
ECONOMIC IMPACT OF GM OPERATIONS IN OSHAWA

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Table of Contents

Executive Summary.....	1
Introduction	3
Direct Impact: Assumptions.....	4
Total Impact: Results.....	6
Summary and Observations.....	11
Appendix A: C ₄ SE Provincial Economic Modeling System.....	12
Appendix B: Scenario Results.....	16
Low Case Scenario.....	16
High Case Scenario.....	19

About this Study

This report was prepared for Unifor, Canada's largest private sector union. With over 305,000 members across the country, Unifor represents workers in every major sector of the Canadian economy. Unifor brings a modern approach to unionism: adopting new tools, involving and engaging its members, and always looking for new ways to develop the role and approach of the union to meet the demands of the 21st century. For more information, please see www.unifor.org.

GM Canada has been building cars in Oshawa for over a century, but with the imminent loss of Camaro production and with no new vehicle models scheduled for the complex, the future of this landmark facility has been called into question. This study estimates the economic impact of GM ceasing operations in Oshawa using the C₄SE's provincial economic modeling system. The effects of Oshawa's closure on the provincial and national economies, labour markets, and fiscal balances are estimated by comparing two simulations of the closure to a "baseline" scenario in which Oshawa continues operating at its 2013 level of activity.

The report was conducted by Robin Somerville, Director, of the Centre for Spatial Economics (C₄SE). The C₄SE monitors, analyzes and forecasts economic and demographic change throughout Canada at virtually all levels of geography. It also prepares customized studies on the economic, industrial and community impacts of various fiscal and other policy changes, and develops customized impact and projection models for in-house client use. The C₄SE provides economic models, analysis and forecasts to nine provincial and territorial governments across Canada. For more information please go to www.c4se.com.

Executive Summary

GM Canada has been producing automobiles in Oshawa for over a century and is an integral part of that community. The facility presently produces 5 different vehicles from two assembly lines. However, one of the most important Oshawa-built vehicles - the Camaro - is being reassigned to an assembly facility in the U.S., and some of the others are approaching the end of their normal life-cycle. No new vehicle models have currently been allocated to Oshawa to offset lost production. As result, the future viability of Oshawa operations has been called into question. The closure of that facility would have a profound impact on the communities in the eastern half of the GTA, for the province as a whole, and indeed for the Canadian economy.

This report assesses the economic implications of shutting down production at GM Canada's Oshawa facility using the C₄SE's Provincial Economic Modeling System. This is assumed to lead to a direct loss of 4,100 jobs, currently producing 325,000 passenger vehicles and generating about \$1.1 billion of GDP. The modeling system provides estimates of the spill-over implications of the closure for GDP, employment, and government revenue in Ontario and the rest of the nation. While this effect would be concentrated in the communities in the eastern half of the GTA, this report does not attempt to quantify the economic impacts below the provincial level of geography.

The analysis consists of three scenarios. The baseline scenario assumes that GM Canada's Oshawa plant remains in operation at full production levels. This is the benchmark against which each of the other scenarios is compared. The other two scenarios reflect changes in economic activity arising from the closure of Oshawa operations, assumed to occur in 2015 (the first year of our forecasts). The first of these scenarios is a "low case" which assumes a decline in Canadian parts production equal to 20% of the parts used by the Oshawa plant plus the closure of Oshawa assembly. The second is a "high case" which assumes a decline in Canadian parts production in Ontario equal to 30% of the parts used by the Oshawa plant plus the closure of Oshawa assembly.

The final impact on the provincial and national economies is much larger than the direct jobs (4,100) and direct production (\$1.1 billion in GDP) associated with the Oshawa operation. The closure of operations in Oshawa generates broad and strong spillover effects throughout the economy, including:

- The direct loss of Canadian auto parts production (with the specific impact depending on the scenario considered).
- Other input-output linkages experienced more broadly through the supply chain (with reductions in demand for other inputs to auto assembly and parts production, including metals, plastics, and services). We refer to these as "indirect" effects.
- Second-order impacts on consumer spending, government fiscal balances, and other aggregates resulting from the shock to output and incomes. We refer to these as "induced" effects.

The combined impact of these direct, indirect and induced effects are shown in Table 1 which summarizes the impact of both scenarios on the economy. The closure of the Oshawa facility would constitute an important negative shock to the Canadian economy felt most acutely, of course, in

Ontario. It takes two years for the full effects of the closure to be experienced. By 2017, two years after the closure, Ontario's GDP is up to \$5.7 billion lower than in the baseline scenario (or \$5.2 billion lower in the low case scenario). The total impact of the closure on GDP is therefore more than four times as large as the loss in direct production at the Oshawa complex. Ontario's employment declines by 30-33,000 positions in 2017, after which the labour market gradually adjusts through changes in participation rates, migration rates and wage rates.

Table 1

Summary of Economic Impact of GM Canada's Oshawa Assembly Plant on Canada's Economy								
Difference from the Baseline Scenario	Low Case Scenario Impact				High Case Scenario Impact			
	2015	2016	2017	Average Annual 2018-40	2015	2016	2017	Average Annual 2018-40
GDP (millions of 2014 dollars)								
Ontario	-4,010	-4,798	-5,196	-3,589	-4,358	-5,229	-5,673	-3,921
Canada	-4,166	-4,812	-5,152	-3,714	-4,508	-5,223	-5,600	-4,038
Employment (thousands)								
Ontario	-21.6	-27.3	-29.6	-6.3	-23.4	-29.8	-32.5	-7.0
Canada	-22.1	-26.5	-27.6	-3.0	-23.8	-28.8	-30.2	-3.3
Government Tax Revenue (millions of 2014 dollars)								
Government of Ontario	-377	-540	-603	-405	-388	-567	-640	-423
Federal Government	-549	-680	-705	-478	-564	-705	-734	-483

The decline in employment is sustained over the medium-term, with average employment remaining below baseline scenario levels by between 26 and 28 thousand jobs in 2018, and by between 19 and 21 thousand positions in 2019. After that, employment levels begin to rebound toward the baseline scenario as labour is absorbed into other sectors: stimulated in part by the significant decline in economy-wide average wages experienced as a result of this shock to the labour market. The manufacturing sector experiences the heaviest job loss (about 35% of the total) followed by the businesses services and wholesale and retail trade sectors.

The long-run implications of the closure of a high value-added, high wage, large manufacturing plant, such as GM Canada's operation in Oshawa are interesting. After about a six year adjustment process, GDP in Canada is still permanently lower than it would have been without the plant closure, but employment levels have returned to almost the same levels they were in the baseline scenario. Most people eventually find new work, but the recovery in employment is achieved, in large part, by a permanent decline in average wages. The decline in GDP is concentrated mostly in Ontario where employment remains permanently lower (by several thousand positions) than it would have been without the plant closure, despite a permanent cut to average labour income, measured in 2014 dollars, of up to \$300 a year.

The federal and Ontario governments also experience a substantial loss of income arising from the closure, with both experiencing a permanent loss of revenues and an increase in their combined deficits of almost \$1 billion a year. This reflects the loss of tax revenues to both levels of government resulting from the direct and indirect decline in incomes throughout the economy. This permanent decline in government revenues may eventually affect funding decisions for public programs in Canada (and especially in Ontario), although this potential consequence is not captured in our model.

Introduction

GM Canada has been producing automobiles in Oshawa for over a century and is an integral part of that community. The facility presently produces 5 different vehicles from two assembly lines. However, one of the most important Oshawa-built vehicles - the Camaro - is being reassigned to an assembly facility in the U.S., and some of the others are approaching the end of their normal life-cycle. No new vehicle models have currently been allocated to Oshawa to offset lost production. As result, the future viability of Oshawa operations has been called into question. The closure of that facility would have a profound impact on the communities in the eastern half of the GTA, for the province as a whole, and indeed for the Canadian economy.

