Applying the Wage-Common to Canadian Provinces

by Jonathan Lachaine

Canadian Economic Analysis Department
Bank of Canada
Ottawa, Ontario, Canada KIA 0G9
jlachaine@bank-banque-canada.ca

Acknowledgements

Abstract

As at the national level, available sources of hourly wage data for Canadian provinces sometimes send conflicting signals about wage growth. This note has two objectives. First, we develop a common measure of provincial wages (the provincial wage-common) to better capture the underlying wage pressures, reflecting the overall trend across all data sources. Second, we focus on recent wage developments in Quebec, Ontario, Alberta and British Columbia and the relationship between wage growth in these provinces and some macroeconomic drivers. We conclude that a provincial wage-common provides, for the most part, superior estimates than each of the data sources taken individually because of their timeliness, lower volatility and good relationships with fundamentals. A key finding of our analysis is that the wage-common measures of provinces with a strong energy sector, such as Alberta, are more closely correlated with the national measure and are also more sensitive to oil price shocks than the wage-common measures of the other provinces.

Bank topics: Econometric and statistical methods; labour markets; Recent economic and financial developments
JEL codes: C, C3, C38, J, J3

Résumé

Comme au niveau national, les sources de données disponibles sur les salaires horaires dans les provinces canadiennes envoient parfois des signaux contradictoires quant à leur croissance. La présente note comporte donc deux objectifs : d'abord, nous concevons une mesure commune des salaires provinciaux (salaires-comm), qui rend mieux compte des pressions sous-jacentes exercées sur les salaires et qui reflète la tendance pour l'ensemble des sources de données. Ensuite, nous examinons surtout l'évolution récente des salaires au Québec, en Ontario, en Alberta et en Colombie-Britanique et la relation entre la croissance des salaires de ces provinces et certains déterminants macroéconomiques. Nous arrivons à la conclusion que les mesures de salaires-comm par province sont, pour la plupart, des estimations plus efficaces que chacune des sources de données prise individuellement. Ceci vient du fait que ces nouvelles mesures sont disponibles plus rapidement, elles sont moins volatiles et bien corrélées avec les facteurs fondamentaux. Un résultat clé de l'analyse est que les salaires-comm des provinces où le secteur de l'énergie est fortement présent comme en Alberta sont plus étroitement corrélés avec la mesure nationale et sont aussi plus sensibles aux chocs du prix du pétrole que les autre provinces.

Sujets : Méthodes économétriques et statistiques; Marchés du travail; Évolution économique et financière récente
*Codes JEL : C, C3, C38, J, J3*

Summary

Following Brouillette, Lachaine and Vincent (2018), we develop a new provincial wage measure (the provincial wage-common) to better capture the underlying wage pressures in Canadian provinces. Using the provincial wage-common, we focus on recent wage dynamics in the four largest provinces: Quebec, Ontario, Alberta and British Columbia. Our key findings are as follows:

- The provincial wage-common is a superior estimate relative to individual data sources because of its timeliness, lower volatility and good relationship with the output gap and the unemployment gap.

  - Although Labour Force Survey (LFS) data are the most timely wage data sources, they are also the least informative for provincial wage-common because the LFS wage movements tend to be more idiosyncratic and less correlated with other data sources.

  - For all provinces except Ontario, the National Accounts (NAC) are the main data source for the wage-common. In Ontario, the Survey of Employment, Payrolls and Hours (SEPH) plays this role.

- The provincial wage-common eliminates noisy signals specific to data sources from each province.

- A key finding of the analysis is that the wage-common of provinces with a strong energy sector, such as Alberta, are more closely correlated with the national measure and are also more sensitive to commodity price shocks than the wage-common of other provinces.

  - Alberta's wage-common saw negative growth during the first half of 2016, after the 2014–15 oil price shock, whereas the wage-common showed relatively stable growth in other provinces over this period.

1. Motivation

In early 2018, Bank of Canada staff introduced an hourly wage measure, the wage-common, that better captures the underlying wage pressures in Canada and reflects the overall trend across all data sources (Brouillette, Lachaine and Vincent 2018). The data sources available in Canada, such as the Labour Force Survey (LFS); the Survey of Employment, Payrolls and Hours (SEPH); the Productivity Accounts (PA); and the National Accounts (NAC),[1] sometimes send conflicting signals about wage pressures. This is exactly what happened when the LFS showed higher growth during the 2014–15 oil price shock. The wage-common is therefore a superior estimate relative to each individual data sources because it eliminates noisy signals (**Chart 1**). Furthermore, it is less volatile, more timely and closely related to fundamentals. The national wage-common shows a marked improvement in wage growth since mid-2016, although it was slightly below 3 per cent in the first quarter of 2018 (preliminary estimate), which is the level consistent with an economy that has no labour slack.

Chart 1: The national wage-common eliminates episodes of noisy signal in Canada
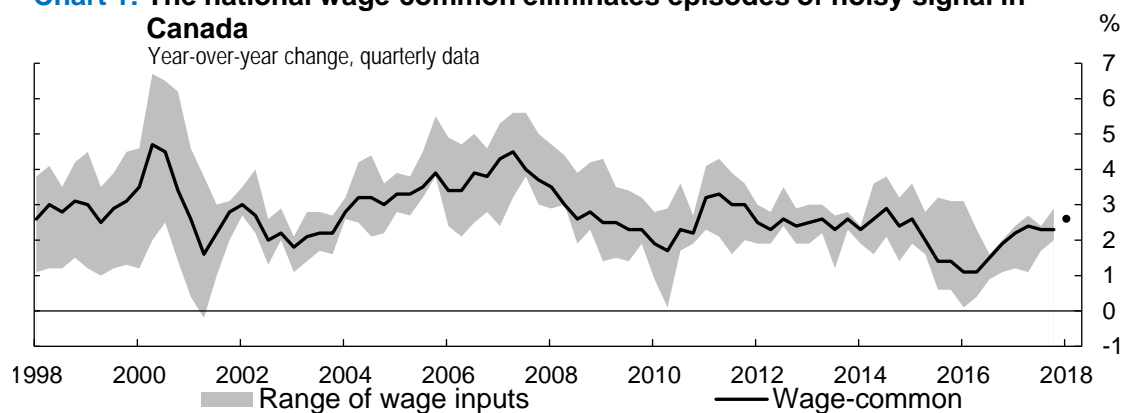
Year-over-year change, quarterly data

Range of wage inputs ▬▬▬ Wage-common

Sources: Statistics Canada and Bank of Canada calculations

Last data plotted: Range of wage inputs, 2017Q4;
Wage-common, 2018Q1

However, the national wage-common does not provide information about underlying wage pressures in each province. Some provinces are experiencing more sustained economic growth in the current business cycle, particularly Quebec, Ontario and British Columbia. These provincial disparities may have implications for wage growth and may provide a useful signal for Canada as a whole. To address these disparities, this note

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[1] See Brouillette, Lachaine and Vincent (2018) for definitions and the data used.

presents the provincial wage-common, following Brouillette, Lachaine and Vincent (2018).[2] However, research at the provincial level is limited to data from the LFS, SEPH and NAC because PA data are not available quarterly. These provincial data sources diverge notably in certain periods, and these divergences are sometimes more significant than they are among the national data sources.

