

Has the Increase in Federal Social Transfers Changed Public/Private Health Spending Patterns Across Provinces?

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by

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and

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Abstract

The public-to-total health spending ratio is an often-quoted statistic measuring the intensity of government involvement in health care. During last years First Ministers Conference, where new federal funding arrangements were negotiated, the media reported that, in 2003, the public-to-total health spending ratio fell below 70 percent for the first time.

This paper analyses movements in the public-to-total health spending ratio from a number of vantage points. First, we pinpoint the years of federal fiscal retrenchment — from 1991 to 1997 — as a critical time when the ratio fell by 4.4 percentage points. But from 1997 to 2004, this ratio fell by only 0.23 percentage points. From 1991 to 1997, the public-to-total ratio in “other professionals”, “drug”, and “other spending” fell sharply. In the 1997–2004 time period, the ratio fell noticeably in the “other professional”, “capital spending” and “other” categories. But it rose sharply in the “drug” category - due to public programs in certain provinces. Among the provinces, during 1991 to 1997 the public-to-total spending ratio fell sharply across all provinces except Newfoundland and British Columbia. During the 1997–2004 period, however, the rate held steady across most provinces, but declined somewhat in Nova Scotia, Quebec and British Columbia.

Finally, we first regress “real per-capita health spending” (private and public separately) against time trend variables and provincial dummies. We also construct indexes of dispersion across provinces for real per-capita health spending (private and public separately), and graph these for total spending and each of the major spending components. One initial finding is that over the 1997–2004 time period — when federal spending rose — the standard deviation across provinces rose for total public spending. We suspect the driving force for increased dispersion of public spending is divergent “drug” policies across provinces. But we have not as yet computed dispersion indexes for the various sub-components.

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I Introduction

Supporters of the “accessibility” provision of the Canada Health Act have long been suspicious of private health care delivery. They point with alarm that the ratio of public health spending to total health care spending has dipped to below 70 percent in recent years. Accessibility supporters view this decline as a sign of increasing privatization, and decreasing accessibility. If private health care institutions charge user fees for services deemed necessary under the Canada Health care Act, such fees would violate the accessibility clause. Supporters of public health care also point to efficiency and quality benefits of public-supported health care.

This paper examines the public-to-total health spending ratio from a number of perspectives. In particular, we study it under two key time periods: 1991–1997 (when public health care spending was under fiscal restraint), and 1997–2004 (when public health spending increased substantially). We study changes in the ratio of public-to-total by health care use and by province (and both at the same time).

This paper is divided into four parts. Section II discusses the policy problem of the decreasing public-to-total spending ratio during the period restrictive federal transfers to 1997, and increasing transfers since that benchmark

year. As well it discusses the problem of measuring private-versus-public spending as discussed by Health Canada. Section III looks at changes in the public-to-total spending ratio over the two 1991–1997 and 1997–2004 periods. Section IV then presents some simple statistical tests as to which components of health care spending were responsible for the changes in the total public spending ratio during the two critical periods. Section V concludes.

II The Public-to-Total Health Care Ratio and Policy Discussion

Supporters of the “accessibility” provision of the Canada Health Care Act often quote the aggregate public-to-total health care ratio as a important statistic in defining the state of public health care in Canada. Naylor (1999; p. 13), states that “...the public share of total health care spending has been declining from 73 percent in 1986 to 70 percent in 1996”. McKillop et. al. (2004, p. 5) state that the 30 percent private-sector share recorded in 2002 “supports a significant portion of health care delivery when considered from an aggregate perspective”. The Canadian Union of Public Employees (CUPE) in an October 2003 press release stated:

“As public spending on health care was rationed, private spending — out-of-pocket expenses, insurance premiums and negotiated health-plans — grew. In 1975 public funding, accounted for 76.4

pre cent of total health care bill. By 1986 it had fallen to 73.5 pre cent and today it is only 70.7 per cent. Private payment for health care services is increasing” (CUPE, 2003).

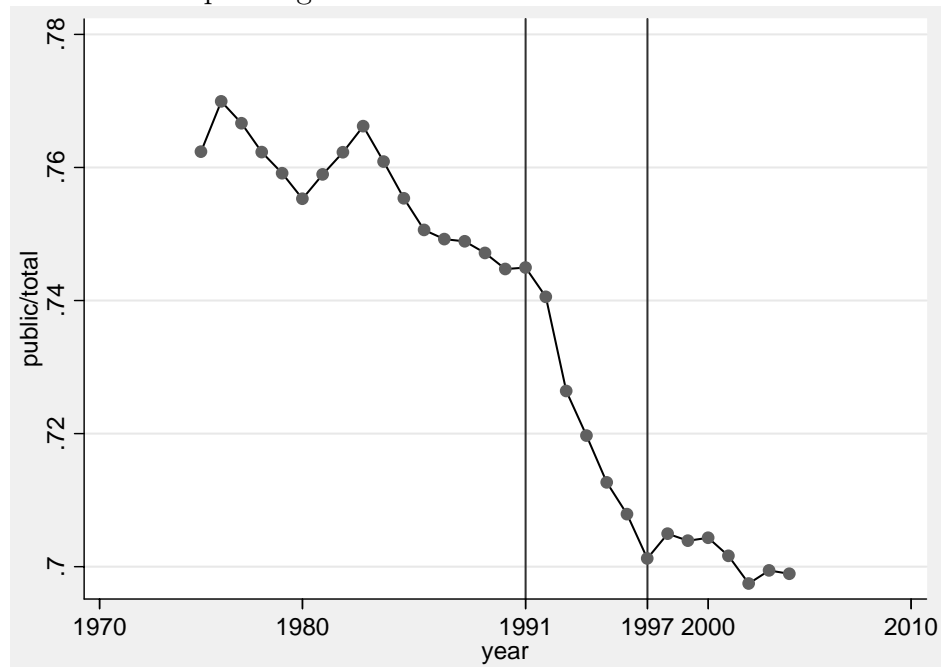
Across countries, the Romanow Commission (2002, 25–27) notes that in 1999 the public sector represented about 76 percent of total health care funding — and this ratio was approximately the same as for other G7 countries, except for the United States.

