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CENTRE
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LIVING
STANDARDS

**Understanding Canada's
Productivity "Emergency"**

Andrew Sharpe

Centre for the Study of Living Standards

CSLS Seminar Presentation

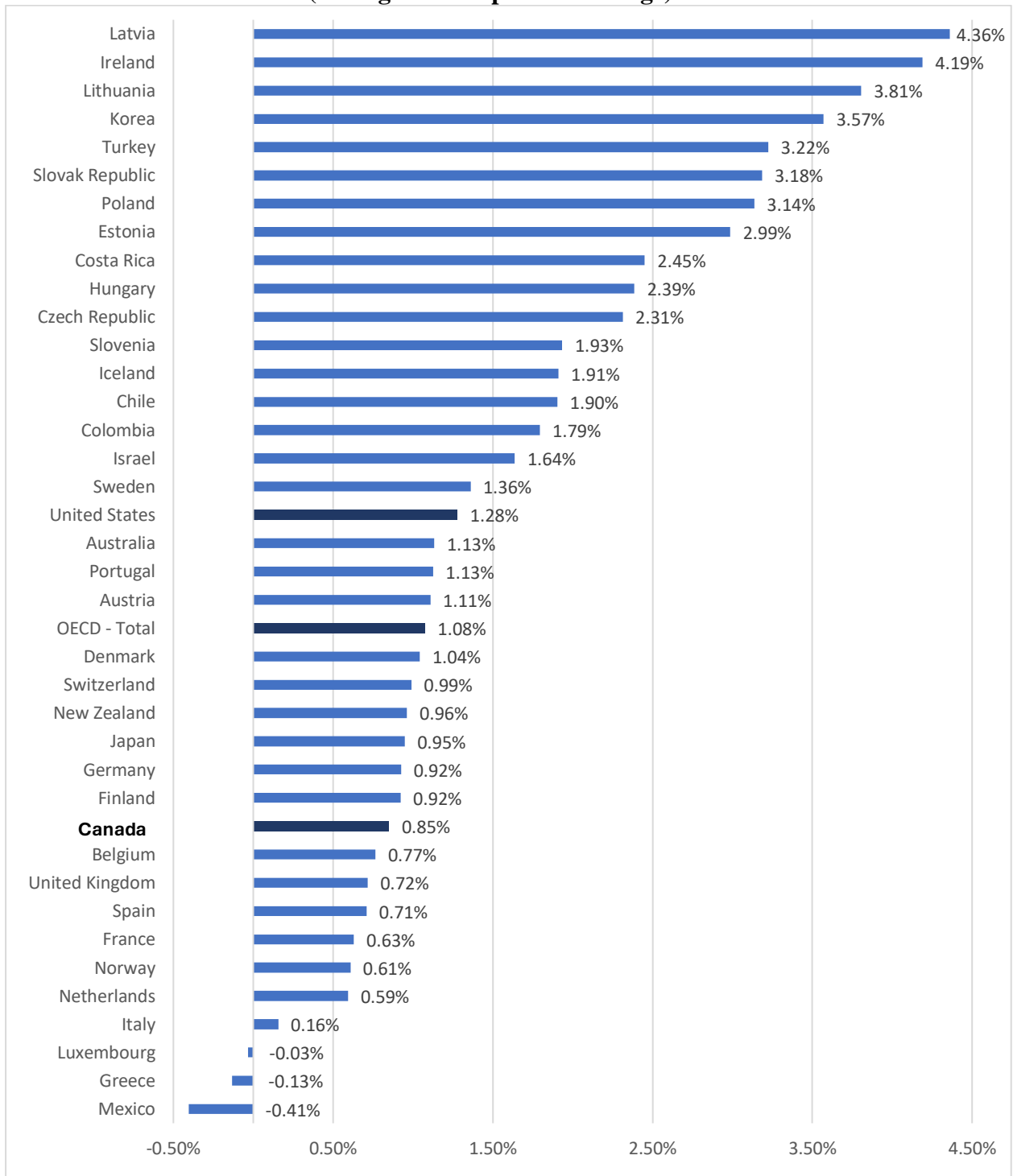
Rideau Club, Ottawa

May 1, 2024

Outline

- I. Introduction (prominent of the issue, importance of productivity, personal path as productivity researcher)
- II. Productivity Concepts and Definitions
- III. Data Sources and Measurement Issues
- IV. International Comparisons of Canada's Productivity Performance
- V. Analysis of Productivity Growth in Canada
 - A. Historical Aggregate Trends
 - B. Trends by Industry
 - C. With-in Sector versus Reallocation Effects
 - D. Trends by Province and Territory
 - E. Sources of Labour Productivity Growth
 - F. Business Sector R&D Expenditure
 - G. Business Sector Investment
- VI. Assessing Productivity Drivers and Policies to Boost Productivity
- VII. Concluding Messages