The way we measure and analyze provincial wage pressures in Canada could therefore be improved. Provincial wage-common indicators and their methodology are presented in Section 2. Section 3 presents the properties of these indicators as well as their relationship to fundamentals. Section 3 also includes an analysis of recent wage-common trends by province.

2. Methodology of the provincial wage-common

2.1 Estimation method

Following Brouillette, Lachaine and Vincent (2018), we use a dynamic factor model to extract the common signal from LFS, SEPH and NAC data. For each of the 10 provinces, the data sources are decomposed into two components: a common component that tracks co-movement between the three wage measures and an idiosyncratic component that captures any source-specific movement (**equation 1**). The unobserved common factor x_t, capturing the underlying wage growth of the three wage measures, follows a first-order autoregressive dynamic (**equation 2**).

$$\begin{bmatrix} LFS_t \\ SEPH_t \\ NAC_t \end{bmatrix} = \begin{bmatrix} \beta_{LFS} \\ \beta_{SEPH} \\ \beta_{NAC} \end{bmatrix} x_t + \begin{bmatrix} \mu_{LFS,t} \\ \mu_{SEPH,t} \\ \mu_{NAC,t} \end{bmatrix}, \qquad [1]$$

$$x_t = \rho x_{t-1} + \epsilon_t. \qquad [2]$$

The parameters β, x_t, the covariance matrix of both the measurement shocks ($\mu_{,t}$) and the transition shock (ϵ_t) are estimated within a state-space framework using the Kalman filter (see Durbin and Koopman 2012). Estimation is performed using quarterly growth rates from 1997Q2 to 2018Q1. Given the model parameters, we obtain the smoothed estimate of x_t, from which we construct the provincial wage-common by benchmarking it against the average of the three aggregate wage sources and its respective standard deviation.

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[2] The data available do not allow us to apply our analysis to the territories.

Similar to the national wage-common, the provincial wage-common has several advantages over individual wage indicators or a simple average. First, it helps eliminate misleading individual indicators: less weight is put on sources that have more idiosyncratic dynamics. Second, the wage-common has a temporal dynamic: it averages not only across the three wage indicators but also their dynamics over time. Third, the wage-common is available at the same time as LFS data even if the SEPH or NAC data have yet not been released because it combines past provincial wage-common information (including all three signals of the previous quarter) and current available signals. For example, at the time of writing, we have LFS data on wage growth for 2018Q1 to inform the provincial wage-common, while the latest available quarterly data for the other measures are only available up to 2017Q4, but still partly fuel the momentum in 2018Q1.[3]

For all provinces except Ontario, NAC is the most useful source of data, followed by SEPH and LFS. This result is similar to that at the national level. LFS data do not contribute much because they do not share similar historical dynamics with other lagged sources. The correlation between the LFS wage measures and the two other data sources is in fact very weak, or even slightly negative, in some provinces. The situation is different for Ontario, where the correlation between data sources is stronger for each. In the case of Ontario, SEPH is the most informative source for the provincial wage-common, followed by the NAC and LFS. The fact that LFS data contribute the least to provincial wage-common highlights the fact that the first signal received on wage pressures is not necessarily the most enlightening. This is a key feature of using this measure. As a result, LFS data become less instructive each time new data are released because other sources appear to be more reliable signals for the provincial wage-common.

2.2 Historical dynamics of the provincial wage-common

Focusing mainly on the four largest provinces—Quebec, Ontario, Alberta and British Columbia—we note that the use of the provincial wage-common eliminates noisy signals.

The provincial wage-common for Quebec and Ontario are shown in **Chart 2** and **Chart 3**, respectively. The underlying measures show more marked growth in 2006–07, during a period of rapid economic expansion. However, these indicators showed growth slowed from 2008 to 2010, following the Great Recession. The slowdown in growth was less pronounced following the 2014–15 oil price shock, compared with the national level. This result stems from divergent wage growth dynamics in provinces with a strong energy sector and the other provinces.

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[3] A preliminary estimate of SEPH in 2018Q1, incorporated in the provincial wage-common, is based on the most recent data available and a staff analysis.
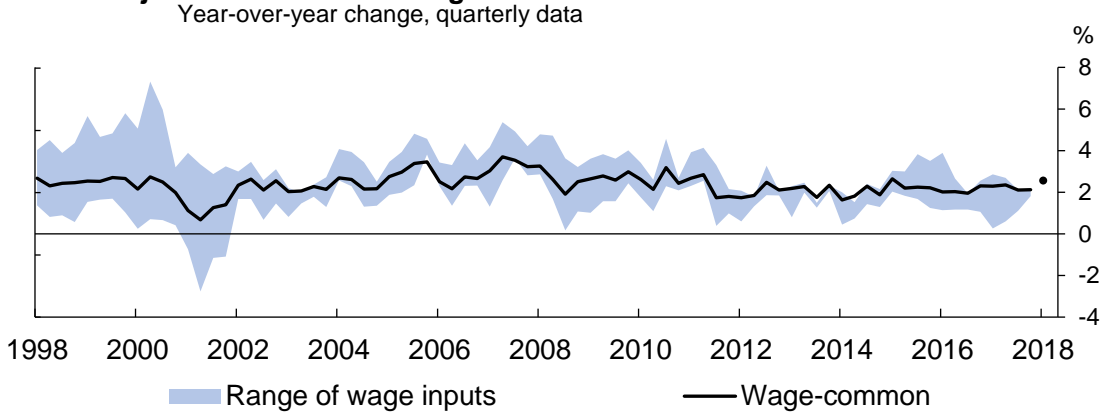
Chart 2: **Quebec wage-common was affected slighly by the 2014–15 oil price shock...**
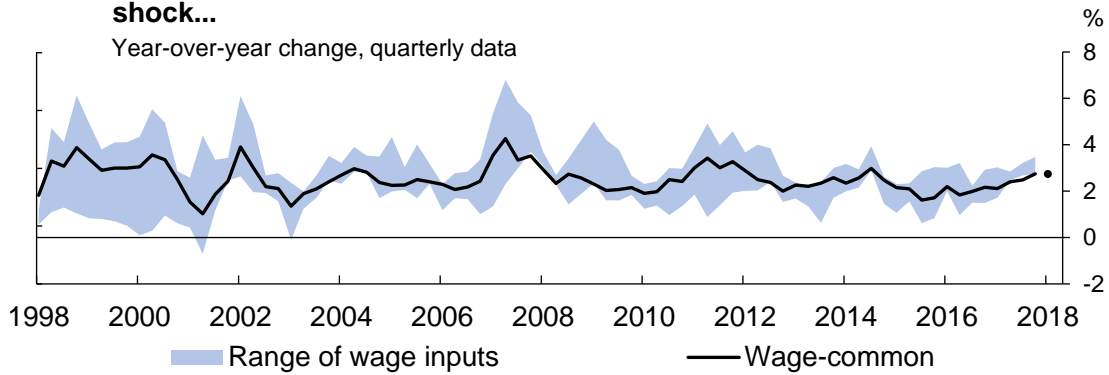
Year-over-year change, quarterly data

Range of wage inputs ▬▬ Wage-common

Last data plotted: Range of wage inputs, 2017Q4;
Wage-common, 2018Q1

Chart 3: **... just like the Ontario wage-common**

Year-over-year change, quarterly data

Range of wage inputs ▬▬ Wage-common

Last data plotted: Range of wage inputs, 2017Q4;
Wage-common, 2018Q1

The Alberta wage-common captures business cycles well and is more sensitive to fluctuations in commodity prices (**Chart 4**). In fact, the Alberta wage-common clearly indicates upward pressure from 2005 to 2007—a period that coincided with strong economic expansion, rising oil prices and excess labour market demand. Furthermore, the Alberta wage-common shows that growth eased sharply after the Great Recession and was even temporarily negative after the 2014–15 oil price shock.