1. *The Public-to-Total Health Care Spending Ratio θ and Its Components θ_j*

For brevity's sake, let us define θ as the annual aggregate ratio of public health care spending to total health care spending across Canada; θ is plotted in Figure 1. Looking at the total θ ratio for Canada as a whole, we see that the spending ratio has declined steadily from 1975 to the present¹. But we notice that the decline was rather steep from 1991 to 1997, and that it had levelled off somewhat from 1997 on.

¹Source of data is from the Canadian Institute for Health Information (CIHI). Note first that the data begins only in 1975 (it would be more fruitful to have earlier data). Also, data for 2003 and 2004 are forecasted data. See the Canadian Institute for Health information (2005).

Figure 1 Annual Ratio of Public Health Care Spending to Total Health Care Spending Across Canada



Several questions leap to mind. First, was the steep decline in θ from 1991 to 1997 due to cuts in federal health transfers, and was the levelling off of θ after 1997 due to the increase in health transfers? One would think so, since the decrease (and increase) in federal transfers would influence provincial public health spending. Up to 1997, the federal government downloaded health obligations to the provincial governments². If so, the numerator θ

²But we should not be restricted to focussing on the first two spending components of overall health spending. The Romanow Commission urges federal involvement into insuring for drug and home care (The Romanow Commission (2002, chapters ___ and ___).

would fall faster than the denominator.

Second, if we disaggregate θ into “sources of health use” (see below) — i.e., if we look at θ_J where $J =$ “hospitals”, “physicians” and so on — which of the θ_J show different (or similar) patterns than θ ? This is important, for two of the eight constituent components — “hospital spending” and “spending on physicians” — are directly covered by rules in the Canada Health Act [see “The Extent of Private health Care in Canada” (2005)]. Third, and finally, how do θ and the θ_J vary across the provinces, during the 1991–1997 and 1997–2004 time periods? For the overall provincial public-to-total spending ratio, we define this as θ_I , and for each of the constituent spending ratios by province, we define these as $\theta_{I,J}$. Both θ_I and $\theta_{I,J}$ are important, for these could provide indicators as to differing provincial approaches to the delivery of health care. This discussion represents the core of our paper. This discussion is important, since the federal government is concerned about provincial government adherence to public provision of (and accessibility to) health care.

Several provinces have increased support for drug expenditures. Provincial policy, thus, influences spending ratios over and above that covered by Canada Health Act.

The private, public, and total spending data is published by the Canadian Institute for Health Information, or CIHI [see CIHI(2005, (2001)]. Analogous data was published by Health Canada on a fiscal year basis, but the data collection was terminated in 2001/02 [Health Canada (2001)]. The data is collected as to “source of payment” basis, as to the sector making the payment³. This approach can be differentiated from the public/private make-up of the health care institutions making the delivery (see Table 1). CIHI defines public spending as spending by provincial, federal and municipal governments plus spending by workers compensation funds and the Quebec Drug Insurance Funds. Private spending is defined as out-of-pocket health care consumption, private health insurance claims and administration costs (paid by profit and non-profit private sector insurance companies), and income to health-care institutions from private sources (such as donations and investment revenue). The CIHI approach thus defines “public” spending as reading down the “public payment” column in the table. For example, public health care spending includes spending on hospital and family physicians services, so long as such services are covered by a public medicare plan. (Hospitals are classified as a government institutions; most physicians practices are private,

³The discussion in this and the next paragraph draws heavily from CIHI (2001, 43–49).

unincorporated businesses). Note in passing that this paper ignores any discussion of not-for-profit government institutions and for-profit health care — a topic heavily covered in the literature⁴. We emphasize public/private health care spending from a source-of-funds view.

Table 1 Examples of Health Care Services Defines as to Institution and Source of Payment*

Institution	Source of Payment	
	Public Payment	Private Payment
Public Institution	<ul style="list-style-type: none"> • medically necessary hospital services provided to Canadian citizens and landed immigrants with government funded health insurance 	<ul style="list-style-type: none"> • medically necessary hospital services provided to a tourist from the United States • a non-necessary fee (such as a private room) paid for by Blue Cross insurance, for a Canadian citizen
Private Institution	<ul style="list-style-type: none"> • medically necessary services provided by a family physician with a private practice 	<ul style="list-style-type: none"> • dentist fees paid by Blue Cross insurance, for a Canadian citizen • over-the-counter non-prescription drugs

* Source: Canada Health Act Division (2005), page 2

CIHI classifies the spending data as “use of funds” categories. There are eight of these: “hospitals”, “other institutions”, “physicians”, “other professionals”, “drugs”, “capital”, “public health administration”, and “other

⁴For example, we ignore such topics as public-private partnerships (or P3). See for example CHA (2002), a policy position favouring P3 establishments. But Rosenberg and Hollingsworth (2005) pose the establishment of extensive P3 relationships.

spending”. Hospitals are differentiated from “other institutions”, in that the latter serve people who reside at the institutions more or less on a permanent basis. “Physicians” are professional in private practice. “Other professionals” are professionals other than physicians (dentists, vision care specialists, massage therapists, etc) in private practice. “Drugs” include prescription drugs, over-the-counter drugs and personal health supplies (such as oral hygiene supplies, or any product used primarily to promote or maintain health). “Capital” includes any investment in any type of medical facility or equipment in a medical institution. “Public health and administration” includes public spending in health prevention, health promotion and safety, and administration of public health departments. “Other health spending” includes spending on home care, health insurance administration (public or private), health research, and miscellaneous health areas.