GM Canada currently employs approximately 7,500 hourly production workers plus just over 1,000 salaried employees in Ontario accounting for a little over 20% of national employment in the auto assembly industry. Employment at the Oshawa facility is about 3,600 production workers plus most of the salaried employees at GM Canada's head office. In 2013, GM Oshawa assembled 325,000 vehicles or about 14% of all passenger vehicles and light trucks produced in Canada.¹ This report assesses the economic implications of shutting down production at GM Canada's Oshawa plant using the C4SE's Provincial Economic Modeling System. This modeling system provides estimates of the implications for GDP, employment, and government revenue in Ontario and the rest of the nation. While this contribution is concentrated in the communities in the eastern half of the GTA, this report does not attempt to quantify the economic impacts below the provincial level of geography.

¹ Full production figures for the facility were not available for 2014 at time of writing, but were estimated to have fallen to about 280,000 due to the phase-out of some marketing and promotion initiatives and shifts in consumer demand.

Direct Impact: Assumptions

This report examines the economic implications of closing GM Canada's Oshawa assembly plant. Closing the Oshawa plant is assumed to lead to a permanent drop in motor vehicle production in Ontario of 325,000 units, relative to baseline scenario production levels, starting in 2015.²

In 2013 the Oshawa plant assembled 14% of all passenger and light vehicle motor vehicle units produced in Canada.³ The 2013 production figures have been used for this analysis for two reasons. First, at time of writing, data for 2014 was not yet available for all concepts required for the analysis. Second, the baseline simulation assumes full production at the Oshawa plant which, based on production data for the last few years, is estimated to be 325,000 units.⁴ Closing the plant, therefore, means that production in Ontario is permanently reduced by 325,000 units. Applying the 14% share to national shipments⁵ by this industry in 2013 and adjusted for inflation to reflect 2015 prices yields an estimate for shipments from the GM Oshawa plant in 2015 of \$7.3 billion which, based on a value added share of 16%,⁶ leads to a direct loss of gross domestic product in Ontario of \$1.1 billion in 2015.

Table 2

Direct Impact of GM Oshawa Operations in 2015		
	GM Oshawa	Canada
Shipments (\$millions)	7,329	53,667
Value Added (\$millions)	1,141	8,357
Production (units)	325,000	2,380,000
Labour Compensation (\$millions)	438	3,209
Employment (number) (*)	4,100	30,023

* GM Oshawa direct employment includes just half of all salaried employees at the facility

This report assumes the elimination of 3,600 production workers in Oshawa plus 500 of salaried non-production workers⁷ for a total loss of employment of 4,100 in the automobile and light-duty motor vehicle manufacturing industry. Total wage and non-wage compensation costs per employee (counting both labour and management) in auto assembly in 2013 was \$101,257⁸ which, adjusted for inflation, yields an estimated reduction in labour income in 2015 of \$436 million.

² Actual production at the plant is unlikely to cease before 2017. The 2015 start date for the simulation was chosen for analytic convenience and can be interpreted as: "in the first full year that the plant is shut down."

³ Total passenger vehicle and light-truck production in Canada was, according to WardsAuto, 2.38 million units in 2013.

⁴ This excludes the vehicles produced by the truck plant that was closed in 2008.

⁵ Shipments data is from Statistics Canada matrix 304-0014 for automobile and light-duty motor vehicle manufacturing in Canada.

⁶ The value added share is for business sector industry 336110, automobile and light-duty motor vehicle manufacturing, from the national detailed level input-output tables for 2010 published by Statistics Canada.

⁷ This represents about half of the salaried non-production workforce in Oshawa; the others are assumed to remain employed to support other GM Canada activities in Canada, including marketing and other administration.

⁸ Total compensation includes wages, salaries and benefits for all employees (hourly and salaried) and is from Statistics Canada matrix 383-0031 for the automobile and light-duty motor vehicle manufacturing industry in Canada.

Table 2 summarizes the direct impact from GM Canada's Oshawa complex in 2015 and puts these figures in context by providing national estimates for these measures.

Motor vehicle assembly plants rely on a highly integrated network of companies that produce and provide parts and other inputs for the vehicles. Statistics Canada's input-output tables⁹ indicate that these input purchases represent about 70% of the manufacturer's shipment cost of the vehicle or about \$5.1 billion in 2015 (see Table 3). Our simulations assume that the parts produced in Ontario for assembly into vehicles in Oshawa will no longer be produced in this province after the Oshawa complex is closed. This is because parts production is typically done as close as possible to the plant purchasing the parts so as to minimize delivery times and costs. Surviving parts manufacturers will, therefore, likely relocate production of their parts to facilities in other jurisdictions closer to the plant assembling the vehicles; some parts suppliers are likely to go out of business altogether as a result of the Oshawa closure.

There is no precise public information on the share of Oshawa's parts purchased that is produced in Ontario or elsewhere in Canada. Industry Canada's Canadian Industry Statistics (CIS) website¹⁰ provides information on the shipments and trade by industry in Canada. Imports account for about a 76% share of the apparent domestic market¹¹ for motor vehicle parts over the last few years, implying conversely that 24% of automotive parts are produced in Canada. Unifor believes that about 30% of the parts used by the Oshawa assembly plant are produced in Canada with the vast majority of that produced in Ontario. It is, however, possible that the proportion of locally produced parts could be lower than this figure.¹² As a result, two closure scenarios are generated: based on either a 20% low case, or 30% high case, reduction in the \$5.1 billion value of parts purchased by the Oshawa plant. In other words, the low case scenario leads to an assumed decline in parts shipments by Ontario producers of \$1.0 billion in 2015, reducing GDP by \$377 million, while the high case scenario leads to a reduction in shipments of \$1.5 billion with GDP falling by \$566 million.¹³

Table 3

Parts Purchases by GM Oshawa in 2015		
Scenario:	20%	30%
Parts Purchased (\$millions)	5,130	5,130
Produced in Ontario (\$millions)	1,026	1,539
Value Added in Ontario (\$millions)	377	566

⁹ This is constructed from the detailed level input-output tables for 2010 published by Statistics Canada and includes intermediate inputs excluding energy and utilities, maintenance, repair and other services and other non-parts commodities.

¹⁰ This can be found at <http://www.ic.gc.ca/eic/site/cis-sic.nsf/eng/home?Open&src=mm2>.

¹¹ The apparent domestic market is generated by adding total imports and subtracting total exports from the value of revenues generated by the parts industry.

¹² There are a variety of factors that could lead to a lower figure than suggested by the high case. These include uncertainty about relocation decisions by parts manufacturers in response to GM Oshawa's closure or the possibility that the value of parts produced in Ontario is less than the 30% estimate.

¹³ The value added (GDP) estimate is derived from Statistics Canada's detailed level national input-output tables for 2010 based on a 37% value added share of gross output for the business sector industries in NAICS 3363.

Total Impact: Results

This section of the report presents the total economic impact of the closing of GM Canada's assembly plant in Oshawa based on the direct impact assumptions discussed in the previous section. The analysis is conducted using the C₄SE's provincial economic modeling system which is a multi-region, multi-sector, dynamic stochastic general equilibrium model of Canada and its provinces. The model is described in more detail in Appendix A.

The analysis consists of three scenarios. The baseline scenario assumes that GM Canada's Oshawa plant remains in operation at full production levels. This is the benchmark against which each of the other scenarios is compared and is summarized in Appendix A. The other two scenarios reflect changes in economic activity arising from the plant closure. The first of these scenarios is the low case which assumes a decline in parts production equal to 20% of the parts used by the Oshawa plant plus the closure of the Oshawa assembly plant. The second is the high case which assumes a decline in parts production in Ontario equal to 30% of the parts used by the Oshawa plant plus the closure of the Oshawa assembly plant.

