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NEW INDEXES FOR TRACKING THE ALBERTA AND BRITISH COLUMBIA ECONOMIES

Edward J. Chambers
Western Centre for Economic Research
University of Alberta

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NEW INDEXES FOR TRACKING THE ALBERTA AND BRITISH COLUMBIA ECONOMIES

Since western provincial economies are subject to 'boom-bust' cycles there is a need for timely indicators. Questions about how these cycles—effectively business cycles—differ among western provinces, and from the national experience, are frequently posed but they are difficult to answer with the indicator data presently available. Have recessions in Alberta been less or more frequent than in the national economy? How have cycles in Alberta differed from those in British Columbia? Did Alberta experience a downturn when oil prices collapsed in 1986-87 but avoid the national recession of the early 90's?

We know that certain kinds of activities, such as retail sales, the construction industry, the real estate market and a number of other goods producing and service sectors are very sensitive to cycles in locally based jobs and incomes. An expanding provincial economy strengthens prospects in these sectors, while a deteriorating economy weakens their market opportunities. For example, if we look at the recent history of Alberta, employment and retail sales adjusted for inflation grew at annual average rates of 1.95 and 1.84 percent respectively, but both measures fluctuated widely around these trends. Similarly, in British Columbia, while rates of growth over the entire period were 2.51 and 2.03 percent respectively, shorter term fluctuations about these longer term trends were substantial.

A precondition of rational actions is timely and systematic information allowing both policy makers and private sector decision makers to understand where the provincial economy stands at any particular time. A composite coincident indicator of business cycle conditions can provide that information.

It is agreed that measurements of regional and national business conditions are best secured by capturing the common movement across a number of economic data series. There is also agreement that the data should be available frequently enough, preferably monthly, so that timely evaluations of current economic conditions are possible. At the national level, Statistics Canada issues a monthly Gross Domestic Product (GDP) series that provides broadly based and timely information. Unfortunately there is no provincial monthly or even quarterly equivalent. Provincial GDP are available on an annual basis and there is no question that they are important in analyzing provincial economies. The problem in their use for analysis of business conditions is the very fact that they are annual and available only many months into the following year. While annual series are useful for some purposes, they do not permit the short term assessments necessary to understand the cyclical directions of the economy. Knowing where you were last year, after eight months of the succeeding year have passed, is not particularly useful in addressing current issues. Presently, no Alberta monthly composite measure of business activity exists.

At the national level, evaluation of month to month changes in the economy relies heavily on the monthly GDP estimate. Statistics Canada also publishes a composite leading indicator (CLI) designed to anticipate cyclical changes in the economy, i.e., the transitions from periods of expansion to recession and of recession to expansion. This index consists of 8 measures of business activity encompassing types of capital formation, types of consumer expenditure, financial markets, and the equivalent US composite leading indicator (USCLI). In the United States, monthly measures of GDP are not available with the result that interpretation of national business

conditions relies not only on the Department of Commerce-Conference Board composite index of leading indicators—an index effective in forecasting cyclical turning points—but also upon its composite index of coincident indicators and composite index of lagging indicators, the latter useful in confirming cyclical turning points. These are composite measures derived from sets of economic series which over the past several decades have led, coincided with, and lagged behind cyclical turning points. The interested reader can turn to the websites of the Conference Board and of Statistics Canada for additional information.

Our intent is to develop at the provincial level a composite indicator that coincides with cyclical movements in the economy. This is neither a forecasting instrument like the composite leading indicator, nor a confirming index like the composite lagging indicator which serves to confirm cyclical changes in the economy. Rather it is an index that can be used to identify the current state of the economy.

WHY A COMPOSITE RATHER THAN A SINGLE INDICATOR?

Any single indicator is driven by two components: one is the impact of the growth and cyclical forces prevalent in the general economy both national and regional; the second represents economic impacts specific to the particular activity measured. For example, residential construction activity may be moving in an opposite direction to the number of jobs in the economy. While both activities are influenced by longer term trends as well as by the business cycle, there are unique influences in each market, some of which may occur from one month to the next while others may last over several months. Negative unique influences in one market may be so large as to offset the effect of positive trend-cycle forces in a given month, while at the same time in another market, the influence of positive unique factors may serve to reinforce positive trend-cycle influences. Put simply, although business indicators might be expected to move similarly, they sometimes move from month to month in different directions. Thus, assessing the state of an economy by evaluating changes in individual series one by one can lead to an inconclusive interpretation of current economic conditions.