Chart 4: Alberta wage-common is more sensitive to fluctuations in commodity prices
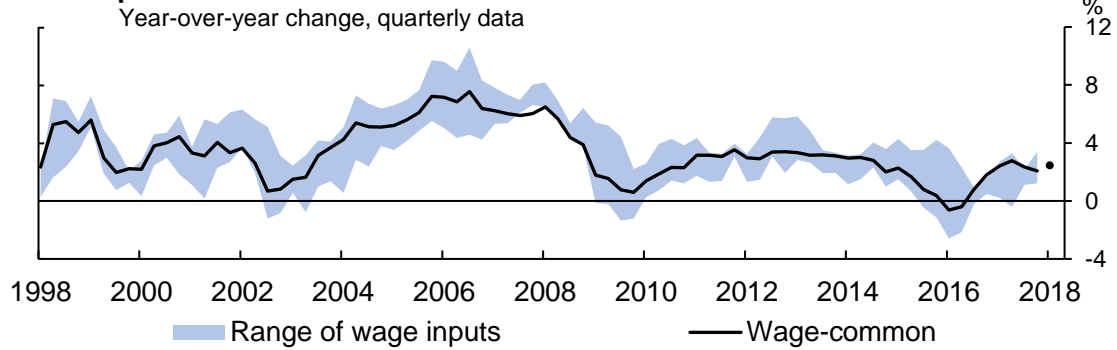
Year-over-year change, quarterly data

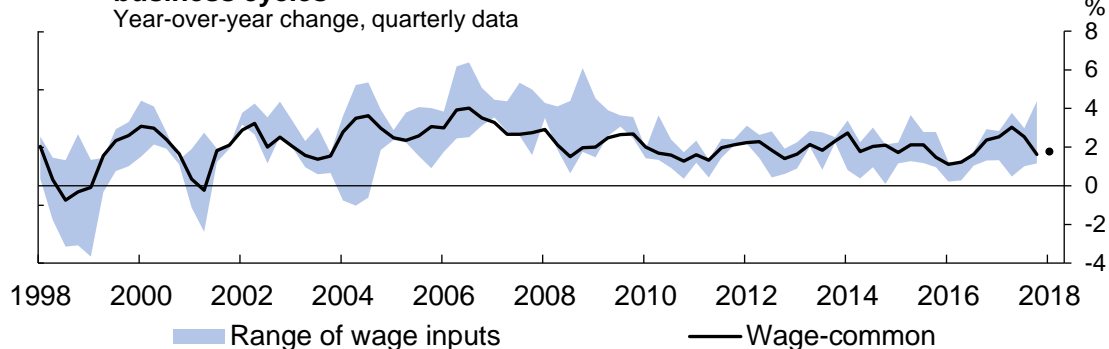Range of wage inputs   —— Wage-common

Sources: Statistics Canada and Bank of Canada calculations

Last data plotted: Range of wage inputs, 2017Q4; Wage-common, 2018Q1

The British Columbia wage-common (**Chart 5**) also seems to better capture business cycles by eliminating some of the false signals induced by LFS (because the dynamics of this series are negatively correlated with the other two data sources). This was particularly true in mid-2004, when, during a period of economic expansion, year-over-year wage growth dropped to -1 per cent according to LFS , whereas the provincial wage-common and other measures showed a slight increase. It seems this was also the case in 2008Q4, when wage growth measured by LFS reached approximately 6 per cent at the beginning of the Great Recession, while the wage-common and other measures showed a decline in growth (below the historical average). The sharp increase in British Columbia's wage growth measured by LFS since 2017Q4 also appears to be partly due to a base effect of idiosyncratic weakness in late 2016 and early 2017. The quarterly growth in hourly wages slowed significantly in the first quarter of 2018, compared with the second half of 2017, but remains higher than it was at the beginning of last year, according to LFS.

Chart 5: British Columbia wage-common also seems to better capture business cycles

Year-over-year change, quarterly data

Range of wage inputs   —— Wage-common

Sources: Statistics Canada and Bank of Canada calculations

Last data plotted: Range of wage inputs, 2017Q4; Wage-common, 2018Q1

The wage-common in other provinces with a strong energy sector, such as Newfoundland and Labrador and Saskatchewan (see **Chart A1** and **Chart A6,** respectively, in Appendix A), has a dynamic similar to that in Alberta. The wage-common for these provinces showed a sharp decline in growth in 2015–16, after the oil price shock. However, the wage-common in the other provinces was more stable after this shock (see Appendix A).

3. Performance of the provincial wage-common

3.1 The provincial wage-common relative to benchmarks

We evaluate the performance of the provincial wage-common relative to three benchmarks and their simple average. Overall, the provincial wage-common performs better than, or at least as well as, the benchmarks (**Table 1**). In fact, in all provinces, the wage-common is less volatile and more timely. Also, for most provinces, including Quebec, Alberta and British Columbia, the wage-common is the indicator that almost always correlates the most positively with the output gap and the most negatively with the unemployment gap.[4] However, there seems to be little correlation between the Ontario wage-common and labour slack, while some sources of wage data for Ontario, such as the LFS and NAC, are more strongly correlated with these gaps.

The results of the evaluation of the wage-common in the other six provinces are shown in **Table B1** in Appendix B. These results are generally similar. In the provinces where there is a weaker correlation between the wage-common and both the output gap and the unemployment gap, it is mainly attributable to the weak correlation between the three data sources and the output and unemployment gaps.

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[4]Quarterly data on the gross domestic product by industry are obtained using a quadratic formula. The output gap is then computed using an HP filter. This is not the methodology the Bank of Canada uses to measure the national output gap. Also, the sum of the provincial output gaps does not necessarily equal the national output gap because the ability to reallocate labour and capital is not the same at the provincial level as it is at the national level. The unemployment gap is defined as the difference between the unemployment rate and its three-year moving average, which does not necessarily represent a gap with respect to the non-accelerating inflation rate of unemployment (NAIRU). The results are roughly the same when using a moving average over a longer period of five or ten years.