2. The Role of Federal Social Transfers and Public/Private Health Spending

In this section, we briefly describe changes in federal social transfers, and links to public and private health care spending. As can be seen from Table 2, real total public health care spending only increased by slightly under 0.4 percent during the 1991–1997 “restraint” period. But this spending variable average an annual growth rate of 5.7 percent during the 1997–2004

time interval. But as can be seen from column (2) of the table, total private spending showed a more stable growth-rate pattern over the two time periods under consideration. Private spending grew by about 4 percent from 1991 to 1997, and by about 6.4 percent from 1997 and 2004. It is the sluggish 1991–1997 public spending that accounted for the sharp drop in total θ during 1991–97.

Table 2 Selected Real Health Spending Data and Government Spending Data for 1991–1997 and 1997–2004.

year	annual growth rate in real public health spending (% Δ)	annual growth rate in real private health spending (% Δ)	share of federal social transfers to total federal spending*	share of federal social transfers to total public health spending	share of federal social transfers to total provincial spending	share of public health spending to total provincial health spending
1991			9.26	30.23	8.90	29.94
	0.38	4.08				
1997			7.76	22.58	6.53	28.92
	5.70	6.36				
2004			9.32	29.90	10.49	35.07
	(1)	(2)	(3)	(4)	(5)	(6)

Source: calculations on data obtained as follows. The health spending is from the Canadian Institute of Health Information. The government spending data comes from the National Income and Expenditure Accounts. “Federal social transfers” are CHST data for 1997 and 2004. For 1991, data for health, higher education and income assistance were first summed.

The cutbacks in federal social transfers during the first part of the 1990s is certainly well known. The Mulroney Progressive Conservatives — and the Chretien Liberals later on — fought high federal deficits in part by reducing federal social transfers. In 1990, the federal net debt was \$390.8 billion (or 58.5 percent of GDP) and the federal deficit was \$133.3 billion (or 5 percent of GDP)⁵. In the 1990/91, the federal government was spending \$6-billion in specific purpose social transfers, but decided to download some of its responsibilities to the provinces. Net federal government transfers to the provinces declined from \$30.87 billion dollars in 1992 to 24.825 billion in 1997 — nearly a 20 percent decline in current-dollar terms⁶. As can be seen from column (3) of Table 2, the share of federal social transfers, to total federal spending, declined from 9.3 percent to less than 7.8 percent. (Note that “social” spending includes spending on post-secondary spending and income assistance).

As can be seen by column (4) of the table, federal social assistance as a percentage of total public spending declined from 30.2 percent to 22.6 percent from 1991 to 1997. Total federal social spending as a share of total provincial spending declined from 8.9 percent to 6.5 percent during this period of

⁵Ruggeri (2005, p. 115)

⁶Ruggeri and Yu (2001, p. 51)

restraint. But in the face of federal transfer cutbacks, provincial governments only cut back health care spending marginally, from about 30 percent to total provincial expenditures to 28.9 percent. [column (6) of Table 2]. Therefore, the drastic federal cutbacks in social spending were not matched dollar for dollar by provincial cutbacks to health care. But even so, actual public health care declines took place:

The benchmark year was 1992, when public sector health expenditures, measured in constant dollar per-capita terms was at its highest (\$1,825 per Canadian). This was followed by significant declines in public sector expenditures It wasn't until 1998 that the 1992 level was matched again (\$1,827.77).

But while it is true that provincial government cut back on health care spending, as a share of total spending, the cutbacks were proportionately not as severe as the federal social transfer cutbacks.

The federal government announced, with the 1997/98 federal budget, that the federal deficit had been eliminated. With the 1999 federal budget, the then Health minister Alan Rock announced a “turning point” in health care, whereby the federal government in cooperation with the provinces” can lay the foundation for a stronger health care system over the long term”⁷. The 1999/00 federal budget announced \$11.4-billion in new health care money.

⁷Health Canada, “Health Minister Says Budget a ‘Turning Point’ for Canadian Health Care”, Media Release, February 17, 1999.

With its 2000 budget, the federal government increased its CHST funding by \$2.5 billion, announcing that total CHST funding would reach an all-time high of \$31-billion by 2000/01⁸. The federal government announced several initiatives, including a National Childrens Agenda and funding for First Nations and Inuit peoples. Finally, in October 2004 the First Ministers meeting in Vancouver led to the First Ministers 10-year plan to Strengthen Health Care, a plan which includes new federal money, reducing wait times, a new pharmaceutical strategy and public health targets⁹.

As can be seen from Table 2, the new federal spending initiatives can be seen by inspecting the relevant data for the 1997–2004 period. The share of CHST spending to total federal spending increased to about 9.3 percent in 2004, a noticeable increase from 1997 and slightly higher than the 9.26 recorded in 1991. The 2004 CHST spending represented 29.9 percent of total current-dollar health spending, a percentage only slightly under the 30.2 percent recorded in 1991. And the 2004 CHST transfers represented 10.49 percent of total provincial spending, a large increase from the 6.52 percent in 1997, and noticeably higher than the 8.9 percent for 1991. But accompa-

⁸Health Canada, Budget 2000 Information, Media Release, February 28, 2000.

