From theory to practice: Canadian economists' contributions to public finance

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Abstract. We survey Canadian economists' contributions to the field of public finance from the mid-1980s to 2016. We highlight the development and extension of the models and tools of public economics and the empirical studies that have deepened our understanding of the efficiency and distributional issues over a wide range of public finance issues. We also highlight contributions to the development of policies through commissioned reports and the important role that Canadian institutions—the Canadian Tax Foundation, the think tanks and the federal and provincial departments of finance—have played in shaping tax and fiscal policies.

Résumé. De la théorie à la pratique : contributions des économistes canadiens à la finance publique. On examine les contributions des économistes canadiens au domaine de la finance publique du milieu des années 1980 à 2016. On souligne le développement et l'extension des modèles et des outils d'économie publique, et les études empiriques qui ont aidé à approfondir notre compréhension des enjeux d'efficacité et de distribution dans un vaste éventail de questions de finance publique. On souligne aussi les contributions des rapports commandités au développement de politiques publiques, ainsi que le rôle important d'institutions canadiennes - l'Association canadienne d'études fiscales, les groupes d'experts, ainsi que les ministères des finances du gouvernement fédéral et des gouvernements provinciaux - dans le design des politiques fiscales.

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1. Introduction

This survey of Canadian economists' contributions to the field of public finance covers the period from the mid-1980s to 2016. We cover both older and more recent contributions—although it is harder to characterize the impact of newer work since the revealed preference of the profession has not yet been expressed

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through subsequent citations and extensions. Our theme is “from theory to practice,” which is how we see the evolution of research and policy applications in the field of public economics over the last 30 years.

“The early 1970s saw many important contributions to the theory of public finance.” Examples include Mirrlees’ (1971) model of optimal income tax, the Diamond and Mirrlees (1971) model of optimal commodity taxation, the Atkinson and Stern (1974) model of optimal provision of public goods financed by distortionary taxation, the Atkinson (1970) measure of income inequality and Barro (1974) on debt financing. The development of tools to analyze issues in public finances included the Diamond (1965) overlapping generations model, the Shoven and Whalley (1984) development of computable general equilibrium models with applications to public finances and the Harberger (1971) analysis of the deadweight loss of taxation. These are some of the key innovations in the 1970s that established the research agenda for public finance economists in Canada and throughout the world and influenced the economists’ approaches to key tax and expenditure policy issues.

The 1980s saw further refinements of these basic models and tools, and extensions of the “theory” continue to the present day. But a notable development has been the application of these models and tools in empirical work and in the development of tax and expenditure policies. One might say that public economics has matured in the last three decades, with more emphasis on detailed extensions of models and empirical applications of the models to help inform fiscal policies.

However, new areas of research and policy have also emerged since the 1970s, including more emphasis on open economy issues and international taxation, fiscal federalism, pension and retirement policies, income inequality and redistribution and political economy.

In the 1990s and 2000s, two dominant trends swept over public finance around the world. First, the empirical revolution in economics (documented by Hamermesh 2013) also influenced public finance. The emphasis of applied empirical work has focused on estimating the response to public policies and aiming to uncover policy-relevant elasticities. Second, public finance theory reconnected to the empirical side with a new theoretical emphasis on developing models that hinged on “sufficient statistics” (Chetty 2009) that could be calculated or estimated from available data. This trend on the theory side naturally gelled with the growing availability of relevant estimates on the empirical side.

In this survey, we highlight some of the contributions of Canadian economists in the development and extension of the models and tools of public economics and the empirical studies that have deepened our understanding of the efficiency and distributional issues over a wide range of public finance topics. Evidence of the high quality and relevance of Canadian public finance research is that 14 of the 23 Purvis Prize winners since 1994 have been public finance economists. We also want to highlight some of the contributions that Canadian economists have made to the development of policies through commissioned reports and the important role that Canadian institutions—the Canadian Tax Foundation, the think tanks and the federal and provincial departments of finance—have played in shaping tax and fiscal policies in Canada over the last 30 years.

Finally, we celebrate the contributions that three prominent public finance economists have made, not only to tax and fiscal policy in Canada but also as recognized leaders throughout the world in the development of the theory and practice of public finance—Richard Bird, Robin Boadway and Jack Mintz.

2. Optimal taxation and the provision of public goods

As noted in the introduction, fundamental contributions to the theory of optimal taxation where made in the early 1970s by Diamond, Mirrlees, Atkinson, Stern, Dasgupta and Stiglitz. In the 1980s, Canadian economists made contributions to the interpretations and applications of the theory of optimal income taxation, especially Weymark (1986, 1987) and Boadway and Keen (1993). The 1990s saw extensions of the basic optimal income tax model, beyond labour supplies that are sensitive to after-tax wage rates and self-selection constraints, to include broader labour market issues including occupation choice, Boadway et al. (1991) and job search, Boadway and Cuff (1999). Taxation of families has also become a more prominent topic in public finance literature with Canadian contributions to the theory by Boadway et al. (2002) and Brett (2007).