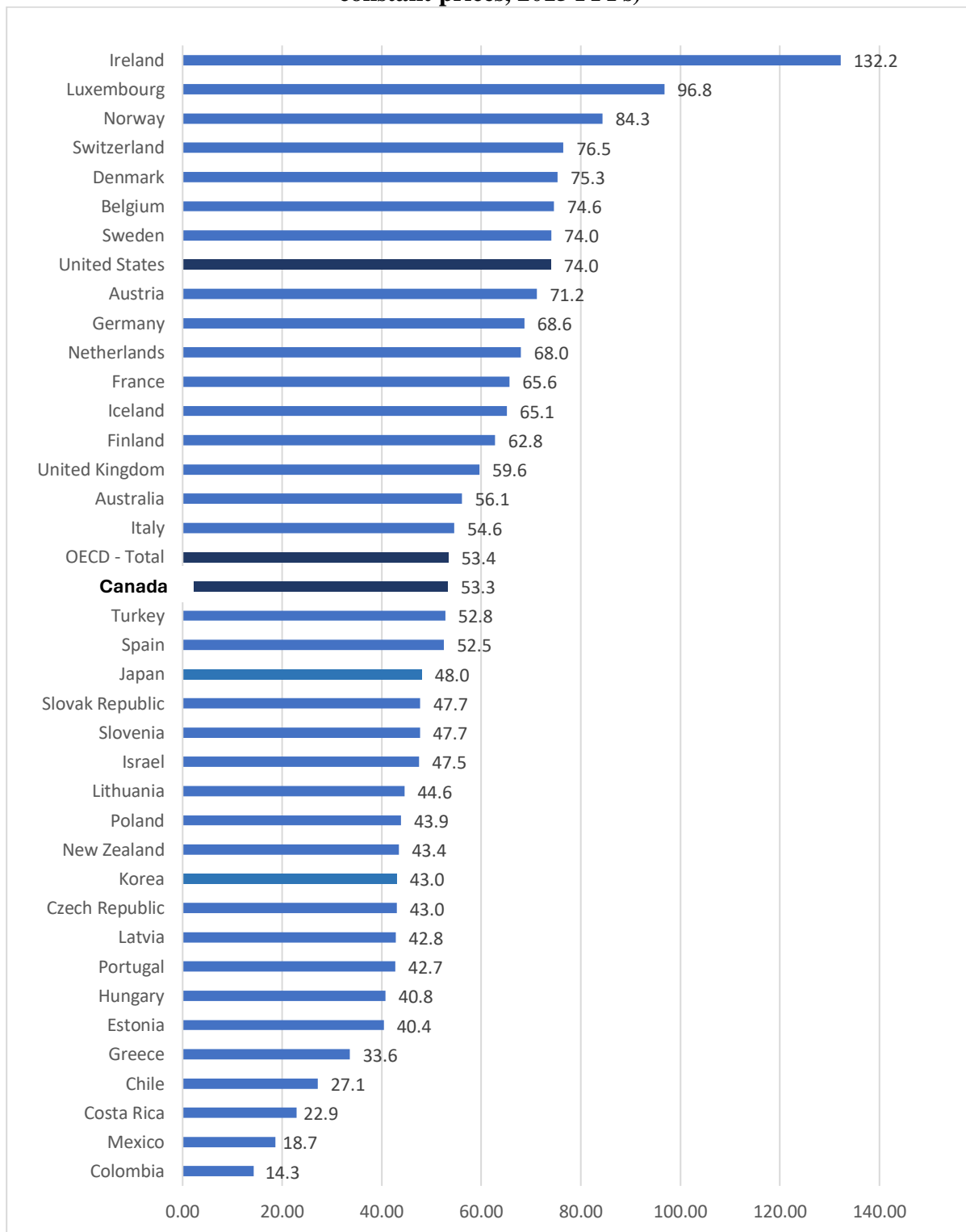
**Chart 1: Total Economy Output per Hour Growth in OECD Countries, 2000-2022
(average annual per cent change)**



Source: https://stats.oecd.org/Index.aspx?DataSetCode=PDB_GR

Note: Some country series feature data breaks and estimated or provisional values instead of official statistics for some observations. For full detail on the countries and observations affected, please see the linked database.

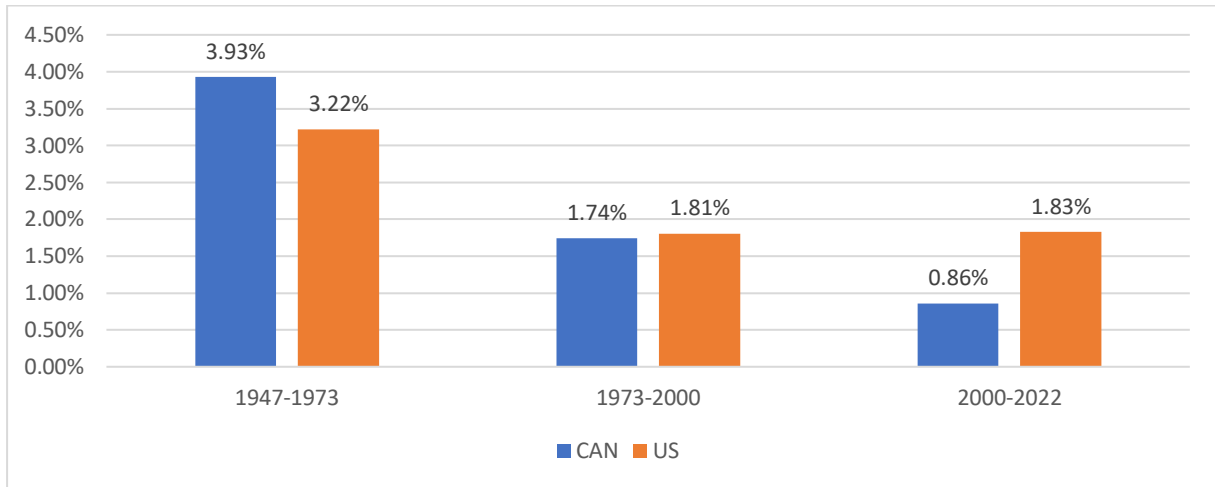
Chart 2: Total Economy Output per Hour Levels in OECD Countries, 2022 (USD, constant prices, 2015 PPPs)



