Business Tax Competitiveness: Canada vs. the United States

Sebastian Dyrda, University of Toronto

Background. The statutory corporate income tax rate in Canada, which combines federal and provincial rates, fell according to the OECD (2020) from 42.4 percent in 2000 to 26.5 percent in 2020 following a series of tax code modifications. The U.S. statutory corporate income tax rate, combining federal and state taxes, was stable at 39 percent between 2000 and 2017 and fell to 25.8 percent in 2018, according to the OECD (2020), because of the TCJA, enacted at the end of 2017. The TCJA introduced several changes to the U.S. personal and corporate tax system. On the corporate tax side, the new law contains several measures aimed at enhancing business competitiveness. These include a reduction in the federal statutory corporate income tax rate from 35 percent to 21 percent and temporary immediate expensing of capital assets with a normal recovery period of 20 years or less. These measures are partially offset by measures that broaden the tax base, including restrictions on the use of net operating losses, a requirement to amortize R&D expenses over a longer period, and limitations on the deduction of net business interest expenses. A detailed analysis of the changes implemented by the TCJA can be found in Auerbach (2018), Barro and Furman (2018) and McKenzie and Smart (2019). On November 21, 2018, as part of the Fall Economic Statement, the Canadian government announced a set of measures aimed at improving Canadian business competitiveness. The 2018 Fall Economic Statement announced the adoption of immediate expensing of machinery and equipment used in the manufacturing and processing of goods, as well as specified clean energy equipment. Additionally, the Statement announced the Accelerated Investment Incentive, which allows businesses to claim up to three times the amount of the deduction normally applicable in the first year. Provinces and territories that are part of the corporate Tax Collection Agreement (all provinces other than Quebec and Alberta) are required to adopt the federal measures, as they affect the amount of taxable income earned by corporations. A more thorough discussion of the modifications implemented through the Fall Economic Statement can be found in McKenzie and Smart (2019). These recent changes in the tax codes in the United States and Canada motivate studying business tax competitiveness between these two countries. Given that many businesses have the option of investing in either the United States or Canada and that these economies share many characteristics, recent tax reforms offer a unique opportunity for a clean identification of the effects of implemented tax changes on both firm and aggregate levels.

Research objective and empirical strategy. The objective of this project is to provide a systematic empirical analysis of business income taxation and the effects of recently implemented changes in the United States and Canada. I intend to use microeconomic data sets to address the following research questions:

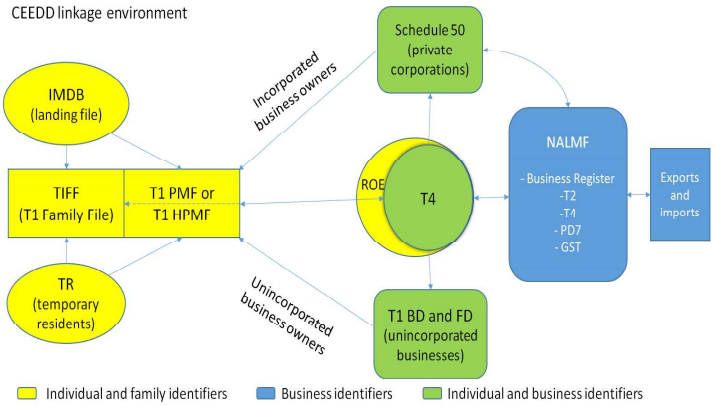
1. How did the tax rates faced by firms in the United States and Canada change because of recent reforms? Which elements of the tax code drive differences in effective rates between the United States and Canada?
2. What was the impact of the reforms on location decisions, productivity, investment, and employment dynamics among firms in the United States and Canada? Did the effects differ depending on a firm's size, age, industry, and legal form of organization?
3. Can differences between the performance of U.S. and Canadian firms over the last twenty years be empirically linked to changes in relative tax competitiveness between these two countries?