Table 1. The wage-common performs better than baseline measurements					
Quebec	**LFS**	**SEPH**	**NAC**	**Average**	**Wage-common**
Timeliness (weeks)	1	7–8	8	8	1
Volatility (σ)	1.0	1.2	1.5	0.8	0.6
Persistence from AR(1) model	0.6	0.7	0.7	0.6	0.7
Correlation with the output gap	0.0	-0.1	0.4	0.2	0.4
Correlation with the labour gap	0.3	0.2	-0.4	-0.1	-0.4
Ontario	**LFS**	**SEPH**	**NAC**	**Average**	**Wage-common**
Timeliness (weeks)	1	7–8	8	8	1
Volatility (σ)	1.1	1.2	1.6	0.8	0.5
Persistence from AR(1) model	0.7	0.8	0.8	0.7	0.6
Correlation with the output gap	0.4	-0.2	0.3	0.3	0.1
Correlation with the labour gap	0.0	0.4	-0.5	-0.1	0.1
Alberta	**LFS**	**SEPH**	**NAC**	**Average**	**Wage-common**
Timeliness (weeks)	1	7–8	8	8	1
Volatility (σ)	2.1	1.9	3.0	1.9	1.9
Persistence from AR(1) model	0.8	0.8	0.9	0.9	0.9
Correlation with the output gap	0.3	0.3	0.6	0.5	0.6
Correlation with the labour gap	-0.3	-0.2	-0.7	-0.5	-0.6
British Columbia	**LFS**	**SEPH**	**NAC**	**Average**	**Wage-common**
Timeliness (weeks)	1	7–8	8	8	1
Volatility (σ)	1.3	1.7	1.8	1.2	0.9
Persistence from AR(1) model	0.6	0.8	0.7	0.8	0.8
Correlation with the output gap	0.1	0.3	0.3	0.4	0.4
Correlation with the labour gap	0.3	0.0	-0.3	0.0	-0.2

Note: The results presented in the table are based on the period from 1998Q1 to 2017Q4 and on year-over-year growth. LFS means Labour Force Survey; SEPH means Survey of Employment, Payrolls and Hours; and NAC means National Accounts.
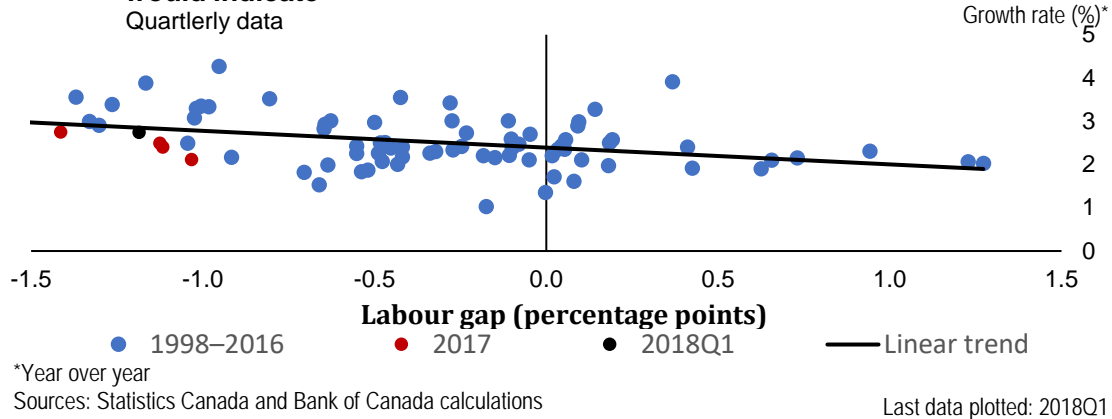
3.2 The wage-common, fundamentals and recent developments

To determine whether the wage-common is consistent with its fundamentals, we analyze the relationship between wages and the unemployment gap. According to economic theory, this relationship should be negative because an unemployment rate that is weak relative to its equilibrium indicates that labour demand is in excess of labour supply, which should drive wage growth upward.

This negative relationship between the wage-common and the unemployment gap is confirmed in Quebec (**Chart 6**). Quebec has seen a steady rise in wages in recent quarters, with the wage-common showing growth at 2.7 per cent in 2018Q1 (preliminary estimate).

Quebec has benefited less from interprovincial migration than other provinces such as British Columbia and Ontario, while its labour force participation rate has remained fairly stable and near its historic average in recent quarters.[5] These findings suggest that labour supply in Quebec had relatively less capacity to adjust to labour demand.

Chart 6: **Estimated wage growth in 2018Q1 remains lower than the linear trend would indicate**

Quarterly data

Growth rate (%)*

Labour gap (percentage points)

● 1998–2016   ● 2017   ● 2018Q1   —— Linear trend

*Year over year

Sources: Statistics Canada and Bank of Canada calculations
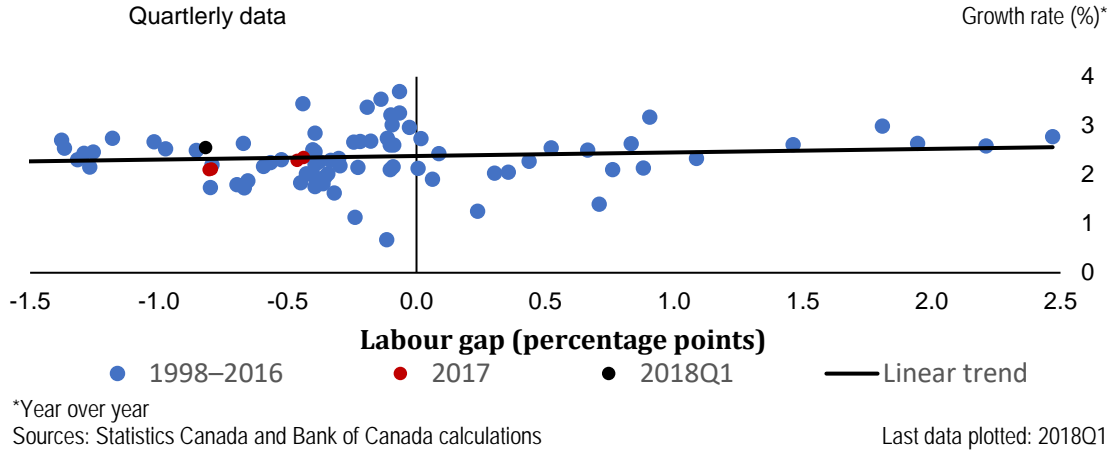
Last data plotted: 2018Q1

Nevertheless, estimated wage growth in 2018Q1 (and throughout 2017) remained slightly below what it would be expected if this increase were accompanied by full employment (see the red and black dots in **Chart 6**). Other factors could also have negatively affected wage growth in Quebec, as they do in other parts of Canada. Competing pressures from ongoing automation of the economy or from offshoring could be a factor. It is also possible that workers are placing greater emphasis on job security than wage growth in response to the crisis in the labour market.[6]

In Ontario, the relationship between the wage-common and the unemployment gap is practically non-existent (**Chart 7**). This is also true for the associated data sources, except for NAC. According to the wage-common, wage growth increased to 2.6 per cent in 2018Q1 (preliminary estimate), surpassing its historical average of 2.4 per cent for the first time since 2015Q1. These results could be largely explained by the increase in the minimum wage in Ontario. This dynamic is also supported by the LFS and SEPH, which showed year-over-year growth of 3.5 per cent and 2.6 per cent, respectively, in 2018Q1.

