transfer payments. It does not, however, include all sources of command over resources that increase the welfare of families. It excludes inheritances, net capital gains, retained earnings of corporations, food and fuel grown and consumed on the farm, and the imputed rent of owner-occupied homes. Yet all of these items are sources of welfare: they improve the economic position of families that receive them relative to the position of families that do not.

The definition of income should be broadened to include these sources of welfare, especially when the focus of the empirical investigation is a comparison of families with different levels of well-being or income. The distribution of this broadly defined income base would be different—and, possibly, significantly different—from the distribution of total money income.<sup>23</sup> Grady's methodology, like the methodology in much other work in this area, does not take these additional sources of welfare into account.<sup>24</sup>

Even this broader income concept, in my view, falls short of being an appropriate income base for studies that attempt to estimate the incidence of taxes and the effects of major tax or transfer reforms on the distribution of income. The problem is how to define income (or welfare) in a model that includes a government. The government (1) applies taxes that reduce the money incomes of families, (2) provides transfer payments that increase the money incomes of families, and (3) finances the provision of public goods and services (such as national defence, highways and streets, medicare

<sup>20</sup> *Supra* footnote 4, at 637, 639, and 640.

<sup>21</sup> *Supra* footnote 2, at 58: "The SPSPD/M . . . omits taxes related to capital, including corporate income taxes and employer (but not employee) contributions to payroll taxes. . . . many provincial and all municipal taxes. . . . [T]he model does account for over 60 percent of the National Accounts estimate of total federal and provincial direct and indirect taxes, which represents about half of all government revenues."

<sup>22</sup> Statistics Canada, *Income Distributions by Size in Canada*, catalogue no. 13-207.

<sup>23</sup> This was found to be the case for grouped data in W. Irwin Gillespie, *The Redistribution of Income in Canada*, Carleton Library Series no. 124 (Toronto: Gage Publishing and Carleton University Press, 1980), appendix A, table 4.

<sup>24</sup> I doubt whether the Department of Finance took these excluded sources of income into account in estimating the distribution of income effects. *Goods and Services Tax*, *supra* footnote 5.

and other health services, and education services, among many other things), all of which increase the welfare or imputed incomes of families. Consequently, the income of a family in a model that includes a government—a post-fisc income measure—should be defined as money income less taxes plus transfers plus the imputed value of government goods. The corresponding income of a family in a model that does not include a government—a pre-fisc income measure—should be defined as money income received as a factor of production.

These two income concepts, although they are not widely accepted in the tax incidence literature,<sup>25</sup> do have the advantage that they treat government consistently: it is either all in the model or all out of the model. Income in the *Survey* data is money income plus transfers: part of the government is in. Consumable income in the SPSD/M and in Grady's study is money income plus transfers less half of the taxes: more of the government is in the model. This definition is an improvement over money income plus transfers, but it is still a long way from being an income concept that incorporates all government. What does it mean to have a model in which a large chunk of the government does not exist—namely, half of the taxes and all of the government spending on goods and services?

The information requirements for an estimation of the post-fisc distribution of income are formidable, but such an estimation can be made.<sup>26</sup> If I understand the SPSD/M correctly, it can be extended to accommodate excluded sources of income, other sources of income in kind, the imputed values of government services, and the effects of taxes not now incorporated in the model. The extended model could then be used to estimate the post-fisc distribution of income in Canada. It is this measure of income that truly measures how well off each family in the database is compared with other families. And it is this distribution of post-fisc income, in my judgment, that should be the starting point for future attempts to estimate the distributive impact of a major policy change.

## CONCLUSIONS

Grady's article is neither an impact study for 1991 nor a longer-run full fiscal year study of the effects of the GST package on the distribution of income. The analytical problems and omissions in the methodology, especially the inappropriate treatment of \$4 billion in revenue from the MST on investment goods, result in the creation of a tax burden where no tax burden exists. This fictitious tax burden accounts for (1) \$4.5 billion of Grady's estimated \$4.6 billion reduction in the consumable income of Canadians during 1991, (2) virtually all of his estimated reduction of \$406 in average consumable income

<sup>25</sup> For two contrasting views on the appropriate conceptual income base see *supra* footnote 1, at 671-74 and *supra* footnote 23, at 17-29.

<sup>26</sup> *Supra* footnote 23 and W. Irwin Gillespie, *The Incidence of Taxes and Public Expenditures in the Canadian Economy*, Studies of the Royal Commission on Taxation, no. 2 (Ottawa: Queen's Printer, 1966).

per family, and (3) a substantial portion of his estimated reduction in consumable income per family for each income group in the distribution of income. Therefore, no meaningful policy conclusions can be drawn from Grady's empirical estimates.

Several theoretical issues associated with income distribution analysis require closer examination than Grady gives them. The distinction between the impact effects, full fiscal year effects, and the longer-run equilibrium effects of a change in tax policy is essential to any determination of the effects of the change on the distribution of income. A small part of the reason why Grady's estimates of the effects of the GST package differ from the Department of Finance's estimates is that the two sets of estimates refer to different time frames.

Grady does not carry out a sensitivity analysis to test for the effects of alternative tax incidence theories, an omission that implies that it is possible to identify the distributive impact of a major policy change such as the GST package with considerable precision, whereas in fact it is not possible. Finally, Grady fails to consider the importance in any attempt to measure the distribution of income of choosing an appropriate definition of income.

These theoretical issues, which are still unresolved in the literature, have practical implications for policy makers. It is to be hoped that future attempts to estimate the effects of a major policy change on the distribution of income will consider them more fully.