

Has New Brunswick Pulled Ahead of Nova Scotia?  
A Taxonomy of Gross Domestic Product and  
Labour Market Data

by

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## I. INTRODUCTION

This past spring, Fred McMahon of the Atlantic Institute for Market Studies (AIMS) produced a short research report "New Brunswick Pulls Ahead of Nova Scotia" [McMahon (1999)]. In the report the author states that since 1993 New Brunswick per-capita output has surpassed that of Nova Scotia, and that in the past few years New Brunswick's unemployment rate has fallen below, at has remained below, that of Nova Scotia's jobless rate.

As McMahon mentions in his paper, these statistics indeed seem surprising. Traditionally, as McMahon suggests, "Nova Scotia has been traditionally the richer province" (p. 1). For one thing, Nova Scotia has a true economic city (Halifax-Dartmouth), a city of considerable size that New Brunswick lacks. Standard regional development theory states that urban conglomerations develop relatively higher paying jobs than do smaller cities, an advantage Nova Scotia has and that New Brunswick does not. As well, Nova Scotia has benefitted from a relatively larger light manufacturing base. New Brunswick -- outside of heavy manufacturing in forestry products and oil refining -- lacks a significant manufacturing infrastructure.

But in his essay, McMahon points to the fact that New Brunswick has had a better "quality of governance" during the premiership of Frank McKenna -- a quality of leadership McMahon claims that Nova Scotia has not had during the McKenna years. For McMahon low taxes, balanced government budgets, low government spending, and intelligent government investment spending point the way to stronger economic growth.

In my paper, I wish to look at the first finding of McMahon's report, that of the better economic performance in New Brunswick. I shall ignore, until the end of my paper, the second (and more difficult) part of his report, that New Brunswick's strong economic growth can be attributed to "better governance". In this short paper I wish to look in more detail at the high growth rates in New Brunswick incomes, to see what has accounted for this new phenomenon. However, at the end of the paper I do suggest that some of the detailed data may point to other factors which might have contributed to the strong New Brunswick economy.

Section II of my paper summarizes McMahon's findings, using two of his charts as a point of departure. Section III of the paper decomposes per-capita Gross Domestic Product into its various constituent parts, to see in which areas New Brunswick has gone ahead. Section IV does a simple "earned labour income decomposition", to see which labour market component(s) explains the superior New Brunswick performance. The next section of the paper looks at differences in employment creation, using the two major Statistics Canada surveys. Section VI then does a simple employment and wage rate growth analysis, identifying which industries in New Brunswick (in contrast to Nova Scotia) which have helped create the better New Brunswick performance. Section VII concludes.

## II. FRED MCMAHON'S FINDINGS

In this paper, I focus on two of McMahon's findings: (1) that

per-capita Gross Domestic Product (GDP) in New Brunswick has surpassed that of Nova Scotia, and (2) that New Brunswick's unemployment rate has in recent years been lower than that of Nova Scotia. I discuss each in turn.

### *1. The Ratio of Per-Capita Gross Domestic Product*

Chart 1 reproduces his Chart 1 from the April, 1999 AIMS report. The bar chart shows the ratio of New Brunswick's per-capita (current-dollar) GDP as a ratio of Nova Scotia's per-capita GDP. The first feature that can be seen in the chart is that the ratio follows a pro-cyclical pattern, especially for the more pronounced "national" cycles during the 1980s and 1990s. During the 1980 downturn, for example, the per-capita GDP ratio dropped from 95 percent to 92 percent, before rising sharply. During the 1991-92 contraction, the ratio fell from 100 percent to 95 percent. Before 1980, the pro-cyclical relationship is not as apparent. There was a mild national slowdown in 1970 -- a slowdown not readily visible from the graph. And there was a sharp, inflation-induced recession in 1975 -- a supply-side downturn again not evident in the graph.

That the per-capita GDP ratio exhibits a pro-cyclical trend is not that surprising, given the industrial make up of New Brunswick and Nova Scotia. New Brunswick has, at first glance, a heavy concentration in largely pro-cyclical sectors: lumber, logging, pulp and paper, and metal mining industries. New Brunswick has a smaller exposure to the mildly

pro-cyclical fishing sector, but in the past decade this key sector has experienced well-known supply side difficulties which have made the industry non-cyclical. One pro-cyclical industry which favours Nova Scotia is tourism. But this industry has boomed during the past few years, because of the structural weakness in the Canada/US exchange rate and because of the completion of the bridge from New Brunswick to Prince Edward Island. So during the economic expansion in Canada and the United States during the past several years, it is not certain a priori that Nova Scotia benefitted more in the tourist industry than New Brunswick (this point will be discussed more fully below). Finally, the larger federal government presence (a non-cyclical industry) in Nova Scotia would generally make that province's economy more stable, given fluctuations in the national economic cycle.

The second noteworthy feature in Chart 1 is the noticeable upward trend in the ratio during the 1980s and 1990s. After the 1981-82 national recession, by 1988 and 1989, the ratio rose to 100 percent -- a "par" ratio which was also reached in 1964 and 1974. But after the 1991-92 downturn, as McMahon notes, the per-person GDP ratio rises above the 100 percent level, hovering between 105 to 107 percent from 1995 to 1997. Over the last economic cycle, thus, the New Brunswick-Nova Scotia per-capita ratio has increased to a record high. It is this high rate which McMahon attributes to "good governance", and which I want to explore in greater detail in this paper.

## 2. *The Difference in Provincial Unemployment Rates*

Chart 4 from McMahon's report (reproduced below) shows unemployment rates, for all people aged 15 years and above, for Nova Scotia and New Brunswick, from 1987 to 1997, plus a bar chart showing the arithmetical difference between the two jobless rates. The first point about this graph is that in general the difference in the two provinces' unemployment rates does not appear to follow any cyclical pattern. If we designate 1970, 1975, 1981-82, and 1991-92 as the years of national economic downturns -- and match those years to the bar graph in Chart 4 -- it is clear that no characterization can be made as to how differences in jobless rates move with the national cycle. We could surmise that employment growth might follow the two provinces' GDP growth, and that New Brunswick's job growth, relative to Nova Scotia's, could be procyclical. But any such relationship appears to be washed out by corresponding changes in the provinces' labour force changes -- changes due to either movements in labour forces participation rates or short-term migration (or both).

