

# Information Bulletin

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## CHANGING TRENDS IN THE ALBERTA LABOUR FORCE

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**Contents**

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<b>Introduction.....</b>	<b>1</b>
<b>Evaluating Aggregate Labour Force Participation .....</b>	<b>2</b>
<b>Gender and the LFPR.....</b>	<b>4</b>
<b>Age and the LFPR.....</b>	<b>7</b>
<b>Conclusion .....</b>	<b>13</b>
<b>Appendix. Trend and Business Cycle Components.....</b>	<b>14</b>
<b>References .....</b>	<b>15</b>

Over the past many months 'help wanted' signs have been prominently displayed by employers in towns and cities throughout Alberta. Employment has grown at rates substantially in excess of the long term average and unemployment rates are extremely low by historical standards. With labour shortage the order of the day, there is every reason to look with a longer run perspective at the evolution of the Alberta labour force.

This Bulletin analyses the labour force participation rate (LFPR) in Alberta in aggregate terms, by gender, and by age group through a separation of the effects of longer trends from shorter term influences. The labour force participation rate is simply the percent of the population in the labour force who are working or actively seeking work. The LFPR may be an overall or aggregate rate that is the proportion of the population 15 years of age and older that is in the labour force, or it may be expressed for gender or age sub-groups. Data for the LFPR comes from the Statistics Canada monthly Labour Force Survey of households. Across Canada LFPRs are far from uniform. Nationally, in 2007, the annual average was 67.6%. However, at the low end was Newfoundland and Labrador with a rate of 59.2%, while our neighbouring province of British Columbia recorded a rate of 66.3%. At a 2007 rate of 74.1%, Alberta was substantially above the national average and, indeed, had the highest rate in Canada—and one of the highest in the western world. Given the rather unique situation in Alberta, it is useful to examine in more detail the path of the LFPR over past decades and to consider the patterns of change in the demographic groups that make up the labour force.

Obviously at the personal level, decisions about whether to be a member of the labour force represent a myriad of considerations, many but not all, economic. For younger age groups seasonal swings in participation are large. When school is out, there is an influx of students to the labour market. With older age groups, changes in social norms, in educational attainment, and in cultural values are important influences on labour market involvement. The importance of these longer run influences is evident in the fact that 30 years ago there were 60 women for every 100 men in the provincial labour force while today that ratio has changed to 84 women for every 100 men. But seasonal and longer term trends are not the only influences. It is well recognized that business conditions, namely the business cycle, impact the LFPR with bad times leading to labour force withdrawal and boom times drawing individuals into the labour market pool. The result of these and other shorter term swings is that the participation rate is far from stable, and as a consequence there can be a non-trivial impact of the LFPR on the available labour supply. To illustrate, given 2007 Alberta population levels, an increase of 1% in the aggregate participation rate increases the available labour force by 2,000 workers.

The object of this report is twofold: first, to identify longer term trends in the aggregate LFPR, in gender, and in age cohorts; and second, to separate out the cyclical components in the LFPR and to establish the relationship of these to movements in an aggregate measure of Alberta business activity.

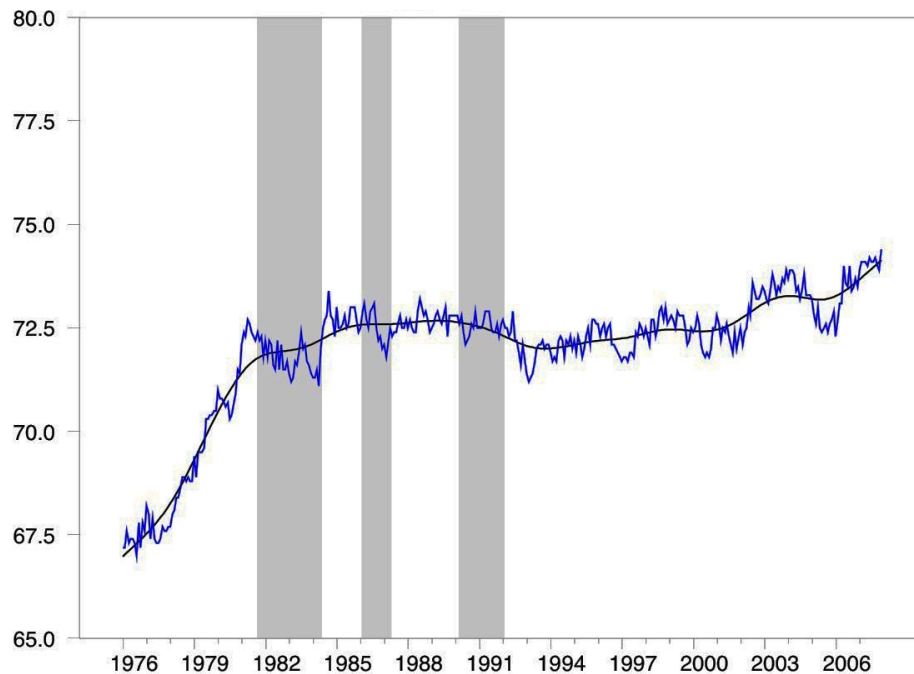
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## Evaluating Aggregate Labour Force Participation

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The aggregate LFPR gives an overview of labour supply for those in the population who are 15 years of age and over. Data for the province are available monthly on a consistent basis since January of 1976.<sup>1</sup> A plot of the aggregate LFPR is found in Figure 1a which shows the path of the seasonally adjusted monthly LFPR commencing in January of 1976 together with a fitted trend line. The shaded areas in Figure 1a are periods of recession in Alberta as identified by the WCER (Chambers 2007). A dominant feature is the rise in the LFPR through January 1989 when the trend reached 72.7, some five percentage points higher than 13 years before. However, almost all of this increase occurred between 1976 and January of 1986 so that during these years it is clear that trend factors dominate the LFPR. The significance of this change is that given the earlier LFPR there would have been 98,000 fewer workers in 1989. The years from 1989 through early 2001 are characterized by a stable trend followed by a renewed upward movement through 2007.