Robin Boadway's Munich Lectures in Economics, *From Optimal Tax Theory to Tax Policy*, was delivered in at the University of Munich in 2009 when he was honoured as a Distinguished CES Fellow. The lecture, later published in Boadway (2012), is a vindication of optimal taxation theory from the allegation that it had little influence on tax policy analysis and reforms over the last 40 years. Boadway draws on his extensive contributions to optimal taxation theory, some of which are noted above, and argued that the widespread adoption of VAT systems, the shifts from the personal income tax base towards a personal expenditure base, the Nordic countries' dual income taxes and the shift from universal transfer programs to targeted refundable tax credits are examples of tax policies that have been justified and supported by optimal taxation theory. While providing a stout defense of the relevance of optimal taxation theory, Boadway also acknowledged the limitations of the optimal income tax framework and suggested areas for further research that would make the optimal tax framework even more relevant for policy analysis and reform.

3. Fiscal federalism

Canada is the most decentralized federation in the world because the provincial and municipal governments' have extensive tax and expenditure powers and responsibilities. As such, fiscal federalism has always been a central concern for Canadian economists. However, since the 1970s, the increase in oil and gas prices, with the consequent increase in revenues for the resource rich provinces and the resulting horizontal fiscal imbalances, as well as the desire in Quebec for fiscal independence (and for some, complete sovereignty), made federalism issues even more prominent. Fiscal federalism issues also emerged in Eastern Europe in the 1990s with the break up of the Soviet Union and the desire for a more decentralized form of government than had prevailed in the communist regime. Furthermore, there was an increase in interest in decentralizing fiscal powers in many developing countries, such as Brazil and South Africa. With our long experience in making decentralized government work, Canadian economists were well placed to provide policy advice on fiscal federalism to the international community. A Canadian economist, Anwar Shah at the World Bank, was instrumental in promoting decentralization of fiscal powers in developing countries and drawing on the Canadian experience and Canadian economists to provide analysis and advice on a range of federalism issues. See, for example, Shah (2006). The Boadway and Shah (2007, 2009) books are the product of the collaborations between a key figure in the World Bank and the leading public finance economist in Canada.

A key paper in the fiscal federalism literature from the 1980s is Boadway and Flatters (1982), which concerned the potential for inefficient allocations of labour if provincial governments have access to source-based revenues, such as oil and gas royalties. The paper established a coherent efficiency argument for federally financed equalization transfers to some provinces. This paper spawned a large body of literature on fiscal policies with regionally mobile populations. Prominent among these were the papers by Myers (1990) and Mansoorian and Myers (1993) in which regional governments have an incentive to make interregional transfers to achieve their desired populations levels. The resulting population allocations are efficient and there is no efficiency role for transfers from central governments as in the Boadway and Flatters model. Empirical studies of interprovincial population mobility in Canada between 1974 and 1996 by Day and Winer (2006, 2012) found that unemployment insurance system may have affected interprovincial migration in the Atlantic region; the resulting flows were too small to have altered regional unemployment rates.

The renewed theoretical and policy interest in the equalization program and intergovernmental transfers generally spawned both theoretical literature on the efficiency arguments for equalization transfers, including Dahlby and Wilson (1994). Smart (1998) has become a standard reference on the recipient provinces' incentive to impose higher tax rates when equalization grant formulas are based on per capita tax bases. In a subsequent paper, Bucovetsky and Smart (2006) qualified the implication of efficiency losses from equalization transfers when there is tax competition among subnational governments. In this context, equalization transfers may offset the bias toward low tax rates caused by tax competition. Albouy (2012) makes two main contributions to the theory of equalization transfers in the context of the Boadway and Flatters model. His model indicates that federal transfers should be higher in regions where federal tax payments are higher because productivity and wage rates are higher in those regions. The second major contribution is that his model shows that differentials in the regional governments' fiscal capacities with respect to residence-based taxes, such as sales and personal income taxes, should not enter the formula for the optimal federal transfers; only the differentials in the source-based taxes levied by regional governments are relevant, with higher federal transfers to individuals in regions where the regional governments' source-based taxes are lower. However, unlike the equalization grants that are actually made by the Canadian federal government, and other central governments around the world, the transfers in the Albouy model are made to individuals based on their region of residence and personal characteristics and not to the regional governments that levy taxes and provide public services.

Econometric studies by Baker et al. (1999), Snodden (2003), Cyrenne and Pandey (2015) and Ferede (2016) have investigated the effects that federal transfers on the provincial governments' fiscal policies. For example, Cyrenne and Pandey find that the equalization program reduces productivity-enhancing expenditures by recipient provinces and Ferede finds that the equalization program created an incentive for recipient provinces to raise their business and personal income tax rates.

