A Note on Recently Revised Data and New Estimates of the Canada-U.S. Productivity and Income Gaps, June 4, 2002

Since the publication of "Recent Productivity Developments in the United States and Canada: Implications for the Canada-U.S. Productivity and Income Gaps" in the fourth *International Productivity Monitor* (Spring 2002, published on May 29, 2002, and available at www.csls.ca), revised data have become available that have important effects on the estimates of the gaps presented therein. Whereas the previous estimates showed Canada slipping from 86.8 per cent of U.S. GDP per worker in 1989 to 79.6 per cent in 2001 and from 85.5 per cent to 80.6 per cent of GDP per hour over the same period, the latest estimates show the respective percentages fall from 86.6 to 80.2 and from 85.3 to 81.1. All three income gaps, namely in GDP, personal income and personal disposable income per capita, have likewise been narrowed due to the incorporation of the data revisions. Given that these differences are somewhat substantial, both appendix tables from "Recent Productivity Developments . . ." have been updated and included here. The remainder of this note will explore the specific nature of the data revisions.

First of all, Statistics Canada completed its annual revision of the national accounts on May 31, 2002, affecting real and nominal income estimates for the 1981-2001 period. These revisions focused on changes in the treatment of four components of income/expenditure, namely license and registration fees, farm inventories, land transfer taxes, and spectrum charges. Licensing fees were previously treated as taxes on production, but for consistency with international standards are now classed as transfers from consumers to government, causing a downward revision in GDP. Farm inventories have been revised based on the 1996 Census of Agriculture. Land transfer taxes are now classed as taxes on products rather than on factors of production, as was previously the case, although this change only affects GDP at basic prices and not at market prices, the series used in calculating the income and productivity gaps. Finally, spectrum charges are fees paid by telecommunication companies to the government for the use of airwaves, and are now treated as royalties paid rather than a tax on a factor of production. They have been treated as royalties since 1996, but the recent revision extends this treatment back to 1993, when spectrum charges were first introduced.

Before the revisions GDP was $361,355 million in current (Canadian) dollars in 1981 and $1,084,119 million in 2001. After the revisions were implemented these changed to $360,471 million in 1981 and $1,092,246 million in 2001, increasing total growth over this period from 200.0 per cent before the revision to 203.0 per cent after the revisions. Growth in nominal personal income and personal disposable income increased similarly. GDP per worker and per hour and GDP, personal income, and personal disposable income per capita in current dollars are shown in the updated Appendix Tables 1 and 2 included here and can be compared to data in Appendix Tables 1 and 2 of "Recent Productivity Developments . . ." to further illustrate the implications of the revisions to the national accounts. Also, "The 2002 Revisions of the National Economic and Financial Accounts" published by Statistics Canada and available at www.statcan.ca has been summarized briefly here and can be consulted for further information.

Having a much smaller effect on the estimates of the productivity and income gaps are two revisions to the National Income and Product Accounts in the United States. On March 28, 2002, the GDP estimate for the fourth quarter of 2001 was revised upwards, causing the estimate of nominal GDP for 2001 as a whole to rise from $10,205.6 billion to $10,208.1 billion (in U.S. dollars). On March 29, 2002, monthly personal income for October 2001-January 2002 was revised downwards, causing the estimate for 2001 as a whole to fall from $8,723.9 billion to $8,723.5 billion. Personal disposable income in 2001 was revised similarly, from $7,417.6 billion to $7,417.3 billion.

Finally, a larger effect on the productivity and income gaps is that caused by the use of a new population series for the United States. The population series used previously was that from the 2002 Economic Report of the President for 1959-2000, with the 2001 value obtained by applying the 2000-2001 growth rate from the 2000 census estimates to the 2000 value from the Economic Report of the President series. However, this has been replaced by the recently released series used by the Bureau of Economic

Analysis in its calculation of per capita personal disposable income in the National Income and Product Accounts. These population estimates are based on extrapolation and interpolation between censuses until the Bureau of the Census releases intercensal estimates, which are then substituted. The BEA series is hence consistent for the entire 1959-2001 period but incorporates the latest 2000 census population base, unlike the Economic Report of the President. The use of this new BEA population series has caused the population estimates for 1991 onwards to be substantially higher. For example, in 1991 the Economic Report of the President reports the population of the United States as 252,665 thousand, while the BEA series reports 253,336 thousand. Between 1991 and 2001 the Economic Report of the President series grew a total of 10.0 per cent while the BEA series grew 12.9 per cent. Higher population estimates mean that GDP, personal income, and personal disposable income per capita in the United States are now smaller than previously estimated, the latter in 2001 falling from US$26,683 before the revisions to US$25,943 after the revisions.