**Figure 1a. Level & Trend: Aggregate LFP 15 and over**

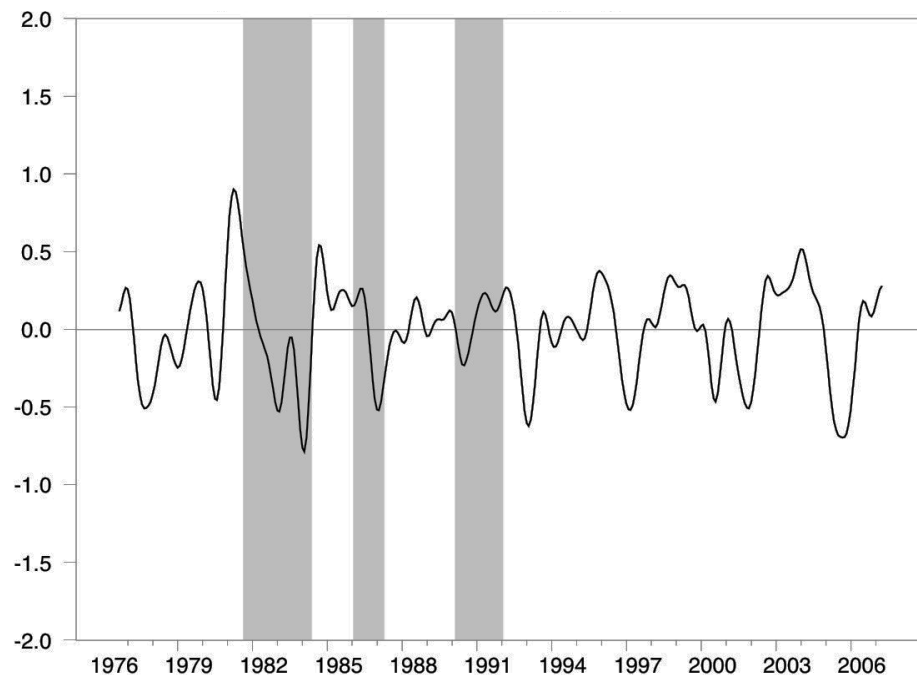


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1. See Statistics Canada, Cansim II, series v2064571.

From Figure 1a it is clear that shorter term fluctuations are also evident in the LFPR. These are filtered out and recorded in Figure 1b.<sup>1</sup> The more prominent of these cycles are associated either with recessions in Alberta or with a distinct retardation in the rate of growth in the provincial economy. The effects of the long recession of 1981-1984 produced a two percentage point swing in the LFPR. Again the recession of 1986-87 resulted in withdrawals from the labour force, though that was not the case in the 1990-1992 recession when the LFPR fell only after the initial period of relatively weak recovery had commenced. There are other distinct cycles unrelated to the provincial business cycle like those in 1997-98 and in 2004-05, which lag a deceleration in the provincial growth rate as measured by the WCER Alberta coincident indicator.

**Figure 1b. Cyclical Component in Aggregate LFPR**



Examination of the monthly movements of the aggregate LFPR suggests that both trend factors and cyclical influences have played a role but, in the period under study, trend factors dominate the LFPR profile. The recent renewed upward movement in the trend raises the questions of its source, whether it will continue (could it really be cyclical resulting from boom conditions), or whether the economy is likely to see a return to the participation levels that prevailed during the final fifteen years of the last century.

<sup>1</sup> Trend values in the paper are obtained through the Hodrick-Prescott method fitted to seasonally adjusted series. Shorter term fluctuations are eliminated from the seasonally adjusted data through Henderson smoothing with a span of 18. Cyclical movements are then taken to be the Henderson smoothed series minus the trend values. A useful discussion of the methodologies of time series decomposition is found in Higo and Nakada (1998).

The rise in the LFPR during the late 1970s through the 1980s represents the feminization of the labour force. Particularly significant in understanding these changes has been the rise in LFPR for female age cohorts from 25 to 54 (Beaudry and Lemieux 1999). Many explanations have been offered for the increased role of women, and there is every reason to believe these are just as applicable in the Alberta context as they are elsewhere.<sup>2</sup> These include both economic and broader social-cultural factors. For example, over the period the average earnings of female workers, though still less than males, have nevertheless increased not only in absolute but also in relative terms (Welch 1997). However, that is far from a complete answer. Service sectors have increased in importance and these are activities in which women are more likely to be employed. The educational attainment of women has increased measurably, reflected in the fact that the majority of postsecondary students in Alberta (and nationally) are women, and they wish to make economic use of their training (Jaumotte 2003a, Goldin 2006). There is no doubt, too, that paid parental leave through the EI program eases entry and exit to the labour force for women (Jaumotte 2003b). Perhaps also the greater—but far from universal—availability of day care has facilitated the change. It is also clear that much of the technological change and its wide diffusion over the last half century has reduced the time and energy required for many household chores such as cleaning, washing and cooking that have been the traditional role of women (Greenwood et al 2005). Higher rates of marital breakdown may also have been a factor (White 1990). And finally improvements in birth control techniques have offered a greater range of choice to women (Goldin and Katz 2002).