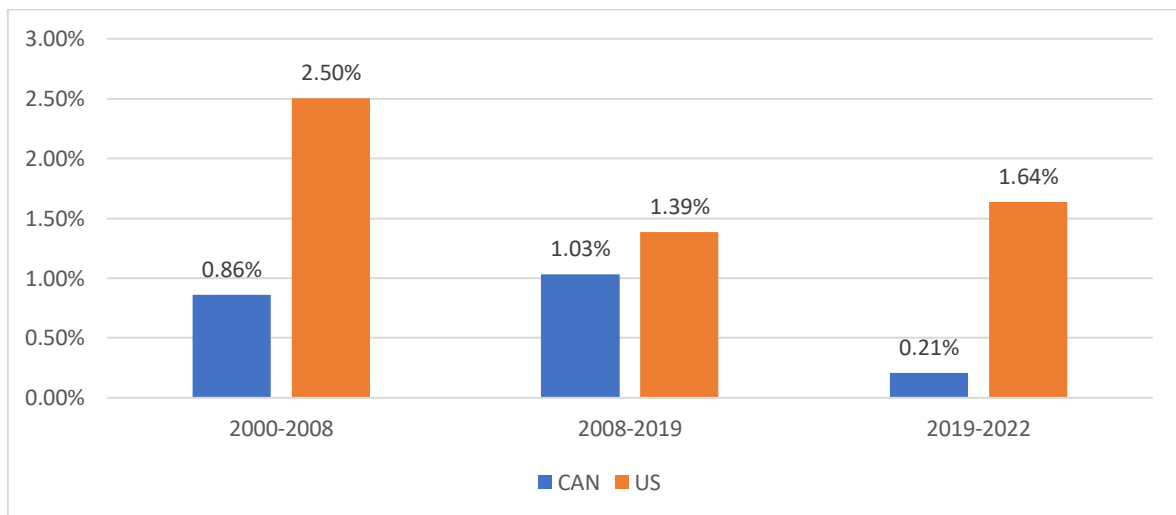
Source: https://stats.oecd.org/Index.aspx?DataSetCode=PDB_GR#

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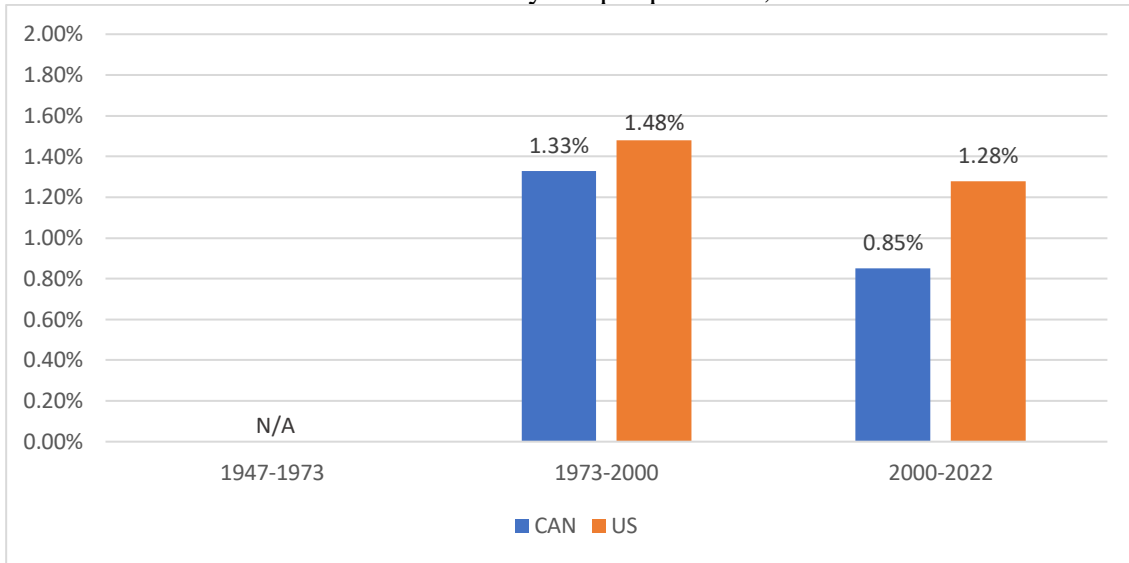
Chart 3: Labour Productivity Growth Trends in Canada and the United States
 Panel A: Business Sector Output per Hour Trends, 1947-2022



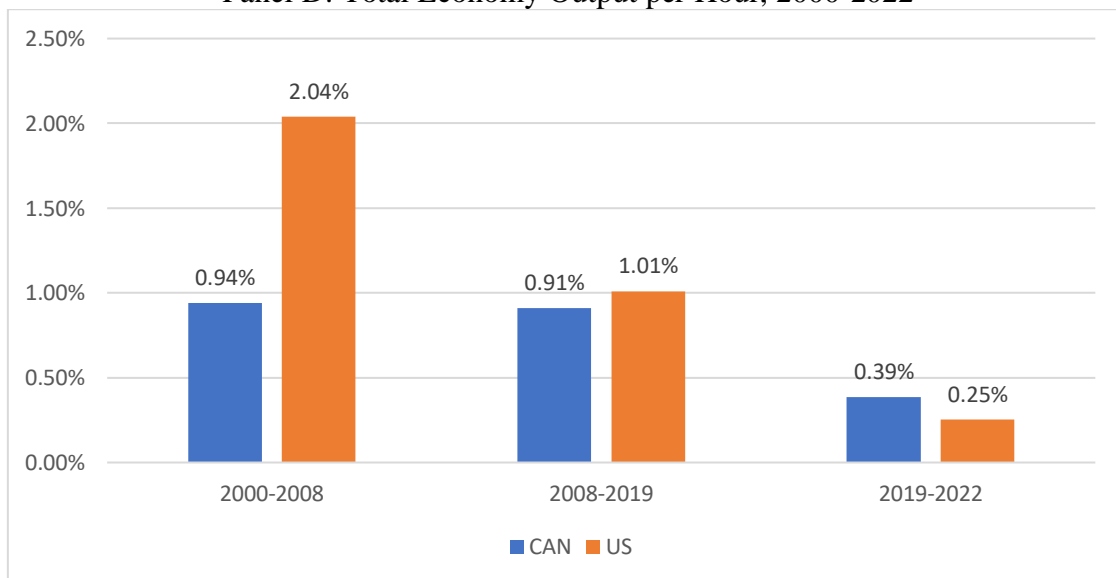
Panel B: Business Sector Output per Hour Trends, 2000-2022