The second point about the graph -- and which Fred McMahon emphasizes in his essay -- is that during the last four years the rate of unemployment in New Brunswick has remained below that of Nova Scotia. This is a striking and noteworthy development: it represents the first time since statistics have been gathered<sup>1</sup> that New Brunswick jobless rate has remained below that of Nova Scotia. Moreover it is a striking development since it shows the New Brunswick economy outperforming that of Nova Scotia's from a completely different data-set.

### III. DECOMPOSING PER-CAPITA GDP ON THE INCOME SIDE

Fred McMahon first shows (from Chart 1) that New Brunswick's per-person Gross Domestic Product has surpassed that of Nova Scotia. It is this important trend which I want to examine more closely in this section. In this section, I present per-capita GDP statistics by component form, to see in which sub-areas New Brunswick has taken the lead.

Before showing the results, two small accounting matters should be discussed. First, I look at GDP at factor cost and not GDP at market prices. GDP at factor cost excludes indirect taxes -- taxes which do not reflect actual differences in economic production (or welfare). This is crucial when comparing differences across provinces: if a province increases indirect taxes substantially over a given period, its GDP at market prices would go up, but its GDP at factor cost would not, on that account. GDP at factor cost is used to avoid biases in indirect taxation.

Second, the National Accounts Division of Statistics Canada undertook revisions in accounting methodology, such that current statistics are only back-cast to 1992. I undertook a comparison of data for Nova Scotia and New Brunswick GDP components, using 1992 as an "overlap year", and found very little, meaningful differences from one GDP accounting methodology to the next. Consequently data from 1987 and 1988 are taken from the unrevised Statistics Canada data, and 1996 and 1997 are drawn from the revised database. One point to note is that the New Brunswick "success story" does not come about from technical Statistics Canada revisions.

Table 1 shows the per-person GDP differentials, by GDP sub-component, between New Brunswick and Nova Scotia, for the two 1987 and 1988 years, taken as an average, and the 1996 and 1997 years, taken as an average. I calculate averages of two years to minimize sharp year-to-year fluctuations. I use the 1987 and 1988, and the 1996 and 1997 "paired years", to cover the administration period of the Liberal government of Frank McKenna in New Brunswick -- the time span in which the so-called "good governance" possibly could be attributed.

The data are in current (nominal) dollars, showing the difference in per-capita GDP between the two provinces. A "0" entry would mean that New Brunswick and Nova Scotia would have exactly identical per-capita income for that component. A negative entry would mean that an average person in New Brunswick earns less than an average person in Nova Scotia. A positive entry means the opposite. For "wages, salaries, and supplementary income", the first line in the table, New Brunswickers during 1987 and 1988 earned \$873 less per person than Nova Scotians; during 1996 and 1997 New Brunswickers on average earned \$235 more.

The bottom line in Table 1 shows the total GDP at factor cost differential, and the change in that differential during the ten-year period. The first important point from the table is that, in 1987 and 1988 a person in New Brunswick earned<sup>2</sup> \$277 less than an average person in Nova Scotia, but in 1996 and 1997 the average person in New Brunswick earned \$838 more. The switch from a negative to a positive differential reflects the bar chart in McMahon's Chart 1, moving from below the 100 percent line to above the line.

A second noteworthy feature of the table is that the first

difference change of "wages, salaries, and supplementary income" -- the \$1108 as seen in first datapoint of column three in the table -- is almost identical to the total GDP differential \$1115, the bottom number of the third column. Nearly all of the change in the per-capita GDP differential can be accounted for by the change in wages and salaries. This is an interesting finding which I exploit in Section IV of this paper below, where earned income changes are linked to the aggregate labour market.

A third important feature from Table 1 is that changes in all the other "measurable" income components, except for the "residual error" entry as shown in the third column, show positive "+" signs, stating that New Brunswick gained relatively to Nova Scotia in all other GDP components. This means that in looking at income-side GDP components only, that the relative gains for New Brunswick are across the board. Note that the -\$468 for the "residual error" means that, looking at GDP on the expenditure side, the statistics would show that New Brunswick only gained marginally to Nova Scotia. Note that the "residual error" is relatively large in provincial economic accounting, given (1) the large accounting errors in measuring exports and consumption<sup>3</sup>, and (2) difficulties in measuring corporate profits and inventory valuation adjustments within a province. I consider that the problem (1) is more severe than problem (2), i.e., the GDP provincial estimates on the income side are more accurate than the GDP provincial estimates on the expenditure side. Consequently I ignore analyzing per-capita differences on the expenditure side, and suggest that in looking at income side differences only, that New Brunswick has done well relative to Nova Scotia.

#### IV. AN "EARNED-INCOME RELATIVE" DECOMPOSITION ANALYSIS, FOR NEW BRUNSWICK AND NOVA SCOTIA

As stated above, nearly all of per-capita earned income differentials can be accounted for by changes in the important wages and salaries component of GDP. So in this section of the paper, I wish to look at what aggregate labour market indicators account for the differential in "earned income". ("Earned income" is denoted as **W** in the algebra below). That is, I wish to look at the New Brunswick/ Nova Scotia differentials in all earned income accruing to households in the respective provinces. I follow the convention of defining "earned income" as including small business income as well as wages and salaries (see Anderson [1988], 59-60)<sup>4</sup>. Earned income thus is the sum of wages, salaries, supplementary income, net farm income, and income accruing to non-farm, unincorporated business income.