The nature and implications of tax competition among subnational governments was another important development in the fiscal federalism literature, following the classic papers by Zodrow and Meskowski (1986) and Wilson (1986). Bucovetsky (1991, 2005, 2009) and Bucovetsky and Wilson (1991) developed important models of tax competition, especially with respect to tax competition between jurisdictions of different sizes. Subsequent empirical studies of tax rate setting by the provincial governments by Hayashi and Boadway (2001) and econometric studies by Mintz and Smart (2004) and Department of Finance Canada (2015) have shown that the provincial corporate tax bases can be highly sensitive to differences in provincial CIT rates.

The tax competition literature from the mid-1980s focused on the horizontal fiscal externalities between subnational governments that arise when their tax bases are mobile and they purse different tax and expenditure policies. Somewhat surprisingly, the interdependence of the tax bases of different levels of government did not play a prominent role in the 1980s models of fiscal federalism. These vertical fiscal externalities are especially important in Canada because both the federal government and the provinces independently set tax rates on the main income, sales and excise tax bases. Boadway and Keen (1996) and Dahlby (1996) developed models of the implications of these vertical tax and expenditure externalities for the optimal direction and form of the fiscal transfers between levels of government. The implications of these vertical fiscal externalities for tax and expenditure policies were further developed by Boadway et al. (1998) and Dahlby and Wilson (2003), with important implications for the financing of productivity-enhancing activities, such as education and public infrastructure, in a federation.

4. Municipal finances

Municipal governments play a huge role in the daily lives of Canadians through the provision of basic services and infrastructure, and yet municipal fiscal issues have, until recently, received much less attention than those at the federal or provincial level. Over the last 20 years, major contributions to understanding of municipal fiscal issues, and especially the important role that property taxes play in financing local government, have been made by Kitchen and Slack (1993, 2003) and Kitchen (2002, 2006). An empirical study of property tax rate setting by BC municipalities by Brett and Pinkse (2000) concluded that municipal governments respond to tax changes in neighbouring jurisdictions, but that tax competition is relatively weak. They also found that municipal tax rates are affected by the tax rates imposed on the same base by super-municipal bodies, which is evidence of a vertical tax externality.

Another example of "from theory to practice" is *A Tale of Two Taxes*, by Bird et al. (2012), which analyses the impacts of property taxes reforms in Ontario. Among other issues, they describe the unintended consequences of the 1998 Ontario property tax reform, which they argue has resulted in a more complex, and less transparent, system of taxation than the preceding system. The authors also investigate whether the property tax can be used to finance more spending or whether it has been "tapped out" as a source of revenue. Although the study found that the responsiveness of the property tax base to property tax rates varies a good deal across municipalities, in general they found that municipalities were on the upward sloping sections of their property tax revenue Laffer curves, i.e., higher property tax rates generate more tax revenue. Of course, that does not mean that the property tax rates should be increased but only that more revenue could be generated through higher tax rates. They consider the very high effective property tax rates on commercial and business properties to be highly distortionary. The authors proposed the equalization of municipal tax rates on non-residential and residential properties, combined with the elimination of the provincial education property taxes, reforms that merit consideration in other Canadian provinces, such as Alberta.

As mayors across the country have lamented their lack of fiscal powers to deal with the alleged municipal infrastructure "deficits," more attention is being paid to local government in recent years. Kitchen and Lindsey (2013), Bazel and Mintz (2015) and Tassonyi and Conger (2015) analyze the ability of municipalities to finance public infrastructure and framework for evaluating the need for current and future levels public infrastructure spending. The budget documents and financial reports of Canada's largest cities are now regularly reviewed in report cards published by the C.D. Howe Institute. See Dachis et al. (2016) for the most recent report card.

5. International taxation

Since the 1970s there has been much greater emphasis on international taxation issues because of greater capital mobility among countries, the growing importance of intra-firm trade in intermediate goods and services, foreign direct investment and free trade agreements. With these trends, economists have placed more emphasis on open economy models to understand the efficiency and distributional effects of taxes, especially corporate income taxes. Arguably, the open economy models and empirical evidence on the tax sensitivity of foreign direct investment has had a major influence on tax policies, including the dramatic decline in statutory and marginal effective tax rates in Canada and many other countries.