⁹Health Canada, “Annual Conference of the Federal/Provincial/Territorial Ministers of Health”, Media Release, October 2004.

nying the turnaround in CHST expenditures was a stronger commitment in provincial government priorities. By 2004 health care spending reached 35 percent of total provincial government spending. The emphasis on increased health care spending can be seen by the 5.7 percent annual growth rate in real health care spending during the 1997–2004 period, a sharp increase from the 0.4 annual rate average during the 1991–1997 retrenchment period.

To summarize, this section has sketched the federal transfer environment surrounding public health care spending. We show that the 1991–97 deficit fighting period led to cutbacks in federal social transfers, which led to only slow real growth in public health spending (and an absolute decline in per-capita terms. Once the federal deficit was eliminated by 1997, new federal funding initiatives did in fact lead to increased public health spending. Note however, that real private health spending averaged an annual 6.36 percent after 1997. So the total θ measure as we have defined it still declined slightly during 1997–04, albeit at a much slower rate than during 1991–97. But we want to discuss the changes in θ as to its major components, and provincially. This is what we do in the next section.

III The Public-to-Total Health Care Ratio Decomposed by Spending Use and by Province

Above we showed a graph of total θ — the ratio of public health care spending to total health care spending — and stated that we can define sub-components of θ , θ_J , by spending use. We can also decompose θ by province — calling the aggregate provincial public-to-total ratio θ_I and the provincial ratio disaggregated by spending use $\theta_{I,J}$. Recall that two spending uses — “hospitals” and “physicians” — are governed by the Canada Health Act and the remaining six components are not.

Table 3 Public-to-Total Health Sending Ratios, $\theta_{I,J}$: 2004

prov	hosp	oth inst	phys	oth prof	drugs	capital	public health	other	total
N. L.	95.97	89.7	99.81	8.63	34.08	90.97	100	79.54	78.97
P.E.I.	93.18	63.45	99.31	7.03	26.28	94.61	100	69.94	69.94
N.S.	88.81	79.38	99.11	7.74	29.93	86.26	100	69.89	69.89
N.B.	96.33	64.23	98.75	6.88	28.44	94.09	100	62.89	70.64
Quebec	96.23	60.83	97.75	10.48	45.16	80.86	100	55.22	70.66
Ontario	89.56	72.04	98.73	6.73	37.04	72.86	100	55.11	67.21
Manitoba	86	74.84	98.61	10.36	42.99	78.32	100	72.16	72.75
Sask.	93.59	78.2	99.65	16.91	41.34	91.69	100	75.95	75.95
Alberta	89.92	76.41	97.92	10.14	37.2	81.52	100	61.6	70.78
B.C.	94.96	86.34	98.39	6.77	37.95	76.03	100	61.88	71.94
territories	94.05	71.54	99.86	44.79	58.79	93.2	100	95.77	88.76
Maritimes	92.2	72.01	98.98	7.35	29.07	88.71	100	62.77	70.19
Canada	92.07	73.32	98.47	8.37	39.02	76.9	100	59.53	69.89

Source: CIHI (2005). These data are the ratio of current-dollar public spending to total spending, by “use of funds” and by province, territory and Canada. See text for definitions of the “use of funds” definition.

Short forms: province, prov; hospital, hosp; other institutions, oth inst; physicians, phys; oth prof, other professionals

In this section we wish to look at changes to the θ_J and $\theta_{I,J}$ for the two fiscal time periods under consideration, the retrenchment 1991–97 period (Table 3) and the increased-spending 1997–04 period (Table 4). The extreme

right-bottom cells of both tables show one key point depicted in Figure 1, that the total θ dropped significantly (by 4.37 percentage points) from 1991 to 1997, and much more gradually (by 0.23 percentage points) from 1997 to 2004.

Table 4 Changes in Public-to-Total Health Sending Ratios, $\Delta\theta_{I,J}$: 1991–1997

prov	hosp	oth inst	phys	oth prof	drugs	capital	public health	other	total
N.L.	3.73	2.76	0.06	- 4.48	2.48	- 1.93	0	- 3.79	- .24
P.E.I.	- 3.76	- 3.80	0.35	- 0.44	- 1.13	- 24.11	0	- 4.06	- 5.01
N.S.	- 2.05	6.38	- .15	- 5.97	- 5.43	- .47	0	1.98	- 2.95
N.B.	7.57	0.58	- 3.65	- 2.50	- 8.33	-12.20	0	- 2.59	- 2.45
Quebec	4.98	- 9.38	- 1.14	- 5.86	- 0.05	0.01	0	- 9.83	- 3.53
Ontario	- 3.84	- .78	0.18	- 3.15	- 3.18	8.56	0	- 5.42	- 6.48
Manitoba	- 2.81	- 6.95	- 0.01	0.5	- 1.21	0.29	0	- 6.85	- 5.17
Sask.	2.74	- .90	0.02	- 10.93	-12.05	1.42	0	- 1.91	- 4.36
Alberta	- 1.58	15.87	- 0.05	- 12.29	- 2.11	- 18.20	0	- 1.74	- 5.30
B.C.	4.22	3.61	0.21	- 1.65	0.54	- 3.72	0	2.53	- 0.01
territories	2.71	- 2.17	0.76	- 6.46	1.21	0	0	2.11	0.61
Maritimes	1.62	2.75	- 1.59	- 4.27	- 6.34	- 7.25	0	- 0.32	- 2.90
Canada	0.38	- .22	- .19	- 4.77	- 2.24	- .32	0	- 4.30	- 4.37

Source: Calculations from data in CIHI (2005). These data are first difference changes in the percentage of current-dollar spending to total spending, by “use of funds” and by province, territory and Canada.