The effect of all three of these revisions has improved the picture for Canada somewhat. The gap in GDP per capita in 2001 has narrowed by 2.86 percentage points, with Canada obtaining 79.49 per cent of the U.S. level according to data before the revisions and 82.35 per cent according to revised data. The widening of the gap since 1989 is also less severe according to revised data, with Canada's percentage of U.S. personal disposable income per capita falling 6.99 percentage points from 78.15 per cent in 1989 to 71.16 per cent in 2001. This is in contrast to the 10.02 percentage point drop recorded by the unrevised data over the same period, from 78.38 per cent of the U.S. level in 1989 to 68.36 per cent in 2001. Nevertheless, the income gaps are still widening, and the same goes for the productivity gaps. As discussed in "Recent Productivity Developments . . ." there is little hope of closing the Canada-U.S. income gap without first closing the Canada-U.S. productivity gap.

Appendix Table 1
Relative Productivity Trends in Canada and the United States

	Canada					United States		Canada as % of US	
Year	GDP per worker, current CAD$	GDP per hour, current CAD$	GDP PPP exchange rate, US$/CAD$	GDP per worker, current US$	GDP per hour, current US$	GDP per worker, current US$	GDP per hour, current US$	GDP per worker	GDP per hour
	A	B	C	D=A*C	E=B*C	F	G	H=F/D*10	I=G/E*100
1976	20,488	11.26	0.854	17,498	9.62	20,551	10.94	85.15	87.90
1977	22,326	12.29	0.851	19,001	10.46	22,076	11.80	86.07	88.63
1978	24,042	13.10	0.855	20,561	11.20	23,904	12.83	86.02	87.29
1979	26,301	14.35	0.846	22,245	12.14	25,969	14.01	85.66	86.65
1980	28,737	15.94	0.832	23,913	13.26	28,152	15.35	84.94	86.42
1981	31,909	17.99	0.82	26,165	14.75	31,189	17.01	83.89	86.73
1982	34,700	19.63	0.80	27,760	15.70	32,747	18.09	84.77	86.81
1983	37,307	21.09	0.79	29,473	16.66	35,057	19.27	84.07	86.47
1984	39,786	22.45	0.80	31,829	17.96	37,453	20.49	84.98	87.65
1985	41,810	23.45	0.81	33,866	18.99	39,319	21.66	86.13	87.71
1986	42,787	24.03	0.81	34,657	19.46	40,630	22.47	85.30	86.61
1987	45,367	25.59	0.80	36,293	20.47	42,178	23.32	86.05	87.78
1988	48,236	26.78	0.80	38,589	21.43	44,432	24.68	86.85	86.83
1989	50,647	27.76	0.80	40,518	22.21	46,779	26.06	86.62	85.25
1990	51,966	28.92	0.81	42,092	23.43	48,851	27.28	86.16	85.88
1991	53,333	30.28	0.81	43,200	24.53	50,852	28.55	84.95	85.90
1992	54,897	31.67	0.82	45,015	25.97	53,328	29.83	84.41	87.05
1993	56,557	32.20	0.82	46,377	26.40	55,233	30.79	83.97	85.76
1994	58,793	33.05	0.83	48,798	27.43	57,324	31.84	85.13	86.16
1995	60,675	34.36	0.83	50,360	28.52	59,251	33.10	84.99	86.16
1996	62,162	34.98	0.83	51,595	29.04	61,663	34.45	83.67	84.29
1997	64,085	36.04	0.83	53,191	29.91	64,206	35.69	82.84	83.82
1998	64,706	36.70	0.84	54,353	30.83	66,798	37.10	81.37	83.10
1999	67,477	37.94	0.841	56,736	31.90	69,434	38.70	81.71	82.42
2000	71,430	39.87	0.830	59,308	33.10	73,020	40.79	81.22	81.15
2001	72,445	41.25	0.837	60,614	34.52	75,592	42.54	80.19	81.14

Source: CSLS Income and Productivity database, based on data from Canadian National Accounts and Labour Force Survey, and US BEA and BLS, Current Population Survey, June 3 2002. PPP exchange rates from Statistics Canada *National Income and Expenditure Accounts, Third Quarter 1999* , Cat. No. 13-001-XPB.