To calculate earned income relatives, the following well-known identity is used part of the decomposition of per-capita earned income. Per-capita earned income **W/H** is defined as follows:

$$W/H = (W/E) (E/LF) (LF/H15) (H15/H)$$

where:

- W** = earned income (in millions of dollars)
- E** = number of individuals employed
- LF** = number of individuals in the labour force
- H15** = number of individuals aged 15 and over
- H** = total population

Looking at the above identity, it is clear from the cancelling on the right hand side that the four ratios (all in parentheses) equal by definition per capita earned income  $W/H$ . The four ratios have the following concepts.  $W/E$  is akin to an annual wage rate: it takes earned income averaged annually and divides this by the number of employed in the provincial economy, using averages for the two years in question. The ratio  $E/LF$  -- i.e. the number of employed individuals divided by the number of individuals in the labour force -- is equal to the inverse of the unemployment rate (i.e. one minus the unemployment rate). Thus  $E/LF$  rising is the same as the unemployment rate falling. The ratio  $LF/H15$  is the standard labour force participation rate. And the ratio  $H15/H$  is similar to the inverse of the "age dependency" ratio used in development economics. The higher is  $H15/H$ , the lower is the age dependency ratio.

For the sake of brevity, I claim that increases in any (or all) of the four ratios on the right-hand-side of the equation can be construed as an improvement in economic development in the province. From Anderson (1988), imagine an aggregate labour market graph, with a rigid wage to create unemployment and appropriate curves to indicate labour force population and total population (see Figure 3.4 on page 73 of his text). We define (without elaborate explanation) that a *rightward* shift in the aggregate labour demand curve is an improvement in provincial economic development.

Consider for a moment that a rightwards shift in labour demand that increases only the wage rate (with all other labour market variables remaining constant) means that 100 percent of "provincial economic development" can be attributed to an increase in wage rates. Analogously,

a rightwards shift in the labour demand that holds the wage rate constant (and for the sake of argument holds the participation rates and dependency ratios constant), means that 100 percent of "provincial economic development" can be attributed to declines in unemployment rates (all of increased employment reduces joblessness in the province).

In reality, one could presume that a rightwards shift in demand would not only increase wage rates and reduce unemployment -- such that the 100 percent attributions in the above paragraph would be much lower percentages -- but that the demand-curve-for-labour shift also has repercussions for the labour force participation rates and dependency ratios. In particular the usual story of Canadian regional economic development is that prosperous provinces have high labour force participation rates (Anderson [1988], 63). And finally, the dependency ratio term  $H15/H$  is typically positively related to provincial economic development, in the sense that children earn little or no income.

In this section, I undertake a per-capita earned-income decomposition exercise for New Brunswick and Nova Scotia, for the 1987/1988 and 1996/97 "paired years", and compute percentage growth changes over the 10-year time horizon, and then calculate differentials on the growth rates between the two provinces. I, in short, wish to be able to attribute the relative gains in New Brunswick's per-capita earned income to the four different labour market variables (ratios) that appear in the right hand side of the above equation.

Table 2 shows the results of this exercise. The extreme right-hand column (in boldface) shows the growth rates in per-capita earned income,  $W/H$ , for each province. As can be seen from Table 2, New

Brunswick's per-capita income was about \$1200 lower than that for Nova Scotia during the 1987 and 1988 years, but New Brunswick's per-person earned income was about equal to that of Nova Scotia by the 1996 and 1997 years. (Note that New Brunswick's earned income is not higher than that for Nova Scotia -- as is the case in McMahon's Chart 1 -- since New Brunswick does relatively better in the other variables not counted in earned income: corporate profits, interest, and miscellaneous investment income). Over the ten years, New Brunswick's per-person earned income grew by almost 33 1/2 percent; Nova Scotia's per-person earned income grew by slightly less than 21 1/2 percent -- a 12 percent difference (line 7, right hand column).

Table 2, in calculating the earned income differentials for the two provinces, thus takes that 12 percent earned-income growth-rate differential, and attributes that to the four labour-market ratios discussed above. The four ratios are shown in the first four columns of Table 2. Note that the multiplication of the first four columns equals the extreme right-hand (bold face) column, for lines 1 and 2 and 4 and 5.

Line 3 of the table shows the percent change in the four labour market ratios for New Brunswick. (Note that for lines 3, 6, 7, and 8 the first four columns *sum up* to the extreme right-hand column, given the natural log derivation of the percent growth rates). As can be seen by line 3, New Brunswick benefitted from increases in all four labour force components: the rightwards shift in labour demand led to increases in all four ratios. Note that the percentage change in New Brunswick's wage rate  $W/E$  (27 percent in line 3) accounted for the major portion of the rise in per-capita earned incomes.

Line 6 in Table 2 shows the corresponding four labour market ratios for Nova Scotia. As can be seen from line 6, Nova Scotia's wage rate grew more slowly than New Brunswick, 20 percent to New Brunswick's 27 percent. But the numbers for Nova Scotia's **E/LF** and **LF/H15** are negative, indicating that the employment rate for the province, **E/H15**, fell and that the unemployment rate rose. (This statistic is partly reflected in the higher relative unemployment rates differential, in Fred McMahon's Chart 4). The labour demand curve for the province could have risen or fallen, but in all likelihood the curve fell. The **H15/H** ratio rose -- indicating that there was an aging of the population similar to New Brunswick and elsewhere in the country. But the fact that this ratio rose less quickly means that there was more net outmigration in Nova Scotia, relative to New Brunswick, since migrants tend to be adults, and since birth and death rates are similar in both provinces.

Lines 7 and 8 summarize the difference in labour-market changes over the ten-year period, for New Brunswick and Nova Scotia. As can be seen from the two bottom lines, the relative difference in wage rate **W/E** growth explains about 7.2 percent, or about 60 percent, of the 12 percent growth rate differential in per-capita earned incomes. The labour market changes in the remaining three variables -- representing the sum total of "quantity" changes in the aggregate labour market graph -- account for the remaining 40 percent of the per-capita income differential between the two provinces. As can be seen from line 8, these three variables each account for between 10 1/2 to 16 1/2 percent of the total per-individual income differential. Noteworthy is that the dependency ratio **H15/H** accounts for 10 1/2 percent of the total differential, a high

number considering that one expects that, at first glance, the age distribution between these two provinces ought not to change all that much over ten years.

To summarize this section, per-capita earned income grew much more quickly in New Brunswick than in Nova Scotia, due to stronger labour demand in New Brunswick. But the stronger income growth was accounted for by growth in all four labour market ratios.