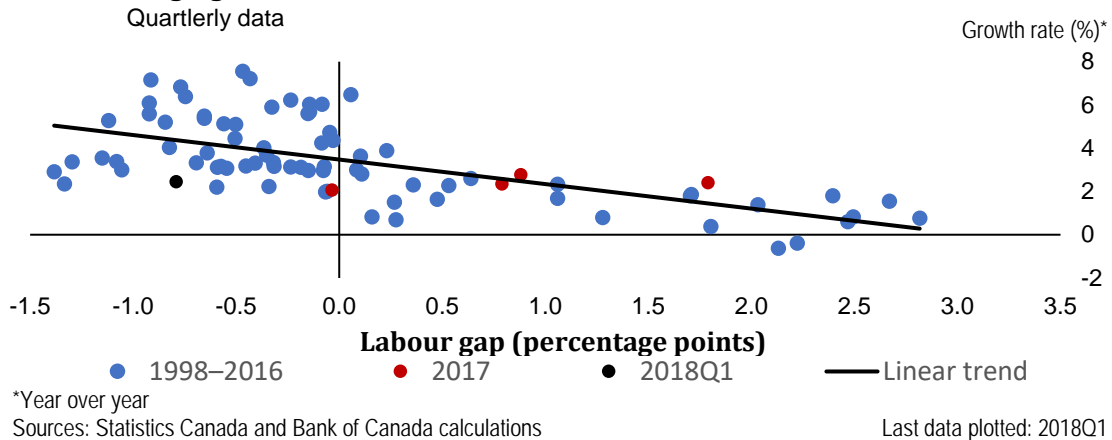[5] See Amirault, De Munnik and Miller (2016).

[6] See the Bank of Canada's April 2018 *Monetary Policy Report* for a more complete description of these factors.

Chart 7: Wage growth in Ontario in 2018Q1 supasses historic average for the first time since 2015Q1

Quartlerly data

Growth rate (%)*

Labour gap (percentage points)

● 1998–2016　　● 2017　　● 2018Q1　　——Linear trend

*Year over year

Sources: Statistics Canada and Bank of Canada calculations
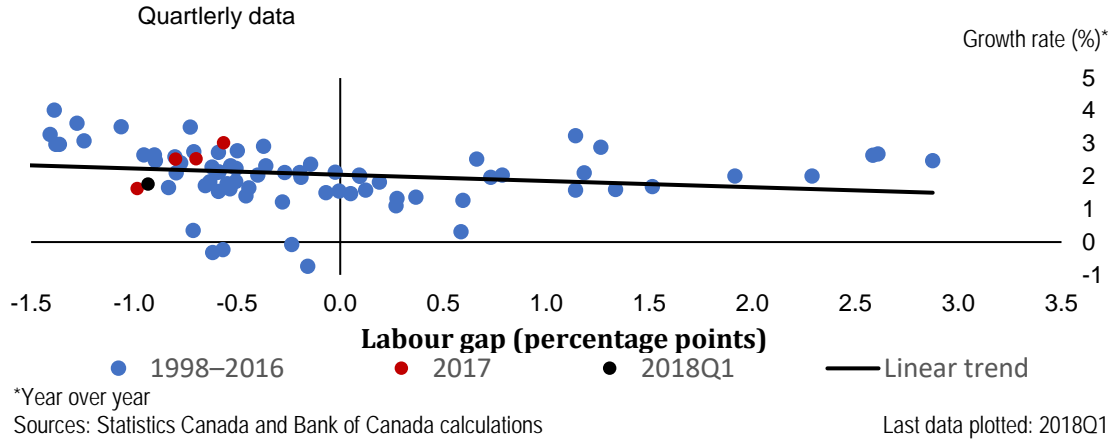
Last data plotted: 2018Q1

In Alberta, the relationship between the wage-common and the unemployment gap is negative and more pronounced than it is in Quebec (**Chart 8**). This appears to be characteristic of an elastic labour market that responds well to supply and demand conditions. Moreover, the wage-common dynamic in Alberta correlates most closely with the national indicator, which seems to highlight the importance of commodity price fluctuations to Canada's business cycles and their key role in the labour market. While wage-common growth has improved considerably since its low in mid-2016, it nevertheless remained near 2 per cent in 2018Q1 (preliminary estimate). This growth is weaker than the national average and than what is expected by the relationship to the unemployment gap in that province. This suggests that the effects of the reallocation of labour that followed the 2014–15 oil price shock might still be lingering.

Chart 8: Wage growth in Alberta remains near 2% in 2018Q1

Quartlerly data

Growth rate (%)*

Labour gap (percentage points)

● 1998–2016　　● 2017　　● 2018Q1　　——Linear trend

*Year over year

Sources: Statistics Canada and Bank of Canada calculations

Last data plotted: 2018Q1

In British Columbia (**Chart 9**), wage growth remained moderate at close to 2 per cent (preliminary estimate), especially in 2017Q4 and 2018Q1, even though it is ahead in the business cycle. This could be explained by an increase in interprovincial and international migration and by the rising participation rates of youths and prime-age workers in the labour force. This ability to attract new workers has undoubtedly allowed the labour supply to adjust to the strong demand.[7]

Chart 9: Wage growth in 2018Q1 remains moderate in British Columbia
Quartlerly data

*Year over year

Sources: Statistics Canada and Bank of Canada calculations   Last data plotted: 2018Q1

4. Conclusion

In conclusion, the provincial wage-common eliminates noisy signals specific to data sources from each province. Furthermore, the provincial wage-common produces accurate results relative to benchmarks and correlates with the output and unemployment gaps. The provincial wage-common is therefore a useful tool for evaluating labour market pressures in the provinces.

References

Amirault, D., D. De Munnik and S. Miller. 2016. "What Drags and Drives Mobility? Explaining Canada's Aggregate Migration Patterns." *Canadian Journal of Economics* 49 (3): 1035–1056.

Bank of Canada. 2018. *Monetary Policy Report* (April).

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[7] Factors explaining the different wage pressures across provinces will be the subject of further research. This was not the primary purpose of this paper.

Brouillette, D., J. Lachaine and B. Vincent. 2018. "Wages: Measurement and Key Drivers." Bank of Canada Staff Analytical Note No. 2018-2.

Durbin, J. and S. J. Koopman. 2018. *Time Series Analysis by State Space Methods: Oxford Statistical Science Series.* 2nd ed. Oxford University Press*.*