Understanding the interactions of the tax systems of Canada, the US and other countries has been a major challenge for the economics profession. Issues such as exemptions on foreign source income under a territorial system and credits for foreign taxes under a worldwide system, the deferral of tax on repatriated dividends and withholding taxes on interest, dividends and royalties, affect incentives for domestic versus foreign investments by multinational corporations. Jack Mintz has been a major contributor to analysis of the international taxation system, including the implications of these provisions for investment incentives and how profits can be shifted through transfer pricing and debt placement among the foreign subsidiaries of multinational corporations. Some of his contributions include Leechor and Mintz (1993), Elitzur and Mintz (1996), Altshuler and Mintz (1996), Mintz (2004a) and Mintz and Weichenrieder (2010). Steven Clark, working first at the Department of Finance and then as Head of the Tax Policy and Statistics Unit in the OECD Centre for Tax Policy and Administration, has also been a major contributor to the analysis of effective tax rates on investment in Clark (2000) and OECD (2001, 2007). Mintz has also provided analysis and advice on tax harmonization in the EU in Mintz and Weiner (2003) and Mintz (2004b). In a rather provocatively titled of paper, In Praise of Tax Havens, Hong and Smart (2010) consider the possibility that tax havens may benefit developed countries by reducing the tax burden on, and therefore increasing the level, of FDI. They conclude that fears of a "race to the bottom" in corporate tax rates may be exaggerated.

There have been fewer econometric studies of the implications of foreign and domestic tax policies on foreign direct investment in Canada than in other countries because of the limitation of the FDI data collected Statistics Canada. However, one important Canadian study is Jog and Tang (2001), which found that the debt–asset ratios of US controlled corporations operating in Canada increased substantially from 1984 to 1994, a period in which Canada went from being a relatively low-tax country to a high-tax country vis-a-vis the US. Smart (2011) is an innovative study of the effect on outbound FDI of switching from a credit to an exemption system. In recent years, the United Kingdom and Japan have switched from using a worldwide basis for levying tax, with a credit for foreign tax paid up to the domestic level, to a territorial system that exempts active business income of foreign subsidiaries. There is a strong interest in determining whether a country's use of the exemption or credit system affects FDI, especially with proposals in the US to switch to a territorial regime. Smart (2011) used the change in the Canadian tax treatment of countries with which we have tax treaties, and where the exemption system applies, and non-treaty countries, where the credit system applies, to examine the impact on Canadian outward FDI, and found that outbound FDI from Canada increased 79% to countries that signed tax treaties with Canada.

6. Inequality and redistribution

Over the last 30 years, the dominant trend in the pre-tax income distribution in Canada has been an increasing concentration of income at the top. Middle incomes shrank for 15 years until 1995, then have rebounded since to recover lost ground. Much of the work in documenting these trends requires detailed microdata, access to which has emerged only over the last two decades. Frenette et al. (2007), contrast the 1980s and 1990s. Their work emphasizes that most of the action has been at the tails of the income distribution rather than the middle. This is consistent with the findings of Lu et al. (2011). At the bottom end of the income distribution, Osberg (2000) documents trends in Canadian income poverty, while Pendakur (2001) looks at consumption poverty. At the high end, Saez and Veall (2005) and Veall (2012) focus on the top of the income distribution, documenting the increase in income concentration among the highest earners. Fortin et al. (2012) provide a detailed portrait of those in the top 1% of the income distribution, and this work was refined and extended in Lemieux and Riddell (2016). Wolfson et al. (2016) show that accounting for private corporation income among high earners adds substantially to the level and trend of high income concentration.

Of course, public finance economists also focus their efforts to understand what impact the tax system can have on the ultimate post-tax distribution of income and welfare. In his 1984 Innis Lecture, John Whalley presents a full fiscal incidence analysis of Canada's tax system in the style of Pechman and Ockner (1974) in the US or Gillespie (1980) for Canada. These full fiscal incidence studies attempt to characterize the impact on the distribution of income of the full set of tax instruments, ranging from personal income tax to sales taxes to property tax to corporate taxes. The end goal is to determine the degree of overall progressivity of the tax system.

Whalley's results demonstrated the strong sensitivity of the conclusions about the progressivity of Canada's tax system to the assumptions made about the individual components of the tax system. Whalley—with justification—decried the weak quality of the data then available and predicted a strong future for the analysis of tax inequality with better data because of its importance to policy decisions:

> I therefore see tax incidence calculations as continuing to tax the minds and energies of public finance economists for some years to come. At the same time, I view activity of this form as an integral part of a healthy policy process, since, even if policy debates remain unresolved in any definitive sense, at least they take place on a higher level.

There was indeed more work on broad tax incidence over the next 20 years—including Vermaeten, Gillespie and Vermaeten (1994, 1995), Ruggeri et al. (1994), Kesselman and Cheung (2004, 2006) and Dyck (2005). In broad strokes, these papers find a central role for the personal income tax in contributing to progressivity of the overall fiscal system. However, as Whalley found in 1984, the conclusions about overall tax progressivity remained generally sensitive to assumptions about the incidence of the individual tax components.