In particular I plan estimate the effective tax rates faced by firms in both countries and inspect the effects on them due to recent tax code changes at the firm level. The statutory income tax rates provide a high-level measure of income taxes payable by a profitable corporation. However, this method does not account for differences in the definition of taxable income, the availability of tax incentives and deductions, as well as, other taxes that businesses and their owners may have to pay. For this reason, it can be advantageous to use more comprehensive measures of tax competitiveness. Such metrics include the average effective tax rate (AETR) and the marginal effective tax rate (METR). The empirical analysis will therefore focus on these two measures. The AETR measures the effect of taxation on investment projects earning economic rents; it is based on a comparison of the net present values of pre- and post-tax cash flows. This indicator is used to analyze investment decisions at the extensive margin, that is, location decisions; for instance, when a multinational enterprise decides to locate a plant in one of many jurisdictions or make one of several technology choices. The METR is an estimate of the level of taxation on new business investment, and considers federal, provincial, and territorial statutory corporate income tax rates as well as other features of the corporate tax system. These other features include investment tax credits and key deductions such as capital cost allowances. The METR also considers other taxes paid by corporations, such as capital taxes and unrecoverable sales taxes paid on capital purchases. The METR is particularly useful for making comparisons among coutries and among sectors of the economy. Since the METR takes many factors into account, it provides a broad indication of overall tax competitiveness that is an important supplement to comparisons of statutory tax rates. My proposed estimation process for AETR and METR would closely follow the methodology outlined in Hanappi (2018). I further plan to decompose the gap in METR between the United States and Canada into the following seven categories: (1) statutory tax rate, (2) interest deductibility, (3) deductions for capital investments, (4) inventory accounting methods, (5) capital taxes, (6) sales tax on capital inputs and (7) investment tax credits. Furthermore, to investigate the effects of recent tax reforms at the firm level I plan to follow closely the methodology presented by Yagan (2015), who estimates the impact of 2003 dividend tax cuts on corporate investment exploiting the difference-in-difference regression. Moreover, his methodology also allows inspecting the heterogeneity of the effects in the cross-section of firms, which would allow me to address my empirical research questions and compare firms' outcomes between the United States and Canada.

Data sources. I plan to exploit several data sources to conduct the empirical analysis. First, I plan to use Compustat North America, a database of 24,000 U.S. and Canadian publicly held companies. Second, I will also analyze privately held businesses, conditional on being able to access the relevant data. For the United States, I plan to exploit publicly available data from the Internal Revenue Services and restricted-access data from the Kauffmann Firm Survey. Importantly, for Canada I plan to get access to the administrative data set: the Canadian Employee-Employer Dynamics Database (CEEDD). This data set offers a unique opportunity to investigate taxation of privately held businesses, both incorporated and unincorporated (sole proprietorships and partnerships). Since in my budget draft I am asking for covering the costs of purchasing the access to this data in what follows I will describe briefly it's structure, which is illustrated in Figure 1.

CEEDD is a set of linkable files from different sources instead of being a single gigantic linked file containing all variables. Using the unique personal and/or firm identifiers available on each linkable file, information at the employee and firm level can be linked across different component files over time (longitudinality). The data spans from 2001 to 2019 and a new vintage is expected in 2022. Figure 1 illustrates

Figure 1: Canadian Employee-Employer Dynamics Database (CEEDD) linkage environment



Source: Statistics Canada. More information on CEEDD can be found here.

the main components of the CEEDD data: (1) Individual and family identifiers (2) Business identifiers (3) Individual and business identifiers. Given the focus of the proposed project on taxation of businesses the following components are the most relevant:

- NALMF file is a comprehensive longitudinal database of Canadian enterprises that links administrative data from the Statements of Remuneration Paid (T4), the Payroll Account Deductions (PD7), the Corporate Income Tax Returns (T2), and GST/HST administrative files to key enterprise information from the Business Register. Since incorporated firms are required to file a T2 form, all incorporated businesses are included in the NALMF. Besides, NALMF also includes a subset of unincorporated businesses, namely those with employees. The main firm-level variables from NALMF include: firm size, as measured by the number of employees or revenues, industry, province, firm age, a multi-establishment enterprise indicator, profitability, productivity as measured by value added, exporter status, R&D expenditures, and measures of capital intensity.
- Information about *unincorporated business owners* can be identified from the T1 files as well as the T1 Financial Declaration files (T1FD). T1FD is a file that contains all financial declarations made by individuals who report any sort of self-employment income. It may contain multiple records for a given business in case of multiple owners. Information about unincorporated businesses can be identified from the T1 Business Declaration files (T1BD). T1BD is a file that consolidates all financial declarations for same business and hence one record per business.
- *Incorporated business owners* are identified through T2 Schedule 50. It provides direct ownership information on shareholders who hold at least 10% of shares for all corporations. One can obtain other information by linking Schedule 50 to other files. For example by linking to T4 using personal identifiers, it is also possible to obtain information on whether and how much each owner pays himself or herself in each of owned corporations as well as wages/salaries from other businesses where they are employed. Potential income for incorporated business owners that includes dividends and net change in retained earnings and information on owned business including employment, revenue, profit, and industry code can also be extracted by linking to T2 using firm identifiers.

References

Auerbach, Alan J., "Measuring the Effects of Corporate Tax Cuts," *Journal of Economic Perspectives*, Fall 2018, *32* (4), 97–120.

Barro, Robert J. and Jason Furman, "Macroeconomic Effects of the 2017 Tax Reform," *Brookings Papers on Economic Activity*, 2018, *49* (1 (Spring), 257–345.

Hanappi, Tibor, "Corporate Effective Tax Rates," 2018, (38).

