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CUSTOM REPORT

The Trans Mountain Expansion Project: Understanding the Economic Benefits for Canada and its Regions

Presented: November 21, 2014

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ERRATA NOTE:

This version of the report corrects several tables contained in the same report filed with the Trans Mountain Expansion Pipeline application to the National Energy Board in December 2013, where the provincial fiscal impacts associated with the Trans Mountain Expansion Project's operations for Alberta and British Columbia were transposed. This does not impact the total national figures or the figures for other provinces. The following tables were affected.

Table 1. Summary of the Economic and Fiscal Impacts of the TMEP (page 8)

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This version of the report, dated November 21, 2014, also adds a disclaimer not included in the same report filed with the Trans Mountain Expansion Pipeline application to the National Energy Board in December 2013. The disclaimer can be found on page 3.

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Executive Summary

Oil is a global commodity, with a well established transportation infrastructure. As a result, global benchmark prices are usually nearly identical to one another once adjustments for quality and transportation costs are taken into account. However, this has not been the case in recent years, with Canadian benchmark prices lagging considerably behind their global peers. The combination of stagnant North American demand, rising North American production, and an oil transportation infrastructure that is largely confined to exporting Canadian production to the U.S. Midwest all contributed to this outcome. The result is that Canada has not been getting the full fiscal and economic benefits associated with exploiting its non-renewable oil resources.

In response, there has been growing interest in developing new oil pipeline infrastructure in North America. There are currently four major pipeline projects under consideration that would carry oil away from Western Canada if completed. One of these is the Trans Mountain Expansion Project (TMEP or the Project), which would nearly triple the capacity of the existing pipeline that runs from Edmonton, Alberta to Burnaby, British Columbia. The objective of this report is to assess the economic and fiscal impacts associated with the proposed expansion of the Trans Mountain pipeline. We do this in three ways:

- Assessing the impacts associated with the initial required investments to build the pipeline and related infrastructure.
- Assessing the impacts associated with operating the pipeline once it is up and running.
- Assessing the impacts associated with higher netbacks to oil producers that are expected to result from smaller price differentials between Canadian and international oil price benchmarks.

Impacts of TMEP's Development Phase

If approved, the TMEP is expected to cost approximately $5.5 billion[1], with the expenditures taking place over a seven-year period, from 2012 to 2018. If we adjust for price increases, that is equivalent to $4.9 billion in 2012 dollars. Parts of the Project, such as planning and regulatory fillings have already begun; however, the bulk of the spending is expected to take place in 2016 and 2017, when construction activity peaks. For the purposes of our analysis, we exclude the financing costs from the analysis; thus we assess the economic impacts of $4.6 billion of expenditures in 2012 dollars.[2]

This spending generates direct impacts in the construction sector, supply chain impacts associated with the inputs needed to complete the Project, and induced effects, which occur when the wages that employees earn from the direct and supply chain effects are spent. Combined, these three effects are expected to support 58,037 person-years of employment, with nearly half of those effects being direct,

[1] The Trans Mountain Expansion Application to the NEB provides an estimated capital cost for the Project of $5.4 billion; this reflects a reduction in the required investment associated with the expected contribution from Westridge Dock bid premiums, which do not reduce the total expenditures on of the Project for the purposes of this Report.

[2] All subsequent dollar figures are in 2012 dollars unless otherwise noted.

and the rest being indirect and induced. Most of the employment effects will occur in British Columbia (61.8 per cent) and Alberta (25.2 per cent), reflecting that this is where the pipeline will be built. However, Ontario (8 per cent), Quebec (2.4 per cent), and the other Prairie provinces (1.9 per cent) will also experience job gains.

The additional economic activity also generates fiscal effects at both the federal and provincial level. The development of the TMEP is expected to generate a total of $1.2 billion in federal ($646 million) and provincial ($568 million) government revenues. This is equivalent to $27 for every $100 of investment. The largest fiscal impacts are found in personal income taxes ($559 million), indirect taxes such as sales taxes ($335 million), and corporate income taxes ($184 million). Assuming that the federal tax revenues will be distributed across the provinces on a per capita basis, British Columbia ($394 million) and Ontario ($307 million) will experience the largest combined federal and provincial fiscal effects. Other regions of the country, such as Alberta ($239 million), Quebec ($166 million), and the Prairies ($58 million) will also experience fiscal benefits.

Impacts of TMEP's Operational Phase

Once operational, the TMEP will also generate positive economic and fiscal impacts on an ongoing basis. We assess the operational impacts of the pipeline over its first 20 years of service under two scenarios. The first considers the impact of only the long-term contracts that have been signed and can be considered the minimum impact associated with firm commitments. The second scenario assesses the economic impacts when the spot or non-firm capacity in the pipeline is fully utilized, and can be considered the maximum impact.

At a minimum, including the direct, supply chain, and induced effects we expect pipeline operations will support 50,273 person-years of employment, and this figure rises to 65,184 if the non-firm capacity is fully utilized. British Columbia (60.2 per cent) and Alberta (20.5 per cent) still experience the largest portion of the employment impacts. However, other regions of the country, such as Ontario (12.6 per cent), Quebec (3.9 per cent), and the Prairies (2 per cent) benefit from the employment impacts during the operational phase of the Project.

In terms of fiscal effects, pipeline operations are expected to generate between $2.5 and $3.3 billion in combined federal and provincial revenues over the first 20 years of operations. A key reason for this is that the oil pipeline industry generates large corporate income tax effects. Corporate profits account for the largest share of the revenues (60.1 per cent), followed by personal income taxes (19.7 per cent) and indirect taxes (12.5 per cent). Regionally, assuming a per capita distribution of federal revenues, British Columbia experiences the largest combined federal and provincial impact (34.8 per cent), followed by Ontario (24.3 per cent), Alberta (18.4 per cent), and Quebec (13.8 per cent).

Impacts of Higher Netbacks for Producers

In addition to the economic and fiscal impacts associated with building and operating the pipeline the TMEP has the potential to improve the price Canadian oil producers receive for their product. At a minimum, shippers on the TMEP will have access to tidewater, allowing them the ability to attract world prices for their product, rather than North America prices. However, the market study completed by IHS

Global Canada Limited (the IHS study) found that the TMEP and other planned pipeline expansion projects will alleviate the glut of oil flowing to the hub at Cushing, Oklahoma, which is expected to raise prices for all heavy oil producers in Western Canada.

As indicated in the IHS study, producers of conventional heavy oil and bitumen from the oil sands will benefit from higher prices, leading to higher revenues and profits. In turn, these businesses may choose to pay higher dividends or reinvest these profits. As well, there will be fiscal implications in terms of higher royalties and corporate profits paid to federal and provincial governments. We estimate these fiscal impacts under the three different production cases developed by IHS, a base case outlook, a high production outlook, and a low production outlook.

In the IHS base case oil company revenues rise by $45.4 billion over the first 20 years of the pipeline's operations as a result of higher netbacks that can be attributed to the market access provided by the TMEP. This generates total fiscal benefits of $14.7 billion. The federal corporate income tax effects account for $6.1 billion of these effects. The combined royalty and corporate income tax effect for Alberta is $8.2 billion, and for Saskatchewan it is $454 million. The cumulative fiscal effect ranges between $9.2 billion in the high production case and $13.8 billion in the low production case.

Summary

Table 1 summarizes the economic and fiscal impacts associated with the TMEP using the minimum operating impacts and the base case for assessing the impact of higher netbacks. Between 2012 and 2037, the Project is expected to generate 108,310 person-years of employment. As well, the Project will produce $18.5 billion of fiscal benefits over the same period.

Table 1. Summary of the Economic and Fiscal Impacts of the TMEP (cumulative effects, 2012-2037)

	Atlantic Canada	Quebec	Ontario	Other Prairies	Alberta	British Columbia	Territories	Canada
	Using Minimum Operational Effects and the Base Case for Higher Netbacks							
Employment effects (person-years)	**617**	**3,372**	**11,004**	**2,124**	**24,926**	**66,132**	**135**	**108,310**
Project development	289	1,402	4,659	1,099	14,632	35,864	92	58,037
Project operations	327	1,970	6,345	1,025	10,293	30,269	43	50,273
GDP effects (millions of 2012$)	**46.0**	**285.8**	**951.5**	**185.5**	**5,360.5**	**11,329.2**	**15.7**	**18,174.2**
Project development	21.7	120.1	408.6	98.5	1,402.4	2,789.1	11.2	4,851.7
Project operations	24.3	165.6	542.9	87.0	3,958.1	8,540.2	4.5	13,322.5
Fiscal Impact (millions of 2012$)	**564.0**	**1,920.1**	**3,277.7**	**1,030.5**	**9,545.8**	**2,118.0**	**26.6**	**18,482.7**
Project development	48.2	166.2	306.6	57.5	239.1	394.3	2.2	1,214.1
Project operations	104.0	352.1	620.1	111.1	437.8	918.8	4.7	2,548.6
Higher netbacks	411.8	1,401.8	2,351.0	861.9	8,868.9	804.9	19.7	14,720.0

Source: The Conference Board of Canada.