Short forms: province, prov; hospital, hosp; other institutions, oth inst; physicians, phys; oth prof, other professionals

Table 5 Changes in Public-to-Total Health Sending Ratios, $\Delta\theta_{I,J}$: 1997–2004

prov	hosp	oth inst	phys	oth prof	drugs	capital	public health	other	total
N.L.	0.53	3.7	0.14	- 5.94	2.37	- 2.00	0	4.01	0.67
P.E.I.	0.61	- 0.43	- .040	- 1.79	6.28	35.19	0	- 1.34	2.32
N.S.	- 0.89	7.34	- 0.31	- 1.37	3.07	9.42	0	- 3.80	- 0.80
N.B.	1.05	- 0.36	3.02	- 0.27	6.56	16.27	0	- 4.33	0.24
Quebec	1.21	- 0.88	- 0.34	- 2.49	11.75	- 12.64	0	- 10.63	- 1.39
Ontario	2.56	3.7	- 0.64	- 1.49	6.28	- 9.36	0	- 7.98	0.56
Manitoba	- 6.69	3.26	- 0.62	- 4.77	15.19	- 11.50	0	- 1.59	0.05
Sask.	- 2.48	2.25	0.74	0.37	12.64	- 6.93	0	- 1.94	1.47
Alberta	- 2.49	- 6.34	- 0.64	- 0.88	7	22.25	0	- 10.83	0.91
B.C.	4.05	1.63	- 0.66	- 7.72	0.06	- 0.22	0	- 10.96	- 1.46
territories	- 2.60	- 19.62	- 0.14	6.25	13.36	- 6.80	0	- 2.73	- 0.64
Maritimes	0.21	4.17	1.1	- 0.99	4.79	- 12.60	0	- 3.91	- 0.14
Canada	1.11	1.41	- 0.44	- 2.74	7.42	- 5.93	0	- 8.03	- .23

Source: Calculations from data in CIHI (2005). These data are first difference changes in the percentage of current-dollar spending to total spending, by “use of funds” and by province, territory and Canada.

Short forms: province, prov; hospital, hosp; other institutions, oth inst; physicians, phys; oth prof, other professionals

Looking at the disaggregated θ_J by spending use for Canada as a whole — the bottom rows for Tables 2 and 3 respectively — we first see that the sharp

drop for the total θ can be accounted for in the “other professionals”, “drugs” and “other sub-categories”. These sub-components fell by 4.8, 2.24 and 4.3 percentage points respectively¹⁰. Note that the two CHA-components, “hospitals” and “physicians”, show a 0.4 and 0.2 percentage point decline respectively over this period. For the increased-spending 1997–2004 time period, the θ_J for “other professionals” and “other spending” continued to fall, by 2.7 and 8 percentage points respectively. Note that the two CHA-related components, “hospitals” and “physicians”, again changed very little in the post-1997 recovery period. And note that the θ_J for “drugs” grew fast, by a 7.4 percentage point change — a dramatic reversal in the -2.24 percentage-point decline during the 1991–97 period. Consequently it is a turnaround in this key component which explains much of the flat-lined direction in the total θ after 1997. We will be discussing this point in greater detail below. Differences across provinces the θ_I and $\theta_{I,J}$ — can be seen by inspecting the right-hand-side columns and the interior columns of the two tables. For the 1991–97 retrenchment period, the total θ_I for the provinces tended to move

¹⁰One may ask why the rates-of-change for the eight sub-components do not average out to the total 4.37 decline for the total θ . Note that the two CHA-components, hospitals and physicians, grew very slowly over this period, and “drugs” and “other” grew very quickly. So there is an important compositional shift not captured by the data in the table.

together. Except for Newfoundland and British Columbia, two provinces where θ_I held steady, for the remaining eight provinces the range in decline for θ_I was between 2.45 percentage points (for New Brunswick) and 6.48 percentage points (for Ontario). The reasons for the flat-lined change in Newfoundland and British Columbia's θ_I were similar: their respective “hospitals”, “other institutions” and “drugs” $\theta_{I,J}$ posted increases. For the remaining eight provinces, their $\theta_{I,J}$ show differing movements. Concentrating on the CHA-related components, Ontario, displayed a sharp 3.84 percentage point decline in “hospitals”, whereas Quebec showed a 5 percentage point rise in that component. Both Newfoundland and British Columbia raised their CHA-related “hospitals” and “physicians” spending — and it was this phenomenon which allowed these two provinces to hold their aggregate θ_I steady. Finally, Alberta has often been singled out as the province advocating “privatisation” of health care. Yet its -5.3 percentage point change in θ_I is not substantially different than Manitoba, Saskatchewan, Ontario, or Prince Edward Island.

For the 1997–2004 “increased spending” period, we first note that, for the two CHA-related components “hospitals” went up by 1.1 percentage point and “physicians” went down by a half-percentage point. “Other profession-

als” and “other spending” continued to post percentage point declines, continuing that trend from the 1991–1997 period. But note that it was the key “drugs” component that showed an abrupt turnaround, showing a 7.5 percentage point increase. If it was not for this sharp increase — and note that spending on pharmaceutical drugs is the fastest growing spending component — the aggregate national θ would have declined at a rather fast rate.