Panel C: Total Economy Output per Hour, 1973-2022

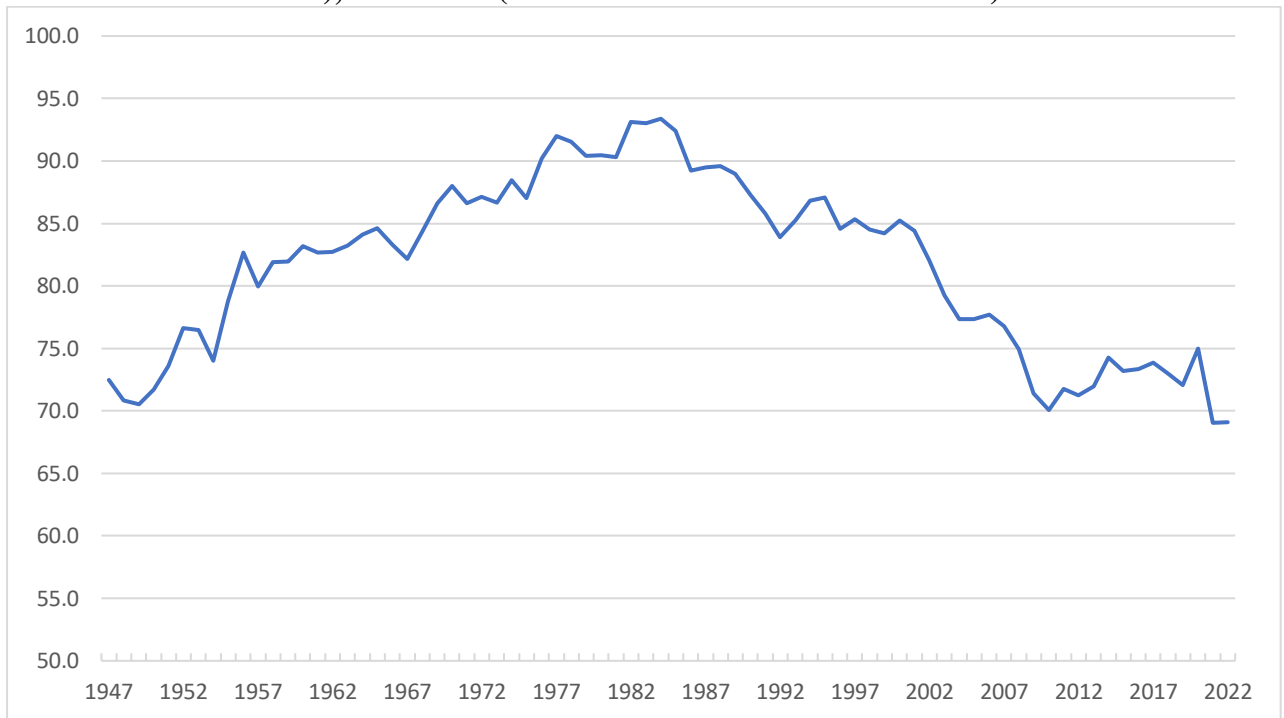


Panel D: Total Economy Output per Hour, 2000-2022



Sources: Canada business sector labour productivity data from Statistics Canada: Table 36-10-0305-01 for 1947-1960, Table 36-10-0208-01 for 1961-2021, Table 36-10-040-01 for 2022. United States business sector labour productivity data from BLS Labour Productivity and Cost Measures – Major Sectors – August 3, 2023 (XLSX sheet). Total Economy labour productivity data from OECD – Productivity and ULC – Annual, Total Economy: https://stats.oecd.org/Index.aspx?DataSetCode=PDB_GR#.