#### V. AN ASIDE: CROSS-CHECKING AGGREGATE EMPLOYMENT GROWTH IN NEW BRUNSWICK AND NOVA SCOTIA, USING TWO DIFFERENT DATA SOURCES

In this paper (as discussed below), I am interested in looking at industry sources for the superior employment and wage growth in New Brunswick. To do so would allow me to at least make some cautious statements as to whether other causes -- other than (or in addition to) "good governance" -- might have played a role in New Brunswick's performance.

Below I present industry employment growth rates, using the 1987/88 and 1996/97 years as benchmarks, for New Brunswick and Nova Scotia. I choose to present industry growth rates using statistics from the Labour Force Survey, and not from the Employment, Hours, and Earnings survey. Data from the first survey can be tied to other labour market variables -- which I have already done in the discussion above (the E employment variable discussed above is from the Labour Force Survey). Furthermore, the "number of employed" from the Labour Force Survey is far more comprehensive.

However, a crucial problem exists (see Table 3, looking at the top and bottom numbers of column 3). Whereas for New Brunswick the employment growth rates from the two surveys are reasonably close (9.6 percent using the Employer Survey and 9.2 percent using the Labour Force Survey), for Nova Scotia the two growth rates are markedly different. The Employers Survey shows a strong 10.9 percent increase in employment, but the Labour Force Survey shows only a 5 1/2 percent growth rate. It is the latter statistic which partly drives the relatively higher unemployment rate for Nova Scotia, and which is used to "explain" about 13 percent of the of the superior per-capita earned income growth in New Brunswick. Since there is a sharp difference in Nova Scotia's employment rates, we wish to undertake a simple correspondence exercise to see if the discrepancy can be resolved.

Briefly put, the Employers Survey looks at only paid employees on the payroll, and excludes self-employed individuals and unpaid workers working on family enterprises. Moreover, the Employers Survey excludes the agricultural and fishing industries, the latter industry important in the two provinces. Because of these two reasons "total employment" from the Employers Survey could be expected to be smaller than total employment from the Labour Force Survey. There is one key difference between the two surveys than could -- if one adjusted for the first two differences -- could make the Employment Survey numbers larger than the Labour Force Survey. Some people work at multiple jobs (usually part-time jobs), and as such the Employers Survey would count the same person twice. This would not occur with the Labour force Survey.

Table 3 shows the correspondence between "total employment"

between the two surveys, for New Brunswick and Nova Scotia. Line 1 shows total employment from the Employers Survey. From this line we subtract paid employment in the forestry and mining sectors, to arrive at total paid employment for all industries except primary industries (line 3). To line 3 we add primary industry employment from the Labour Force Survey (agriculture and other primary industries), which yields a line 6 "sub-total". To line 6 we add the number of self-employed to set a "sub-total" (line 8) which ought to correspond to total employment in the Labour Force Survey.

If one compares line 8 to line 1, one sees that now total employment in Nova Scotia grew be 1 percent less than New Brunswick (using the Employers Survey employment in Nova Scotia grew by 1.3 percent more than in New Brunswick). There are two reasons for the improved New Brunswick performance. First, Nova Scotia has suffered from sharp cutbacks in the fishing industry. As well, agriculture as declined in Nova Scotia. Finally, New Brunswick has posted stronger gains in "self-employment".

In line 9, I calculate an error term, subtracting line 8 from line 10. There is one reason why the error term should be positive, such that stated LFS employment should be greater than line 8 sub-totals. This is that there is a small "unpaid family worker" component which is not accounted for in the table. Some of these workers could already be counted in agriculture and other primary, but most could be working in other industries not accounted for in the Employers Survey.<sup>5</sup> There are two reasons why the error term might be negative. First, from the artificial construction of the table, adding total self-employed (line 7)

to other primary and agriculture employment double-counts LFS employment, such that the adding up of lines 4, 5 and 7 would double-count, and make line 7 artificially high. But more importantly, the existence of "multiple job" holders will make line 1 (and thus line 8) artificially high.

Looking at line 9 in Table 3, note that for New Brunswick the rather small negative number (2100) of employed people become more negative. This makes sense, since over time there are more part-time jobs taking place. As well, it has been noted that there is a decline in the number of unpaid "family" job taking place. For Nova Scotia, however, there is a large 18 1/2 thousand positive term for the 1987 and 1988 years. It is difficult to believe that such a large number occurs from "unpaid family work", so this large discrepancy remains a puzzle. But during the 1996 and 1997 years, this large (positive term) nearly disappears, at a rate of decline relatively faster than that for New Brunswick. I suggest tentatively that, in Nova Scotia, unpaid family work declined at a faster rate (perhaps due to the worse fortunes in fishing and agriculture) and that multiple-job holdings grew at a faster rate.

If one buys in to these arguments to explain lines 8 and 9, one buys in to the argument that employment in Nova Scotia grew more slowly than in New Brunswick (line 10). The slow Nova Scotia job creation is discussed in more detail in the first part of the next section.

## VI. INDUSTRY EMPLOYMENT AND WAGE RATE DIFFERENCES, FOR NEW BRUNSWICK AND NOVA SCOTIA, FROM 1987/88 AND 1996/97

In this section, I calculate employment and wage rate growth rate differences, for New Brunswick and Nova Scotia, over the ten-year time period under analysis, to see in what industries account for the stronger employment creation and wage rate growth in New Brunswick. Disaggregated employment and wage rate growth rates are discussed in turn.

### *1. Industry Employment Growth Rates Differences*

Table 4 shows industry employment growth rates for New Brunswick and Nova Scotia, for the 1987/88 to 1996/97 reference period. The bottom (boldface) row shows the 9.2 and 5.5 overall employment growth rates, for New Brunswick and Nova Scotia respectively. Note that for the 10-year period, the overall growth rates translate into annual growth rates of slightly under 1 percent for New Brunswick and 1/2 percent for Nova Scotia. These rates indicate a steady, albeit unspectacular growth rate for New Brunswick, but a poor job creating performance for Nova Scotia.