Among the provincial θ_I and $\theta_{I,J}$, there is some variance across provinces. Quebec and British Columbia show 1.5 percentage point declines; and Nova Scotia reveals a smaller decline. The remaining seven provinces show modest θ_I increases, led by Saskatchewan and Prince Edward Island. Concentrating on the CHA-related spending, note that Ontario under the McGinty government has undertaken a program to re-socialize private hospital clinics — and this has led to a 2.5 percentage point rise in its hospital $\theta_{I,J}$. British Columbia shows an even larger rise in this component. But note that the three prairie provinces all reveal decreases in this spending area. For the “physicians” $\theta_{I,J}$, all of the provinces show little change, except for New Brunswick, which shows a large 3 percentage point rise. Among the non-CHA spending components, perhaps the “drugs” $\theta_{I,J}$ is the most interesting. All provinces register percentage point gains. But the increases were particu-

larly large for Quebec, Manitoba and Saskatchewan. The “other” $\theta_{I,J}$ posted declines in all provinces except Newfoundland — with large drops noticeable in Quebec Alberta and British Columbia.

The fact that the changes in θ_I and $\theta_{I,J}$ vary across provinces lead us to consider measuring the variance (or standard deviation) for these components for each year, across provinces. Is there any underlying trend underway? Has the variance (or standard deviation) changed from the restricted spending regime (1991–97) to an increased-spending regime? This is the question we tackle in the next section.

IV Statistical Tests and Descriptive Graphs

The main topic thus far is the annual provincial ratio of public to total health care spending. Since public health care spending involves very different institutions, contracts, and payment than private health care spending the paths of these two forms of spending could be very different over time. This section examines real provincial public per-capita health care spending over time and real private provincial per-capital health care spending over time. As pointed out above, the years 1991 to 1997 are associated with federal fiscal retrenchment. With regard to public spending the main question for

this section is, are changes in real provincial per-capita public expenditure between 1975 and 1990 very different than between 1991 and 1997 (the period of federal fiscal retrenchment) and between 1998 and 2000? With regard to private spending the main question is, how has real provincial per-capital private expenditure been changing over time?

With data from one province we could examine the following explanatory variables:

a constant: this variable is associated with the earliest year in the sample which is 1975

time: the number of years since 1975

1975–1990: equal to one if the observation is associated with the years from 1975 to 1990; this serves as a reference category

1991–1997: equal to one if the observation is associated with the years from 1991 to 1997 and zero otherwise; this is the period of fiscal restraint

1991–1997, time: equal to time between 1991 and 1997 and equal to zero otherwise

1998–2004 equal to one if the observation is associated with the years from

1998 to 2004 and zero otherwise

1998–2004, time equal to time between 1998 and 2004 and equal to zero otherwise.

Furthermore an indicator variable is constructed for each province and crossed with each of these explanatory variables; Ontario and 1975–1990 serve as reference categories. These 60 explanatory variables are regressed on real provincial per-capita public expenditure; there are 300 observations in this sample. Ordinary least squares results in an R^2 of 0.98 and hence almost all of the variation in the dependent variable is explained by these dependent variables. The parameter estimates and t-statistics from this one regression are reported in Tables 6 and 7.

Table 6 Real Provincial Per-Capita
Public Expenditure

300 observations, R^2 : 0.98, adjusted R^2 : 0.99

Variable	$\hat{\beta}$	t-statistic
constant	1116.41	37.79
time	45.81	14.99
1991-1997	1225.84	5.68
1991-1997, time	-68.72	-6.20
1998-2004	-1237.94	-4.27
1998-2004, time	39.20	3.54
<hr/>		
Newfoundland (nfld)	-259.40	-6.21
time nfld	-2.41	-0.56
1991-1997 nfld	-986.66	-3.23
1991-1997, time nfld	56.01	3.58
1998-2004 nfld	-802.02	-1.96
1998-2004, time nfld	54.53	3.48
<hr/>		
Prince Edward Island (pei)	-93.38	-2.24
time pei	-9.46	-2.19
1991-1997 pei	-706.86	-2.31
1991-1997, time pei	39.56	2.53
1998-2004 pei	-543.02	-1.33
1998-2004, time pei	28.08	1.79
<hr/>		
Nova Scotia (ns)	-199.65	-4.78
time ns	2.64	0.61
1991-1997 ns	-451.15	-1.48
1991-1997, time ns	18.34	1.17
1998-2004 ns	208.20	0.51
1998-2004, time ns	-5.46	-0.35
<hr/>		
New Brunswick (nb)	-285.88	-6.84
time nb	9.86	2.28
1991-1997 nb	-347.42	-1.14
1991-1997, time nb	14.66	0.94
1998-2004 nb	198.45	0.48
1998-2004, time nb	-10.23	-0.65

Table 7 Real Provincial Per-Capita
Public Expenditure

300 observations, R^2 : 0.98, adjusted R^2 : 0.99

Variable	$\hat{\beta}$	t-statistic
Quebec (que)	132.88	3.18
time que	-15.75	-3.64
1991-1997 que	-486.96	-1.59
1991-1997, time que	27.84	1.78
1998-2004 que	452.22	1.10
1998-2004, time que	-10.50	-0.67
Manitoba (man)	87.32	2.09
time man	-2.76	-0.64
1991-1997 man	-482.96	-1.58
1991-1997, time man	25.98	1.66
1998-2004 man	-290.17	-0.71
1998-2004, time man	22.47	1.43
Saskatchewan (sask)	1.15	0.03
time sask	6.10	1.41
1991-1997 sask	15.73	0.05
1991-1997, time sask	-4.65	-0.30
1998-2004 sask	84.74	0.21
1998-2004, time sask	-4.21	-0.27
Alberta (alt)	153.07	3.66
time alt	4.39	1.02
1991-1997 alt	524.63	1.72
1991-1997, time alt	-41.64	-2.66
1998-2004 alt	-651.01	-1.59
1998-2004, time alt	16.13	1.03
British Columbia (bc)	233.05	5.58
time bc	-3.91	-0.90
1991-1997 bc	-46.85	-0.15
1991-1997, time bc	4.80	0.31
1998-2004 bc	187.37	0.46
1998-2004, time bc	-4.15	-0.27

For Ontario the discrete jump in 1991 depends on the 1991–1997 parameter. For all other provinces this jump depends on two parameters. For example, the 1991 jump for Newfoundland (nfld) depends on the 1991–1997 and the ‘1991–1997 nfld’ parameters. For each province a statistical test

performed under the null hypothesis that this jump in 1991 is equal to zero. For Newfoundland the p-value associated with this statistical test is equal to 0.27 and hence there little evidence to reject the null hypothesis. For Prince Edward Island the p-value is 0.02 and hence there is some evidence to reject the null hypothesis. For all other provinces this statistical test is associated with a p-value of less than one percent. These same tests were performed for the discrete changes in 1998; the 12 separate tests are each statistically significant at 1 percent.