Note: the GDP PPP exchange rates for 1999-2001 were calculated by multiplying the PPP rate in 1998 by the index value (1998=1.00) of the US GDP deflator as a percentage of the Canadian GDP deflator in each year. The GDP PPP exchange rates for 1976-1980 were calculated by multiplying the PPP rate in 1981 by the index value (1981=1.00) of the US GDP deflator as a percentage of the Canadian GDP deflator in each year. PPP estimates for 1981-1998 are only published to 2 decimal places.

Appendix Table 2

Relative Aggregate Income Trends in Canada and the United States

	Canada									United States				Canada as % of US		
Year	GDP per capita, current CAD$	PI per capita, current CAD$	PDI per capita, current CAD$	GDP PPP exchange rate, US$/CAD$	Household Consumption PPP exchange rate, US$/CAD$	GDP per capita, current US$	PI per capita, current US$	PDI per capita, current US$	PDI/PI ratio, %	GDP per capita, current US$	PI per capita, current US$	PDI per capita, current US$	PDI/PI ratio, %	GDP per capita	PI per capita	PDI per capita
	A	B	C	D	E	F=A*D	G=B*E	H=C*E	I=H/B*100	J	K	L	M=L/K*10	N=J/F*100	O=K/G*10	P=L/H*100
1961	2,241	1,661	1,503	1.033	0.881	2,315	1,463	1,324	90.47	2,970	2,342	2,081	88.87	77.95	62.47	63.59
1962	2,386	1,772	1,605	1.030	0.880	2,459	1,560	1,412	90.54	3,143	2,454	2,174	88.58	78.22	63.56	64.96
1963	2,515	1,857	1,681	1.020	0.878	2,566	1,630	1,476	90.55	3,268	2,541	2,249	88.52	78.52	64.15	65.61
1964	2,705	1,959	1,759	1.008	0.871	2,727	1,707	1,532	89.78	3,462	2,687	2,412	89.76	78.77	63.51	63.53
1965	2,928	2,113	1,891	0.990	0.867	2,898	1,833	1,640	89.47	3,705	2,868	2,567	89.50	78.21	63.92	63.90
1966	3,216	2,332	2,047	0.970	0.858	3,119	2,001	1,756	87.77	4,015	3,084	2,742	88.90	77.69	64.87	64.04
1967	3,396	2,500	2,162	0.958	0.856	3,253	2,139	1,850	86.49	4,197	3,272	2,899	88.59	77.51	65.36	63.81
1968	3,651	2,692	2,297	0.964	0.856	3,519	2,303	1,966	85.33	4,541	3,559	3,119	87.64	77.50	64.72	63.01
1969	3,962	2,955	2,472	0.967	0.864	3,831	2,553	2,136	83.67	4,860	3,851	3,329	86.45	78.83	66.28	64.15
1970	4,204	3,160	2,607	0.971	0.883	4,082	2,790	2,302	82.50	5,070	4,101	3,591	87.56	80.51	68.04	64.10
1971	4,491	3,399	2,790	0.987	0.896	4,434	3,045	2,499	82.08	5,434	4,358	3,860	88.58	81.59	69.87	64.75
1972	4,956	3,804	3,138	0.971	0.882	4,811	3,356	2,768	82.49	5,909	4,736	4,138	87.36	81.42	70.85	66.90
1973	5,744	4,388	3,620	0.937	0.870	5,382	3,819	3,151	82.51	6,537	5,253	4,619	87.93	82.32	72.69	68.21
1974	6,765	5,180	4,240	0.890	0.873	6,023	4,522	3,702	81.87	7,017	5,730	5,013	87.49	85.84	78.92	73.85
1975	7,514	5,930	4,882	0.882	0.859	6,630	5,093	4,193	82.33	7,571	6,166	5,470	88.71	87.58	82.61	76.66
1976	8,541	6,683	5,462	0.854	0.845	7,295	5,645	4,614	81.74	8,363	6,765	5,960	88.10	87.23	83.44	77.41
1977	9,330	7,320	5,988	0.851	0.834	7,940	6,108	4,997	81.81	9,222	7,432	6,519	87.72	86.10	82.19	76.65
1978	10,246	8,093	6,699	0.855	0.824	8,762	6,666	5,517	82.77	10,313	8,302	7,253	87.37	84.96	80.29	76.06
1979	11,582	9,024	7,488	0.846	0.840	9,796	7,580	6,290	82.99	11,401	9,247	8,033	86.87	85.92	81.98	78.31
1980	12,859	10,147	8,413	0.832	0.866	10,700	8,788	7,287	82.92	12,276	10,205	8,869	86.91	87.16	86.12	82.16
1981	14,523	11,716	9,613	0.82	0.85	11,909	9,958	8,171	82.05	13,614	11,301	9,773	86.48	87.48	88.12	83.61