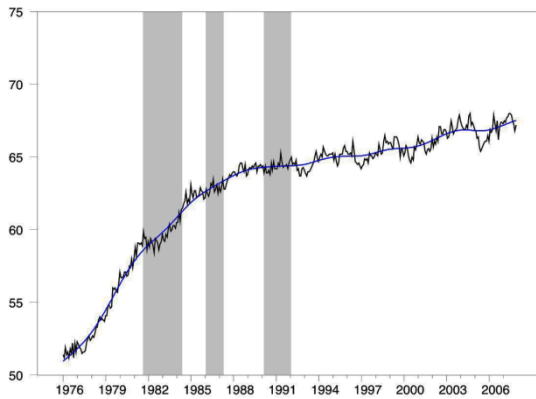
A look at Figure 2a shows the magnitude of that change with female participation rates rising over the period from approximately 51% to 67%. The significance of this change is readily apparent were current population to be multiplied by the 1976 female LFPR. The result of this hypothetical would be 238,000 fewer people in the labour force. It is also apparent that the level and trend in participation shows continuous increase, though at a declining rate, with female LFPR increasing a further 3% since recovery from the 1986-87 recession. Figure 2b shows the level and trend in male LFPR which to some degree counters the change in the female LFPR. It declined from a high trend value of 84% before the onset of the 1981-84 recession, continued to fall during the 1980s and the early 1990s, but levelling around 79.5% between 1993 and 2001. Subsequently, the level and trend has raised the male LFPR by more than a percentage point.

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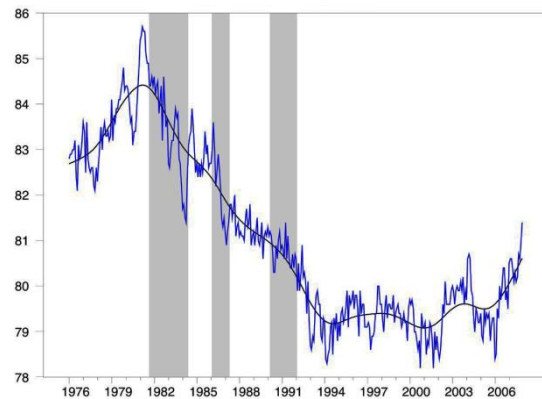
<sup>2</sup> See the references at the end of the Bulletin for a number of relevant papers.

**Figure 2. LFPR 15 and over**

**Figure 2a. Level and Trend of LFPR for Women**

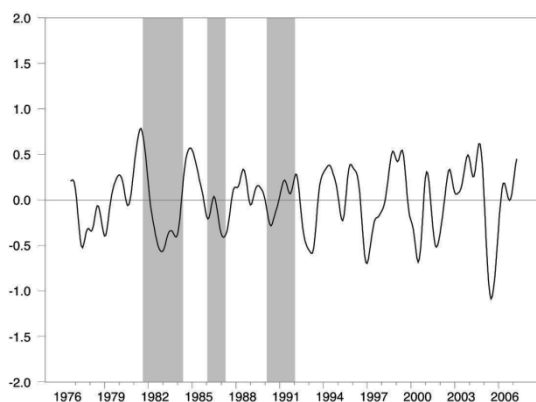


**Figure 2b. Level and Trend of LFPR for Men**

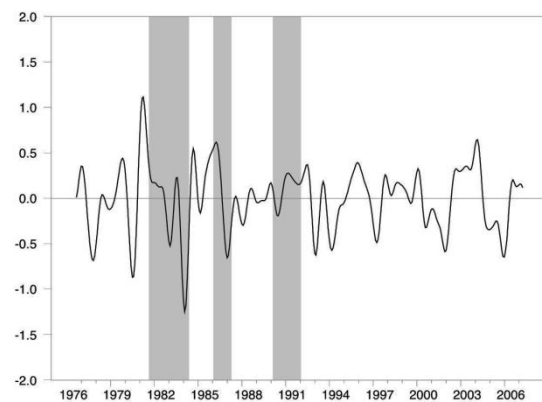


A number of explanations may be offered for the downward male LFPR though it is clear that more research has gone into explanations for the rising female LFPR than on the declines in the male LFPR. Explanations for the male LFPR include the amount of downsizing and early retirement buyouts that occurred during the 1980s. The availability of the Canada Pension Plan and extended disability benefits may have played a role (Baker and Benjamin 1999, Campolieti 2002). It can also be argued that the decline in relative wages for those with limited education and skill attainment may have contributed.

**Figure 2c. Cyclical Component of LFPR for Women**



**Figure 2d. Cyclical Component of LFPR for Men**





While the general impression is that trend movements appear to dominate for both genders, the cyclical components of LFPR for each gender are found in Figures 2c and 2d. The Figures show that these influences also play a part in bringing about shorter run changes. One key question is how these cyclical movements are related to the Alberta business cycle and to periods of accelerating or decelerating growth in the broader economy. Table 1 shows the correlation of these cyclical components with the monthly rate of change in the WCER Alberta Coincident Indicator (ACI).