McKenzie, Ken and Michael Smart, "Policy Forum: Business Tax Reform in the United States and Canada," *Canadian Tax Journal*, 2019, *67* (1), 57–66.

OECD, "Corporate tax statistics (2nd Ed.)," 2020.

Yagan, Danny, "Capital Tax Reform and the Real Economy: The Effects of the 2003 Dividend Tax Cut," *American Economic Review*, December 2015, *105* (12), 3531–3563.

Budget Estimate for Proposal:

Business Tax Competitiveness: Canada vs. the United States

Sebastian Dyrda, University of Toronto

Using resources from the NBER Small Grant I plan to purchase access to the administrative data set: Canadian Employee-Employer Dynamics Database (CEEDD). The exact price depends on the scope of the data request. Access to the data is granted through the application process to Statistics Canada, which also determines the pricing. Based on the information from the current users of the data at the Department of Economics at the University of Toronto I estimate that purchasing the access would cost around **$10,000**, which is the requested amount.

Sebastian Dyrda

University of Toronto
Department of Economics
Max Gluskin House
150 St. George Street, 210
Toronto, Ontario

Phone: 416-978-4189
Fax: 416-978-6713
Office: Max Gluskin House 210
Email: sebastian.dyrda@utoronto.ca
Homepage: http://dyrda.info

Employment

University of Toronto, Department of Economics, Assistant Professor, July 2015–present.

Education

Ph.D. Economics, University of Minnesota, 2015.

Dissertation: "Essays in Macroeconomics with Heterogeneity".

Committee: José-Víctor Ríos-Rull, V. V. Chari, Christopher Phelan, Jonathan Heathcote.

M.A. Economics, University of Minnesota, 2013.

M.A. Economics, Warsaw School of Economics, 2009.

Research

Research Interests: Macroeconomics, Firm dynamics, Labor economics, Public finance

Publications

1. "Discussion of 'Taxation and the Life-Cycle of Firms' by Erosa and Gonzalez", ***Journal of Monetary Economics***, Volume 105; August 2019.

Working Papers

1. "Optimal Fiscal Policy in a Model with Uninsurable Idiosyncratic Risk", with Marcelo Pedroni; *Conditionally Accepted at* ***The Review of Economic Studies***.
2. "Fluctuations in Uncertainty, Efficient Borrowing Constraints and Firm Dynamics".
3. "Living Arrangements and Labor Market Volatility of Young Workers", with Greg Kaplan and José-Víctor Ríos-Rull.
4. "Taxes, Private Equity and Evolution of Income Inequality in the US", with Benjamin Pugsley.
5. "How to Tax Capitalists in the Twenty-First Century?", with Benjamin Pugsley.

Policy Papers

1. "Models of Government Expenditure Multipliers", with José-Víctor Ríos-Rull.

Work in Progress

1. "Decomposing the rise of pass-throughs.", with Benjamin Pugsley.
2. "A Macroeconomic Perspective on Taxing Multinational Enterprises", with Guangbin Hong and Joseph Steinberg.

Grants, Fellowships, & Awards

Compute Canada, 2021 Fast Track Resource Competition, project: "Calibration of Macroeconomic Models with Heterogeneity", 235 core years (approx. value $28,514), joint with Joseph Steinberg.

Research and Scholarly Activity Grant, University of Toronto, $ 8,450, 2020.

Compute Canada, 2020 Resource Competition, project: "Calibration of Macroeconomic Models with Heterogeneity", 257 core years (approx. value $32,978), joint with Joseph Steinberg.

SSHRC Insight Development Grant, project: "Home Base: A comprehensive macroeconomic perspective of living arrangements of young adults around the world", $ 30,977, 2018-2020.

Research and Scholarly Activity Grant, University of Toronto, $ 9,845, 2018.

Connaught New Researcher Award, University of Toronto, $ 10,000, 2016.

Research and Scholarly Activity Grant, University of Toronto, $ 9,345, 2016.

Kauffman Dissertation Fellowship, Ewing Marion Kauffman Foundation, 2015.

Hella Mears Graduate Fellowship, University of Minnesota, 2014.

Distinguished Instructor, Department of Economics, University of Minnesota, 2014.

Graduate Research Partners Program Fellowship, University of Minnesota, 2013.

Distinguished Teaching Assistant, Department of Economics, University of Minnesota, 2010, 2011.

Leonid Hurwicz Fellowship, University of Minnesota, 2009.

Short Term Visits

Federal Reserve Bank of Minneapolis, April 2019; CERGE-EI Prague, May 2019.

Autonomous University of Barcelona, Barcelona, December 2017.

Einaudi Institute for Economics and Finance, Rome, April - May, 2016.