Table 4

Summary of Economic Impact of GM Canada's Oshawa Assembly Plant on Canada's Economy								
Difference from the Baseline Scenario	Low Case Scenario Impact				High Case Scenario Impact			
	2015	2016	2017	Average Annual 2018-40	2015	2016	2017	Average Annual 2018-40
GDP (millions of 2014 dollars)								
Ontario	-4,010	-4,798	-5,196	-3,589	-4,358	-5,229	-5,673	-3,921
Canada	-4,166	-4,812	-5,152	-3,714	-4,508	-5,223	-5,600	-4,038
Employment (thousands)								
Ontario	-21.6	-27.3	-29.6	-6.3	-23.4	-29.8	-32.5	-7.0
Canada	-22.1	-26.5	-27.6	-3.0	-23.8	-28.8	-30.2	-3.3
Average Annual Labour Income (2014 dollars)								
Ontario	-163	-240	-305	-274	-176	-258	-332	-298
% difference	-0.3%	-0.4%	-0.5%	-0.4%	-0.3%	-0.5%	-0.6%	-0.5%
Canada	-74	-101	-126	-130	-79	-109	-138	-142
% difference	-0.1%	-0.2%	-0.2%	-0.2%	-0.1%	-0.2%	-0.2%	-0.2%
Government Tax Revenue (millions of 2014 dollars)								
Government of Ontario	-377	-540	-603	-405	-388	-567	-640	-423
Federal Government	-549	-680	-705	-478	-564	-705	-734	-483

Results are generated by comparing activity in the latter two scenarios against the baseline scenario. Table 4 summarizes the economic benefits from the three scenarios.¹⁴ The total impacts in Table 4 include the direct loss in production derived in the previous section plus the indirect impact on parts and other suppliers of everything from utilities to office supplies used in producing the vehicles plus the induced impacts. Induced impacts include the impact on the economy from employees at the direct and indirect level of impact spending their incomes - and then the income that process generates being re-spent by its recipients. The provincial economic modeling system also considers changes in business investment spending arising from the shifts in the economy, changes in wages, prices, interest and exchange rates, and changes in population as people move based on prevailing economic conditions. As

¹⁴ A set of tables describing the macroeconomic impacts across Canada in more detail is provided in Appendix B.

a result of these factors, the total impact of the Oshawa closure is several times larger than the direct loss of production. Moreover, that impact is felt, in varying degrees, across the country.

As would be expected, the impact of the closure is felt most acutely in Ontario where GDP (expressed in millions of 2014 reference year dollars) immediately falls between \$4.0 and \$4.4 billion in 2015. Ontario's economy continues to deteriorate over the medium term as it reacts to the closure. The worst effects are experienced in 2017 (two years after the closure), when Ontario's GDP is between \$5.2 and \$5.7 billion lower as a result of the closure. Over time, provincial GDP partially recovers as other sectors absorb some of the displaced labour and other resources, but nevertheless the province experiences a permanent long-term loss of over \$3 billion per year as the adjustment process continues. The national impacts are very similar but are, for most years, slightly larger than the Ontario impacts: between \$4.2 and \$4.5 billion in 2015, \$5.2 and \$5.6 billion in 2017 and \$3.7 and \$4.0 billion a year over the long-term.

Employment in Ontario falls immediately by between 22 and 23 thousand jobs in 2015. Job losses get worse through the first two years of the closure: reaching between 30 and 33 thousand jobs lost in 2017. Employment remains below the baseline scenario level by between 26 and 28 thousand jobs in 2018, and by 19 to 21 thousand jobs in 2019. Job losses moderate over the longer-term, eventually settling at about 6 to 7 thousand jobs a year less than in the baseline scenario. The impact on employment nationally is initially worse than in Ontario, but then becomes more moderate over both the medium and long-term. As may be expected, the manufacturing sector experiences the heaviest job loss, about 35% of the total, followed by the businesses services and wholesale and retail trade sectors.

The eventual, partial recovery in employment levels reflects the working of several responses in Canada's labour market to the shock of the Oshawa closure. Reduced employment, higher unemployment, and the decline in average productivity all contribute to a decline in average wages. By 2018, average annual labour income in Ontario has declined by as much as \$350 (measured in 2014 dollars) compared to the baseline scenario (and by an average of around \$150 per year across Canada). This decline in income is experienced even by workers who have no connection at all to the auto industry and further undermines consumer spending and aggregate economic conditions. Even in the very long-run, average annual wages in Ontario remain up to \$300 lower than in the baseline scenario. Other elements of the labour adjustment process involve net out-migration from Ontario (as a result of the permanent decline in employment conditions) and a decline in labour force participation. The recovery in total employment levels assumes that employers will eventually respond to lower wage levels by stepping up their hiring; if this response does not occur, then the recovery of total employment will remain even more incomplete. The decline in labour productivity is also permanent; productivity declines most markedly in manufacturing, but falls in other sectors too due, in part, to lower investment and a decline in the capital-labour ratio across the economy that also reflects the decline in average wages.

Government of Ontario tax revenues are tied directly to the strength of the overall economy so the closure of Oshawa, and the resulting shock to overall GDP and employment, has a major impact on government finances. Provincial government revenues, measured in 2014 dollars, fall by between \$380 and \$390 million in 2015; the loss worsens to as much as \$600 million in 2017. Over the long-term,

provincial government revenues settle at permanently reduced levels: between \$400 and \$420 million a year lower than the baseline. Most of the revenue losses arise from lower indirect taxes and personal income taxes; each accounting for a little over a third of the total decline.¹⁵