Beyond these economic and fiscal benefits, the TMEP will also provide important strategic benefits. In particular, by allowing significant volumes of Canadian oil to reach tidewater Canadian production will no longer be landlocked inside the stagnant North American market. Many producers would now have access to growing markets in Asia. Ultimately, the TMEP is a means for Canada to maximize the value it receives for its non-renewable oil resources.

Chapter 1: Introduction

Oil is a global commodity, with a well established transportation infrastructure. As a result, global benchmark prices are usually nearly identical to one another once adjustments for quality and transportation costs are taken into account. However, this has not been the case in recent years, with North American benchmark prices lagging considerably behind their global peers.[3] This situation has had significant negative economic and fiscal consequences for Canada, particularly in its oil producing regions.

In response, there has been growing interest in developing new oil pipeline infrastructure in North America. There are currently four major pipeline projects under consideration that would carry oil away from Western Canada if completed. One of these is the Trans Mountain Expansion Project (TMEP or the Project), which would nearly triple the capacity of the existing pipeline that runs from Edmonton, Alberta to Burnaby, British Columbia.

The objective of this report is to assess the economic and fiscal impacts associated with the proposed TMEP. (See text box "Trans Mountain Expansion Project Description.") As part of this process, we examine the potential impacts in multiple ways, including the following:

- The impacts associated with the initial required investments to build the pipeline and related infrastructure.
- The impacts associated with operating the pipeline once it is up and running.
- The impacts associated with higher netbacks to oil producers that are expected to result from smaller price differentials between Canadian and international oil price benchmarks.

The results of this analysis allow for a clearer understanding of the economic and fiscal impacts of the pipeline itself, as well as the potential implications for Canada's governments and the oil extraction industry. We discuss the results at both the national and the provincial level, with a particular focus on British Columbia and Alberta, since this is where most of the benefits would occur. We also examine how other provinces and the country overall will benefit, with a focus on supply chain and fiscal effects.

[3] Kelly, Steve. *Trans Mountain Expansion Direct Evidence.*

Trans Mountain Expansion Project Description

The Trans Mountain pipeline system commenced operations 60 years ago and now transports a range of crude oil and petroleum products from western Canada to locations in central and southwestern British Columbia (BC), Washington state and offshore. Trans Mountain currently supplies much of the crude oil and refined products used in BC. Trans Mountain pipeline is operated and maintained by staff located at Trans Mountain's regional and local offices in Alberta (Edmonton, Edson, and Jasper) and BC (Clearwater, Kamloops, Hope, Abbotsford and Burnaby).

The Trans Mountain pipeline system has an operating capacity of approximately 47,690 m^3/d (300,000 b/d) using 24 active pump stations and 40 tanks. The expansion will increase the capacity to 141,500 m^3/d (890,000 b/d).

The proposed expansion will comprise the following:

- Pipeline facilities that complete a twinning (or "looping") of the pipeline in Alberta and BC with about 987 km of new buried pipeline.
- New and modified facilities, including pump stations and tanks.
- A total of three new berths at the Westridge Marine Terminal in Burnaby, BC each capable of handling Aframax tanker size.

Source: Trans Mountain.

Chapter 2: Economic Impacts Associated With the Development of the Trans Mountain Expansion Project

In terms of economic effects, all projects go through two distinct phases. The first is the development phase, when a project is planned, construction activity takes place, and equipment is purchased and installed. The second phase consists of the period over which a project is operational. This includes the annual expenditures on things like labour, facilities maintenance, and other inputs over the lifetime of a project. This chapter considers the economic impacts of developing the TMEP, while the next chapter considers the economic impacts of TMEP operations once the Project is finished.

In this report we quantify four economic effects associated with the development and operations of the TMEP, including the following:

1) **Direct Effects.** These are the economic effects directly associated with the development and operation of the TMEP. During the development phase, most of the direct effects occur in the construction industry, and during the operational phase all of the effects occur in the oil pipeline industry.
2) **Indirect Effects.** The indirect or supply chain effects measure the economic effects associated with the use of intermediate inputs or other support services that will be used to either build the pipeline or maintain it once it is operational.
3) **Induced Effects.** The induced effects occur when the wages that employees earn from the direct and supply chain effects are spent. As such, the economic impacts associated with induced effects generally occur in consumer oriented industries, such as retail.
4) **Fiscal Effects.** Finally, we measure the fiscal impact associated with the other three economic effects, at both the federal and the provincial level.

In order to conduct this analysis, we use both Statistics Canada's interprovincial Input-Output (I/O) model and the Conference Board of Canada's proprietary forecasting models. The direct, indirect, and induced gross domestic product (GDP) and employment impacts associated with the construction and operation of the TMEP were generated using Statistics Canada's I/O model, which allows for detailed supply chain analysis for nearly 300 different industries by province. For a more detailed explanation of I/O models see Appendix C. The fiscal effects were estimated by the Conference Board of Canada. The revenue and cost estimates associated with the construction and operation of the TMEP used to conduct the analysis were prepared by Trans Mountain Pipeline.

2.1 Direct Effects

If approved, the TMEP is expected to cost approximately $5.5 billion, with the expenditures taking place over a seven-year period. Adjusted for price increases, that is equivalent to $4.9 billion in 2012 dollars. Some of these expenditures have already occurred. Parts of the Project, such as planning and regulatory application fillings have already begun, and thus Project Development is expected to cover the 2012 and 2018 period. However, the bulk of the spending activity is expected to take place in 2016 and 2017, when construction activity peaks. (See Table 2.)

Table 2. Expenditure Assumptions Associated With the Development of the TMEP (millions of $)

Year	Nominal $	2012 $	2012 $ Excluding financing costs
2012	34.2	34.2	33.4
2013	55.7	55.0	52.0
2014	93.7	90.3	83.8
2015	273.0	251.7	239.2
2016	2,547.2	2,269.9	2,194.4
2017	2,451.8	2,121.0	1,930.4
2018	49.8	41.7	41.7
Total	**5,505.3**	**4,863.6**	**4,575.0**

Source: Trans Mountain Pipeline.

For the purposes of the analysis, we use the price adjusted figure to conduct the analysis. This is because price inflation does not add to the economic value or jobs that would be supported by the Project. As well, we exclude the estimated financing costs associated with the Project. This is because the economic impacts of the financing costs could be quite small depending on how and where the money is raised. For example, if the project is financed through internal cash flows, or through money raised in foreign markets the impacts on the Canadian financial services sector would be minimal. The end result is that we assess the economic impacts of $4.6 billion of expenditures in 2012 dollars.[4]

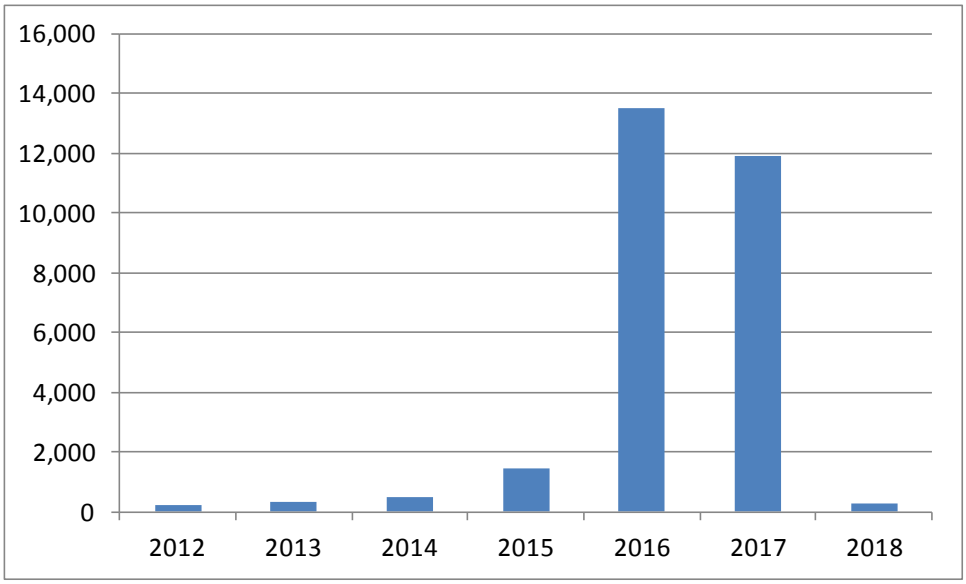
Although only 63.6 per cent of the pipeline's length will be in British Columbia, 69.5 per cent of the expenditures would take place there ($3.2 billion), with the remainder occurring in Alberta ($1.4 billion). To put that into perspective, this is equivalent to 8.7 per cent and 1.9 per cent respectively of total construction expenditures in British Columbia and Alberta in 2011.[5] Factors affecting the regional mix of spending include the terrain that the pipeline covers, the fact that portions of the new pipeline will consist of reactivated existing pipe, and the need to build new port facilities at the Westridge Marine Terminal in British Columbia.