**Table 1. Relation of the Cyclical Components of the LFPR by Gender with the WCER Alberta Coincident Indicator (ACI)**

	<b>Men</b>	<b>Women</b>	<b>Aggregate</b>
Correlation with ACI	.32	.23	.32
Std x/std ACI	.24	.24	.21

The table reporting the correlation between month to month changes in the cyclical components of ACI and of the gender LFPR indicates that the male LFPR is more pro-cyclical than the female. The second row, allowing comparison of the volatility in broader provincial cyclical forces and the LFPRs, indicates that the volatility of the LFPRs is *less* than a quarter as large as that in the ACI. This lesser amplitude suggests that the individual requirement for income to meet household expenses—many of which are contractual in nature—simply cannot respond as readily to decisions about whether to initiate change in rates of production.

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## Age and the LFPR

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Age is an important influence on the changes that have occurred in the Alberta labour force. During the years considered, the baby boom entered the labour force in large numbers and subsequently moved through the age cohorts. Those born from the mid-1940s to the 1960s are now reaching the later stages of their working careers. Lower birth rates in the 1970s and 1980s have influenced the size contribution of the younger members of the labour force.

Some understanding of these changes can be found Figure 3 which charts the proportion of the Alberta population for a set of age cohorts from 15-65 and over annually from 1976 to 2007. It is possible to track the movement of the baby boom population through the labour force from the 15-19 age group in the 1970s through the over 45 age groups in the latter part of the period.

**Figure 3. Percent of Alberta Population 15 and Over by Age Cohort and Median Age of the Labour Force**

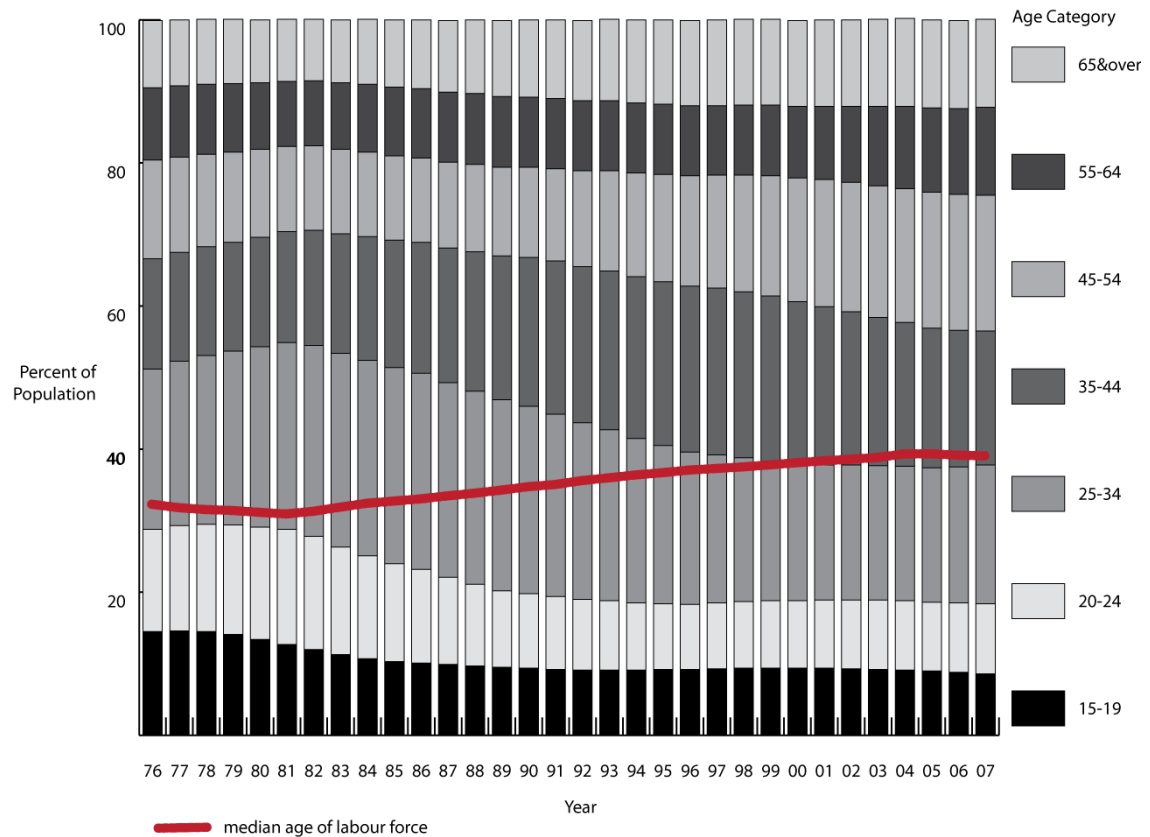
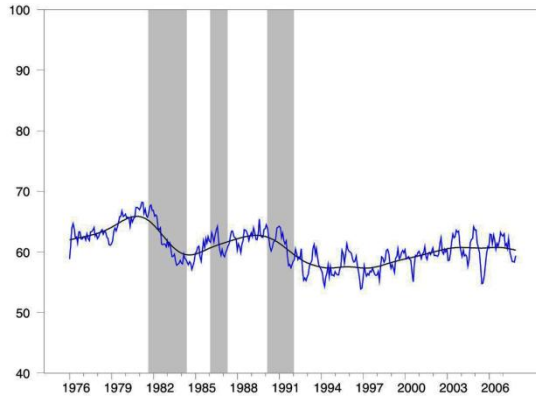