Appendix A | Wage-common charts
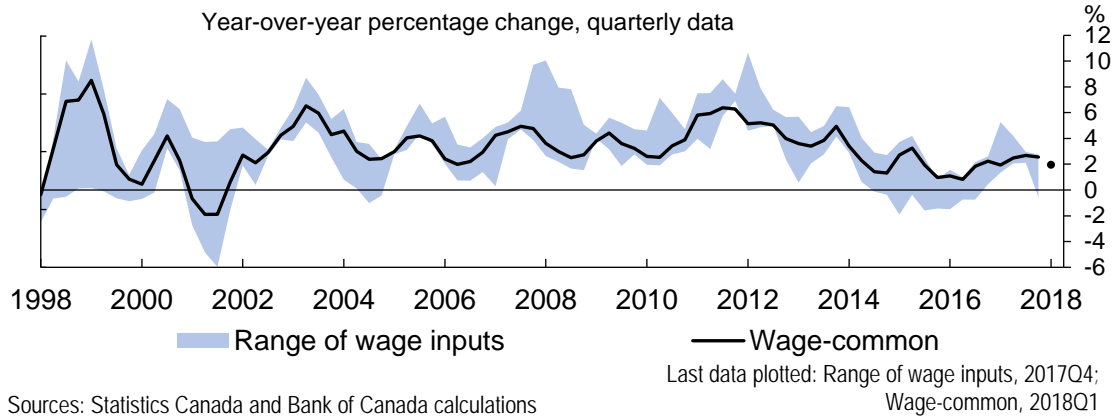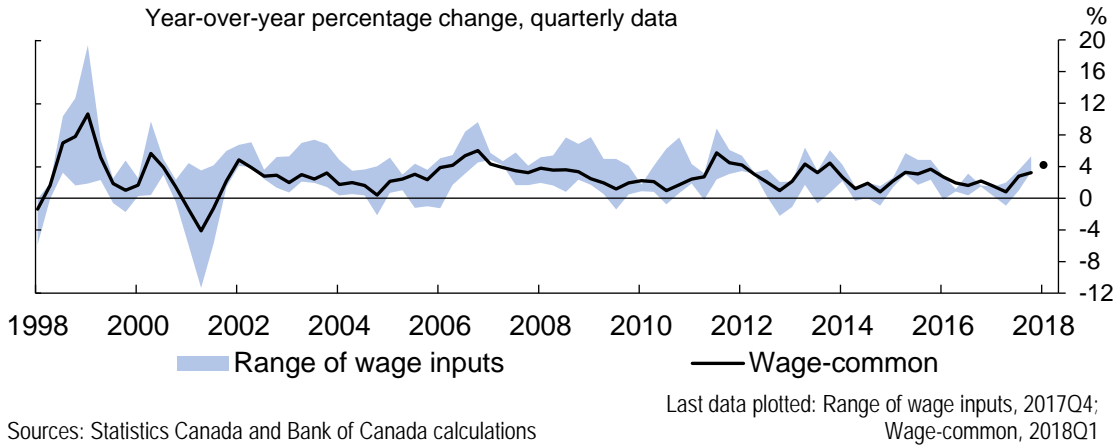
Chart A1: Newfoundland and Labrador

Year-over-year percentage change, quarterly data

Range of wage inputs   Wage-common

Sources: Statistics Canada and Bank of Canada calculations

Last data plotted: Range of wage inputs, 2017Q4;
Wage-common, 2018Q1

Chart A2: Prince Edward Island

Year-over-year percentage change, quarterly data

Range of wage inputs   Wage-common

Sources: Statistics Canada and Bank of Canada calculations

Last data plotted: Range of wage inputs, 2017Q4;
Wage-common, 2018Q1

Chart A3: Nova Scotia

Year-over-year percentage change, quarterly data

Range of wage inputs   Wage-common

Sources: Statistics Canada and Bank of Canada calculations

Last data plotted: Range of wage inputs, 2017Q4;
Wage-common, 2018Q1

Chart A4: New Brunswick
Year-over-year change, quarterly data
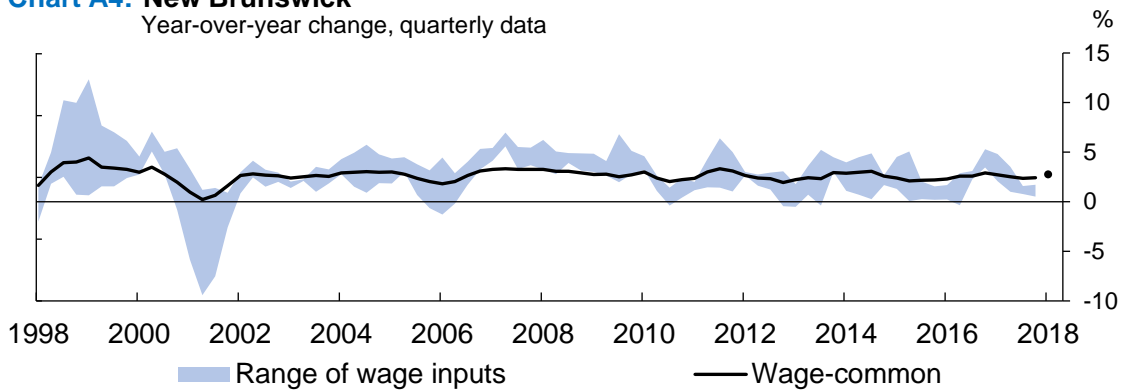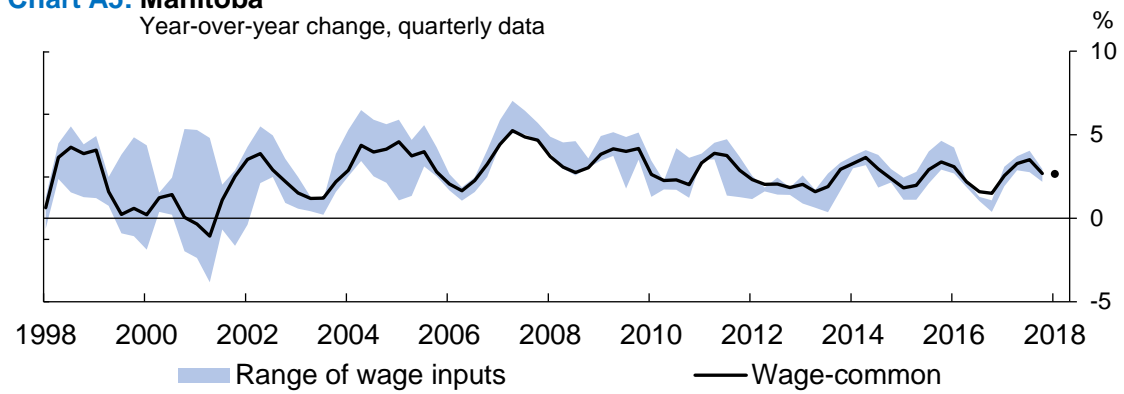

Range of wage inputs — Wage-common

Sources: Statistics Canada and Bank of Canada calculations

Last data plotted: Range of wage inpute, 2017Q4;
Wage-common, 2018Q1

Chart A5: Manitoba
Year-over-year change, quarterly data
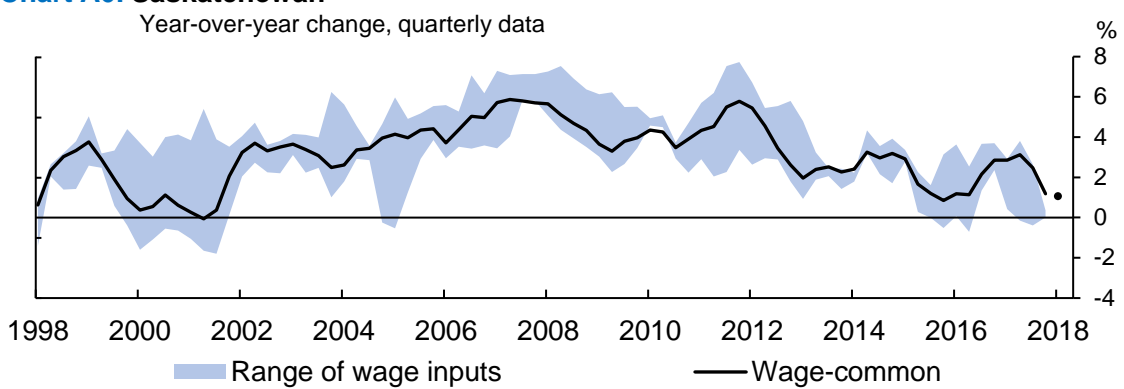