These expenditures will have a direct impact in both provinces. In terms of employment, the development of the pipeline is expected to support 28,202 person-years of employment, with 20,675 of these jobs occurring in British Columbia and the rest occurring in Alberta.[6] The timing of these employment impacts will coincide with changes in annual expenditures on the Project. For example, in 2012, the direct employment impacts were estimated to be 206 people. But at the peak of construction in 2016, the employment supported by the Project will rise to 13,527 people. (See Chart 1.) At their

[4] Unless otherwise noted, all subsequent dollar figures in the report are stated in 2012 dollars.
[5] Based on data from Statistics Canada CANSIM table 029-0024.
[6] A person-year of employment is the amount of work that one person would normally conduct in a year. It is an average figure for each industry and takes into account the fact that some workers are part time.

peak, the provincial employment effects will be equivalent to 4.3 per cent and 1.4 per cent of British Columbia's and Alberta's respective 2016 construction employment.[7]

Chart 1. Employment Impacts Associated With the Construction of the TMEP (number of employees)



Source: The Conference Board of Canada.

In terms of GDP, we expect that the TMEP will directly generate cumulative GDP effects of $2.2 billion over the development period of the Project. Thus for every $100 dollars spent on the Project, $47 dollars in GDP will be generated. This means that 47 cents of every dollar spent goes to wages and profits, primarily in the construction industry, while the other 53 cents is spent on material inputs. The regional and temporal GDP impacts are similar to those noted for employment, with British Columbia accounting for 70 per cent of the total and the rest occurring in Alberta. The GDP effects peak in 2016 and 2017, when construction activity is at its peak.

2.2 Indirect Effects

In addition to the direct effects discussed above, the TMEP will also generate indirect or supply chain effects, and the I/O model captures these effects. Development of the Project will support another 14,055 person-years of employment indirectly. Thus, the combined direct and indirect employment effects of the TMEP are 42,257 person-years of employment. This is equivalent to 9,236 person-years of employment being supported for every $1 billion dollars of investment.

Another way to look at the indirect effects is in terms of multipliers; i.e. how many jobs or dollars of GDP are indirectly generated relative to the direct effects. For example, for every two jobs directly associated with the TMEP, it supports another job indirectly among its suppliers. The GDP multiplier is somewhat larger, with $0.58 of indirect GDP being supported by each direct dollar. The key reason for the higher

[7] The Conference Board of Canada. *Provincial Economic Outlook: Spring 2013.*

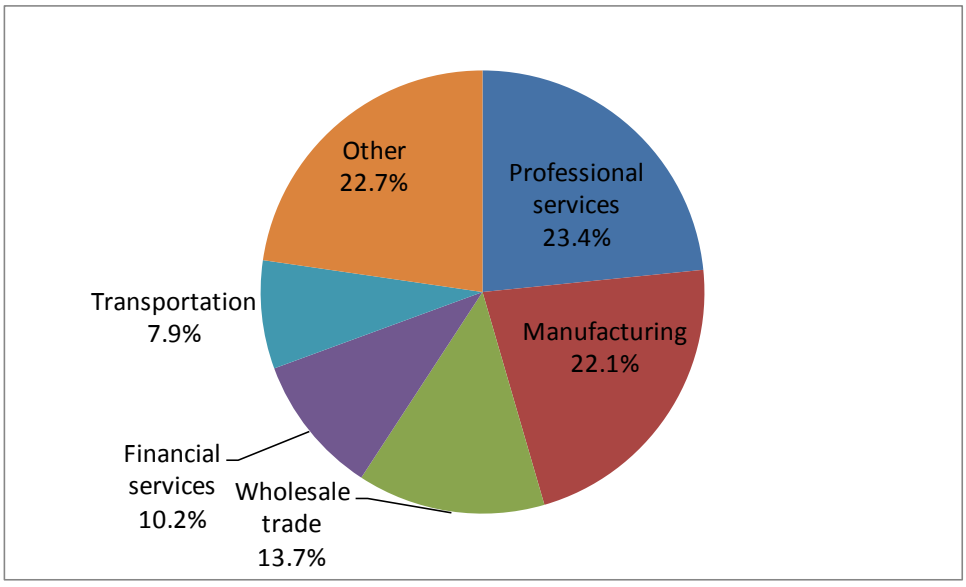
GDP multiplier is that most of the sectors where the largest indirect effects occur have a high level of GDP per employee.

The indirect effects are felt across a wide range of industries that are part of the supply chain that would be linked to the TMEP. The supply chain effects include both those that would directly supply the Project, as well as second and third order effects on suppliers who are farther down the supply chain. Although the majority of the indirect effects occur in British Columbia and Alberta, all of the other provinces experience some benefits. More than one quarter of the indirect employment effects occur in other provinces, with Ontario experiencing the largest benefit. The rest of this section describes how different industries and different regions of the country benefit from the supply chain effects that result from the construction of the TMEP.

2.2.1 Indirect Effects by Sector

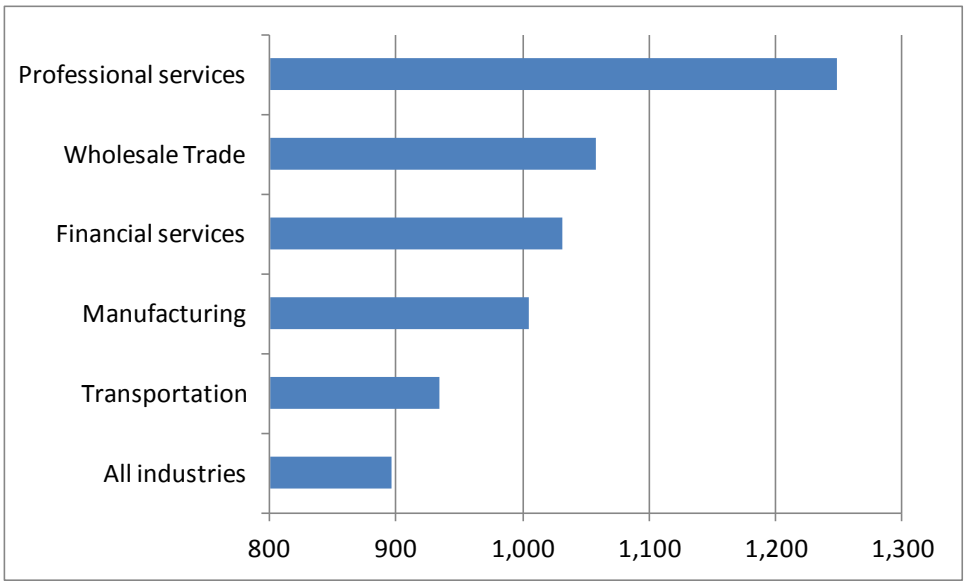
Beyond the number of jobs that would be indirectly supported by the construction of the TMEP, it is also important to examine the types of jobs. The indirect effects are largely confined to five broad sectors. In order of size, they include professional services, manufacturing, wholesale trade, financial services, and transportation. (See Chart 2.) It is worth noting that all of these sectors pay above-average wages. Even the lowest-paying sector, transportation and warehousing, has average weekly earnings that are 5 per cent above the average for all industries. (See Chart 3.) As such, the direct and indirect effects of the TMEP support a substantial number of high paying jobs.

Chart 2. Key Sectors That Experience Supply Chain Effects
(share of supply chain employment effects)



Source: The Conference Board of Canada.

Chart 3. All of the Sectors Most Affected by the TMEP's Development Pay Above Average Wages (average weekly earnings in 2012, including overtime, $)



Source: Statistics Canada CANSIM table 281-0027.

2.2.1.1 Professional Services

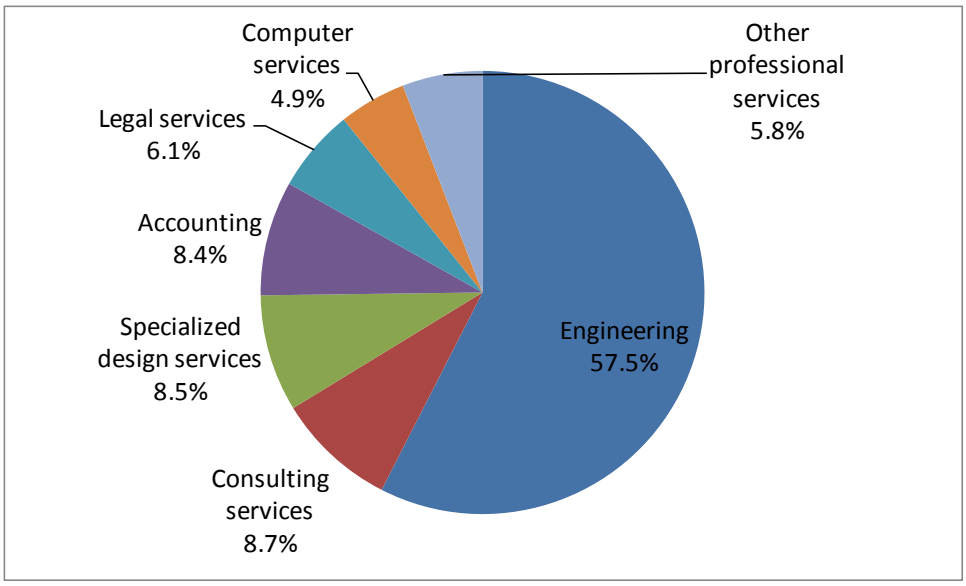
The professional services sector encompasses a wide area of activities in which human capital is the major input. These businesses essentially sell the knowledge and skills of their employees. With 3,287 person-years of employment in the sector being supported by the TMEP, or 719 for every $1 billion of inflation-adjusted investment, the largest supply-chain effects accrue to this sector.