Figure 3 also makes clear that the contribution of any demographic group to the total labour force will be determined not only by its LFPR but also by the gross population in that cohort. For example, the LFPR for an age cohort may display relative stability but the share of that cohort in the total labour force will also depend on the number of people in that cohort (Dugan and Robidoux 1999). The general effect of the changes conveyed in Figure 3 can be summarized in the line which charts the median age of the Alberta labour force over the period. There was a fall in

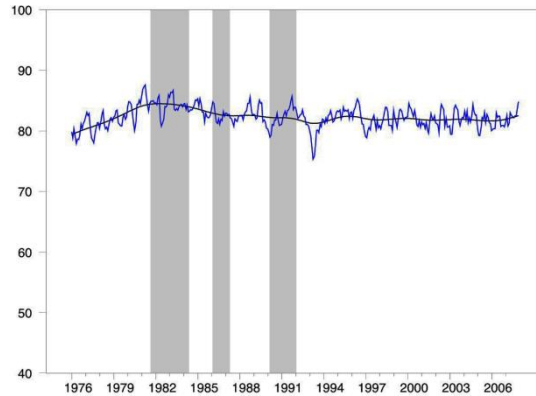
the median age through 1981 as baby boomers entered the labour force. Then the median age rose from 31 years to 39.4 years in 2005. In the last two years this increase has been interrupted, a reflection of the inflow of younger workers into the province associated with the boom conditions of 2006 and 2007. Figures 4a through 4g show the LFPR by age category level and trend.

**Figure 4. LFPR**

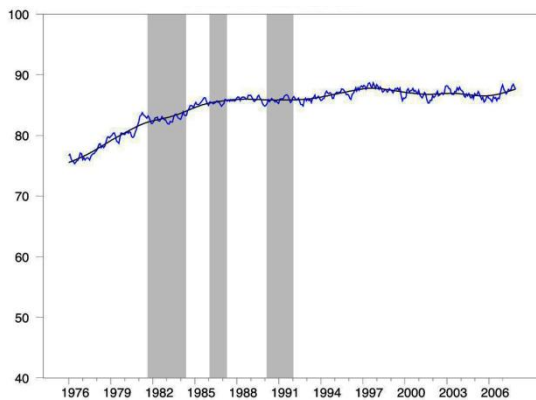
**Figure 4a. Level and Trend LFPR Age 15 to 19**



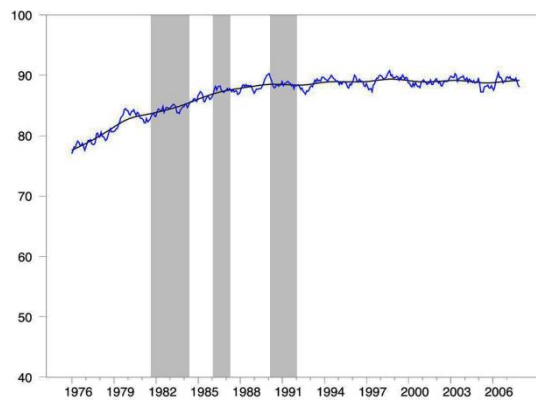
**Figure 4b. Level and Trend LFPR 20 to 24**



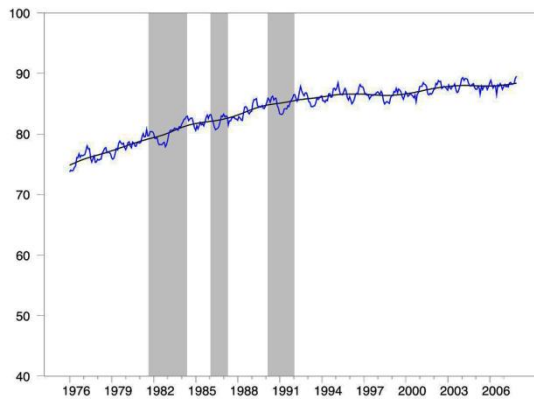
**Figure 4c. Level and Trend LFPR 25 to 34**



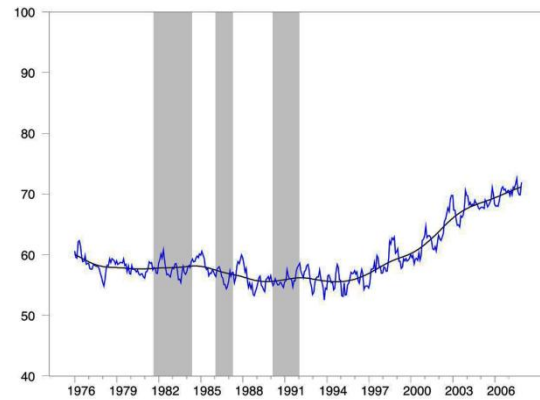
**Figure 4d. Level and Trend LFPR 35 to 44**