Of course, at the national level the monthly GDP estimates generated by Statistics Canada offer a reasonably unambiguous interpretation of the impact of growth and cyclical influences on the economy. An equivalently reliable composite measure is required to interpret provincial economic conditions.

CHOOSING AND TESTING THE SET OF INDICATORS FOR INCLUSION IN A COMPOSITE INDEX

Over many years consensus has developed that identifying cyclical movements in the economy involve several criteria. The first is that periods of expansion and contraction in an economy should be broadly based and not limited to one or two sectors. To be specific, depressed conditions in specific sectors such as agriculture or forestry are not in themselves sufficient to signify a recession in the entire economy. A second consideration is that the change in either an upward or downward direction, should last for a sufficient length of time. Again, in the case of recession, this is now usually taken to mean that declines in real GDP should last for at least two quarters. Finally, observed changes should be of a non-trivial magnitude. For example, observed downward changes over a number of months of 1/10 of 1 percent would hardly be regarded as constituting a cyclical decline. Effectively then, the criteria are diffusion, duration and magnitude.

Applying these criteria is difficult. A central problem is how to choose a select few from among

the many series that could potentially be included in a CCI. Among the considerations are:

1) that those selected should provide broad representation of both the income generating and the expenditure sides of the economy;
2) that there be timely availability of the indicators at both the provincial and national levels;
3) that the series have proved reliable in dating national business cycles;
4) that a fewer rather than a larger number of series is preferred.

These considerations can be summarized as breadth in representation, availability, reliability and simplicity.

We have selected three series: full-time employment; the industrial composite of average weekly hours worked of hourly rated employees (including overtime); and the volume of retail sales (retail sales adjusted for inflation). Full-time employment is a measure of the strength of labour demand; average hours worked per week reflects the intensity with which labour is utilized; and the volume of retail sales is a good measure of household demand and the strength of consumer confidence. There may be surprise at the omission of certain series. For example, while the unemployment rate would appear to an obvious candidate for inclusion in a composite index, the evidence over the past quarter century is that it tends to lag rather than be coincident with cyclical changes. Other series which are available provincially and nationally, such as housing starts, tend to be leading rather than coincident indicators. The method of constructing a CCI is found in Box 1.

There are no official cyclical dates—established by Statistics Canada or provincial governments—at the provincial level. Indeed, the lack of knowledge about the peaks and troughs in provincial economies is an important reason for developing a reliable provincial CCI. National periods of recession and expansion, at least for the post-World War II period, have been identified and recorded by Statistics Canada, while several academic researchers have identified and dated the country's cyclical experience since Confederation.

DOES THE COMPOSITE INDICATOR FOR CANADA TRACK THE NATIONAL BUSINESS CYCLE?

A first step in constructing provincial CCIs is to assess how well a national composite indicator of business conditions, using full-time employment, hours worked and real retail sales, tracks national business cycles as identified by Statistics Canada. Over the period since 1976, three periods of recession have been identified and for two, formal dates have been set. They are provided below in TABLE 1.

The third recessionary period commenced in 1990 and ended in 1991, but Statistics Canada has not formally identified either the peak or the trough. With regard to the 1979-80 and 1981-82 recessions, turning points in the new WCER national index constructed using the three series coincide closely with those identified by Statistics Canada. Below, in TABLE 2, are the leads (+) and lags (-) of the new coincident index with respect to the Statistics Canada dates.

BOX 1

Constructing a Provincial Coincident Composite Indicator

The history of composite indicators—whether leading, coincident or lagging—goes back to the late 1950's through initial work at the U. S. Department of Commerce in collaboration with the National Bureau of Economic Research. References useful to the reader are in the bibliography.

The three coincident indicators used to construct the composite index in this paper are: (1) average hours worked per week (including overtime) of hourly rated employees in firms of all sizes in all industrial sectors; (2) full-time employment of both sexes, aged 15 and over; (3) real retail sales in 1992 dollars. All series are in seasonally adjusted form. Two series—full-time employment and real retail sales have a strong positive time trend. Effectively, the new national and provincial coincident indicators used here incorporate a trend factor.