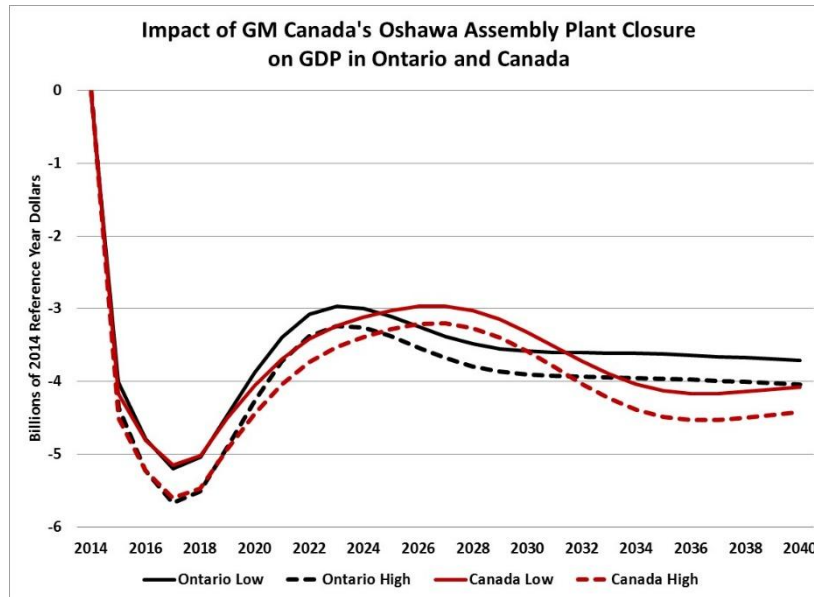


Figure 1

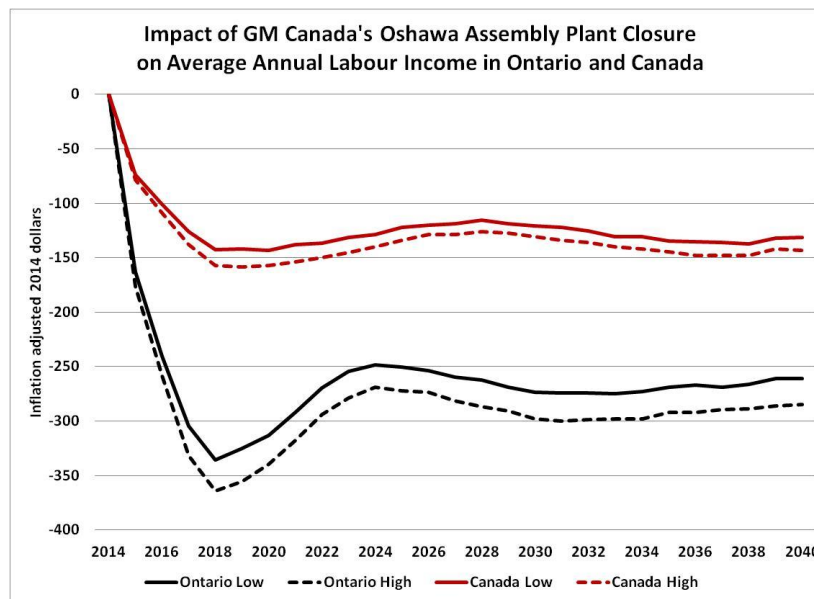


Figure 2

¹⁵ Tables summarizing the impact on government revenue by type of revenue and level of revenue for each scenario are provided in Appendix B. Note that the components do not add up to the total change in revenue by level of government because transfers from one level of government to another have not been included in the table.

The federal government also experiences a decline in tax revenues; in fact, Ottawa's loss is even larger than that for the Ontario government. Federal revenues decline by between \$550 and \$560 million in 2015, over \$700 million in 2017, and a permanent loss of \$480 million a year over the long-term. About half the revenue losses arise from lower personal income tax revenues followed by declines direct business tax revenues.

An interesting and perhaps surprising side-effect of the closure of the Oshawa operations is experienced by the Canada Pension Plan. CPP contributions decline by between \$130 and \$140 million in 2015 (reflecting the loss in employment in Ontario and other provinces), and that loss worsens in the medium-term. A gradual recovery in employment helps reduce the revenue loss to between \$110 and \$120 million a year over the long-term. However, this permanent decline in contributions without a matching reduction in benefits¹⁶ reduces – on a cumulative basis – the amount of assets available to invest in the CPP, and this causes a reduction in average long-run investment income for the CPP that persists long after employment levels have rebounded. If this situation becomes unsustainable, then either contributions must rise or benefits fall. Either one of these policy changes will reduce personal income and lead to lower household spending and GDP than reported in this analysis.

As mentioned above, the economy experiences the initial shock of the loss production at the Oshawa assembly plant and then adjusts over the medium and long-term. Figure 1 through Figure 3 show the year to year Ontario and national impacts to GDP, average annual labour income and employment respectively in both the high and low case scenarios.

After 2015, the impact worsens as lost income leads to reductions in household spending, reduced business investment, and reduced employment. This process is, however, gradually reversed as the wage rate falls relative to the baseline scenario (see Figure 2). By 2018, average annual labour income measured in 2014 dollars, has fallen by about \$150 per worker in Canada and by about \$350 in Ontario. Average wages remain depressed for the remainder of the simulation period.¹⁷ Lower wages reduce family incomes, consumer spending, and government tax revenues. On the other hand, our model expects that they also lead to lower prices and improved competitiveness which, over time, helps increase export sales and contributes to the partial rebound in employment. Figure 1 shows that this adjustment process generates a small cycle in GDP for the Ontario and national economies but that they remain at a new, permanently lower level in the long-term. It is also worth remarking that the difference

¹⁶ The analysis assumes that average benefits are not affected while the number of retirees is only marginally affected by changes in population. Average benefits may, however, be lower than the model predicts because more workers could have lower insurable earnings over their lifetime thus reducing their defined pension benefits.

¹⁷ The C4SE's provincial economic modeling system ensures that the unemployment rate returns, over time, to its 'natural rate' (the 'natural unemployment rate' excludes unemployment due to cyclical activity in the economy). This adjustment process involves not only changes in the wage rate but also changes in labour migration as people move to regions with better employment opportunities. This process has several consequences for the economy. First, the change in wages required to help move the unemployment rate back to its natural rate is reduced when labour is mobile and second, changes in population arising from labour migration introduce economic cycles into the model results as new residential housing, business investment and even public sector spending adjust to reflect higher, or lower, population levels.

between the high and low case scenarios is relatively constant over time, \$0.3 billion a year on average, for both Ontario and Canada.

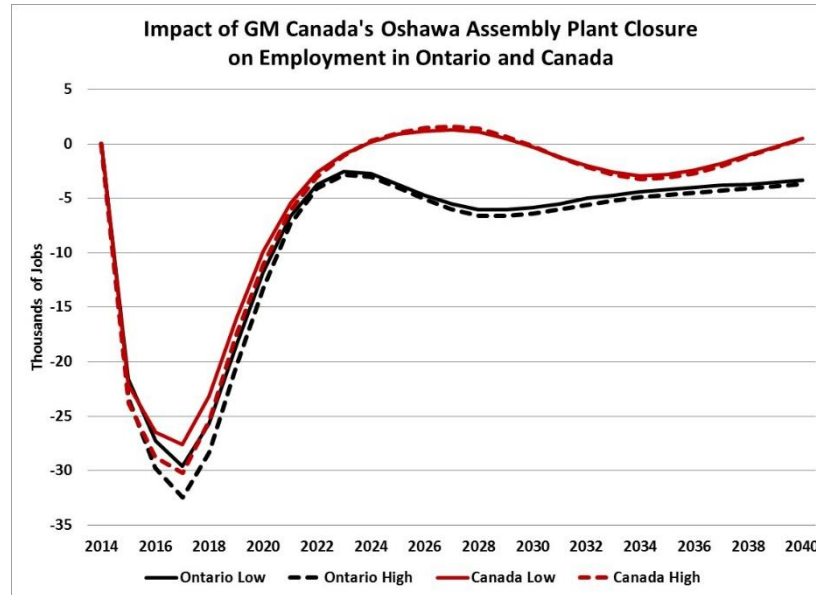


Figure 3

The impact on employment shown in Figure 3 is similar to that for GDP in Figure 1 but also contains some important differences. In the first three years of the shock (2015 through 2018), the number of jobs lost relative to the baseline scenario levels continues to rise: from 22-23 thousand in Ontario in 2015 to 30-33 thousand in 2017. After 2017, the labour market begins to adjust with displaced workers finding new employment - at a lower average wage - and we expect the unemployment rate to fall back towards its natural rate. Over the long-run, employment in Ontario remains permanently below the levels from the baseline scenario (by about 3 to 4 thousand jobs) but Ontario's population has also declined - encouraged to seek opportunities elsewhere in Canada or abroad; this helps to reduce the unemployment rate. Nationally, employment in the long-term is almost the same as it was in the baseline scenario with lower wages fostering adjustments in employment so that the unemployment rate returns to its baseline scenario levels. The wage rate adjustment also helps to close the gap in employment impacts between the high and low case scenarios over time (although this causes a permanent decline in family incomes and government revenues).

Summary and Observations

The long-run implications of the closure of a high value-added, high wage, large manufacturing operation, such as the GM Canada facility in Oshawa, are both worrying and interesting. Even after a multi-year adjustment process, GDP in Canada remains permanently lower than it would have been without the plant closure; a decade after the Oshawa closure national employment levels have, in contrast, returned to almost the same levels they were in the baseline scenario. Most people eventually find new work – assuming that labour markets adjust as expected – but the recovery in employment is achieved, in large part, by a permanent decline in the average wage rate. The decline in GDP is concentrated mostly in Ontario where employment remains permanently lower than it would have been without the plant closure despite a permanent cut to average labour income of over \$250 a year.