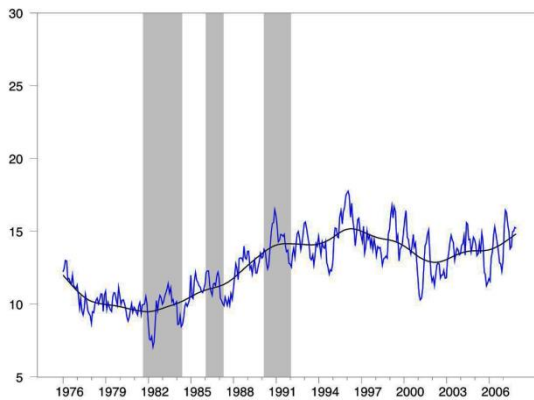
**Figure 4e. Level and Trend LFPR 45 to 54**



**Figure 4f. Level and Trend LFPR 55 to 64**



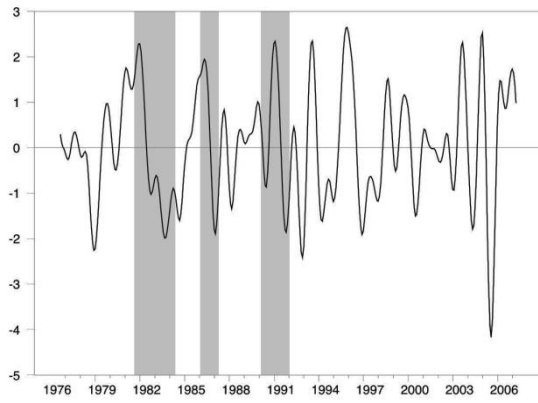
**Figure 4g. Level and Trend LFPR 65 and over**



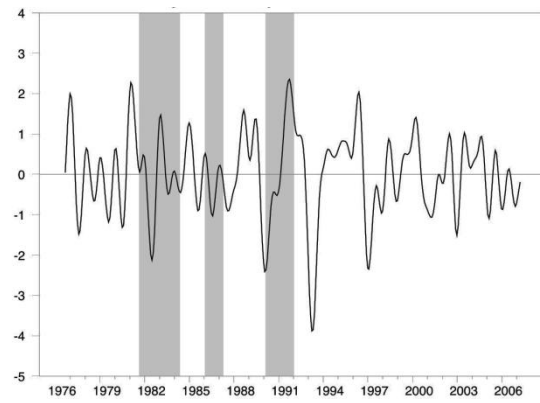
Further evidence of the impact of age on the LFPR is found in Figures 5a through 5g which show the levels and trends together with the cyclical components of each age cohort. Age is a significant influence on labour force behaviour. The 15-19 age cohort, in trading off opportunities to acquire work experience against the need for further educational attainment, has over the period recorded a decline in the LFPR, though the strong demand conditions in the provincial economy over the past 15 years have produced some upswing. However, this cohort's large cyclical component also conveys a weaker attachment to the labour market. The 20-24 age cohort has shown a slight decline in LFPR since the early 1980s, again suggesting increased concern about securing educational qualifications. The cyclical component of the LFPR for this component also shows relatively high volatility reflecting the search process, as individuals strive for employment that matches interest with opportunity, as well as a sustained interest in education.

**Figure 5. Cyclical Components**

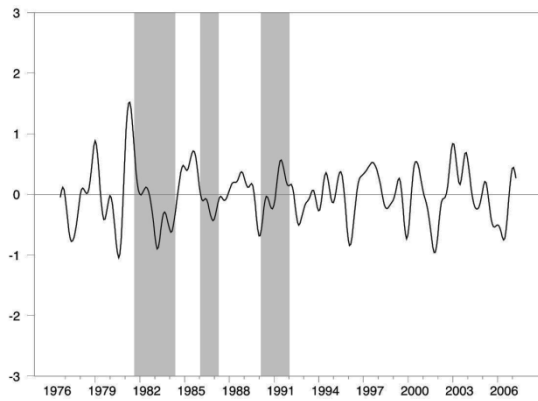
**Figure 5a. Cyclical Component of LFPR 15 to 19**