The first step is to convert the series to index numbers. In this case the base selected was January 1976. The first step is to take monthly log differences in order to treat positive and negative percent changes symmetrically. The second step standardizes for the monthly volatility in each series. Standardization factors are larger for the those series with lower volatility. The procedure takes the standard deviation of monthly logarithmic changes in each component series, sums their inverse, and restates the inverted sum to unity. An additional adjustment was to incorporate the long term trend rate of growth into the full-time employment and real retail sales series. The composite index for a given month was then calculated by taking the level of the index in the previous month and adding to it the standardized average percent change in the component series.

TABLE 1: Cyclical Peaks and Troughs Identified by Statistics Canada

Cyclical Peak	Cyclical Trough
October 1979	June 1980
June 1981	December 1982

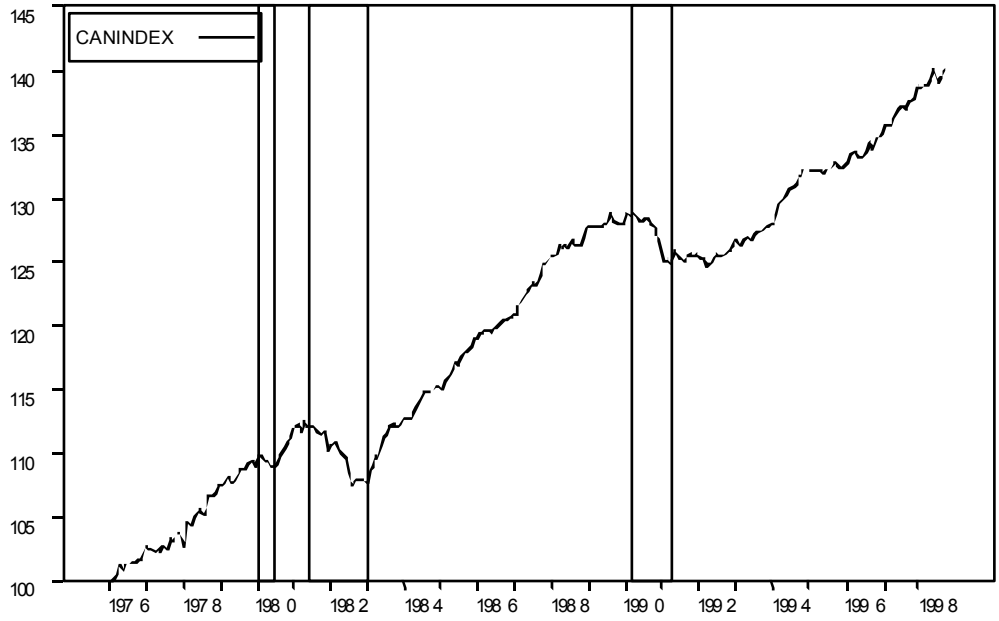
TABLE 2: Leads and Lags of the New WCER National Composite Index at Cyclical Turning Points

Cyclical Peaks	lead (+)/lag (-)	Cyclical Troughs	lead(+)/lag (-)
October 1979	-3	June 1980	0
June 1981	+2	December 1982	0
March 1990	+2	March 1991	-12

The lower turning points of June 1980 and December 1982 are identical, while there is a 12 month lag between our composite coincident indicator and the March 1991 trough. Cyclical peaks in the our new series lagged by 3 months (January 1980) in one instance and led by 2 months (April 1981) in the other. This is revealed below in FIGURE 1 which shows the path of the composite index since January 1976. The index in this Bulletin is set at the base of January 1976=100.

FIGURE 1: Canada Monthly Coincident Indicator

Index (Jan 1976 =100)



Shaded areas are months of recession.
Source: Western Centre for Economic Research, University of Alberta

In the case of the 1990-91 recession there is, however, a measurable difference between the lower turning point—March 1992— identified by our new national coincident index and the dating of the downturn when the path of quarterly GDP is used to set the 1990-91 cyclical peak and trough. The GDP data indicate a peak in the first quarter of 1990 and a trough in the first quarter of 1991. Our new national CCI reached a cyclical peak in January of 1990 and a trough in March of 1992. Our coincident indicator shows clearly that there is little, if any, evidence of a sustained recovery from the downturn commencing early in 1990 until into 1992. This very sluggish recovery was also apparent in quarterly real GDP which grew in total by less than 1.2 percent from its trough at first quarter of 1991 to the second quarter of 1992. A look at the American CCI also reveals the very sluggish recovery of the latter part of 1991 and early 1992. The stalled recovery led to the well known political dictum from the U. S. 1992