The single largest effects within this sector occur in the engineering services industry, with 1,890 person years of employment, or 413 for every $1 billion in investment, being supported by the TMEP. (See Chart 4.) Engineering is the largest activity within this industry, but activities like geophysical surveying and mapping would also likely be an important component of the supply-chain benefits. The benefits for the engineering industry are so large that they account for 13.4 per cent of the total supply chain effects associated with development of the TMEP.

Other industries within the professional services sector would also realize employment benefits. For example, every billion dollars in investment generates 63 person-years of employment in consulting services. Specialized design services (61 person-years) and accounting services (60 person-years) also benefit. A variety of other professional service industries – everything from computer services, to legal services, to advertising and public relations – are also positively affected.

Regionally, the largest impact is in British Columbia, where nearly two-thirds of the employment benefits will occur, while another 25 per cent would be associated with Alberta. Still, substantial benefits do accrue to other Canadian provinces. For every $1 billion in investment spending connected to the TMEP, 83 person-years of professional services employment will be supported outside of the two provinces through which the pipeline would traverse.

Chart 4. Engineering Accounts for Most of the Supply Chain Effects in the Professional Service Sector (share of supply chain employment effects in professional services)



Source: The Conference Board of Canada.

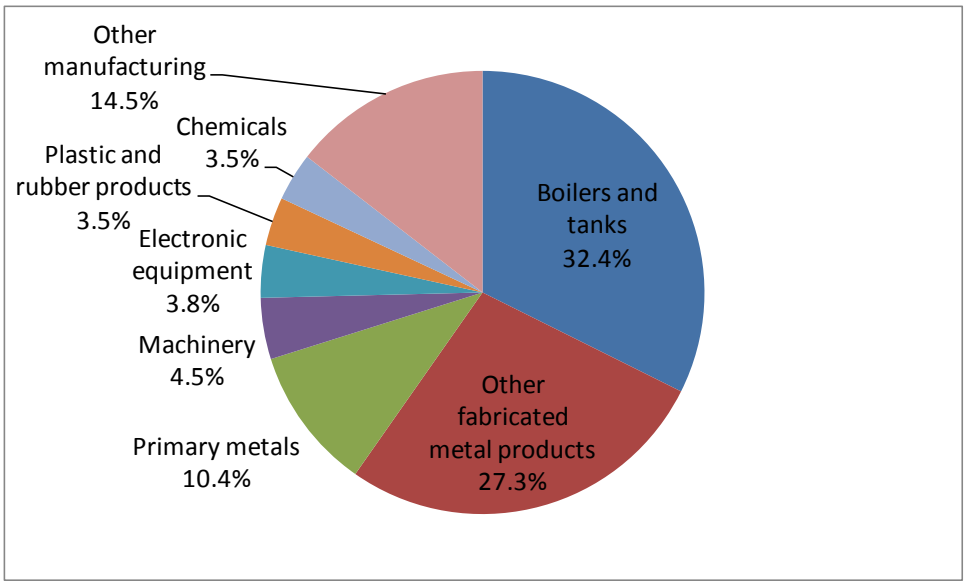
Most of the professional service jobs supported outside of Alberta and British Columbia (65 per cent) will be in Ontario; the province will experience a disproportionate benefit in several industries. For example, even though Ontario accounts for only 8 per cent of the total employment effects in professional services, it accounts for 35 per cent of the effects in the computer services industry—a higher share than either British Columbia or Alberta. It will also receive a relatively high share of the effects in the advertising and public relations (29 per cent), and scientific research and development services (27 per cent) industries. In aggregate, 96 per cent of the expected gains in professional services will accrue to British Columbia, Alberta, or Ontario.

2.2.1.2 Manufacturing

Manufacturing is another sector that experiences indirect effects associated with the development of the TMEP, accounting for 22.1 per cent of the employment benefits. This is equivalent to 3,108 person-years of employment, or 679 for every $1 billion of investment.

Key industries within the manufacturing sector that realize the greatest benefits include makers of boilers and tanks, where 32 per cent of the manufacturing related employment effects will be apparent. (See Chart 5.) Other types of fabricated metal products, such as architectural metal products, and machine shops, as well as primary metals (in particular steel producers) are where the largest effects are apparent. For example, the economic activity associated with the producers of steel pipe (a major input into the Project), is captured in the steel products industry. However, a wide variety of other manufacturing industries, such as machinery, electronic equipment, plastic and rubber products, and chemicals also benefit.

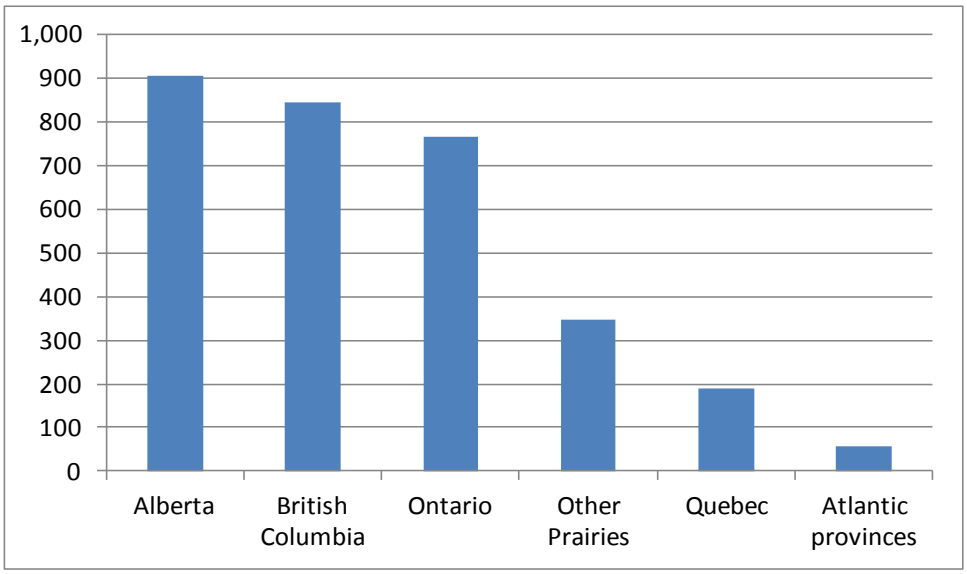
Chart 5. Most of the Manufacturing Impacts Occur Among Producers of Fabricated Metal Products (share of supply chain employment effects in manufacturing)



Source: The Conference Board of Canada.

Compared to the professional services industries, the regional impacts within the manufacturing sector are more diverse. Just 56 per cent of the associated jobs in the sector accrue to Alberta or British Columbia, compared to 88 per cent in professional services. Among the sectors most affected by the TMEP, manufacturing is where the largest benefits occur outside of Alberta and British Columbia. For every $1 billion in inflation-adjusted investment in the TMEP, 297 new person-years of employment are supported outside of Alberta or British Columbia. (See Chart 6.)

Chart 6. The Manufacturing Employment Effects Are Widely Dispersed Across Regions (person years of employment)



Source: The Conference Board of Canada.

One-quarter of all manufacturing-related jobs supported by the TMEP would originate in Ontario, not at all surprising given that the majority of Canada's manufacturing sector is located in that province. In some industries like iron and steel mills, more benefits accrue to Ontario (60 per cent) than to Alberta and British Columbia combined. The province also does well in architectural and structural metals, steel products, and plastics. Nearly 20 percent of manufacturing jobs will be found outside of Alberta, British Columbia and Ontario. Of these, nearly half will occur in Manitoba and Saskatchewan. The remaining manufacturing employment effects are concentrated in Quebec, where 190 person-years of employment can be expected.

2.2.1.3 Wholesale Trade

The wholesaling process is an intermediate step in the distribution of goods. Firms operating in this sector are organized to sell goods in large quantities to other firms, without transformation, and to render services incidental to the sale of merchandise in general. A total of 1,919 person-years of employment would be supported in this sector as a result of the development of the TMEP, which equates to 419 person-years of employment for every $1 billion invested.

Most of the jobs in the wholesale trade sector would be concentrated in two industries; building materials suppliers, and machinery and equipment suppliers. Combined, these two industries account for 73 per cent of the indirect benefits that are expected to accrue to the wholesale trade sector. This essentially reflects the role of wholesalers as middlemen, supplying the equipment and materiel needed to undertake the Project. The only other specific activity worth noting are wholesalers of electronic products, which account for another 10 per cent of the estimated employment effects.

Wholesaling activities are concentrated in the two provinces through which the pipeline would pass. Specifically, British Columbia would realize 1,016 (53 per cent) person-years of employment and Alberta would see 461 person-years of employment (24 per cent). However, for every $1 billion spent on the proposed pipeline, 97 person-years of employment in wholesaling are supported outside those two provinces, and as with all other industries, the majority of them should be expected in Ontario, but about 7 per cent of them could be expected elsewhere.

2.2.1.4 Financial Services

The financial services sector covers a diverse array of activities, including banking, insurance, and investment-related services. As well, activities like the rental and leasing of machinery, equipment, and real estate are included. In total, the indirect benefits associated with this sector include 1,439 person-years of employment. This is equivalent to 315 person-years of employment per $1 billion invested in the TMEP, and 10.2 per cent of the total indirect employment effects.