Whalley's prediction came true in the sense that better data did drive more and better research on the questions of tax incidence. But instead of relying only on the overarching incidence studies listed above, research has trended toward studying the fiscal incidence of particular parts of the tax system. As better micro-data has become more readily available to researchers, detailed studies of particular aspects of the tax system have become more common.

Several studies have focused on the personal income tax system, with varying degrees of inclusion of personal transfers. Frenette et al. (2009) find that the tax and transfer system became more progressive in the 1980s, but fell back in the 1990s. Similarly, Heisz (2007) found that redistribution did not increase enough by 2004 to counteract the rise in market income inequality. Department of Finance (2012) analyzes the distributional impact of the federal personal income tax based on taxation data for 2008, finding that the federal personal income tax is progressive. More importantly, it shows that the federal personal tax/transfer system means that the bottom 30% of the income distribution have negative effective tax rates because they receive more in refundable federal tax credits than they pay in income tax. Heisz and Murphy (2016) take a recent look at the long-run trends, finding important roles in reducing inequality at the low-end of the income distribution for both taxes and transfers. Finally, Milligan (2013; 2016) documents the progressivity of the personal income tax and refundable credits over the last 50 years, finding more redistribution at the bottom driven by the expansion of refundable credits—but less redistribution at the top of the income distribution across the decades.

A few papers have examined the distributive properties of other elements of the tax system. Whalley (1997) looks at corporate taxes, finding that the impact on the income distribution depends critically on assumptions about the characteristics of the firm and international capital mobility. Bird and Smart (2016) look specifically at the Goods and Service Tax. Using household expenditure data, they find, perhaps counterintuitively, that sales and excise taxes are not as regressive as often assumed.

Finally, some recent research has focused on the limits of the personal tax system in redistributing income. Sillamaa and Veall (2001) use the 1988 tax reform to estimate a taxable income elasticity, looking at the sensitivity of reported income to tax rates and find that reported income to be very elastic. Finance Canada (2010) and Milligan and Smart (2015) study the elasticity of taxable income for high earners using provincial-level variation in tax rates. Both of these papers find—at least at the provincial level—substantial sensitivity of reported income to top tax rates, with this responsiveness concentrated among those in the top 1% of earners. Dahlby and Ferede (2012) look at provincial tax base elasticities across corporate, sales and personal tax bases. They find substantial elasticities—especially for provincial corporate taxation.

7. Pension policy

Research on pensions and pension policy over the last 30 years has focused on three issues: first, documenting and estimating the importance of the incentives on savings and retirement behaviour; second, many researchers have looked into the distribution and poverty alleviation brought about by pension programs; and, third, a host of policy papers have analyzed and proposed reforms to Canada's system of public pensions. We review each of these topics in turn.

Under many pension plans, continued work by employees adds to the size of the eventual pension received when retired. These pension accruals can vary substantially, depending on the pension rules, actuarial adjustments for delayed retirement and taxes. A series of papers has documented the impact of pensions on incentives and retirement behaviour from employer-sponsored defined benefit pensions, for example, Pesando and Gunderson (1988, 1991), Pesando et al. (1992), Gunderson et al. (1992ab) and Schirle (2008, 2010). In general, these papers find that defined-benefit rules can have a substantial impact on retirement incentives, and that the labour supply behaviour of older workers is responsive to incentives.

A parallel body of research has examined the retirement impact of public pensions in Canada, including the Canada–Quebec Pension Plan, Old Age Security, and the Guaranteed Income Supplement. Baker and Benjamin (1999ab) look at early retirement provisions in the Canada and Quebec Pension Plans, while Baker (2002) examines the introduction of the Spouse's Allowance. Putting all of these programs together into one pension incentive measure, Baker et al. (2003) find that both the level and the accrual pattern of public pensions matter for retirement decisions for Canadians. Milligan (2005a) and Milligan and Schirle (2008) focus on the incentive effects of the interactions among the public programs. Finally, Milligan and Schirle (2016a) update this work on pension incentives and retirement by incorporating disability insurance alongside the pension incentives.

Another focus for research has been on the impact of taxation on savings. The economic issues and tax institutions in Canada are surveyed in Beach et al. (1988) and Burbidge and Davies (1994). Theoretical contributions on the role and impact of tax-preferred savings were offered by Ragan (1994) and Burbidge (2004). Looking at the impact on household savings, Sabelhaus (1997) looked at aggregate data on RRSP and savings, while Engelhardt (1996) studied Registered Home Ownership Savings Plans. Looking directly at contributions to RRSPs, Veall (2001) finds no impact of tax rates on contributions while Milligan (2002) finds an impact of tax rates on the decision to contribute.