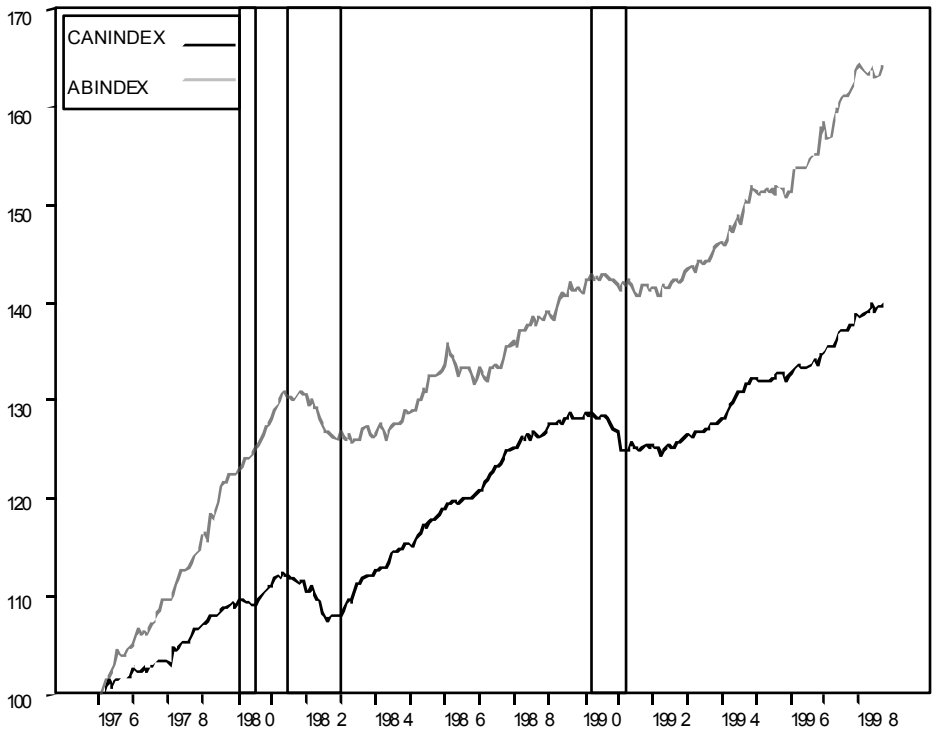
presidential election: "It's the economy, stupid". We conclude that once the ambiguity and uncertainty surrounding recovery from the 1990-91 downturn is acknowledged, the new CCI for Canada coincides well with national cyclical turning points.

PROVINCIAL BUSINESS CYCLES

We used the same set of components used in the national to construct CCIs for Alberta and British Columbia. In FIGURES 2 and 3, composite indicators for the two provinces are plotted with the national. Shaded areas represent national periods of recession as designated in TABLE 3.

FIGURE 2: Canada and Alberta Monthly Coincident Indicators

Index (Jan 1976 =100)



Shaded areas are months of national recession.
Source: Western Centre for Economic Research, University of Alberta

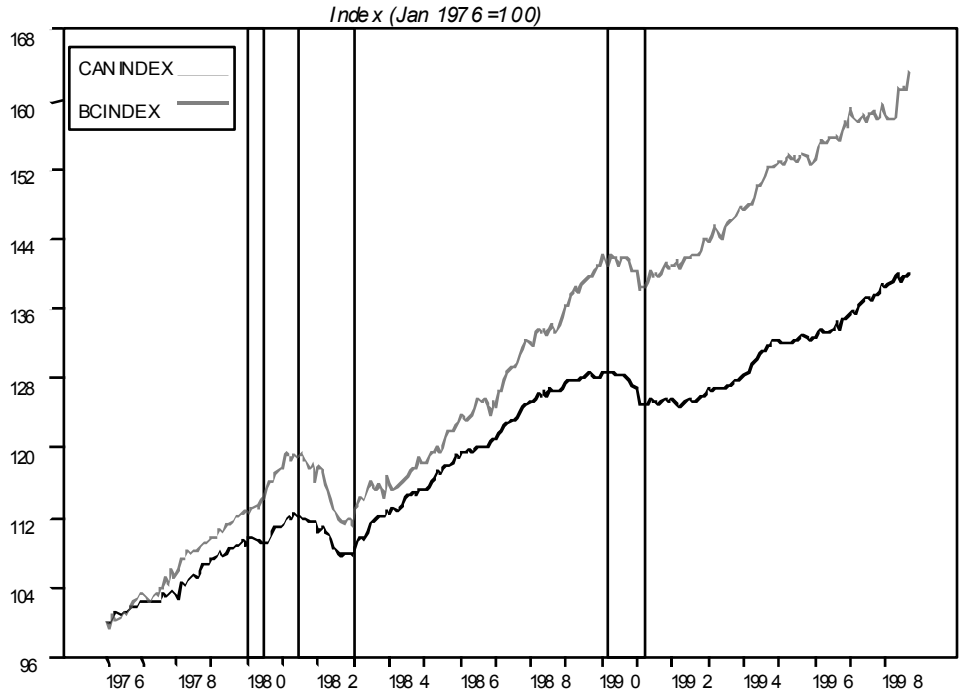
Identification of cyclical turning points is neither a simple nor a straightforward matter. Therefore, some methodology is necessary to distinguish minor changes from what could be characterized as periods of recession.