The aggregate benefits are concentrated in three main industries, including rental and leasing activities, banking, and investment services. In the case of rental and leasing activity, more than 95 per cent of the employment effects occur in either Alberta or British Columbia – a logical outcome given that rental and leasing of machinery and equipment is normally a local activity. However, both the banking and financial investment services industries experience above-average effects outside of Alberta or British Columbia.

For example, 47 per cent of all the indirect benefits in the banking industry occur elsewhere in Canada—as these services are easily tradable they tend to be less location specific.

In aggregate, for every $1 billion invested in the TMEP, 91 person-years of employment in the financial services sector would be supported elsewhere in Canada and more than two-thirds of this would be created in Ontario. Given that most of Canada's largest banks and insurance companies are headquartered in Ontario, it is not surprising that 30 per cent of the employment effects in banking, holding companies, financial investment services, and insurance carriers would be generated there.

2.2.1.5 Transportation

The other sector to derive substantial indirect benefits as a result of the development of the TMEP is transportation. Establishments in the sector use transportation equipment as a productive asset to provide transportation of passengers or cargo, as well as the warehousing and storage of goods. The major modes of transportation include trucking, ground passenger, rail, water, air, and pipelines. Couriers and postal service are also included.

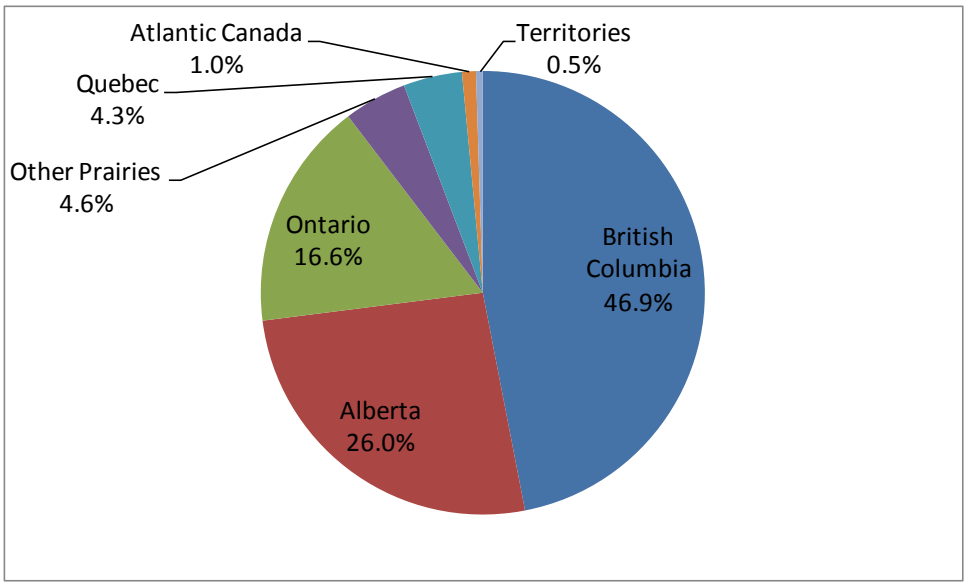
The proposed TMEP, in aggregate, would support 1,116 person-years of employment in the transportation sector, equivalent to 244 for every $1 billion of investment. More than 60 per cent of these will be either in the trucking industry, or activities that support the trucking industry. This reflects the fact that there are logistical challenges involved with getting sufficient materials to the construction sites, given that the actual pipeline will span more than 1,000 km. Rail transportation will also garner 12 per cent of the estimated employment effects, reflecting the need to move some of the material inputs long distances across the country.

Again, British Columbia derives the largest benefits associated with the transportation sector, as 36 per cent of the employment effects will be found there, the wide majority of them in trucking. The story is similar for Alberta, which will garner 29 per cent of the benefits, most of them in trucking. Still, 394 person-years of employment will be supported in other Canadian provinces – or 86 per $1 billion invested. Truck transportation is the dominant industry within the sector across the country, accounting for 63 per cent of the transportation jobs in Ontario, 70 per cent in Quebec, and 62 per cent of the jobs in the Prairie Provinces.

2.2.2 Indirect Effects by Region

Although the majority of indirect impacts will occur in British Columbia and Alberta, every region in the country will derive some economic benefit from the development of the TMEP. We estimate that 27.1 per cent of the indirect employment impacts, or 3,796 person years of employment will occur in other regions of the country. (See Chart 7.) As well, the mix of industries affected in each region can be very different. For example, manufacturing accounts for more than half of the employment effects in the Prairie Provinces, but only 12.8 per cent of the effects in British Columbia.

Chart 7. Indirect Employment Effects Supported by the Construction of the TMEP by Region (share of construction related indirect employment effects)



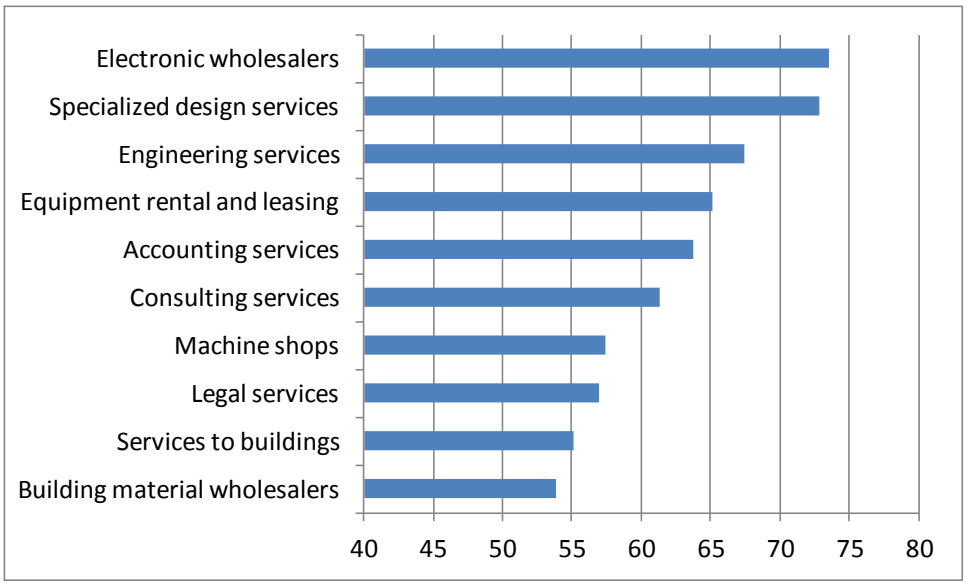
Source: The Conference Board of Canada.

2.2.2.1 British Columbia

British Columbia experiences the largest supply chain effects associated with the development of the TMEP. In total, 6,599 person-years of employment will be supported by the Project, equivalent to 46.9 per cent of the total supply chain effects. Despite the fact that nearly half of the supply chain effects will occur in British Columbia, the mix of sectors affected in the province is somewhat different than in other provinces. Professional services experience the largest benefits by far, accounting for nearly one-third of the total, followed by wholesale trade, and then manufacturing.

It is interesting to note the industries that stand out in British Columbia, in terms of those that experience effects that are both substantial in size and account for an outsized share of the national impacts. For example, 67 per cent of the national impacts in the engineering industry occur in British Columbia, accounting for a total of 1,275 person-years of employment. (See Chart 8.) Engineering accounts for the largest impact by far in British Columbia. However other industries with noticeable effects include wholesalers of building materials, specialized design services, and equipment rentals and leasing.

Chart 8. Key Industries that Experience Outsized Effects in British Columbia
(share of national supply chain employment effects for select industries, per cent)



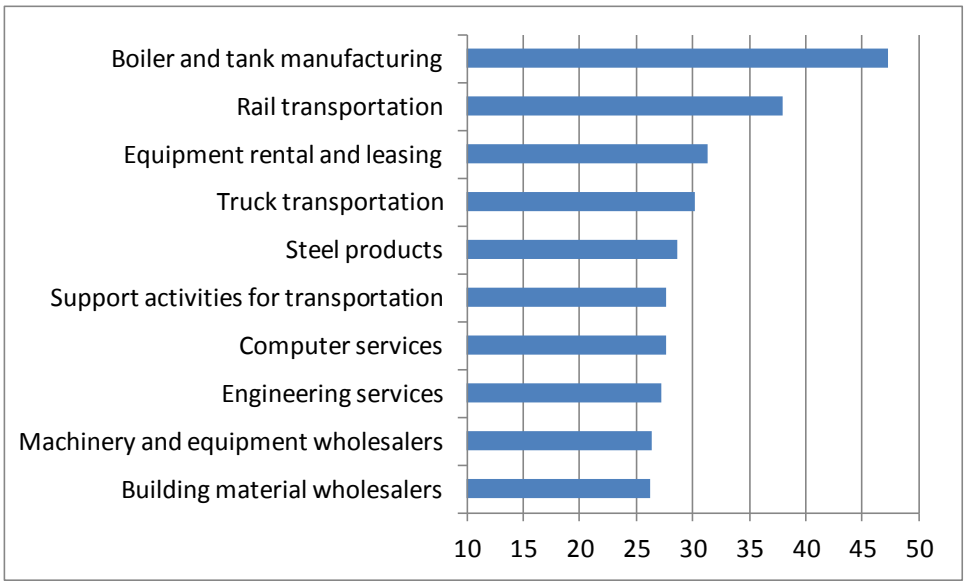
Source: The Conference Board of Canada.