Seminar Presentations

2021: Nottingham School of Economics, University of Guelph, Brock University

2020: Chicago FED, University of Montreal

2019: Atlanta FED, Minneapolis FED, Ryerson University

2018: University of Bonn, University of Houston, University of Texas at Austin

2017: Philadelphia FED, Autonomous University of Barcelona

2016: University of Western Ontario, Wilfrid Laurier University, CERGE-EI Prague, EIEF Rome

2015: Queen's University, IIES Stockholm University, Bocconi University, CEMFI Madrid, University of Southern California Marshall School of Business, Georgetown University, Federal Reserve Board, University of Toronto, University of Zurich, Einaudi Institute for Economics and Finance

Conference Presentations

2021: CESifo Conference on Macroeconomics and Survey Data, North American Summer Meeting of the Econometric Society; Barcelona GSE Summer Forum - Income Dynamics and the Family; SED Annual Meeting; NBER Summer Institute Macroeconomics Within and Across Borders; Stanford Institute for Theoretical Economics Summer Session: Macroeconomics and Inequality, 8th Annual Mannheim Taxation Conference; 114th National Tax Association's Annual Conference on Taxation; Canadian Macro Study Group Annual Meeting, University of British Columbia, Vancouver.

2020: AEA Annual Meeting, San Diego, VMACS Junior Conference, 113th NTA Annual Conference on Taxation.

2019: North American Meeting of the Econometric Society, Atlanta; Advances in Micro-Consistent Macroeconomics, Lillehammer; 2019 Philadelphia Workshop on Macroeconomics and Economic Policy (discussant); SED Annual Meeting, St. Louis; Canadian Macroecoomics Study Group Annual Meeting (discussant), University of Montreal, Montreal.

2018: North American Meeting of the Econometric Society, Philadelphia; Heterogeneity in Macroeconomics a Decade after the Crisis, University of Cambridge; SED Annual Meeting, Mexico City; Fourth Taxation Theory Conference (discussant), Washington University St. Louis; NBER Summer Institute Macro Public Finance, Boston; Carnegie-Rochester-NYU Conference on Public Policy (discussant), Carnegie Mellon University, Pittsburgh; Biennial Conference on Consumer Finance and Macroeconomics, Federal Reserve Bank of Philadelphia, Philadelphia.

2017: SED Annual Meeting, Edinburgh; NBER Summer Institute Entrepreneurship, Boston; Junior Macro Conference, Arizona State University; 110th NTA Annual Conference on Taxation, Philadelphia; CESifo Conference on Macroeconomics and Survey Data, Munich.

2016: North American Meeting of the Econometric Society, San Francisco; 2016 Kauffman Emerging Scholars Conference, Kansas City; SED Annual Meeting, Toulouse; NBER Summer Institute Income Distribution and Macroeconomics, Boston; Asian Econometric Society Meeting, Kyoto; Stanford Institute for Theoretical Economics Summer Session: The Macroeconomics of Uncertainty and Volatility, Stanford University; Canadian Macro Study Group Annual Meeting, Queens University; CESifo Conference on Macroeconomics and Survey Data, Munich.

2015: Tsinghua Workshop in Macroeconomics, Beijing; SED Annual Meeting, Warsaw; NBER Summer Institute Macro Public Finance, Boston; World Congress of the Econometric Society, Montreal; Fall 2015 Midwest Macro Meeting, Rochester.

2014: Doctoral Workshop on Dynamic Macroeconomics, Strasbourg.

2013: International Conference in Computing and Finance, Vancouver.

Professional Activities

Reviewer for: *Econometrica*, *Journal of Political Economy*, *Review of Economic Studies*, *Quarterly Journal of Economics*, *American Economic Review*, *American Economic Review: Insights*, *Journal of Economic Theory*, *International Economic Review*,*Journal of Economic Dynamics and Control*, *Review of Economic Dynamics*, *American Economic Journal: Macroeconomics*, *Canadian Journal of Economics*, *European Economic Review*, *Macroeconomic Dynamics*.

Organizing Committee member: 32nd Annual Meeting Canadian Macroeconomics Study Group.

Minnesota Supercomputing Insitute, Account Administrator, since September 2013.

Graduate Students

Baxter Robinson; committee member; initial placement: Western University.

Wanlin Chen; committee member.

Teaching

University of Toronto

Quantitative Macroeconomics (Ph.D.): Spring 2016, Spring 2017, Fall 2018, Fall 2019, Fall 2020

Intermediate Macroeconomics: every semester since Fall 2015

University of Minnesota

Advanced Macroeconomic Policy: Fall 2012, Fall 2013, Spring 2014

Miscellaneous

Programming Languages: Fortran, OpenMP, Intel MPI, Matlab, Python, Stata.

Languages: Polish (native), English (fluent), German (basic).

Last updated: December 29, 2021