For the two provinces -- looking down the third column showing differences in growth rates -- the first noteworthy feature is that dramatic difference in goods-producing employment growth rates. Jobs in agriculture (a small industry) declined in Nova Scotia, and grew in New Brunswick. And in "other primary industries", which includes the important fishing and mining sectors, there were serious declines in Nova Scotia. We can attribute this decline to the cutbacks in fish quotas

offshore, and the closure of the Westray mine at Stellarton. Jobs in Nova Scotia manufacturing also declined sharply. Some of this decrease stems from declines in processing of primary products (agriculture, fishing, mining), but I speculate that the Canada-US Free Trade and NAFTA agreements might have been relatively more damaging to Nova Scotia manufacturing than that in New Brunswick. New Brunswick specializes more in resource industries than Nova Scotia. Much of Nova Scotia manufacturing (clothing and light manufactured good) is import-replacing, and might be more vulnerable to free trade. Finally, looking at the last industry in the among goods-producing sectors, jobs in construction declined noticeably in Nova Scotia. Some of this might be due to a lack of any recent big construction megaprojects in the province. In New Brunswick, by contrast, the province benefitted from the New Brunswick-Prince Edward Island bridge, the New Brunswick four-lane highway, and expansion of the Irving oil refinery in Saint John.

Among the service industries, the small high-technology sectors (professional, science, technical, management, administration) expanded at high rates in both provinces, but grew more quickly in New Brunswick than in Nova Scotia. Employment, in both provinces, also grew in the provincial-government-funded "education" and "health and welfare" areas, but more quickly in Nova Scotia than in New Brunswick. In "public administration", job creation was very small for both jurisdictions. Finally, in "information, culture, recreation, accommodation, and food" -- sectors which help define the important tourism industry -- we see that employment grew rapidly for both provinces, but particularly so in Nova Scotia.

## 2. *Industry Wage Growth Rate Differences*

Table 5 shows the differences in growth rates, by industry, for New Brunswick and Nova Scotia, over the ten-year (1987/88 to 1996/97) reference period. Given that the data is in nominal (current-dollar) terms, the differences between the first two columns -- the growth rates in wages for New Brunswick and Nova Scotia respectively -- do not appear at first glance to be all that dramatic. In Nova Scotia, wages increased sharply in the non-agricultural resource sector (despite the severe job losses) relative to New Brunswick. But in all other goods-producing industries -- and all service-producing sectors except trade and finance industries -- New Brunswick posted higher wage gains.

It is difficult to generalize much from this table, except to say that overall average weekly wages in New Brunswick surpassed that for Nova Scotia. During 1987 and 1988, the industrial average weekly wage was about \$409 to \$410 for both provinces. In 1996 and 1997, the corresponding wage rate was \$517 for New Brunswick and \$498 for Nova Scotia.

## VII. SUMMARY AND CONCLUSIONS

To sum up the main findings of this paper, the more detailed statistics that I have gathered generally agree with Fred McMahon's findings that the New Brunswick economy grew faster than that of Nova Scotia. The better economic performance occurs across a wide sweep of sectoral and industrial activity. In terms of aggregate regional labour

market -- an analytical tool with which regional development economists like to depict regional development performance -- the data presented here suggests that the aggregate demand curve for labour in New Brunswick moved further up and to the right than that for Nova Scotia. The data suggests that New Brunswick earned incomes are accounted for by relatively better performances in wage rates, unemployment rates, participation rates, and dependency ratios.

This paper did not attempt to test the second part of McMahon's claim, that the superior New Brunswick performance was the result of better governance of the Frank McKenna government administration. If I call the better New Brunswick economic performance "C", and better New Brunswick governance "B", I do suggest that "C" did in fact happen. But there is some evidence, as presented in this paper, that suggests that other exogenous shocks -- we can call these other shocks "A" -- may in fact have been at work to influence "C" in a positive manner.

From the data presented in this paper, one can list several exogenous shocks in "A" that could have caused "C". The major decline in groundfish stocks hit Nova Scotia's fisheries rather hard. The Westray mine closure reduced mining employment. It may be the case that the two free trade agreements hurt Nova Scotia's manufacturing employment in a relatively more significant way than that of New Brunswick. Furthermore lumber, pulp, and paper prices have been high in recent years, causing positive terms of trade advantages for New Brunswick's manufacturing sector. Several "exogenous" megaprojects in or near New Brunswick -- the Northumberland Straits Bridge and the expansion of the petroleum refinery in Saint John -- not only increased construction jobs in the province,

the projects created positive multiplier effects in other industries. We note in passing that the tourist boom in the Maritimes, another key exogenous shock, has benefitted Nova Scotia disproportionately more than New Brunswick. Without the dramatic fall in the Canadian dollar, Nova Scotia might be even further behind New Brunswick than it is now.

Having said that, there is some evidence from this paper that the Liberal McKenna regime did practice "good governance". We suggest that the ongoing construction of the New Brunswick Highway -- built entirely with New Brunswick tax dollars and privatization agreements -- did stimulate provincial economic growth. The New Brunswick government did engineer a success story in terms of attracting call centres and other information technology firms to New Brunswick. These firms constitute export firms in their own right, and not only did they expand high-technology employment at a faster rate in the province, the attraction of such centres do create analogous spread effects as do construction projects. One can perhaps state that the McKenna success in attracting call centres is part of "good governance", but not in the way as Fred McMahon or the Atlantic Institute for Market Studies has defined the term. To attract call centres into the province, the McKenna government did provide small amounts of incentive money, as well as undertake aggressive marketing of the province, often meeting face-to-face with corporate executives.

Finally, part of New Brunswick's superior economic performance may in fact be due to other reasons over and beyond exogenous shocks to both regional economies, and perhaps due to neoclassical adjustment mechanisms underway in the absence of any shocks<sup>6</sup>. This theory states

that in the absence of exogenous shocks, capital accumulation in the regions will lead to an eventual elimination or near-elimination of regional income disparities. New Brunswick had traditionally been the poor-income neighbour to Nova Scotia, so perhaps at least some of the faster income growth in New Brunswick is the result of neoclassical adjustment, at least in certain industries and occupations not exposed to exogenous shocks.