2.2.2.2 Alberta

Much of the remaining indirect employment impacts accrue to Alberta. In total, the development of the TMEP is expected to support 3,660 person-years of employment in Alberta, which is equivalent to 26 per cent of the total national effects. The sector that will experience the single biggest impact in Alberta is manufacturing. This is followed by professional services, and then wholesale trade. Alberta stands out by accounting for an outsized share of the effects in the manufacturing and transportation sectors.

As is the case in British Columbia, engineering services are where the largest employment impacts occur in Alberta. (See Chart 9.) However, where Alberta stands out is in the manufacture of boilers and tanks. Nearly half of the employment effects in this industry occur in Alberta. Other industries where Alberta stands out include truck transportation, wholesalers, and rental and leasing of equipment.

Chart 9. Key Industries that Experience Outsized Effects in Alberta
(share of national supply chain employment effects for select industries, per cent)

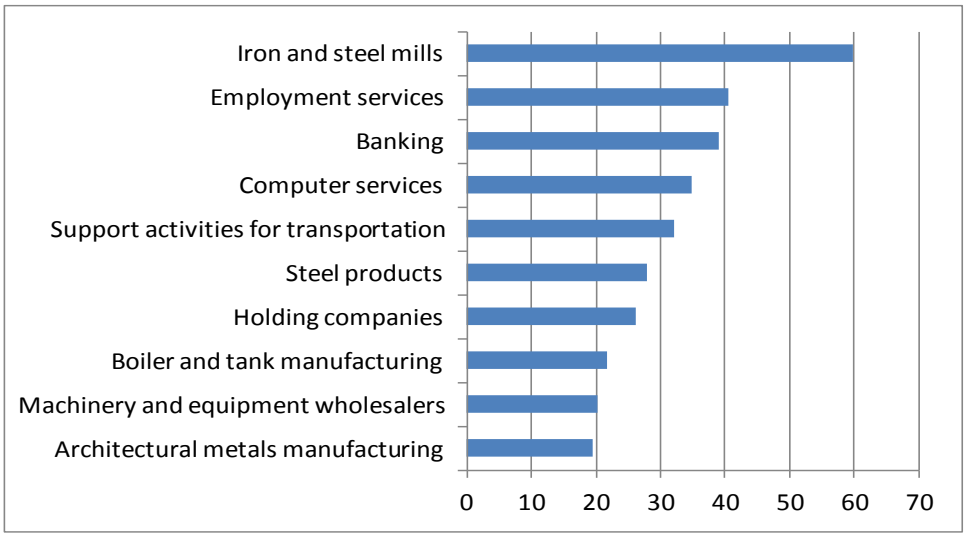


Source: The Conference Board of Canada.

2.2.2.3 Ontario

Outside of Alberta and British Columbia, Ontario experiences the largest supply chain impacts associated with the development of the TMEP. A total of 2,340 person-years of employment will be supported in Ontario, equivalent to 16.6 per cent of the total. Manufacturing and financial services are the two key areas where Ontario stands out. More specifically, industries where Ontario experiences an outsized share of the employment effects include boiler and tank manufacturing, machinery and equipment wholesalers, banking and support activities for transportation. (See Chart 10.)

Chart 10. Key Industries that Experience Outsized Effects in Ontario
(share of national supply chain employment effects for select industries, per cent)

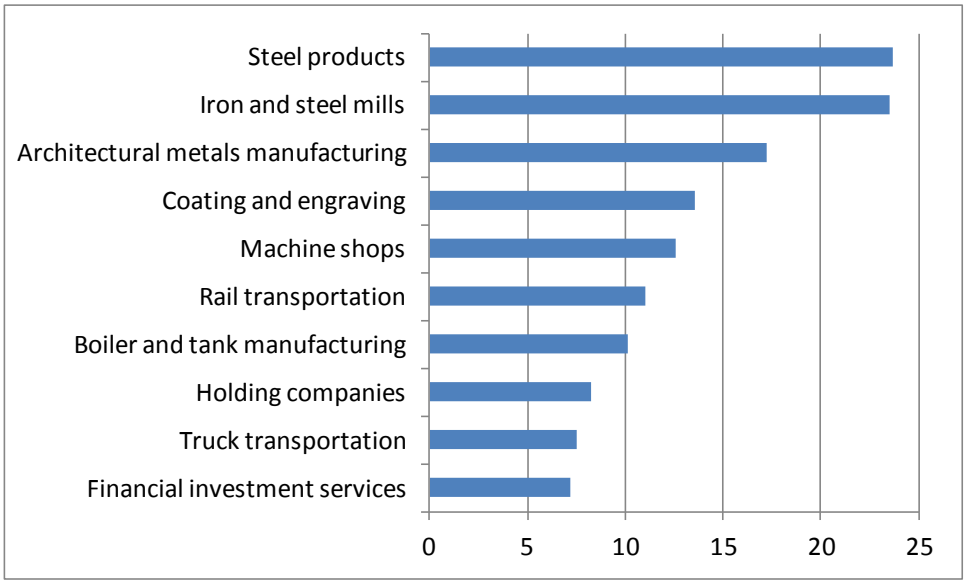


Source: The Conference Board of Canada.

2.2.2.4 Other Prairies

Beyond British Columbia, Alberta, and Ontario, the employment effects associated with the development of the TMEP become smaller. Manitoba and Saskatchewan combined will see 645 person-years of employment being supported by the Project, with the effects split evenly between the two provinces. As a result, the other Prairies region will account for 4.6 per cent of the supply chain effects. The key areas where the region stands out include manufacturing and transportation. We estimate that 53.9 per cent of the employment effects in Manitoba and Saskatchewan are found in the manufacturing sector. Key types of manufactured products include boilers and tanks, architectural metals and steel products. (See Chart 11.) In the I/O model results, a good portion of the pipe used to build the pipeline will be sourced from Saskatchewan.

Chart 11. Key Industries that Experience Outsized Effects in the Other Prairies Region (share of national supply chain employment effects for select industries, per cent)

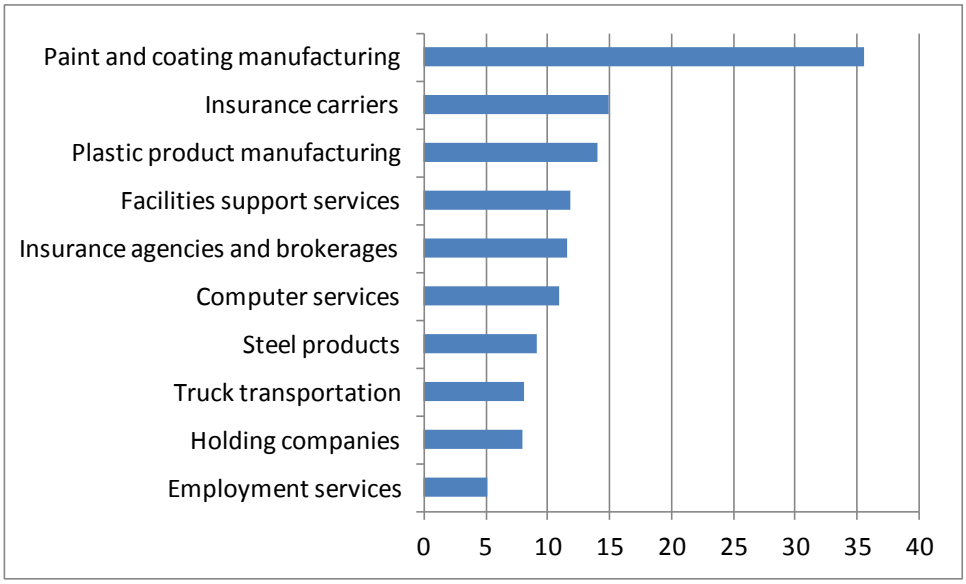


Source: The Conference Board of Canada.

2.2.2.5 Quebec

The employment impacts in Quebec are modestly smaller than those experienced in the other Prairies region. A total of 601 person-years of employment will be supported in Quebec as a result of the development of the TMEP, equivalent to 4.3 per cent of the total. Areas where the effects in Quebec stand out include manufacturing and transportation. In particular, truck transportation, manufacturing of paints and coatings, and computer services will all experience outsized effects. (See Chart 12.)