1982	15,123	12,810	10,489	0.80	0.81	12,099	10,376	8,496	81.88	14,035	11,922	10,364	86.94	86.20	87.04	81.97
1983	16,217	13,364	10,862	0.79	0.79	12,812	10,558	8,581	81.27	15,085	12,576	11,036	87.75	84.93	83.95	77.76
1984	17,557	14,345	11,683	0.80	0.79	14,045	11,332	9,229	81.44	16,636	13,853	12,215	88.18	84.43	81.80	75.56
1985	18,795	15,395	12,498	0.81	0.79	15,224	12,162	9,874	81.18	17,664	14,738	12,941	87.81	86.19	82.53	76.30
1986	19,637	16,312	13,042	0.81	0.79	15,906	12,887	10,303	79.95	18,501	15,425	13,555	87.88	85.97	83.55	76.01
1987	21,132	17,304	13,693	0.80	0.79	16,906	13,671	10,818	79.13	19,529	16,317	14,246	87.31	86.57	83.78	75.94
1988	22,878	18,753	14,748	0.80	0.80	18,302	15,002	11,798	78.64	20,845	17,433	15,312	87.84	87.80	86.06	77.05
1989	24,105	20,022	15,860	0.80	0.80	19,284	16,018	12,688	79.22	22,188	18,594	16,235	87.31	86.91	86.15	78.15
1990	24,545	21,175	16,512	0.81	0.82	19,882	17,364	13,540	77.98	23,215	19,614	17,176	87.57	85.64	88.52	78.83
1991	24,450	21,595	16,857	0.81	0.81	19,805	17,492	13,654	78.06	23,629	20,074	17,663	87.99	83.81	87.14	77.30
1992	24,685	21,872	17,034	0.82	0.82	20,242	17,935	13,968	77.88	24,618	21,001	18,524	88.20	82.22	85.40	75.41
1993	25,335	22,055	17,244	0.82	0.83	20,774	18,306	14,312	78.18	25,544	21,574	18,979	87.97	81.33	84.85	75.41
1994	26,549	22,260	17,278	0.83	0.84	22,036	18,699	14,513	77.62	26,799	22,369	19,623	87.73	82.22	83.59	73.96
1995	27,609	22,897	17,701	0.83	0.85	22,915	19,462	15,046	77.31	27,783	23,280	20,358	87.45	82.48	83.60	73.91
1996	28,204	23,160	17,787	0.83	0.86	23,409	19,918	15,297	76.80	28,993	24,296	21,069	86.72	80.74	81.98	72.61
1997	29,437	23,860	18,213	0.83	0.85	24,433	20,281	15,481	76.33	30,498	25,433	21,881	86.03	80.11	79.74	70.75
1998	30,249	24,739	18,803	0.84	0.85	25,409	21,028	15,983	76.01	31,822	26,910	23,031	85.59	79.85	78.14	69.40
1999	32,149	25,692	19,563	0.841	0.854	27,031	21,937	16,704	76.14	33,204	27,861	23,708	85.09	81.41	78.74	70.45
2000	34,612	27,263	20,724	0.830	0.859	28,738	23,425	17,806	76.01	34,950	29,450	24,889	84.52	82.23	79.54	71.54
2001	35,141	28,076	21,425	0.837	0.862	29,402	24,192	18,461	76.31	35,704	30,512	25,943	85.03	82.35	79.29	71.16

Source: CSLS Income and Productivity database, based on data from Canadian National Accounts and US BEA, June 3 2002.

PPP exchange rates from Statistics Canada *National Income and Expenditure Accounts, Third Quarter 1999* , Cat. No. 13-001-XPB.

Note: the GDP PPP exchange rates for 1999-2001 were calculated by multiplying the PPP rate in 1998 by the index value (1998=1.00) of the US GDP deflator as a percentage of the Canadian GDP deflator in each year. The household consumption PPP exchange rates for 1999-2001 were calculated by multiplying the PPP rate in 1998 by the index value (1998=1.00) of the US CPI deflator as a percentage of the Canadian CPI deflator in each year. The GDP PPP exchange rates for 1961-1980 were calculated by multiplying the PPP rate in 1981 by the index value (1981=1.00) of the US GDP deflator as a percentage of the Canadian GDP deflator in each year. The household consumption PPP exchange rates for 1961-1980 were calculated by multiplying the PPP rate in 1981 by the index value (1981=1.00) of the US CPI deflator as a percentage of the Canadian CPI deflator in each year. PPP estimates for 1981-1998 are only published to 2 decimal places.