Pragmatism rules in establishing the timing and duration of cyclical changes. To assist, the previously mentioned criteria of diffusion, duration, and magnitude can be applied in developing some rules of thumb. The diffusion test is met by the extensive production and expenditure coverage of the three series used to construct the composite indexes. With respect to duration we adopt the rule that recessions should for a minimum of six months, or two quarters. The rule applied for the magnitude test is that the cumulative decline should be at least four times the absolute average monthly change in the index. TABLE 3 contains peaks and troughs for the two provinces based upon the application of these rules of thumb.

In the case of Alberta, there is no evidence of the 1980 national recession. However, the recession commencing in 1981 started later but lasted longer in Alberta, and recovery was considerably slower and more fragile. The distinctive feature is the separate cycle in the Alberta economy commencing in January of 1986. In that year that the price of crude oil collapsed and the effects cascaded throughout the provincial economy.

The 1990 recession commenced later in Alberta, and FIGURE 2 suggests that it was considerably shallower than the national. However, despite the shallow decline, the subsequent recovery in Alberta, like that nationally, was very sluggish, accelerating only in 1993. The composite indexes also reveal accurately the relatively stagnant economic performance in Alberta and nationally in 1995, together with the rapid growth, respectively recorded, in 1996 and 1997. The Alberta composite coincident index in recent months also reflects the fact that declining resource prices have inhibited the further expansion of the economy though there is no evidence as yet of a cyclical decline.

FIGURE 3 : Canada and British Columbia Monthly Coincident Indicators



Shaded areas are months of national recession
Source: Western Centre for Economic Research, University of Alberta

TABLE 3: Peaks and Troughs in Provincial indexes

Peak/Trough	ALBERTA	BRITISH COLUMBIA
Peak	October 1981	July 1981
Trough	April 1983	December 1982
Peak	January 1986	
Trough	October 1986	
Peak	August 1990	March 1990
Trough	July 1991	March 1991

The composite coincident index indicates that British Columbia, like Alberta, did not experience the short and relatively mild national recession of 1980. In the case of the 1981 recession,

the provincial downturn commenced somewhat later than the national but the trough in British Columbia was reached before that in Alberta and coincided with the national. The subsequent recovery in British Columbia was relatively rapid—mirroring the national—and continuous with the slow pace of cyclical expansion in Alberta. British Columbia, unlike Alberta, avoided a recession in 1986. The British Columbia recession period of 1990-91 coincides with the national, though the recovery was considerably more rapid than in either Alberta or nationally. The impact of the difficulties in Asia and lower rates of in-migration are apparent in the sluggish performance of the index in 1997, but the rules of thumb that have been adopted suggest that the impact is as yet insufficient to qualify as a recession.

SUMMARY AND CONCLUSION

Uncertain economic times underscore the need for good measures of the current state of the economy. The Bulletin has calculated a measure which should help business persons, consumers and policy makers to better assess changes occurring in the two most western provincial economies. The purpose of the Alberta and British Columbia monthly coincident indicator indexes is also to help answer reasonably promptly some common questions about how swings in economic activity have affected provincial economies. They are yet another instrument for analysis of a regional economy, and they help us compare the differing impact of the business cycle from one province to another, as well as to distinguish the current aggregate performance of one province from the national.

WCER will report these new provincial CCIs monthly on its website, www.bus.ualberta.ca/CIBS-WCER/.

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