**Figure 5b. Cyclical Component of LFPR 20 to 24**



**Figure 5c. Cyclical Component of LFPR 25 to 34**



**Figure 5d. Cyclical Component of LFPR 35 to 44**

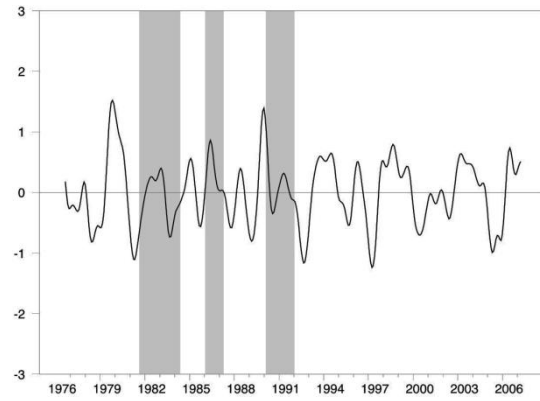


Figure 5e. Cyclical Component of LFPR 45 to 54

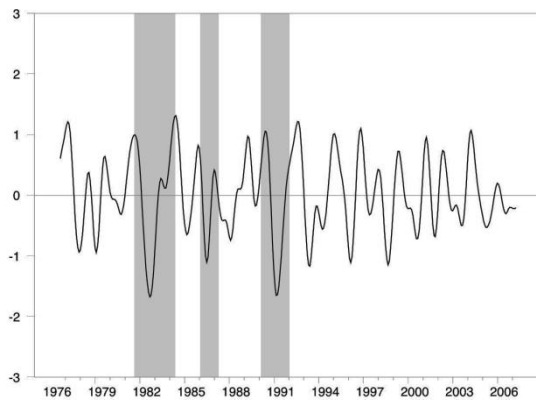


Figure 5f. Cyclical Component of LFPR 55 to 64

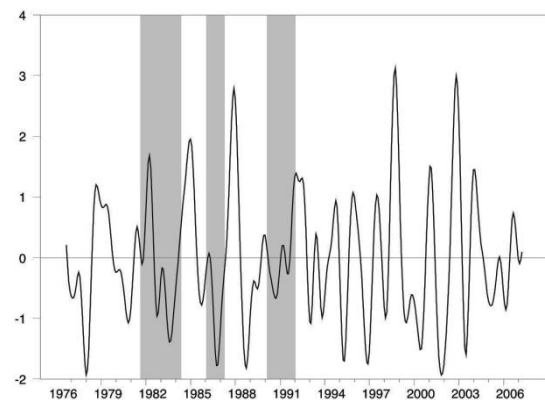
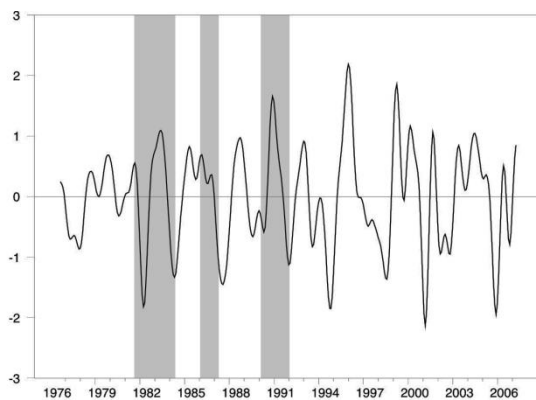


Figure 5g. Cyclical Component of LFPR 65 and over



The middle cohorts—25-34, 35-44 and 45-54—are all characterized by a rising trend in LFPR. As seen from the previous section, this represents the impact of increased LFPRs for women. These also are the cohorts with the lowest cyclical component. Over the past two decades the most significant new labour force developments are the increases in the trend and level of the LFPR for those in the two upper age cohorts, particularly the 55-64 group, which runs counter to an expectation that older cohorts will record declining LFPRs (Marshall and Ferrao 2007, Friedberg 2007). In the past two decades, the LFPR for the 55-64 age cohort has increased by a startling 15 percentage points which reflects the impact on this group of sustained buoyancy in the provincial economy over much of this period. This is most evident for those more highly trained with continuing interest in professional activity, possibly financial constraints around retirement planning, and a generally tighter labour market. There is much less evidence of a strong upswing in the 65 and over cohort where the increase has been in the order of to three to four percentage points over the entire period and relative stability during the past decade. Perhaps the virtual elimination of mandatory retirement will have some stronger subsequent effects.

The size of cohort cyclical components and their relationship to the ABCI is summarised in Table 2. The relationship to the cyclical component of the ABCI is primarily evident for the 15-19 cohort, and to a lesser extent for the 25-34 group, which display evidence of being pro-cyclical. For the other cohorts, at least with respect to provincial cycles, the results are largely acyclical (neutral). The relative size of the cyclical components with respect to the ACI is greatest for the younger and older cohorts. Such cohort differences in cyclical experience suggest that the age distribution of the labour force can have an effect on the cyclical component of the aggregate LFPR.

**Table 2. Relation of the Cyclical Components of the LFPR by Age Cohort with the WCER Alberta Coincident Indicator**

	<b>15-19</b>	<b>20-24</b>	<b>25-34</b>	<b>35-44</b>	<b>45-54</b>	<b>55-64</b>	<b>65&amp;over</b>
Correlation with ACI	.34	.01	.23	.07	.14	-.02	.01
Std/StdACI	.84	..69	.29	.36	.43	.70	.55

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## Conclusion

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The analysis above is of LFPRs in a provincial economy that is one part of a national economy. It is important to recognize that a provincial economy is open to domestic migration as well as migration from abroad, and it is well established in the research that differences in job opportunities—in economic growth rates—across the provinces dominate inter-provincial migration. The point is, that in looking at possible future changes in the aggregate Alberta LFPR, some estimates of future net migration to Alberta is required as migration is most likely to impact population levels in specific age cohorts.

That said, changes in the Alberta labour force over the past thirty years have been quite dramatic. The most significant of these is the rising share of women in the labour force which has been the strongest influence on the rising aggregate LFPR. A second is the influence of the baby boom generation as it has worked its way from youth through the core cohorts and into the older groups. Another powerful factor has been the evidence of some decline in the LFPRs of youth, despite high labour demand, presumably in recognition of the better job opportunities for those with higher educational and skill attainment. After detrending, it is clear that there are cyclical fluctuations present in all LFPRs which in most instances bear some positive relationship to the path of the provincial economy.