Note that no rigorous empirical modelling is done for this paper. Only suggestive statistics are presented to indicate that, for several or many reasons, New Brunswick's economy may have surpassed that of Nova Scotia. The relatively good New Brunswick performance may in fact be temporary. For example, the development of the remarkable oil and natural gas industry in Newfoundland and Nova Scotia may lead to an important expansion of primary, secondary, and tertiary employment in the Halifax-Dartmouth area. That New Brunswick can remain ahead of Nova Scotia in the years ahead is open to question.

Chart 1: New Brunswick per capita GDP  
as a per cent of Nova Scotia per capita GDP

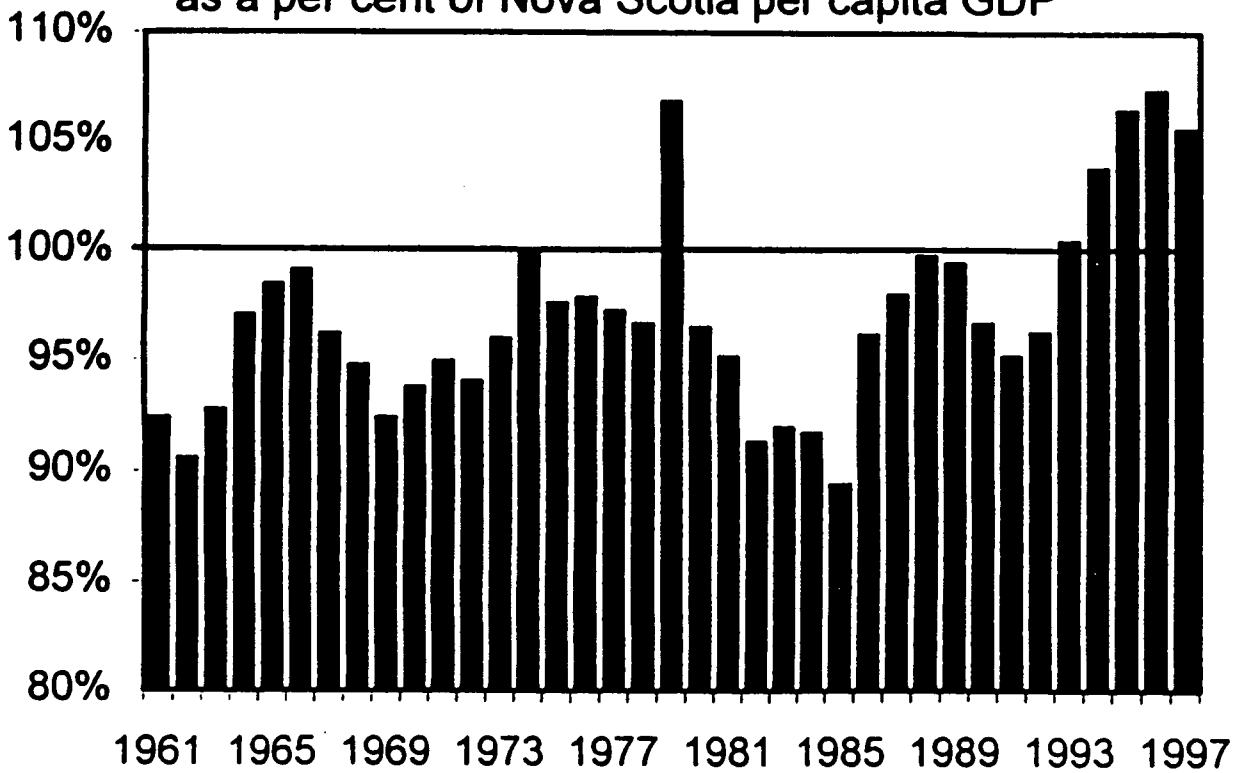


Chart 4: Unemployment rate: New Brunswick and Nova Scotia

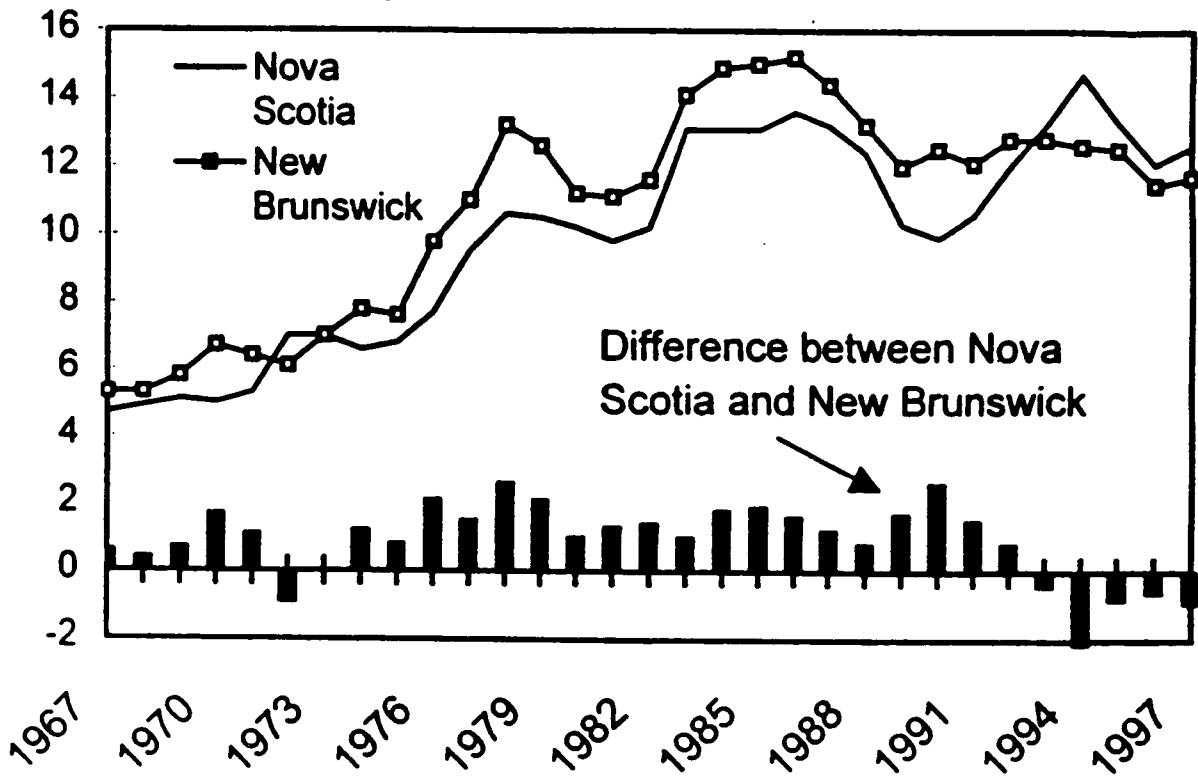


Table 1

PER-CAPITA GROSS DOMESTIC PRODUCT (GDP)  
DIFFERENTIALS BETWEEN NEW BRUNSWICK  
AND NOVA SCOTIA, BY GDP COMPONENT,  
-- FOR 1987/88, 1996/97 AND THE CHANGE  
OVER THOSE PAIRED YEARS\*  
(in current \$)

	<u>1987/88</u>	<u>1996/97</u>	<u>change from 1987/88 to 1996/97</u>
wages and salaries	-873	+235	+1108
farm income	-019	+ 12	+ 31
non-farm small business income	-319	-250	+ 69
interest and misc. investment	+351	+517	+ 166
corporate profits	+363	+536	+ 173
inventory valuation adjustment	- 14	- 17	+ 31
capital consumption allowance	+ 22	+ 29	+ 7
statistical error	+212	-256	- 468
\$GDP at factor cost	-277	+838	\$1115

\* This table shows the per-capita Gross Domestic Product *differentials*, by each GDP sub-component, for the paired years 1987 and 1988, and 1996 and 1997, and the change over the paired years. A "0" entry would mean that New Brunswick and Nova Scotia have exactly the same per-capita income for a given GDP component; a "+" entry means that New Brunswick has a higher per-capita GDP component than Nova Scotia; and a "-" entry means that New Brunswick has a lower per-capita GDP component than Nova Scotia.

Source: Calculated from data from Statistics Canada Provincial Economic Accounts, Cat. N. 13-216, "Table 1: Gross Domestic Product -- Income Based", as shown in CANSIM Matrices #2613 and 2614, and from Table 19: Selected Economic Indicators", as shown in CANSIM Matrices #6970 and 6971.

Table 2

CALCULATING "EARNED INCOME" RELATIVES FOR NEW BRUNSWICK  
AND NOVA SCOTIA, AND CORRESPONDING GROWTH RATES --  
BY LABOUR MARKET COMPONENT\*

New Brunswick