The second topic in pension policy to consider is the impact on income distribution and poverty. A long-run analysis is provided in Milligan (2008) and Baker and Milligan (2009). Schirle (2013) extends this work further and provides decomposition analysis to explain poverty patterns. Finnie et al. (2013) study the dynamics of lower-income seniors after age 65, finding evidence that the oldest seniors do suffer from failing own-income sources as they hit older ages—especially surviving females. Another strand to the income adequacy literature is the estimation of replacement rates—what percentage of work-life earnings are replaced by different sources of retirement income. These calculations require detailed longitudinal microdata, which has become available only in recent years. Three recent papers have contributed in this way: LaRochelle-Côté et al. (2010), Ostrovsky and Schellenberg (2010) and Denton et al. (2011). These papers all find that replacement rates are high among low earners, driven mostly by public pensions. Signs of weak replacement rates among middle earners without workplace pensions were found. This information was vital to the debate over Canada Pension Plan expansion in the years that followed.

The third and final topic to consider is the research that was directly related to public pension reform in Canada over the last 30 years. There were two major rounds of Canada/Quebec Pension Plan reform, in the mid 1990s and from 2010 to 2016. The 1990s round of reform led Pesando (1997) to write a framework for privatizing the Canada Pension Plan, along the lines of the Chilean individual account-based system. More recently, several papers contributed reform options as expansion of the Canada Pension Plan was being considered by provincial and federal governments. Broad perspectives on the potential need for expansion was provided by Horner (2009) and Baldwin (2009). Kesselman (2010) surveyed several options for expansion of the Canada Pension Plan. Wolfson (2013) introduced the 'Wolfson Wedge' proposal, which targeted the expansion to middle and upper earners. Milligan and Schirle (2014) simulated the replacement rates of several proposals; the same authors in Milligan and Schirle (2016b) simulated and analyzed the impact of the enacted reform option arrived at by the nation's finance ministers in 2016.

8. Political economy

As noted in the introduction, models that predict how politics shapes government tax and expenditure policies have become much more prominent in the literature on public finances since the 1980s. Stanley Winer has been a leading exponent of the importance of incorporating public choice models into the arsenal of tools that economists use to evaluate and advise governments on fiscal policy issues. Hettich and Winer (1988, 2005) developed models in which governments adopt tax policies to maximize expected voter support. They argue that essential features of tax systems that depart from those derived under normative models of tax policy, are the predicted outcome of the pursuit of self-interest on the part of both voter and politicians. An interesting application of the political economy framework to Canada is Winer and Hettich (1991), which explains the development of revenue structure in Canada from 1871 to 1913, a period when major revenue sources consisted of the tariff, debt and excises. Another study of the effects of electoral politics in Canada is Kneebone and McKenzie (2001), which examines the fiscal policies of provincial governments and finds that provincial governments regardless of political orientation avoid tax increases in election years and that the electoral cycle also influences public expenditures.

A major contribution to theory of public choice is Gans and Smart (1996), while Besley and Smart (2007) explores the welfare implications of fiscal restraint in a model where politicians may be either corrupt or honest, and corrupt incumbents can escape detection if their level of corruption is not too high. They conclude that whether fiscal restraints are in fact desirable depends on the balance between its effect on the selection of honest or corrupt politicians and the discipline that it imposes on the latter.

9. Other contributions to the theory and practice of public finance

There are contributions by Canadian economists and Canadian institutions to the theory and practice of public finance that are not easily slotted into the seven areas that we have highlighted in the above sections. Here we want to highlight at least some of them.

Two important advances in tax policy analysis has been the measurement of the marginal effective tax rates (METRs) on investment. Major advances in the modelling of the METRs were made by Boadway et al. (1984), Boadway et al. (1987), McKenzie et al. (1997) and McKenzie (2008). As result, METRs have become a standard tool to measure the distortionary effects of taxation. These METRs are widely used by governments and analysts for tax policy analysis. Mintz and his co-authors publish annual estimates of the METRs for the federal and provincial governments in Canada and for over 90 other countries. See for example Bazel and Mintz (2016). Mintz and Chen (2012) and Crisan and Mintz (2016) have extended the METR concept to include the royalties levied on oil and gas production, making it possible to compare oil and gas taxation regimes across provinces, states and countries.

Measuring the effective tax rates is the first step in tax policy analysis. Measuring the behavioural effects of taxes is the next step. As mentioned earlier, important contributions to our knowledge of the responsiveness of personal income bases to tax rates have been made by Sillamaa and Veall (2001) and Milligan and Smart (2015), with the latter study finding that elasticities of taxable income at the provincial level are larger for the top 1% than for lower earners, which has implications for the revenue-maximizing top marginal tax rates. Other prominent studies of the behavioural responses to taxation include Milligan (2005b), which investigated the pro-natalist tax policies in Quebec on fertility rates, Parsons (2008), which found that a 10% reduction in the tax component of the user cost of capital increased the capital stock in the Canadian manufacturing sector by 3% to 7%, and McKenzie and Sershun (2010), which investigated the extent to which R&D tax subsidies and the overall competitiveness of the production tax system affect investment in R&D.