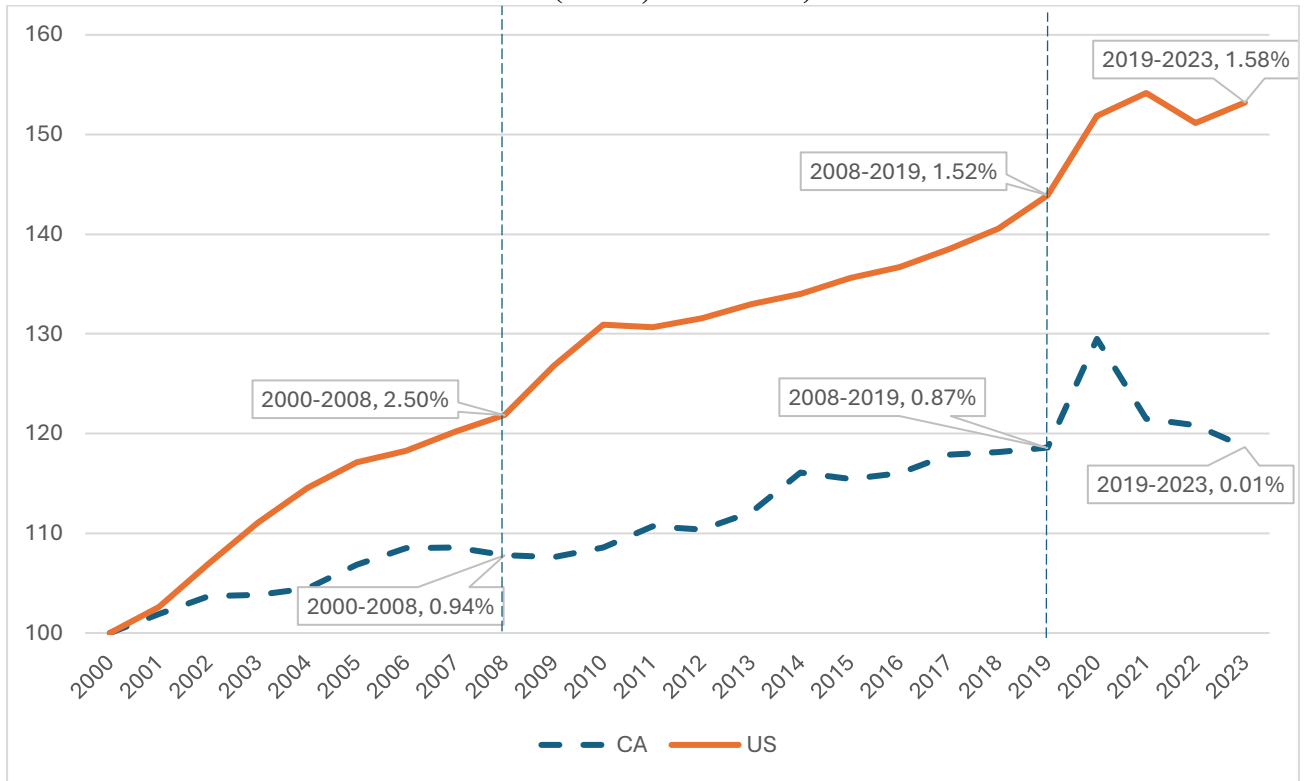
Chart 4: Relative Labour Productivity Levels (GDP per Hour in the Business Sector in Canada), 1947-2022 (Canada as a % of the United States)



Source: Canada labour productivity data from Statistics Canada: Table 36-10-0305-01 for 1947-1960, Table 36-10-0208-01 for 1961-2021, Table 36-10-0480-01 for 2022. US labour productivity from BLS Labour Productivity and Cost Measures – Major Sectors – August 3, 2023 (XLSX sheet). 1999 benchmark of Canada’s output per hour at 84.2% of US output per hour from Statistics Canada (2008) "Relative Multifactor Productivity Levels in Canada and the United States: A Sectoral Analysis" Catalogue no. 15-206-X, no. 019, July, p.32.

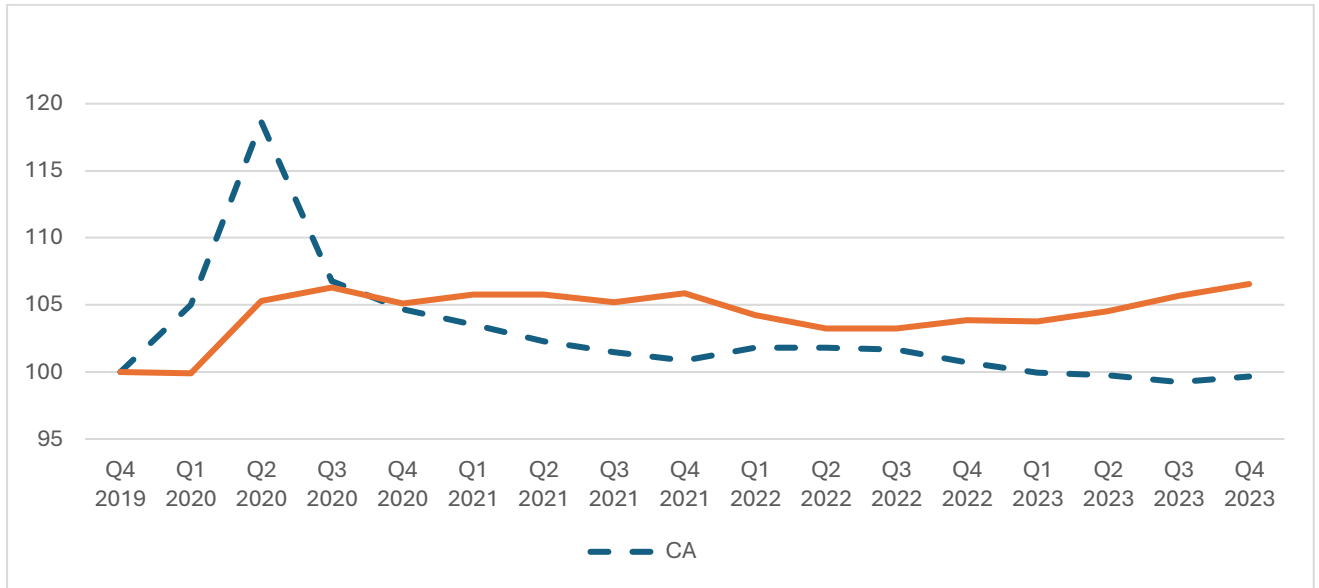
Note: US-Canada purchasing power parity based on Statistics Canada benchmark of Canadian business sector output per hour at 84.2% of US business sector output per hour in 1999 (Statistics Canada, 2008).