	<u>W/E</u>	<u>E/LF</u>	<u>LF/H15</u>	<u>H15/H</u>	<u>W/H</u>
1. 1987/1988 average <sup>1</sup>	24,088	.8747	.5890	.7606	9,439.1
2. 1996/1997 average <sup>1</sup>	31,582	.8768	.5968	.8002	13,182.3
3. percent change <sup>2</sup> (line 2 over line 1)	27.087	.240	1.014	5.075	33.401

Nova Scotia

	<u>W/E</u>	<u>E/LF</u>	<u>LF/H15</u>	<u>H15/H</u>	<u>W/H</u>
4. 1987/1988 average <sup>1</sup>	25,969	.8875	.6061	.7625	10,650.6
5. 1996/1997 average <sup>1</sup>	31,673	.8756	.6005	.7920	13,188.5
6. percent change <sup>2</sup> (line 5 over line 4)	19.856	-1.350	-.928	3.796	21.372

	<u>W/E</u>	<u>E/LF</u>	<u>LF/H15</u>	<u>H15/H</u>	<u>W/H</u>
7. New Brunswick/Nova Scotia Differentials (line 6 minus line 3)	7.231	1.590	1.994	1.279	12.042
8. percent share of total differential	59.8	13.1	16.5	10.6	100.0

<sup>1</sup> The "average" is calculated using averages for the two years in question, then calculating appropriate ratios.

Source: Statistics Canada, Provincial Economic Accounts, Cat. No. 13-213 for the "earned income" W data; and Statistics Canada, The Labour Force Survey, for the E, LF, H15 data.

**Table 3**

SIMPLE CORRESPONDENCE EXERCISE LINKING  
TOTAL EMPLOYER-SURVEY(ES) EMPLOYMENT TO  
TOTAL LABOUR FORCE SURVEY(LFS) EMPLOYMENT,  
FOR NEW BRUNSWICK AND NOVA SCOTIA  
-- FOR 1987/88, 1996/97 AND THE CHANGE  
OVER THOSE PAIRED YEARS  
(in '000s)

New Brunswick

	<u>1987/88</u>	<u>1996/97</u>	<u>change from 1987/88 to 1996/97</u>
1. total employment (ES)	227.7	250.7	9.6
2. subtract: forestry and mining(ES)	-7.9	-8.0	1.3
3. sub-total	235.6	258.7	9.8
add:			
4. other primary (LFS)	12.2	12.8	4.8
5. agriculture (LFS)	5.8	6.7	14.4
6. sub-total	253.6	278.2	9.7
add:			
7. self-employed (LFS)	35.3	47.3	29.3
8. sub-total	288.9	325.5	11.9
9. error	-2.1	-11.0	....
10. total employment (LFS)	286.8	314.5	9.2

Nova Scotia

	<u>1987/88</u>	<u>1996/97</u>	<u>change from 1987/88to 1996/87</u>
1. total employment (ES)	279.5	310.0	10.9
2. subtract: forestry and mining (ES)	-7.2	-5.3	-30.6
3. sub-total	272.3	304.7	11.7
add:			
4. other primary (LFS)	19.5	14.9	-26.6
5. agriculture (LFS)	8.3	7.1	-15.6
6. sub-total	300.1	326.7	8.9
add:			
7. self-employed (LFS)	49.8	61.1	22.7
8. sub-total	349.9	387.8	10.8
9. error	18.5	.7	....
10. total employment (LFS)	368.4	388.5	5.5

Source: Calculated from data from Statistics Canada Labour Force Survey, Cat. No. 71-001, and Employment, Earnings and Hours, Cat. No. 72-001.