After the Oshawa closure, the economy immediately experiences a significant loss of output, income and jobs, with the impacts heavily concentrated in Ontario. The first year impacts are magnified over the next two years by the indirect and induced effects of the closure: a widespread loss of income in many sectors, and subsequent reductions in spending. The federal and Ontario governments experience a substantial and permanent loss of income, resulting in a permanent loss of revenues (and corresponding increase in their deficits) of around \$1 billion a year combined. Additional implications are also experienced by the CPP, where either contribution rates may have to be increased or benefits reduced to help preserve the long-run solvency of the fund.

Appendix A: C4SE Provincial Economic Modeling System

The C4SE's Provincial Modeling System is a dynamic, multi-sector, regional economic model of the country. It includes a bottom-up set of macroeconomic models for the provinces, the territories and the rest of the world. The national model links economic activity in one region with activity in the other regions through trade. The provincial models include detailed income and expenditure categories and demographic and labour market information. The purpose of the modeling system is to produce medium- to long-term projections of the provincial economies and conduct simulation studies that require industry and demographic detail.

This modelling system consists of a set of provincial and territorial macroeconomic models that are linked through trade, financial markets and inter-provincial migration. The impact on the supply chain – in terms of output and employment – is fully captured by the multi-sector model, which incorporates the purchasing patterns from the current input-output tables. But, in contrast to an input-output model, a dynamic macroeconomic model also considers the impact on supplier's investment decisions that occur as a result of the change in economic activity.

The model produces impacts on employment, labour income, value added output, productivity, investment and exports for at least fourteen industry sectors (see list below). It also produces the impacts on government revenue by level of government and source of revenue. The dynamic nature of the model, however, makes it more challenging to develop a single summary measure that provides a “rule-of-thumb” result. The need for such a measure is satisfied by generating an average impact over several years of the simulation or, when appropriate, a Return on Investment statistic.

C4SE Model – Industry Sectors

Agriculture	Finance, Insurance & Real Estate
Other Primary (detail varies by province)	Professional, Scientific & Management Services
Manufacturing (detail varies by province)	Accommodation & Food
Construction	Health Services
Utilities	Other Services
Transportation & Warehousing	Education Services
Trade	Government Services

The model incorporates partial policy responses to economic developments. In terms of monetary policy, the Bank of Canada adjusts interest rates using a Taylor Rule reaction function that responds to inflation relative to its target rate and the unemployment rate relative to the natural rate of unemployment. The exchange rate reacts to Canada-US interest rate differentials and changes in the purchasing power parity value of the dollar. In terms of fiscal policy, government spending is, for many categories, a function of population, while government revenue reacts to changes in the tax base.

The following sections provide the reader with more information on the structure of the individual provincial models and the national model that unites the provincial and territorial models.

Provincial Models

The provincial and territorial models are very similar in structure – the parameters in each model differ to reflect differences in the economic experience of each region.

The provincial models are similar in nature to a general equilibrium model, but full product and factor substitution is not implemented. At present, substitution is restricted to the energy products and value-added. For purposes of manageability there is only one wage rate and one set of cost of capital measures – construction and equipment – in the model. Changes in these measures of labour and capital costs cause labour and capital intensities to change across all sectors of the economy.

The model's economy is organized into four broad sectors. Firms employ capital and labour to produce a profit-maximizing output under a Cobb-Douglas constant-returns-to-scale technology. Households consume the domestic and foreign products and supply labour under the assumption of utility maximization. Governments purchase the domestic and foreign products and produce output. Foreigners purchase the domestic product and supply the foreign product.

There are two main markets in the model. These markets correspond to the domestic and foreign products and the labour market. Each of these markets is concerned with the determination of demands, supplies, and prices. Like most sub-national models, the Ontario model assumes that most prices are set in national markets. The presence of the National model in the system means that interest rates, exchange rates and the price of some goods and services are affected by changes in economic activity in Ontario and the rest of the country.

In sub-national economies, the movement of labour is a key factor in the adjustment of the local economy to changes in economic conditions. The C₄SE's model allows net migration – and therefore the total population – to adjust over time to reflect changes in economic conditions. If the economy and employment is growing, then the demand for labour rises and net migration rises. This feature is an important consideration when examining economic impacts over one or more decades.

National Model

The design of the national model is what makes the C₄SE's system unique. The national block adds up the economic activity across the country and uses this information to help determine prices, interest rates, exchange rates and the rest-of-country external demand for goods and services – all factors that are exogenous to the other provincial modelling systems.

To see why this is important, consider an increase in one province's economy. This raises that province's demand for imports. In this system each of the other provinces sees an increase in demand for their exports to that province which, in turn, raises their own economies. The increase in economic activity will put upward pressure prices, interest rates and the exchange rate. The entire national economy, therefore, adjusts over time to the initial shock.

Summary of C4SE Winter 2014-15 Outlook

The Provincial Economic Modeling System models and forecasts used in this analysis were released in January, 2015. The outlook is summarized in the following two tables. The outlook incorporates lower prices for oil and other commodities plus weaker economic growth for Canada's key trading partners. The slump in oil prices slows economic growth in Alberta, Saskatchewan, and Newfoundland and Labrador this year. Economic growth is expected to pick up again for the last few years of the decade but then slows – driven by demographic changes – over the long-term.

Table 5

C4SE Economic Outlook: Winter 2014-15								
	2015	2016	2017	2018	2019	2020	Average 2015-20	Average 2020-40
GDP Growth by Province:								
Canada	2.0%	2.4%	2.4%	2.6%	2.1%	1.8%	2.3%	1.5%
Newfoundland & Labrador	1.0%	1.6%	0.7%	5.4%	2.2%	2.4%	2.4%	0.1%
Prince Edward Island	1.9%	2.9%	2.8%	2.1%	2.2%	1.6%	2.3%	1.3%
Nova Scotia	1.6%	2.4%	2.3%	2.0%	1.4%	1.0%	1.8%	0.6%
New Brunswick	1.3%	2.1%	2.5%	2.2%	1.5%	1.6%	2.0%	0.8%
Quebec	1.6%	1.9%	2.7%	2.7%	2.0%	1.7%	2.2%	1.7%
Ontario	2.7%	2.4%	2.3%	2.3%	1.7%	1.6%	2.0%	1.6%
Manitoba	2.5%	3.6%	2.0%	1.4%	1.4%	1.3%	2.0%	1.6%
Saskatchewan	1.4%	2.7%	2.1%	2.2%	1.3%	0.3%	1.7%	0.9%
Alberta	0.8%	1.7%	1.9%	2.6%	2.9%	2.5%	2.3%	1.5%
British Columbia	2.4%	3.2%	3.6%	3.9%	2.8%	2.1%	3.1%	1.7%
Employment Growth by Province:								
Canada	0.9%	1.2%	1.4%	1.5%	1.0%	0.7%	1.1%	0.6%
Newfoundland & Labrador	-0.9%	0.8%	-0.9%	0.8%	0.8%	1.3%	0.6%	0.2%
Prince Edward Island	1.2%	2.1%	2.1%	1.3%	1.1%	0.5%	1.4%	0.3%
Nova Scotia	0.8%	1.1%	1.3%	0.8%	0.2%	-0.3%	0.6%	-0.6%
New Brunswick	0.3%	1.0%	1.4%	1.2%	0.5%	0.2%	0.9%	-0.4%
Quebec	0.6%	0.7%	1.5%	1.4%	0.7%	0.4%	0.9%	0.6%
Ontario	1.0%	1.1%	1.1%	1.2%	0.6%	0.5%	0.9%	0.5%
Manitoba	0.9%	1.9%	1.6%	1.2%	0.9%	0.7%	1.3%	0.8%
Saskatchewan	0.7%	1.6%	1.3%	1.5%	0.6%	-0.1%	1.0%	0.4%
Alberta	0.6%	1.3%	1.6%	2.2%	2.2%	1.7%	1.8%	0.9%
British Columbia	1.5%	2.1%	2.2%	2.2%	1.8%	1.0%	1.9%	0.6%
Employment Growth by Industry:								
Agriculture	1.3%	-0.7%	0.3%	0.0%	-0.5%	-0.8%	-0.3%	-0.8%
Other Primary	0.8%	-0.2%	0.1%	-0.1%	-0.1%	-0.2%	-0.1%	-0.8%
Manufacturing	1.2%	1.4%	1.6%	1.2%	0.0%	-0.9%	0.7%	-0.9%
Utilities	-0.3%	0.9%	1.5%	1.2%	0.9%	0.6%	1.0%	0.3%
Construction	-0.8%	1.3%	0.7%	1.9%	1.1%	1.0%	1.2%	-0.4%
Transportation & Warehousing	1.8%	1.6%	1.6%	1.5%	0.8%	0.1%	1.1%	0.1%
Wholesale & Retail Trade	0.7%	0.9%	1.5%	1.7%	1.1%	0.7%	1.2%	0.4%
Finance, Insurance & Real Estate	1.2%	1.2%	1.3%	1.4%	0.8%	0.5%	1.0%	0.4%
Information & Professional Services	1.0%	1.6%	1.7%	1.8%	1.0%	0.5%	1.3%	0.3%
Accommodation & Food Services	1.1%	1.3%	1.6%	1.5%	0.8%	0.6%	1.2%	0.5%
Education Services	-0.7%	-0.8%	-0.3%	-0.2%	0.1%	0.4%	-0.2%	1.1%
Health & Social Services	2.1%	2.2%	2.5%	2.4%	2.5%	2.5%	2.4%	2.2%
Other Services	1.1%	1.4%	1.6%	1.6%	1.0%	0.6%	1.2%	0.4%
Government Services	0.3%	0.7%	0.9%	1.0%	1.1%	1.2%	1.0%	1.2%