For Ontario the difference between the 1975–1990 slope and the 1991–1997 slope depends on the ‘1991–1997, time’ parameter. For all other provinces this change in slope depends on two parameters. For example, the 1991–1997 change in slope for Newfoundland (nfld) depends on the ‘1991–1997, time’ and the ‘1991–1997, time nfld’ parameters. For Newfoundland the p-value associated with this statistical test is 0.25 and hence there is little evidence to reject the null hypothesis. For all other provinces there is evidence to reject the null hypothesis that this slope for 1975–1990 is the same as the slope for 1991–1997. These same tests were performed for each of the 1998–2004 time slopes; these 12 separate tests are each statistically significant.

Finally a statistical test was performed for each province under the null

hypothesis that the province specific parameters are all equal to zero; in other words the null hypothesis is that a province is no different than Ontario. Each of these nine test are associated with a p-value of less than 1 percent and hence there is statistical evidence that each province is different than Ontario.

In summary the statistical tests imply that changes in real provincial public per capita spending between 1975 and 1990 and very different than the changes between 1991 and 1997. Furthermore each of the provinces is statistically different than Ontario. The parameter estimates imply that between 1991 and 1997 real public per capita health care spending is falling in Ontario, Quebec, Saskatchewan, Alberta, and British Columbia and rising Newfoundland, Prince Edward Island, Nova Scotia, New Brunswick and Manitoba. The parameter estimates also imply that real provincial public per-capita spending is rising in all province; some faster than others.

The real provincial private per-capita findings are reported in Table 8

Table 8 Real Provincial Per-Capita
Public Expenditure

300 observations, $R^2:0.92$, adjusted $R^2:0.91$

Variable	$\hat{\beta}$	t-statistic
constant	423.53	423.53
time	30.30	30.30
time squared	-1.27	-1.27
time cubed	0.04	0.04
Newfoundland (nfld)	20.16	20.16
time nfld	13.98	13.98
time squared nfld	-3.29	-3.29
time cubed nfld	0.08	0.08
Prince Edward Island (pei)	32.80	32.80
time pei	24.05	24.05
time squared pei	-2.97	-2.97
time cubed pei	0.07	0.07
Nova Scotia (ns)	-76.34	-76.34
time ns	-16.36	-16.36
time squared ns	0.95	0.95
time cubed ns	-0.02	-0.02
New Brunswick (nb)	-238.82	-238.82
time nb	48.20	48.20
time squared nb	-3.57	-3.57
time cubed nb	0.07	0.07
Quebec (que)	-128.24	-128.24
time que	-5.47	-5.47
time squared que	0.49	0.49
time cubed que	-0.02	-0.02
Manitoba (man)	-118.98	-118.98
time man	9.09	9.09
time squared man	-1.01	-1.01
time cubed man	0.02	0.02
Saskatchewan (sask)	72.12	72.12
time sask	-15.42	-15.42
time squared sask	-0.29	-0.29
time cubed sask	0.01	0.01
Alberta (alt)	-28.47	-28.47
time alt	3.03	3.03
time squared alt	-0.90	-0.90
time cubed alt	0.02	0.02
British Columbia (bc)	96.12	96.12
time bc	-19.75	-19.75
time squared bc	0.92	0.92
time cubed bc	-0.02	-0.02

Statistical test suggest that each province is statistically different than Ontario. For Newfoundland the predicted real provincial public per capital expenditure is decreasing in the 1980s and early 1990s. For all other provinces this dependent variable appears to be remaining constant or increasing. The slopes over time are relatively steep after 1998.

The general message is that between 1991 and 1997 real provincial public spending per-capita was either slowly increasing or decreasing and these changes are statistically different than between 1975 and 1990; Newfoundland stands out as an exception. In contrast between 1991 and 1997 real provincial private spending per-capita is increasing; Newfoundland stands out as an exception. Between 1998 and 2004 both private and public provincial spending per capita are increasing.

The final questions to be examined are;

- How have the mean and standard deviation of real public per-capita spending across provinces been changing over time?
- How have the mean and standard deviation of real private per-capita spending across provinces been changing over time?

Figure 2 plots the mean and standard deviation for public spending. Be-

tween 1991 and 1997 the mean is relatively constant and the standard deviation across provinces is falling. This implies relatively constant more equitable real per-capita public spending. In contrast between 1997 and 2004 both the mean and standard deviation are rising. This implies that real public per-capita spending is rising and becoming more diverse across the provinces.