Range of wage inputs — Wage-common

Sources: Statistics Canada and Bank of Canada calculations

Last data plotted: Range of wage inputs, 2017Q4;
Wage-common, 2018Q1

Chart A6: Saskatchewan
Year-over-year change, quarterly data

Range of wage inputs — Wage-common

Last data plotted: Range of wage inputs, 2017Q4;
Wage-common, 2018Q1

Sources: Statistics Canada and Bank of Canada calculations

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Appendix B | Performance of the provincial wage-common

Table B1. Performance of the provincial wage-common					
Newfoundland and Labrador	**LFS**	**SEPH**	**NAC**	**Average**	**Wage-common**
Timeliness (weeks)	1	7–8	8	8	1
Volatility (σ)	3.0	2.3	3.0	2.1	1.9
Persistence from AR(1) model	0.8	0.6	0.8	0.7	0.8
Correlation with the output gap	0.2	0.3	0.4	0.4	0.4
Correlation with the labour gap	-0.2	-0.2	-0.2	-0.3	-0.2
Prince Edward Island	**LFS**	**SEPH**	**NAC**	**Average**	**Wage-common**
Timeliness (weeks)	1	7–8	8	8	1
Volatility (σ)	2.1	2.4	4.1	2.1	2.0
Persistence from AR(1) model	0.7	0.6	0.6	0.6	0.6
Correlation with the output gap	0.0	0.2	0.6	0.4	0.6
Correlation with the labour gap	0.1	0.2	0.2	0.2	0.2
Nova Scotia	**LFS**	**SEPH**	**NAC**	**Average**	**Wage-common**
Timeliness (weeks)	1	7–8	8	8	1
Volatility (σ)	1.6	2.0	3.5	1.6	1.6
Persistence from AR(1) model	0.6	0.6	0.8	0.7	0.8
Correlation with the output gap	-0.1	0.1	-0.1	-0.1	-0.1
Correlation with the labour gap	0.3	0.0	-0.5	-0.3	-0.5
New Brunswick	**LFS**	**SEPH**	**NAC**	**Average**	**Wage-common**
Timeliness (weeks)	1	7–8	8	8	1
Volatility (σ)	1.7	1.7	3.4	1.7	0.7
Persistence from AR(1) model	0.6	0.6	0.8	0.7	0.8
Correlation with the output gap	0.0	0.3	0.4	0.4	0.4
Correlation with the labour gap	-0.1	-0.4	-0.5	-0.4	-0.5
Manitoba	**LFS**	**SEPH**	**NAC**	**Average**	**Wage-common**
Timeliness (weeks)	1	7–8	8	8	1
Volatility (σ)	1.5	1.7	2.1	1.3	1.3
Persistence from AR(1) model	0.6	0.7	0.8	0.7	0.8
Correlation with the output gap	0.1	0.0	-0.2	-0.1	-0.2
Correlation with the labour gap	0.1	0.1	0.3	0.2	0.2

Saskatchewan	LFS	SEPH	NAC	Average	Wage-common
Timeliness (weeks)	1	7-8	8	8	1
Volatility (σ)	1.8	1.9	2.4	1.6	1.5
Persistence from AR(1) model	0.8	0.8	0.9	0.9	0.9
Correlation with the output gap	-0.1	0.1	-0.1	-0.1	0.0
Correlation with the labour gap	-0.2	-0.2	-0.1	-0.2	-0.2

Note: The results presented in the table are based on the period from 1998Q1 to 2017Q4 and on year-over-year growth. LFS means Labour Force Survey; SEPH means Survey of Employment, Payrolls and Hours; and NAC means National Accounts.

Appendix C | Wage-common relative to the unemployment gap
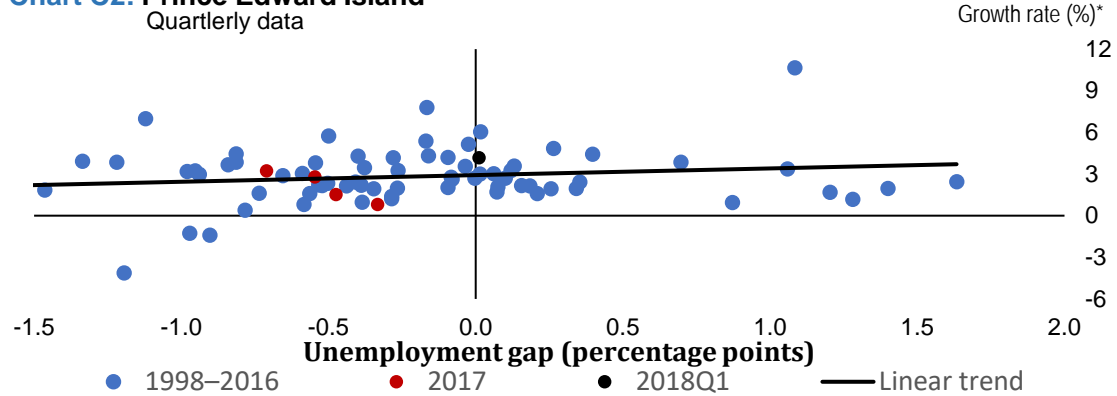
Chart C1: Newfoundland and Labrador
Quarterly data
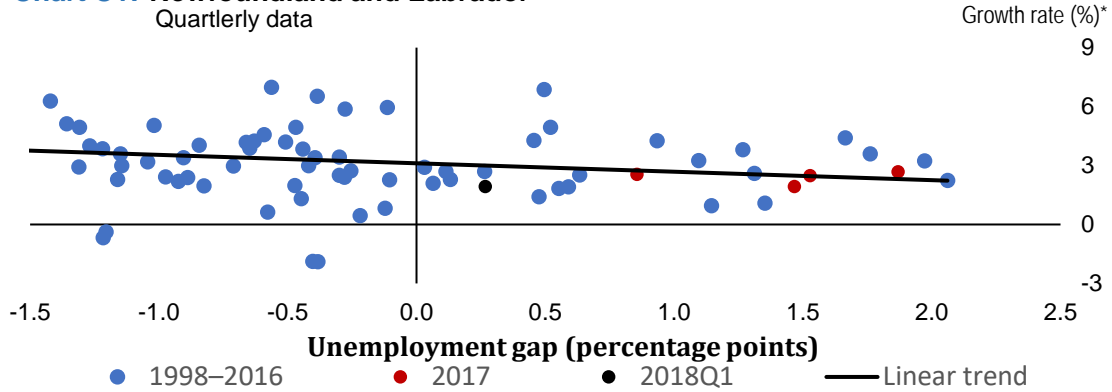
Growth rate (%)*

Unemployment gap (percentage points)