Chart 12. Key Industries that Experience Outsized Effects in Quebec
(share of national supply chain employment effects for select industries, per cent)

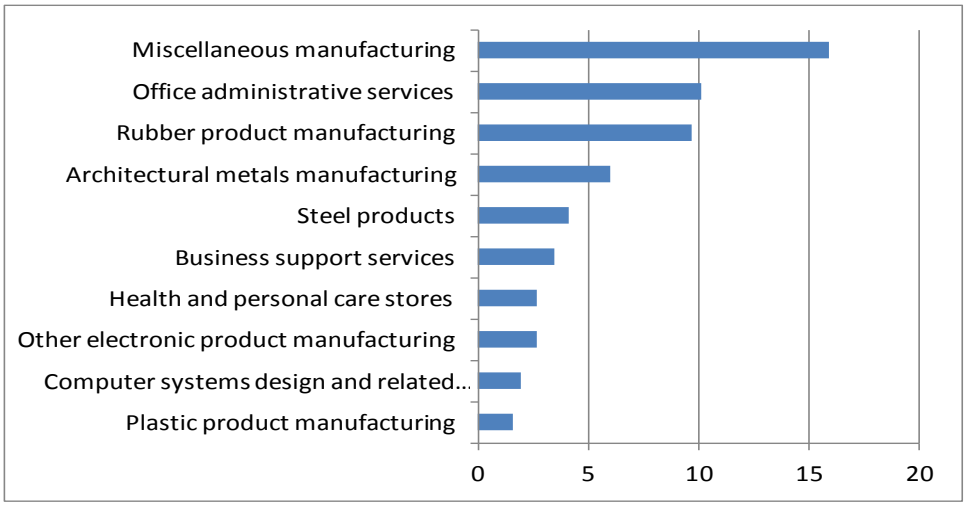


Source: The Conference Board of Canada.

2.2.2.6 Atlantic Canada

The Atlantic Provinces experience the smallest employment effects as a result of the development of the TMEP. Their smaller size and physical distance from where the TMEP will be built are both factors limiting the benefits they will experience. Only 142 person-years of employment will be supported in the region, equivalent to 1 per cent of the total impact. Most of those effects will occur in Nova Scotia and New Brunswick. The effects in any particular industry are generally quite small, but there are outsized effects in a few industries, such as architectural metals, office administrative services, and miscellaneous manufacturing. (See Chart 13.)

Chart 13. Key Industries that Experience Outsized Effects in Atlantic Canada
(share of national supply chain employment effects for select industries, per cent)



Source: The Conference Board of Canada.

2.3 Induced Effects

Additional benefits beyond those described above will arise as a result of the development of the TMEP. For example, the person-years of employment supported both directly and indirectly by development of the pipeline generates wages that, when spent, sustain additional employment across the country. This income effect is commonly referred to as "induced effects" in the economic literature.

Induced effects lead to additional impacts on GDP, employment, income, and tax revenues and they are felt across a wider range of industries relative to the supply-chain effects described above. And because the direct and indirect jobs created tend to be in high-wage industries, the spin-off effects are substantial. Indeed, the induced impacts associated with developing the TMEP are estimated to be slightly larger, in terms of both GDP and employment, than the indirect benefits.

In total, 15,780 person-years of induced employment would be supported by development of the pipeline – equivalent to 3,450 jobs for every $1 billion in inflation-adjusted investment. These employment impacts are widespread, with 10 different sectors experiencing an impact of at least 500 person-years of employment. When the induced employment impacts are added to the previously discussed direct and indirect employment effects, the development of the TMEP is expected to support 58,037 person-years of employment.

The induced GDP effects are also considerable. For every $1 in GDP directly created as a result of the Project, another $0.66 is supported by the income effects, in addition to $0.58 in supply-chain benefits. Thus, in aggregate, the GDP effects associated with the development of the Project are $4.9 billion ($2.2 billion directly, $1.3 billion indirectly, and $1.4 billion induced). This is equivalent to $1.06 of GDP for each dollar spent on the development of the TMEP.

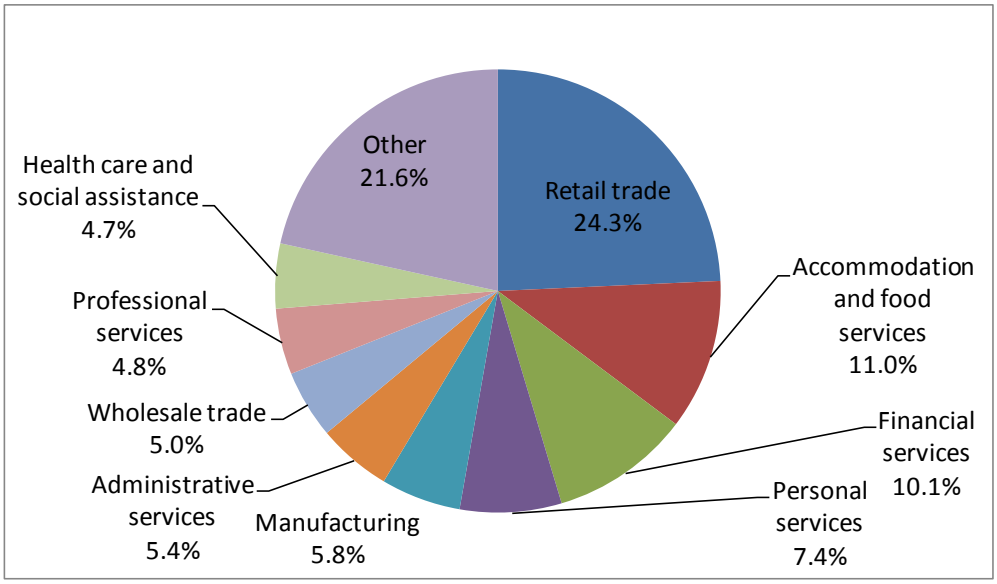
2.3.1 Induced Effects by Sector

The distribution of the induced employment effects across sectors is largely a reflection of how Canadian consumers spend their money. (See Chart 14.) For example, the largest impact is found in the retail sector, which accounts for 3,831 person-years of employment, or 24.3 per cent of the total. Specifically, the induced effects accruing to the retail sector would support 1,220 person-years of employment in food and beverage establishments, another 445 in clothing and accessories, and 328 in motor vehicles and parts sales. The benefits are extremely varied, with impacts apparent in everything from furniture and home furnishings, to home electronics and appliances, to sporting goods and hobbies.

Accommodations and food services is another consumer oriented sector that experiences sizeable benefits. A total of 1,729 person-years of employment, or11 per cent of the total employment effects occur in this sector. Other major sectors where sizeable employment impacts will occur include financial services (1,589 person-years of employment), personal services (1,168 person-years of employment), and manufacturing (918 person-years of employment). The impacts in the financial services sector reflect people's need for things like chequeing accounts and consumer financing. Personal services includes things like household services (such as maids, nannies, and gardeners), as well as activities like

motor vehicle repair, laundry services, and hair salons. Finally the impacts in manufacturing generally occur among makers of consumer goods, such as food and furniture.

Chart 14. The Induced Impacts Affect a Range of Consumer Oriented Sectors (share of induced employment effects by sector, per cent)



Source: The Conference Board of Canada.

2.3.2 Induced Effects by Region

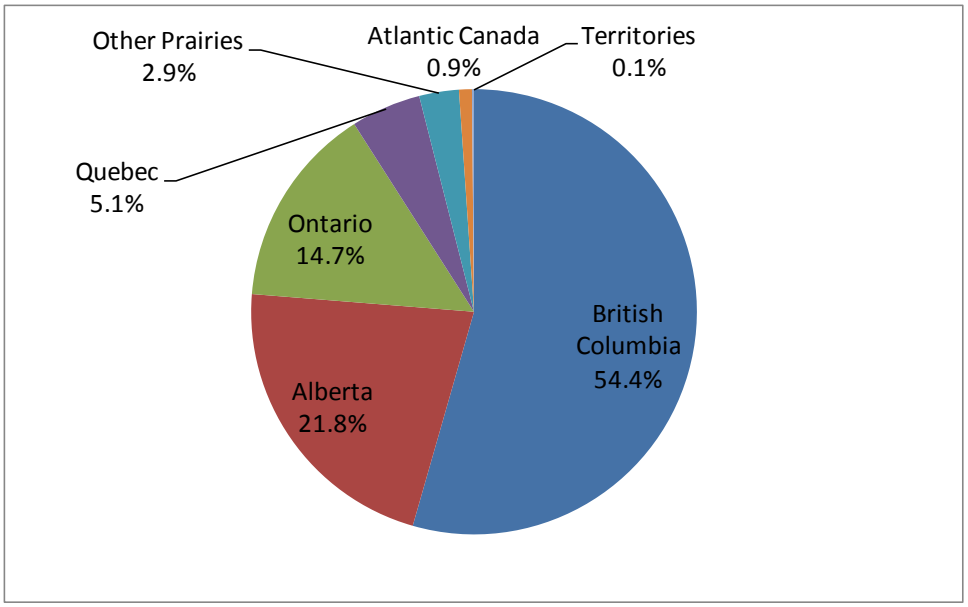
The regional distribution of the induced effects is fairly concentrated. Some 76 per cent of the total benefits accrue to either British Columbia (8,590 person-years) or Alberta (3,445 person-years). (See Chart 15.) This is not surprising. The majority of the direct and indirect jobs and labour income supported by the Project occur in those provinces, and the residents of those provinces who benefit from the Project will spend most of their income there. The induced impacts across the rest of the provinces largely reflects their shares of the direct and indirect effects.

The sectoral mix of the induced effects is similar across the different regions, since people tend to buy the same sorts of goods and services regardless of where they live. However, because the different regions of the country specialize in making different types of consumer products, there are some variations across the provinces. For example, although Ontario receives 14.7 per cent of the total induced employment effects on an aggregate basis, 24.2 per cent of the benefits in the financial services sector accrue there. Ontario also experiences an outsized share of the effects in the manufacturing sector.