Figure 2 Real Provincial Public Per-Capita Spending

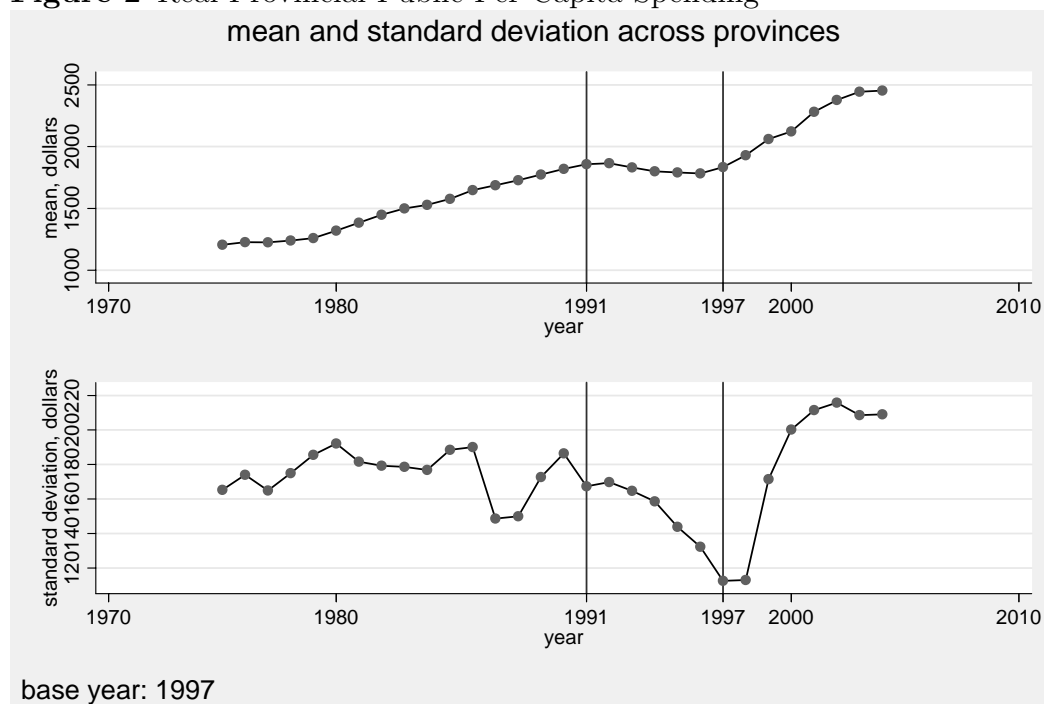
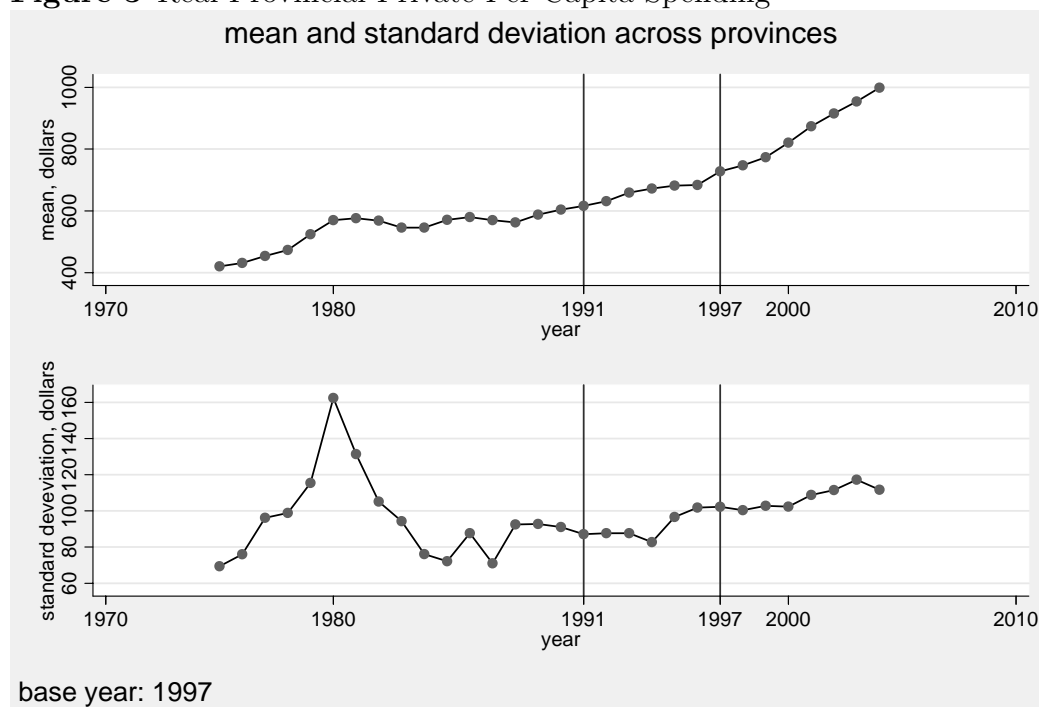


Figure 3 plots the mean and standard deviation for private spending.

After 1991 the mean is consistently rising and the standard deviation is generally rising.

Figure 3 Real Provincial Private Per-Capita Spending
mean and standard deviation across provinces



V Conclusions

Figure 1 reports that between 1991 and 1997 the fraction of total health care spending associated with public funding is falling. During this time period real public per capita health care spending is falling in Ontario, Quebec, Saskatchewan, Alberta, and British Columbia and rising in Newfoundland,

Prince Edward Island, Nova Scotia, New Brunswick and Manitoba. Furthermore more between 1991 and 1997 the mean across provinces remains relatively constant and the standard deviation falls.

Figure 1 reports that between 1998 and 2004 the fraction of total health care spending associated with public funding is relatively low. During this time period real public per capita health care spending is rising across all provinces and the standard deviation is rising as well.

Since 1991 real provincial private spending per-capita has been rising, particularly after 1997. This is in part why the proportion of spending associated with public funding fell between 1991 and 1997 and remained low there after.

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