Table 6

C4SE Economic Outlook: Winter 2014-15 percent change unless otherwise noted								
	2015	2016	2017	2018	2019	2020	Average 2015-20	Average 2020-40
Economic Performance								
Real per capita GDP	0.8%	1.2%	1.4%	1.4%	1.0%	0.6%	1.1%	0.8%
Real per capita Disposable Income	0.7%	0.7%	1.0%	1.0%	1.4%	1.0%	1.0%	1.1%
Labour Productivity	1.0%	1.1%	1.0%	1.2%	1.1%	1.1%	1.1%	1.0%
Demographics, Labour & Housing								
Population	1.1%	1.1%	1.1%	1.1%	1.1%	1.2%	1.1%	0.7%
Net Immigration (thousands)	248	263	270	282	295	314	279	266
Unemployment Rate	7.0	6.8	6.5	6.1	5.9	5.9	6.4	5.7
Housing Starts (thousands)	195	200	204	213	217	223	209	166
External & Government Balances								
Real Trade Balance (\$2007 billions)	-14	0	18	22	21	19	11	17
Nominal Trade Balance (\$ billions)	-47	-29	0	14	12	8	-7	15
Federal Net Lending (\$ billions)	-10	-7	-6	-2	-1	-1	-4	0
Provincial Net Lending (\$ billions)	-35	-27	-22	-17	-16	-18	-22	-36
Wages & Prices								
Consumer Price Index	1.5%	2.5%	1.8%	2.0%	1.9%	1.9%	2.0%	2.2%
Wage Rate	2.6%	3.0%	3.1%	3.5%	3.1%	3.0%	3.1%	2.9%
Unit Labour Costs	0.0%	1.8%	3.4%	1.7%	1.6%	1.6%	2.0%	2.0%
Financial Markets								
3-Month T-Bill Rate	1.16	2.33	3.31	3.74	4.05	3.82	3.07	4.18
10-Year GOC Bond Rate	3.06	4.13	4.61	4.64	5.05	5.22	4.45	5.85
Exchange Rate (US cents per CAD)	0.85	0.86	0.86	0.86	0.86	0.86	0.86	0.87

Appendix B: Scenario Results

The following tables provide a summary of the economic and fiscal impacts for each GM Canada Oshawa assembly plant closure scenario (for selected time periods) compared to the baseline scenario. A set of tables with the impacts by year are also available in a Microsoft Excel file.

Low Case Scenario

The Low Case Scenario impacts assume that, in addition to the closure of the GM Canada assembly plant in Oshawa in 2015, parts production in Ontario is reduced by the equivalent to 20% of the parts purchases made by the Oshawa plant.

Low Case Scenario Impact of GM Canada's Oshawa Assembly Plant on GDP and Employment by Province & Industry Sector								
	Difference from the Baseline				Percent Difference from the Baseline			
	2015	2016	2017	Average Annual 2018-40	2015	2016	2017	Average Annual 2018-40
GDP Impact by Province (millions of 2014 dollars):								
Canada	-4,166	-4,812	-5,152	-3,714	-0.2%	-0.2%	-0.2%	-0.1%
Newfoundland & Labrador	-1	10	11	32	0.0%	0.0%	0.0%	0.1%
Prince Edward Island	-1	0	1	0	0.0%	0.0%	0.0%	0.0%
Nova Scotia	-5	0	7	12	0.0%	0.0%	0.0%	0.0%
New Brunswick	-8	-8	-7	2	0.0%	0.0%	0.0%	0.0%
Quebec	-102	-130	-142	-83	0.0%	0.0%	0.0%	0.0%
Ontario	-4,010	-4,798	-5,196	-3,589	-0.5%	-0.6%	-0.7%	-0.4%
Manitoba	-19	-26	-21	4	0.0%	0.0%	0.0%	0.0%
Saskatchewan	-16	-14	-5	4	0.0%	0.0%	0.0%	0.0%
Alberta	21	91	103	-69	0.0%	0.0%	0.0%	0.0%
British Columbia	19	115	152	10	0.0%	0.0%	0.1%	0.0%
Employment Impact by Province (thousands):								
Canada	-22.1	-26.5	-27.6	-3.0	-0.1%	-0.1%	-0.1%	0.0%
Newfoundland & Labrador	0.0	0.1	0.1	0.3	0.0%	0.0%	0.0%	0.1%
Prince Edward Island	0.0	0.0	0.0	0.0	0.0%	0.0%	0.0%	0.1%
Nova Scotia	0.0	0.1	0.1	0.3	0.0%	0.0%	0.0%	0.1%
New Brunswick	0.0	-0.1	0.0	0.1	0.0%	0.0%	0.0%	0.0%
Quebec	-0.8	-1.0	-1.2	-0.2	0.0%	0.0%	0.0%	0.0%
Ontario	-21.6	-27.3	-29.6	-6.3	-0.3%	-0.4%	-0.4%	-0.1%
Manitoba	-0.1	-0.1	-0.1	0.3	0.0%	0.0%	0.0%	0.0%
Saskatchewan	-0.1	-0.1	0.1	0.2	0.0%	0.0%	0.0%	0.0%
Alberta	0.3	0.9	1.5	1.3	0.0%	0.0%	0.1%	0.0%
British Columbia	0.2	1.1	1.6	1.0	0.0%	0.0%	0.1%	0.0%
Employment Impact by Industry (thousands):								
Agriculture	-0.2	-0.3	-0.2	0.1	-0.1%	-0.1%	-0.1%	0.0%
Other Primary	-0.1	-0.1	-0.1	0.2	0.0%	0.0%	0.0%	0.1%
Manufacturing	-8.0	-8.3	-8.1	-3.3	-0.5%	-0.5%	-0.4%	-0.2%
Utilities	-0.2	-0.3	-0.3	-0.2	-0.1%	-0.2%	-0.2%	-0.1%
Construction	-0.2	-0.8	-1.3	0.5	0.0%	-0.1%	-0.1%	0.0%
Transportation & Warehousing	-1.4	-1.8	-1.8	0.1	-0.2%	-0.2%	-0.2%	0.0%
Wholesale & Retail Trade	-4.2	-4.8	-5.0	-0.4	-0.2%	-0.2%	-0.2%	0.0%
Finance, Insurance & Real Estate	-1.4	-2.0	-2.2	-0.4	-0.1%	-0.2%	-0.2%	0.0%
Information & Professional Services	-4.4	-5.4	-5.7	-0.6	-0.2%	-0.3%	-0.3%	0.0%
Accommodation & Food Services	-0.6	-1.0	-1.0	0.8	-0.1%	-0.1%	-0.1%	0.1%
Education Services	0.1	0.0	0.1	-0.1	0.0%	0.0%	0.0%	0.0%
Health & Social Services	0.0	0.0	0.1	0.0	0.0%	0.0%	0.0%	0.0%
Other Services	-1.5	-2.1	-2.1	0.3	-0.1%	-0.1%	-0.1%	0.0%
Government Services	0.0	0.0	0.0	0.0	0.0%	0.0%	0.0%	0.0%