Chart 5: Business Sector Labour Productivity Growth, United States and Canada, 2000-2023 (Index, 100 = 2000)



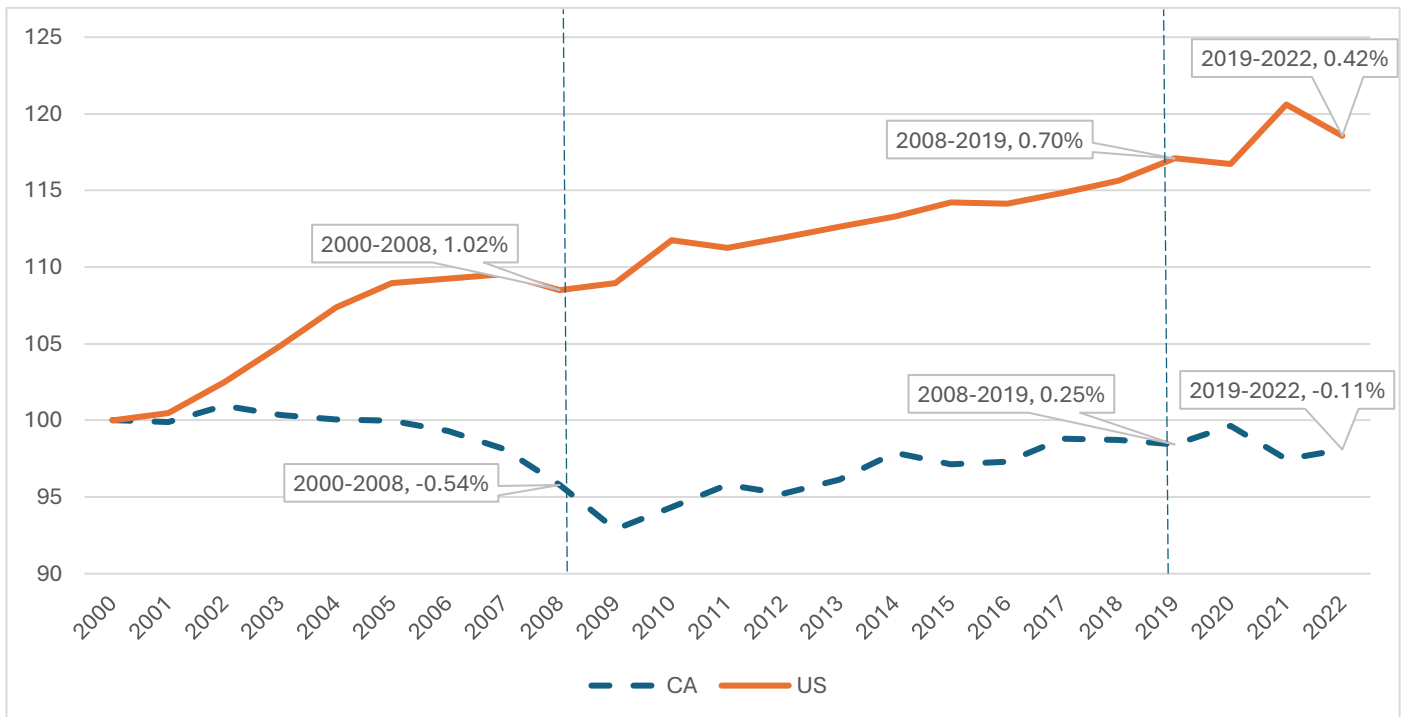
Source: Canada Business Sector labour productivity data from Statistics Canada: Table 36-10-0206-01. US labour Annual labor productivity and related measures for major sectors, BLS.

Chart 6: Business Sector Labour Productivity Growth, United States and Canada, Q42019-Q42023 (Index, 100 = Q42019)



Source: Canada Business Sector labour productivity data from Statistics Canada: Table 36-10-0206-01. US labour Quarterly labor productivity and related measures for major sectors, BLS.

Chart 7: Business Sector Total Factor Productivity Growth, United States and Canada, 2000-2022 (Index, 100 = 2000)



Source: Canada Business Sector total factor productivity data from, Statistics Canada Table 36-10-0208-01. US data from Annual total factor productivity and related measures for major sectors, BLS.

Table 1: Labour Productivity Growth Rate by Business Sector Industry, Compound Annual Growth Rate, 2000-2022 (percentage points)

	2000-2008 (1)	2008-2019 (2)	2019-2022 (3)	change (4) = (3) – (2)	2000-2022 (5)
Business sector industries	1.00	1.05	0.23	-0.82	0.92
Agriculture, forestry, fishing and hunting	1.85	3.73	4.05	0.33	3.09
Mining and oil and gas extraction	-4.57	1.52	0.54	-0.98	-0.87
Utilities	1.05	0.93	0.24	-0.68	0.88
Construction	-0.03	0.43	-0.13	-0.56	0.19
Manufacturing	1.09	0.87	-0.31	-1.18	0.79
Wholesale trade	3.23	2.05	0.51	-1.54	2.27
Retail trade	2.89	1.28	2.62	1.34	2.04
Transportation and warehousing	1.37	0.46	-1.59	-2.05	0.51
Information and cultural industries	2.74	1.00	-2.72	-3.72	1.11
Finance and insurance	1.73	2.41	2.96	0.55	2.23
Real estate, rental and leasing	0.24	0.71	2.99	2.28	0.85
Professional, scientific and technical services	0.31	0.83	-3.19	-4.02	0.08
Holding Companies	2.30	2.84	-24.45	-27.29	-1.58
ASWMRS	0.69	0.58	-3.87	-4.45	0.00
Educational services	1.24	-0.23	2.42	2.65	0.66
Health care and social assistance	0.08	-0.44	0.83	1.27	-0.08
Arts, entertainment and recreation	-1.46	0.52	-4.34	-4.86	-0.88
Accommodation and food services	0.88	0.56	-0.46	-1.02	0.54
Other private services	1.41	1.03	2.57	1.54	1.38

Source: CSLS calculations based on Statistics Canada Table: 36-10-0480-01.