Given appropriately measured effective tax rates and estimates of behavioural responses, the third step in tax policy analysis is to estimate the efficiency cost of raising the tax revenue. Progress has been made in evaluating the deadweight loss or the marginal cost of public funds from taxes in studies by Fortin and Lacroix (1994), Diewert and Lawrence (1996), Dahlby (2008) and Dahlby and Ferede (2011).

In addition to their contributions to public finance through the publication of journal articles and working papers, Canadian economists have influenced public policies as authors of public reports that have been commissioned by governments. Three of the most prominent public reports are briefly noted here. The Technical Committee on Business Taxation was established by the Chretien government in 1996. The Technical Committee's Report (1997), also known as the Mintz Report, provided a comprehensive review of the business tax system in Canada and recommended major reductions in corporate income tax rates. Starting in 2000, federal statutory corporate income tax rates have fallen from 29% to 15% in 2017. Whether or not the Report's recommendation was responsible for this trend, the Report and the background studies it commissioned have provided a trusted source of Canadian research on business taxation and are generally recognized to have influenced business tax policy over the last 20 years. The Expert Panel on Equalization and Territorial Formula Financing was established by the federal government in 2005 to make recommendations on the allocation of the equalization and territorial transfer programs. The Expert Panel's 2006 report, *Achieving a National Purpose: Putting Equalization Back on Track*, widely known as the O'Brien Report, recommended a return to the 10 province standard for calculating equalization entitlement, a reduction in the number of tax bases used to compute fiscal capacities and the inclusion of 50% of resource revenues in the equalization calculations, and these changes were adopted by the federal government.

The Commission on the Reform of Ontario's Public Services was mandated by the McGuinty government to make recommendations on how to reduce the province's deficit by reforming the provision public services including health, education and social programs. The 2012 report, *Public Services for Ontarians: A Path to Sustainability and Excellence,* also known as the Drummond Report, contained a comprehensive set of recommendations for reforming public services in Ontario. The fiscal path subsequently followed by the Ontario government limited the immediate policy impact of the Drummond Report, but its detailed analysis of the broad range provincial programs and recommendations for reforms has provided all Canadian analysts with valuable benchmarks for the evaluation of public expenditure programs.

Although not a government-appointed commission, the Ecofiscal Commission, a group of economists under the leadership of Chris Ragan, has produced influential policy reports on the use of fiscal instruments to deal with environmental problems. Its report, *The Way Forward: A Practical Approach to Reducing Canada's Greenhouse Gas Emissions*, was awarded the Purvis Prize for 2015.

Canadian institutions have played a major role in the contributions that Canadian economists have made to public finance. It is impossible to overestimate the importance of the Canadian Tax Foundation in promoting research and dissemination of information on tax policy and Canadian public finances generally. As it is sponsored by Chartered Professional Accountants Canada and the Canadian Bar Association, the Canadian Tax Foundation enables economists to interact with accountants, lawyers and other tax professionals to incorporate these other perspectives in the analysis of public finance issues. Through the *Canadian Tax Journal*, the *National Finances*—its publication of books and monographs—and sponsorship of conferences, the Canadian Tax Foundation is an independent, non-partisan source of information and analysis and a key institution in the analysis of public policies that many other countries lack.

The other key policy institutions in Canada are the think tanks, which generate a steady flow of tax and fiscal policy analysis from a variety of perspectives. Through the publications and conferences of the C.D. Howe Institute, the Institute for Research on Public Policy, the Fraser Institute, the Canadian Centre for Policy Alternatives and the Macdonald–Laurier Institute, Canadian economists have vehicles for disseminating their research to a wide audience, including policy makers in government, industry and labour leaders, journalists and the general public. These think tanks are an important part of the public finance ecosystem, operating at the top of the intellectual food/policy chain.

Finally, it is important to recognize the important contributions made by economists in Canadian governments in fiscal policy analysis. An important vehicle for the dissemination of information on the implications of tax policies is the annual tax expenditure reports from the Department of Finance. Each year these reports contain tax evaluations and research reports, often utilizing tax administration data that provide detailed insights into the distributional and behavioural impacts of government tax and fiscal policies. For example, the *Report on Federal*

Tax Expenditures 2017 contains evaluations of the Children's Fitness Tax Credit, the Children's Arts Tax Credit and the Goods and Services Tax Credit.[1]

10. Three prominent Canadian contributors to public finance

This review will have conveyed the breadth and depth of Canadian economists' contributions to public finances. Nonetheless we feel that it is important to highlight the contributions by three prominent Canadian economists—Richard Bird, Robin Boadway and Jack Mintz—as internationally recognized contributors to the theory and practice of public finance.