● 1998–2016   ● 2017   ● 2018Q1   —— Linear trend

*Year over year
Sources: Statistics Canada and Bank of Canada calculations

Last data plotted: 2018Q1

Chart C2: Prince Edward Island
Quarterly data
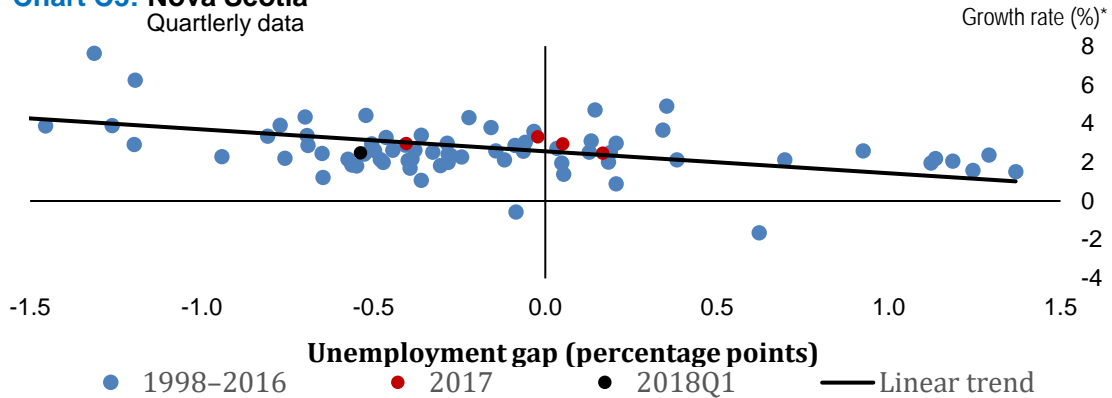
Growth rate (%)*

Unemployment gap (percentage points)

● 1998–2016   ● 2017   ● 2018Q1   —— Linear trend

*Year over year
Sources: Statistics Canada and Bank of Canada calculations

Last data plotted: 2018Q1

Chart C3: Nova Scotia
Quarterly data

Growth rate (%)*

Unemployment gap (percentage points)
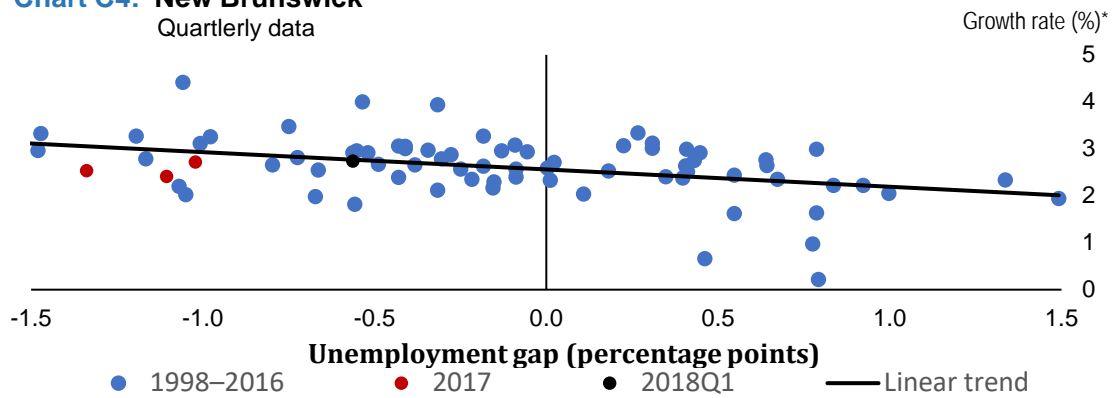
● 1998–2016   ● 2017   ● 2018Q1   —— Linear trend

*Year over year
Sources: Statistics Canada and Bank of Canada calculations

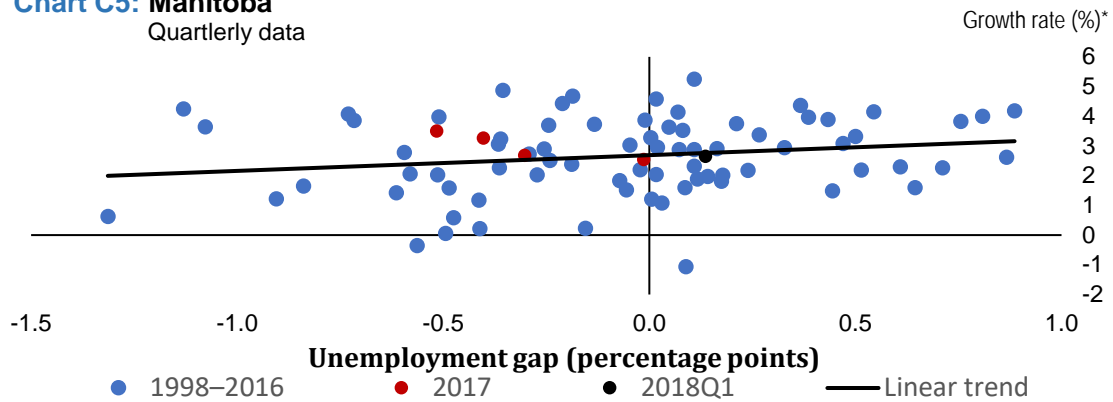Last data plotted: 2018Q1

Chart C4: New Brunswick
Quartlerly data

Growth rate (%)*

Unemployment gap (percentage points)

● 1998–2016   ● 2017   ● 2018Q1   —— Linear trend

*Year over year
Sources: Statistics Canada and Bank of Canada calculations

Last data plotted: 2018Q1

Chart C5: Manitoba
Quartlerly data

Growth rate (%)*

Unemployment gap (percentage points)

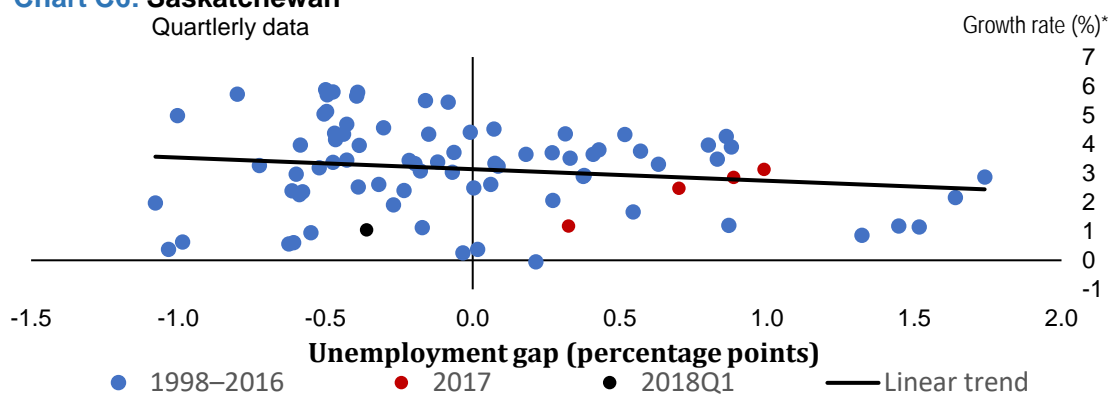● 1998–2016   ● 2017   ● 2018Q1   —— Linear trend

*Year over year
Sources: Statistics Canada and Bank of Canada calculations

Last data plotted: 2018Q1

Chart C6: Saskatchewan
Quartlerly data

Growth rate (%)*

Unemployment gap (percentage points)

● 1998–2016   ● 2017   ● 2018Q1   —— Linear trend

*Year over year
Sources: Statistics Canada and Bank of Canada calculations

Last data plotted: 2018Q1