Note: ASWMRS is Administrative and support, waste management and remediation services.

Table 2: CSLS Decomposition by Industry, Within-Sector and Re-allocation Effects on Canadian Business Sector Labour Productivity Growth, 2000-2022

	2000-2008	2008-2019	2019-2022	2000-2022
Within-Sector Effect	0.73	1.15	0.18	0.86
Re-allocation Level Effect	0.52	-0.03	0.20	0.20
Re-allocation Growth Effect	-0.25	-0.06	-0.10	-0.13
Net Re-allocation Effect	0.27	-0.09	0.11	0.07
Summed Effects	1.00	1.06	0.29	0.93
Actual Business Sector Productivity CAGR	1.00	1.05	0.23	0.92
discrepancy (summed effects minus actual rate of growth)	0.00	0.01	0.05	0.01

Source: Authors' calculations based on Statistics Canada Table: 36-10-0480-01.

Note: For the underlying two-digit NAICS industry-level data on labour productivity levels and labour input for key years in the 1997-2022 period, as well as measures of productivity growth subperiods for each of the periods of interest, see Haun (2023).

Table 3: Sources of Canadian Business Sector Labour Productivity Growth, 1961-2021

Panel A: Absolute Contributions (percentage points)

	1961-1981	1981-2000	2000-2019	2000-2008	2008-2019	2019-2021
Labour Productivity Growth	2.85	1.72	0.96	0.86	1.03	1.09
Multifactor Productivity	0.97	0.46	-0.09	-0.54	0.24	-0.71
Capital Intensity	1.33	0.87	0.79	1.13	0.54	1.29
ICT Capital Intensity	0.18	0.56	0.22	0.43	0.07	0.14
Non-ICT Capital Intensity	1.20	0.35	0.56	0.70	0.48	1.15
Labour Quality	0.53	0.38	0.26	0.28	0.25	0.52
Total Contributions	2.82	1.71	0.96	0.87	1.03	1.10

Panel B: Relative Contributions (%)

	1961-1981	1981-2000	2000-2019	2000-2008	2008-2019	2019-2021
Labour Productivity Growth	100.0	100.0	100.0	100.0	100.0	100.0
Multifactor Productivity	34.0	26.6	-9.2	-63.3	23.7	-65.4
Capital Intensity	46.6	50.6	82.1	131.5	52.2	117.9
ICT Capital Intensity	6.2	32.4	22.4	49.5	6.8	12.6
Non-ICT Capital Intensity	42.3	20.3	58.8	81.0	46.3	105.4
Labour Quality	18.5	22.3	27.0	32.3	23.8	48.0
Total Contributions	99.1	99.5	99.9	100.5	99.7	100.6

Source: CSLS calculations based on Statistics Canada Table 36-10-0208-01

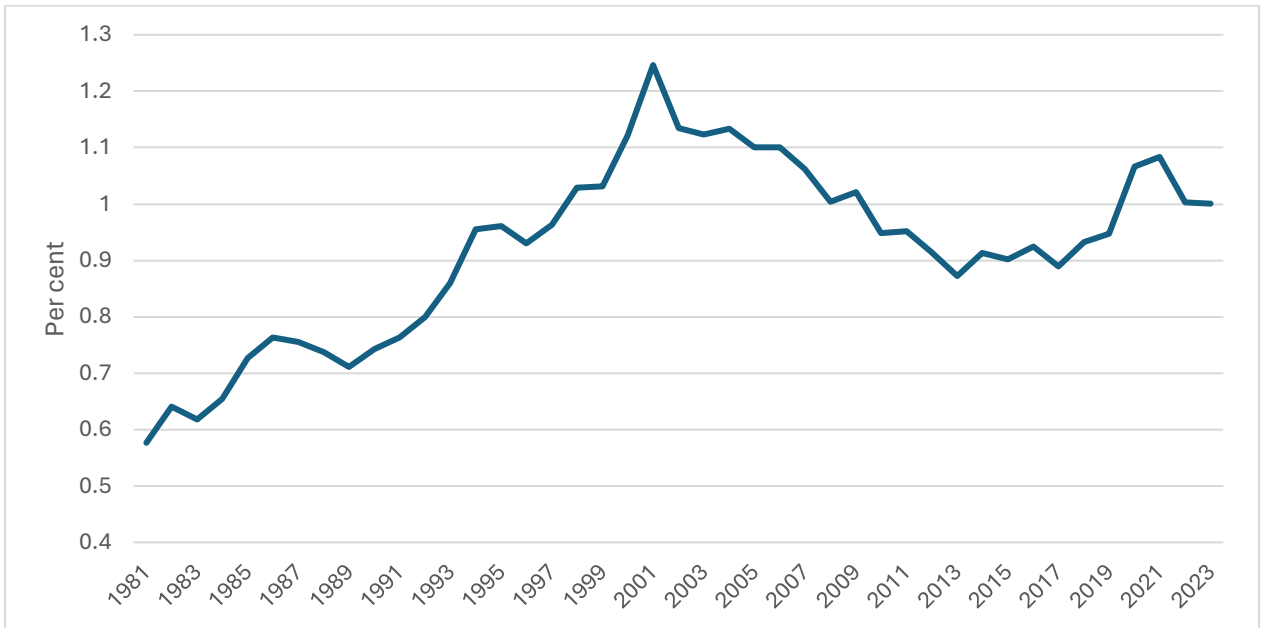
Note: Contributions from growth in multifactor productivity, capital intensity, and labour quality are official Statistics Canada estimates. Contributions from growth in ICT and non-ICT capital intensity are calculated using Statistics Canada data on hours worked and ICT/non-ICT capital inputs and costs for each period. Labour and capital cost shares are calculated by taking the arithmetic average of the share of costs for labour and capital at the start and end of each period.