Economic Impact of GM Operations in Oshawa

Low Case Scenario Impact of GM Canada's Oshawa Assembly Plant on Selected Indicators				
<i>% difference from baseline, except where indicated</i>	2015	2016	2017	Average Annual 2018-40
Economic Performance				
Real per capita GDP	-0.2%	-0.2%	-0.4%	-0.1%
Real per capita Disposable Income	-0.4%	-0.3%	0.0%	-0.2%
Labour Productivity	-0.1%	-0.1%	-0.1%	-0.1%
Demographics, Labour & Housing				
Population (difference in thousands)	0.3	0.4	1.1	-1.5
Net Immigration (difference in thousands)	0.2	0.1	0.8	-0.1
Unemployment Rate (difference)	0.1	0.1	0.0	0.0
Housing Starts (difference in thousands)	0.3	0.4	0.3	-0.1
External Balances				
Real Trade Balance (difference in \$2014 millions)	-2460	0	-1265	-662
Nominal Trade Balance (difference in \$ millions)	-2308	-1831	-1369	-2162
Government Balances				
Federal Budget Balance (difference in \$ millions)	-613	-745	-726	-873
Provincial Budget Balance (difference in \$ millions)	-405	-538	-561	-549
Combined Budget Balance (difference in \$ millions)	-1018	-1283	-1287	-1421
Wages & Prices				
Consumer Price Index	0.0%	-0.1%	0.0%	-0.4%
Wage Rate	-0.2%	-0.2%	-0.3%	-0.6%
Unit Labour Costs	0.0%	0.0%	0.0%	-0.3%
Financial Markets				
3-Month T-Bill Rate (difference in basis points)	-4	-3	-2	-1
10-Year GOC Bond Rate (difference in basis points)	-2	-2	-2	-1
Exchange Rate (difference in US cents)	0	0	0	0

Low Case Scenario Impact of GM Canada's Oshawa Assembly Plant on Government Revenues and Deficits <i>absolute difference from the baseline</i>				
	2015	2016	2017	Average Annual 2018-40
Government Revenues (millions of 2014 dollars)				
Canada	-549	-680	-705	-478
Newfoundland & Labrador	-1	1	2	13
Prince Edward Island	0	1	1	2
Nova Scotia	0	5	8	-1
New Brunswick	-2	-2	-3	-5
Quebec	-21	-20	-19	-1
Ontario	-377	-540	-603	-405
Manitoba	1	7	11	4
Saskatchewan	4	15	26	29
Alberta	13	41	65	202
British Columbia	5	29	45	29
Government Deficits (millions of 2014 dollars)				
Canada	576	689	662	601
Newfoundland & Labrador	1	0	1	-5
Prince Edward Island	0	-1	-1	-2
Nova Scotia	0	-2	-4	8
New Brunswick	1	2	2	5
Quebec	7	10	10	19
Ontario	367	505	540	533
Manitoba	-1	-4	-7	7
Saskatchewan	-2	-8	-13	-13
Alberta	-8	-13	-15	-152
British Columbia	-2	-11	-14	-17

Economic Impact of GM Operations in Oshawa

Low Case Scenario Impact of GM Canada's Oshawa Assembly Plant on Government Revenues by Revenue Source <i>absolute difference from the baseline</i>				
Millions of 2014 dollars	2015	2016	2017	Average Annual 2018-40
Federal Government Revenue				
Total	-549	-681	-705	-477
Direct Taxes - Persons	-222	-291	-344	-213
Direct Taxes - Business	-202	-186	-138	-122
Contributions to Social Insurance	-54	-68	-78	-47
Direct Taxes - Non-Residents	-25	-44	-36	-24
Indirect Taxes	-28	-70	-88	-61
Other Personal Transfers	0	0	0	0
Investment Income	-19	-22	-23	-14
CPP				
Contributions to Social Insurance	-132	-166	-189	-113
Investment Income	-26	-76	-149	-1,674
Aggregate Provincial Government Revenue				
Total	-392	-473	-466	-143
Direct Taxes - Persons	-136	-175	-204	-137
Direct Taxes - Business	-151	-137	-96	-86
Contributions to Social Insurance	-23	-29	-32	-18
Indirect Taxes	-63	-154	-189	-107
Other Personal Transfers	-17	-19	-22	-13
Investment Income	-12	3	20	151
Ontario Government Revenue				
Total	-377	-540	-603	-405
Direct Taxes - Persons	-123	-174	-209	-135
Direct Taxes - Business	-137	-126	-93	-87
Contributions to Social Insurance	-22	-30	-36	-22
Indirect Taxes	-74	-184	-232	-141
Other Personal Transfers	-12	-17	-20	-13
Investment Income	-17	-20	-21	-14

High Case Scenario

The High Case Scenario impacts assume that, in addition to the closure of the GM Canada assembly plant in Oshawa in 2015, parts production in Ontario is reduced by the equivalent to 30% of the parts purchases made by the Oshawa plant.