In a distinguished career that has spanned more than 50 years, not only is Richard Bird a major contributor and commentator on public finances in Canada but he also has lectured and published extensively on tax and public finance issues in many other countries, especially in Latin America. As an internationally recognized authority in such areas as tax administration, VAT systems and intergovernmental fiscal relations, he is a well-travelled advisor to governments around the world. His first published paper, "A national tax on the unimproved value of land: The Australian experience, 1910–1952," in the *National Tax Journal* in 1960, shows from the beginning of his career his interest in public finance issues beyond Canada's shores. As an economist working for the Carter Commission, he published in 1963 "Effects of taxation on Canada's international competitive position" with Claude Forget, indicating an appreciation of the importance of international taxation issues that became part of the main stream of public finance only 30 years later. Richard Bird's work in any area of public finance is distinguished by the elegant, yet simple and direct, writing style in which he conveys his ideas. The other distinguishing feature of his work is a healthy skepticism about the extent of our knowledge of the economic effects of taxation and our ability to adopt and implement even second or third best policies, given the limited ability of tax administrations and political systems to cope with complex and controversial policies. With over 19,500 citation recorded by Google Scholar, he is undoubtedly one of the most highly regarded Canadian economists. Elected a Fellow of the Royal Society of Canada in 1978, he received the Douglas Sherbaniuk Award from the Canadian Tax Foundation in 1997 and the Daniel M. Holland Award from the National Tax Association in the United States in 2006 for a lifetime achievement in the study of the theory and practice of public finance.

Robin Boadway's contribution to public finance have been noted at many points in this review, but these represent only a small sample of the 250 articles, books, monographs and edited volumes that he has made in the field of public economics since joining the Department of Economics at Queen's University, first as a PhD student and then as a faculty member and head of the department. His influence on the profession extends well beyond the highly cited academic papers. His commitment to teaching is at least as impactful as his research,

[1] fin.gc.ca/taxexp-depfisc/2017/taxexp17-eng.asp

as evident in the textbooks he has written including *Public Sector Economics* (with David Wildasin), *Welfare Economics* (with Neil Bruce) and *Principles of Micro-Economics and Macro-Economics and the Canadian Economy* (with Joseph Stiglitz). The MA and PhD students that he has supervised and mentored fill the Departments of Economics across Canada and in many other countries, such as Japan. He has also influenced the direction of research in public economics, and economics generally, as editor of the *Canadian Journal of Economics* and the *Journal of Public Economics,* the leading international journal in the field. His key leadership roles include President of the Canadian Economics Association, as well as the International Institute of Public Finance, 2009–2012. His honours and awards include Fellow of the Royal Society of Canada, Officer of the Order of Canada, Distinguished CES Fellow, Queen Elizabeth II Diamond Jubilee Medal and Fellow of the Canadian Economics Association conferred in 2014.

Jack Mintz has been a colleague and co-author of the other two celebrated economists in this review, Richard Bird and Robin Boadway, and continues their high-profile contributions to the theory and practice of public economics. Mintz's academic contributions to public finance in developing and disseminating research on marginal effective tax rates on investment, tax competition and international taxation issues have been noted earlier in this review, as well his chairing the Technical Committee on Business Taxation. He was a founding editor of *International Tax and Public Finance.* But his influence on public economics in Canada extends well beyond his academic research, especially as President and Chief Executive Officer of the C.D. Howe Institute from 1999 to 2006. He has served as an advisor and consultant to federal and provincial governments in Canada, as Chair of the Alberta Financial and Investment Policy Advisory Commission, Research Director of the Federal–Provincial Ministers of Finance Working Group on Retirement Income Research and a member of the Advisory Panel on Healthcare Innovation. Regarded as one of the world's most influential tax experts, Mintz is frequently asked by the international agencies, foreign governments and firms in the private sector for advice on domestic and international taxation issues. As a bi-weekly contributor of commentaries in the National Post, he helps shape public opinion on a wide range of economic issues. In 2015, Jack Mintz was made a Member of the Order of Canada.

A common element across these three economists is that they are all builders of institutions and people. Their legacy is stronger institutions and better economists across the country.

11. Conclusion

Our survey of Canadian public finance over the last 30 years has emphasized the transition from theory to practice. This has manifested itself in specific research areas such as the economics of federalism. The development by Canadians of some of the most influential theories of federalism is surely a result of Canada's essential federal nature. This theoretical expertise has led to global practical influence as other countries have drawn on Canadian expertise to meet their own federal challenges. More broadly, our survey has demonstrated that expertise developed by Canadian public finance economists has had a large practical impact on policy topics ranging from inequality, the impact of taxation and the adequacy of retirement income. We view this interplay between policy concerns and research to have been an essential element of Canadian public finance over the last 30 years—and we expect this to continue into the future.

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