Table 4: Business Sector Labour Productivity Growth, Provinces and Territories, 2000-2022

	2000-2008	2008-2019	2019-2022	2000-2022
Canada	1.00	1.05	0.23	0.92
Newfoundland and Labrador	5.02	-0.67	-2.04	1.17
Prince Edward Island	1.12	0.77	1.69	1.03
Nova Scotia	0.49	1.11	0.24	0.76
New Brunswick	1.11	0.57	1.30	0.87
Quebec	0.95	0.99	0.65	0.93
Ontario	0.67	0.99	0.12	0.75
Manitoba	1.96	1.42	-0.44	1.36
Saskatchewan	1.51	0.89	0.63	1.08
Alberta	0.18	1.37	-0.50	0.68
British Columbia	1.28	1.04	1.04	1.13
Yukon	4.80	0.02	12.33	3.35
Northwest Territories	3.16	-0.51	-2.78	0.49
Nunavut	0.86	0.62	8.36	1.73

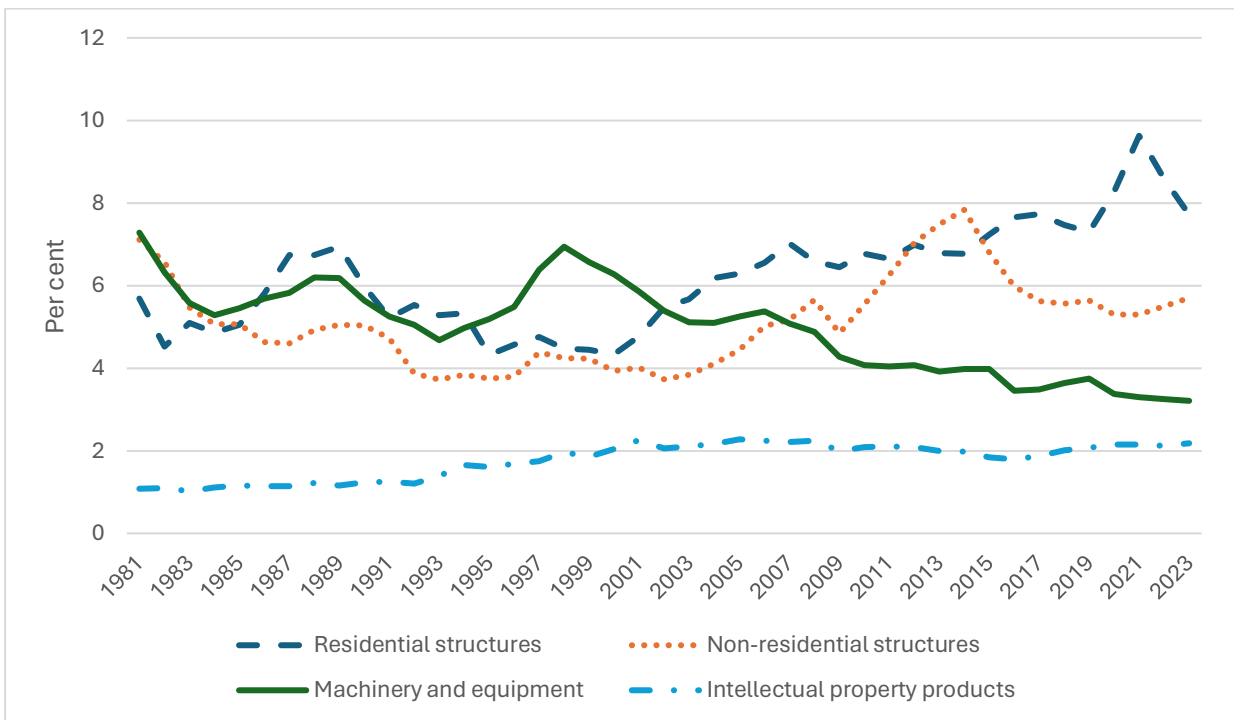
Source: CSLS calculations based on Statistics Canada Table: 36-10-0480-01.

Chart 8: Share of R&D Expenditure Performed by Business Sector in Nominal GDP, Canada, 1981-2023 (per cent)



Source: Statistics Canada Table: 27-10-0273-01, Table: 36-10-0222-01 and Table: 36-10-0104-01.

Chart 9: Share of Business Sector Investment Components in Nominal GDP, Canada, 1981-2023 (per cent)



Source: Statistics Canada Table: 36-10-0222-01 and Table: 36-10-0104-01.

References

Haun, Chris (2023) “A Detailed Analysis of Canada’s Post-2000 Productivity Performance and pandemic Era Productivity Slowdown,” CSLS Research Report 2023-11, December.
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