High Case Scenario Impact of GM Canada's Oshawa Assembly Plant on GDP and Employment by Province & Industry Sector								
	Difference from the Baseline				Percent Difference from the Baseline			
	2015	2016	2017	Average Annual 2018-40	2015	2016	2017	Average Annual 2018-40
GDP Impact by Province (millions of 2014 dollars):								
Canada	-4,508	-5,223	-5,600	-4,038	-0.2%	-0.3%	-0.3%	-0.2%
Newfoundland & Labrador	0	11	12	36	0.0%	0.0%	0.0%	0.1%
Prince Edward Island	-1	0	1	0	0.0%	0.0%	0.0%	0.0%
Nova Scotia	-5	1	8	14	0.0%	0.0%	0.0%	0.0%
New Brunswick	-8	-8	-7	3	0.0%	0.0%	0.0%	0.0%
Quebec	-104	-133	-148	-85	0.0%	0.0%	0.0%	0.0%
Ontario	-4,358	-5,229	-5,673	-3,921	-0.6%	-0.7%	-0.7%	-0.4%
Manitoba	-20	-26	-21	6	0.0%	0.0%	0.0%	0.0%
Saskatchewan	-16	-14	-4	6	0.0%	0.0%	0.0%	0.0%
Alberta	27	104	119	-72	0.0%	0.0%	0.0%	0.0%
British Columbia	24	130	172	16	0.0%	0.1%	0.1%	0.0%
Employment Impact by Province (thousands):								
Canada	-23.8	-28.8	-30.2	-3.3	-0.1%	-0.2%	-0.2%	0.0%
Newfoundland & Labrador	0.0	0.1	0.1	0.3	0.0%	0.0%	0.0%	0.1%
Prince Edward Island	0.0	0.0	0.0	0.0	0.0%	0.0%	0.0%	0.1%
Nova Scotia	0.0	0.1	0.1	0.3	0.0%	0.0%	0.0%	0.1%
New Brunswick	0.0	-0.1	0.0	0.1	0.0%	0.0%	0.0%	0.0%
Quebec	-0.8	-1.1	-1.3	-0.2	0.0%	0.0%	0.0%	0.0%
Ontario	-23.4	-29.8	-32.5	-7.0	-0.3%	-0.4%	-0.5%	-0.1%
Manitoba	-0.1	-0.1	-0.1	0.3	0.0%	0.0%	0.0%	0.0%
Saskatchewan	-0.1	0.0	0.1	0.3	0.0%	0.0%	0.0%	0.0%
Alberta	0.3	1.0	1.7	1.5	0.0%	0.0%	0.1%	0.1%
British Columbia	0.3	1.2	1.8	1.1	0.0%	0.0%	0.1%	0.0%
Employment Impact by Industry (thousands):								
Agriculture	-0.2	-0.3	-0.2	0.2	-0.1%	-0.1%	-0.1%	0.1%
Other Primary	-0.2	-0.1	-0.1	0.2	-0.1%	0.0%	0.0%	0.1%
Manufacturing	-9.1	-9.5	-9.5	-4.1	-0.5%	-0.5%	-0.5%	-0.2%
Utilities	-0.2	-0.3	-0.3	-0.2	-0.1%	-0.2%	-0.2%	-0.1%
Construction	-0.2	-0.8	-1.4	0.5	0.0%	-0.1%	-0.1%	0.0%
Transportation & Warehousing	-1.5	-1.9	-1.9	0.2	-0.2%	-0.2%	-0.2%	0.0%
Wholesale & Retail Trade	-4.4	-5.1	-5.3	-0.3	-0.2%	-0.2%	-0.2%	0.0%
Finance, Insurance & Real Estate	-1.5	-2.1	-2.3	-0.3	-0.1%	-0.2%	-0.2%	0.0%
Information & Professional Services	-4.5	-5.6	-6.0	-0.5	-0.2%	-0.3%	-0.3%	0.0%
Accommodation & Food Services	-0.6	-1.1	-1.0	0.8	-0.1%	-0.1%	-0.1%	0.1%
Education Services	0.1	0.0	0.1	-0.1	0.0%	0.0%	0.0%	0.0%
Health & Social Services	0.0	0.0	0.1	0.0	0.0%	0.0%	0.0%	0.0%
Other Services	-1.6	-2.2	-2.3	0.4	-0.1%	-0.1%	-0.1%	0.0%
Government Services	0.0	0.0	0.0	0.0	0.0%	0.0%	0.0%	0.0%

Economic Impact of GM Operations in Oshawa

High Case Scenario Impact of GM Canada's Oshawa Assembly Plant on Selected Indicators				
<i>% difference from baseline, except where indicated</i>	2015	2016	2017	Average Annual 2018-40
Economic Performance				
Real per capita GDP	-0.2%	-0.2%	-0.4%	-0.1%
Real per capita Disposable Income	-0.4%	-0.3%	0.0%	-0.2%
Labour Productivity	-0.1%	-0.1%	-0.1%	-0.1%
Demographics, Labour & Housing				
Population (difference in thousands)	0.3	0.4	1.2	-1.6
Net Immigration (difference in thousands)	0.3	0.1	0.8	-0.1
Unemployment Rate (difference)	0.1	0.1	0.0	0.0
Housing Starts (difference in thousands)	0.4	0.5	0.3	-0.1
External Balances				
Real Trade Balance (difference in \$2014 millions)	-2432	0	-1119	-460
Nominal Trade Balance (difference in \$ millions)	-2298	-1760	-1249	-2028
Government Balances				
Federal Budget Balance (difference in \$ millions)	-631	-774	-755	-869
Provincial Budget Balance (difference in \$ millions)	-416	-562	-589	-531
Combined Budget Balance (difference in \$ millions)	-1047	-1336	-1344	-1400
Wages & Prices				
Consumer Price Index	0.0%	-0.1%	0.0%	-0.4%
Wage Rate	-0.2%	-0.2%	-0.3%	-0.6%
Unit Labour Costs	0.0%	0.0%	0.0%	-0.4%
Financial Markets				
3-Month T-Bill Rate (difference in basis points)	-4	-3	-3	-1
10-Year GOC Bond Rate (difference in basis points)	-2	-2	-2	-1
Exchange Rate (difference in US cents)	0	0	0	0

High Case Scenario Impact of GM Canada's Oshawa Assembly Plant on Government Revenues and Deficits <i>absolute difference from the baseline</i>				
	2015	2016	2017	Average Annual 2018-40
Government Revenues (millions of 2014 dollars)				
Canada	-564	-705	-734	-483
Newfoundland & Labrador	-1	1	2	14
Prince Edward Island	0	1	2	2
Nova Scotia	0	5	8	-1
New Brunswick	-2	-2	-3	-5
Quebec	-23	-22	-21	-1
Ontario	-388	-567	-640	-423
Manitoba	1	7	12	5
Saskatchewan	4	16	28	32
Alberta	14	44	71	216
British Columbia	5	32	48	31
Government Deficits (millions of 2014 dollars)				
Canada	593	715	688	599
Newfoundland & Labrador	1	0	2	-5
Prince Edward Island	0	-1	-1	-2
Nova Scotia	0	-2	-4	8
New Brunswick	2	2	2	6
Quebec	8	11	11	22
Ontario	378	529	569	540
Manitoba	-1	-5	-8	7
Saskatchewan	-3	-9	-14	-14
Alberta	-8	-13	-15	-161
British Columbia	-3	-13	-15	-18

Economic Impact of GM Operations in Oshawa

High Case Scenario Impact of GM Canada's Oshawa Assembly Plant on Government Revenues by Revenue Source <i>absolute difference from the baseline</i>				
Millions of 2014 dollars	2015	2016	2017	Average Annual 2018-40
Federal Government Revenue				
Total	-563	-706	-734	-483
Direct Taxes - Persons	-239	-317	-376	-232
Direct Taxes - Business	-193	-175	-123	-104
Contributions to Social Insurance	-58	-74	-85	-51
Direct Taxes - Non-Residents	-24	-42	-33	-19
Indirect Taxes	-30	-76	-96	-66
Other Personal Transfers	0	0	0	0
Investment Income	-20	-23	-24	-14
CPP				
Contributions to Social Insurance	-142	-179	-205	-123
Investment Income	-28	-82	-161	-1,814
Aggregate Provincial Government Revenue				
Total	-403	-494	-490	-138
Direct Taxes - Persons	-146	-190	-223	-149
Direct Taxes - Business	-145	-129	-86	-73
Contributions to Social Insurance	-25	-31	-35	-20
Indirect Taxes	-68	-166	-206	-116
Other Personal Transfers	-18	-21	-24	-14
Investment Income	-12	3	22	162
Ontario Government Revenue				
Total	-388	-567	-640	-423
Direct Taxes - Persons	-133	-189	-228	-147
Direct Taxes - Business	-130	-118	-83	-76
Contributions to Social Insurance	-24	-33	-39	-24
Indirect Taxes	-80	-200	-254	-155
Other Personal Transfers	-13	-18	-22	-14
Investment Income	-17	-21	-23	-14