The future may be rather different from the experience of the period considered here. First, it is quite unlikely that the female LFPR will move up from its present levels, although that conclusion may be subject to the greater availability of benefit packaged part-time work. The female LFPR, in fact, has changed by 2 percentage points in the last 20 years compared with their growth of some 15 points in the first decade. The future is more likely to hold relatively small changes in women's rate of participation. In the next decade the aging of the boomers will have significant impacts. Consider that the current LFPR of those 45-54 is about 88% while that of the 55-64 cohort approximates 70%, and for those 65 and over it is—in a booming economy—14.5%. Longer life expectancy and a buoyant economy may serve to maintain the LFPRs of the oldest cohorts but the challenge for employers will be to provide the type of flexible work arrangements that will appeal to older—and more experienced—members of the labour force. Perhaps the most likely scenario is for a decline in the LFPR over the coming decade. In those circumstances it becomes ever more important for actions to enhance the productivity of those who do participate in the labour force and to find the type of innovative work arrangements that make it attractive for individuals to continue working.



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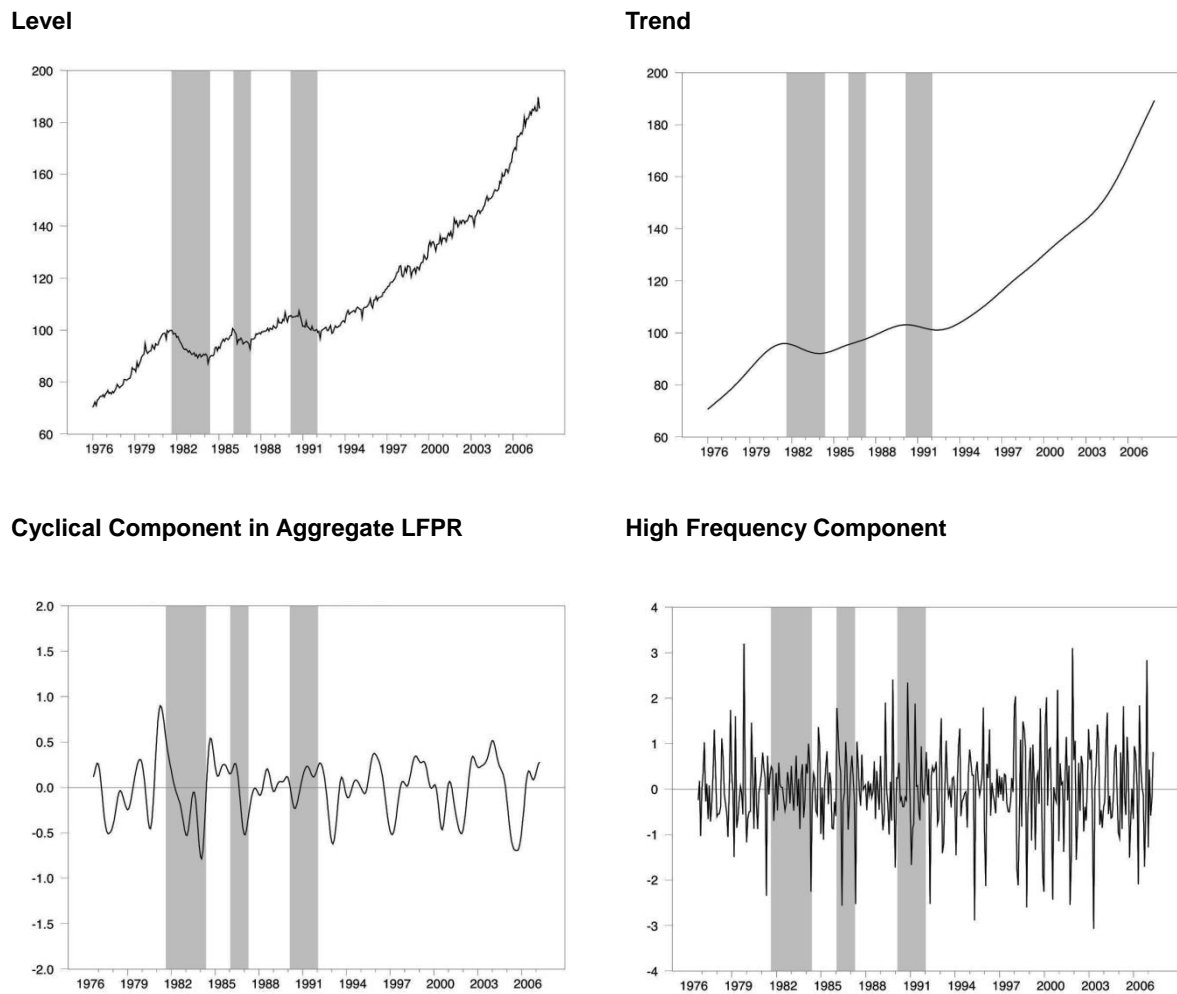
## Appendix. Trend and Business Cycle Components

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Time series consist of trend and cyclical components of differing frequency. In this study the trend component was identified through the widely used Hodrick-Prescott filter. Lower frequency cycles were identified by taking the difference between trend values and the seasonally adjusted level of the series smoothed by application of a Henderson filter, with a span equal to 18. High frequency fluctuations are those with a span of less than 18 months and are identified as the difference between the Henderson smoothed and the seasonally adjusted levels of the series.

Figure A1 presents graphs of the decomposition for the Western Centre's Alberta Coincident Indicator. In the analysis of the LFPR in aggregate, for gender, and by age cohort the cyclical component of the coincident indicator is correlated with that of the identified LFPRs of the different segments of the labour force.

**Figure A1. Decomposition of the Western Centre for Economic Research Alberta Coincident Indicator**



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