Table 4

EMPLOYMENT GROWTH RATES AND DIFFERENCES  
IN GROWTH RATES, BY INDUSTRY FOR  
NEW BRUNSWICK AND NOVA SCOTIA,  
-- FROM 1987/88 TO 1996/97<sup>1</sup>

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	<u>New Brunswick</u>	<u>Nova Scotia</u>	<u>difference</u> <sup>2</sup>
agriculture	13.7	-15.7	29.4
other primary	5.2	-26.6	31.8
utilities	9.0	-33.0	42.0
construction	6.0	-14.8	20.8
manufacturing	-2.5	-12.0	9.5
trade (wholesale and retail)	-1.2	3.9	-5.1
finance, insurance, etc.	7.3	2.8	4.5
prof., science, technical	58.5	29.2	29.3
management and administration	72.7	44.6	28.1
educational	7.3	8.6	-1.3
health care and welfare	15.6	20.3	-4.7
information, culture and rec.	12.1	27.8	-15.7
accommodation and food	12.9	22.7	-9.8
other services	6.9	9.0	-2.1
public administration	.7	.5	.2
<b>all industries</b>	<b>9.2</b>	<b>5.5</b>	<b>3.7</b>

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<sup>1</sup> This table shows the ten-year employment growth rates -- by industries and for New Brunswick and Nova Scotia -- calculated by taking the employment average of 1997 and 1996, and then the employment average for 1987 and 1988, and then taking the percent changes over the two "paired years".

<sup>2</sup> This column is simply the arithmetical difference between the first two columns.

Source: Calculated from data from Statistics Canada CANSIM database, using matrices # 3476 (for New Brunswick) and #3475 (for Nova Scotia). The CANSIM data is from Statistics Canada's Labour Force Survey.

Table 5

WAGE GROWTH RATES, AND DIFFERENCES  
IN GROWTH RATES, BY INDUSTRY FOR  
NEW BRUNSWICK AND NOVA SCOTIA,  
-- FROM 1987/88 TO 1996/97<sup>1</sup>

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	<u>New Brunswick</u>	<u>Nova Scotia</u>	<u>difference</u> <sup>2</sup>
forestry	18.5	33.9	-15.4
mining	19.1	25.8	-6.7
manufacturing	37.3	28.5	8.8
construction	22.6	19.9	2.7
transp., comm., utilities	25.2	18.3	6.9
trade (wholesale and retail)	28.1	29.9	-1.8
finance, insurance, etc.	24.1	30.7	-6.6
com., business, services	23.7	15.6	8.1
business services	38.6	31.3	7.3
education	12.1	11.7	.4
health and welfare	24.4	18.4	6.0
accommodation and food	34.5	15.3	19.2
other services n.e.s.	27.6	18.1	9.5
public administration	25.6	20.5	5.1
all industries	23.2	19.2	4.1

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<sup>1</sup> This table shows the ten-year wage growth rates -- by industries and for New Brunswick and Nova Scotia -- calculated by taking the average in wages for 1997 and 1996, and then the average in wages for 1987 and 1988, and then taking the percent changes over the two "paired years".

<sup>2</sup> This column is simply the arithmetical difference between the first two columns.

Source: Calculated from data from Statistics Canada Statistics Canada's Annual Estimates of Employment, Earnings and Hours, Cat. no. 72F0002X1B, 1985-1997.

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- Statistics Canada (1992), Guide to Labour Force Survey, Cat. No. 71-528, Ottawa.

## End Notes

1. Data in McMahon's Chart 4 start in 1967, since Statistics Canada has published provincial data for the "small" provinces on an official basis from 1966 on. But unpublished data can be found from 1961 on in David Murrell (ed.), The Provincial Economies: 1961-1978 Data. During the 1961 to 1964 period, New Brunswick had much higher unemployment rates.

2. I am being a bit sloppy in terminology, in considering the average "person" in a province, and stating that that person "earns" the Gross Domestic Product. Certain income components -- such as corporate profits, inventory valuation adjustment, and capital consumption allowances -- are incomes that flow to entities partly-owned by non-residents.

Gross Domestic product is considered "domestic" in that it purports to measure economic activity within a province's geographic borders. That we can say it does, but factors within a province's borders are partly-owned by non-residents. This issue is dealt with in the text below, when we define and use the term "earned income" to focus on that domestic income earned by a province's residents.

3. There are large errors in measuring exports, given that provinces' inter-provincial borders are unguarded, such that no statistics are gathered at interprovincial boundaries. Such data must be gathered by survey methods and by sometimes misleading "provinces of lading" data.

There can be large errors in measuring consumption, given that consumption data includes spending by non-residents, mostly tourists -- data which is netted out of national consumption through the "net expenditure abroad" line in the National Accounts. This line subtracts spending by tourists within Canada, and adds consumption spending by Canadian tourists outside of the country. Note that if "net expenditure abroad" were measured in the Provincial Economics Accounts, that New Brunswick and Nova Scotia have large (negative) "net expenditure abroad" components, given that the two provinces are small, tourist-oriented provinces, with large numbers of tourists coming from other provinces. On this point, see Murrell (1987).

4. This is done since -- in the earned-income relative analysis as discussed in the text -- the labour market variables from Statistics Canada's Labour Market Survey also represent "self-employed" individuals, who may or may not pay themselves a salary. So we should include accounting profit income in the analysis.

Note as well that the three income components that make up "earned" income are obtained by Statistics Canada from Revenue Canada's Personal Taxation Statistics. So self-employed individuals fill in the appropriate business income lines, as part of their calculation of "total income". We include only those lines requiring work effort.

5. From Statistics Canada, unpaid family workers are "...persons who work without pay on a farm or in a business or professional practice owned and operated by another family member living in the

same dwelling". See Statistics Canada, Guide to Labour Force Survey Data, Cat. No. 71-528, 1992, p. 12.

6. For a look at regional income convergence in a Canadian context, see Coulombe (1999), Coulombe and Day(1999), Coulombe and Lee (1995).