Similarly, Manitoba and Saskatchewan combined can expect just 2.9 per cent of the total induced employment effects, but would garner 16.6 per cent of the agricultural impacts. Essentially the food that people buy as a result of the induced impacts needs to be grown somewhere, and the Prairies will supply some of that food. Quebec stands out in terms of its manufacturing sector. Quebec experiences

induced effects of 801 person-years of employment, 5 per cent of the total, but it experiences 15.3 per cent of the employment effects in the manufacturing sector.

Chart 15. The Induced Impacts Primarily Occur in British Columbia and Alberta (share of induced employment effects by sector, per cent)



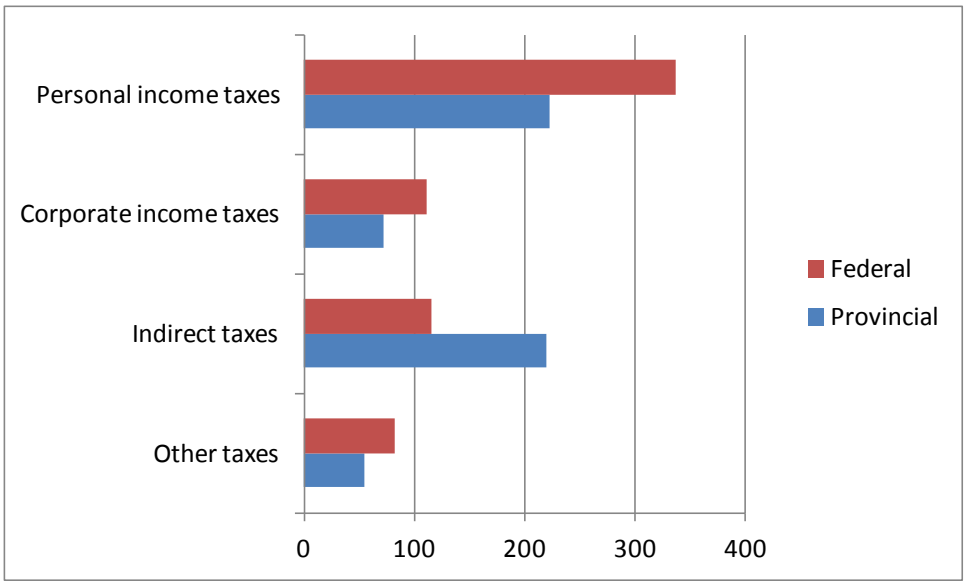
Source: The Conference Board of Canada.

2.4 Fiscal Effects

The direct, supply chain, and induced effects associated with the development of the TMEP also have positive fiscal implications at both the provincial and federal level. The three main types of government revenues that will be affected by the Project include personal income taxes, corporate income taxes, and indirect taxes (such as sales taxes and taxes on fuel). The analysis of the fiscal effects of the project was completed using The Conference Board of Canada's national and provincial forecasting models.

The $4.6 billion in spending associated with the development of the TMEP is expected to generate $1.2 billion in federal and provincial government revenues between 2012 and 2018. This is equivalent to $27 for every $100 of investment. With $3.3 billion in wages and salaries and $1.4 billion in corporate profits being generated by the development of the TMEP, the largest fiscal impacts are found in personal and corporate income taxes. (See Chart 16.)

Chart 16. Personal and Corporate Income Taxes Account for Most of the Fiscal Effects (tax revenues, millions of 2012$)



Source: The Conference Board of Canada.

2.4.1 Federal Impacts

The federal government will experience the largest impact, even larger than that of Alberta and British Columbia combined. In aggregate, the development of the TMEP is expected to generate $645.8 million in federal government revenues, or $14 for every $100 spent on the Project. This is equivalent to 0.3 per cent of total federal government revenues in 2012. Slightly more than half of this will come from higher personal income tax revenues. Other major sources include corporate income taxes (17.2 per cent) and goods and services tax (GST) inflows (14.4 per cent).

Another source of revenues is the $56.4 million generated from higher employment insurance premium receipts. With a total of 58,037 person-years of employment (including the combined direct, supply chain, and induced effects) supported by the development of the TMEP, additional employment insurance premiums will be generated. Since fewer people would be unemployed, government payments of employment insurance would also be reduced, providing an additional benefit not included here.

2.4.2 Provincial Impacts

In aggregate, the TMEP is expected to generate $568.6 million in provincial government revenues, or 12 cents for every dollar spent. This is equivalent to 0.2 per cent of total provincial revenues in 2012. At $222 million, personal income taxes will account for nearly half of the provincial fiscal effects. Indirect taxes (which include sales taxes) and corporate income taxes account for most of the rest of the effects, at $220 million and $73 million, respectively.

In terms of the breakdown by province the largest benefits would accrue to British Columbia, which would receive 54.4 per cent of the total, or $309 million. Alberta would receive most of the rest of the

provincial fiscal effects, at $168 million. Ontario ($57 million), Quebec ($17 million), Saskatchewan ($9 million), and Manitoba ($5 million) will experience much more modest fiscal effects. For the Atlantic provinces, the fiscal effects are very small.

If we assume that the federal government revenues would be spent rather than be used to reduce the deficit, the benefits would filter down to all of the provinces through transfers and other program expenditures. Since many of these expenditures are at least partially dependent on the population distribution across provinces, the impact of higher federal revenues will be higher for most provinces than the direct province-specific fiscal effects. For example, assuming a straight per capita distribution of federal revenues, Ontario would garner 39 per cent, or $250 million of the federal fiscal benefits, compared with a direct provincial fiscal impact of $57 million. The exceptions are British Columbia and Alberta, where the direct provincial impact is bigger than the estimated federal transfers.

2.5 Summary

The development of the TMEP is expected to result in $4.6 billion in investment spending, which will have positive economic and fiscal effects. For example, the combined direct, indirect, and induced employment effects will support 58,037 person-years of employment. (See Table 3.) As well, the combined GDP effects of the Project are $4.9 billion, equivalent to $1.06 dollars for every dollar of investment. Finally, this economic activity is expected to support $1.2 billion in federal and provincial government revenues. British Columbia is the largest beneficiary for all of these effects, but considerable effects are apparent in Alberta and Ontario as well. In the rest of the provinces the effects are smaller, but individual industries do experience notable effects in most regions.

Table 3. Summary of the Regional Impacts of Developing the TMEP (cumulative effects, 2012-2018)

	Atlantic Canada	Quebec	Ontario	Other Prairies	Alberta	British Columbia	Territories	Canada
Employment effects (person-years)	**289**	**1,402**	**4,659**	**1,099**	**14,632**	**35,864**	**92**	**58,037**
Direct	0	0	0	0	7,527	20,675	0	28,202
Indirect	142	601	2,340	645	3,660	6,599	69	14,055
Induced	147	801	2,319	454	3,445	8,590	23	15,780
GDP effects (millions of 2012$)	**21.7**	**120.1**	**408.6**	**98.5**	**1,402.4**	**2,789.1**	**11.2**	**4,851.7**
Direct	0.0	0.0	0.0	0.0	650.1	1,518.0	0.0	2,168.1
Indirect	10.8	52.7	207.7	61.4	394.0	514.8	9.0	1,250.5
Induced	10.9	67.4	200.9	37.1	358.3	756.3	2.2	1,433.0
Fiscal Impact (millions of 2012$)	**48.2**	**166.2**	**306.6**	**57.5**	**239.1**	**394.3**	**2.2**	**1,214.1**
Direct Provincial Revenues	4.4	17.1	56.5	14.1	167.5	308.7	0	568.3
Per Capita Share of Federal Revenues	43.8	149.1	250.1	43.4	71.6	85.6	2.2	645.8

Source: The Conference Board of Canada.

Chapter 3: Economic Impacts Associated With the Operation of the Trans Mountain Expansion

The nature of the oil pipeline industry dictates that the scale of the effects associated with the operational phase of the Project is very different than the construction phase. The pipeline industry is heavily capital intensive; the amount of capital stock per employee in the industry is 50 times the average for all sectors in Canada.[8] This means that a pipeline project involves large upfront costs during its development stage. Meanwhile, the subsequent operational stage generates much smaller employment effects in any given year. For example, the entire oil pipeline industry in Canada employed only 2,700 people in 2012 according to Statistics Canada's Labour Force Survey.

Although the direct employment effects for the oil pipeline industry are generally very small, it still generates considerable GDP effects. There are several factors that determine an industry's GDP, including the wages and salaries that it pays, the amount of depreciation it records on its assets, and the profits that it earns. In all three respects the oil pipeline industry is above average. As a result, the oil pipeline industry has a very high ratio of GDP per employee; at $783,703 per employee it is nearly nine times the average for all industries.[9]

As well, since pipelines are expected to have extended lives, the cumulative impact over the course of their lives can be significant. This chapter assesses the economic and fiscal impacts of the TMEP's operations over a 20-year time horizon. Although the expected life of the Project is much longer—the existing pipeline has been in operation for nearly 60 years—20 years covers the initial period for which Trans Mountain has firm contracts in place.

3.1 Direct Effects

The assessment of the employment and GDP effects of TMEP operations is based on the incremental revenues that the Project is expected to generate. There are 13 shippers that have entered into binding 15 and 20-year contracts to ship a total of about 708,000 b/d of oil through the pipeline once it is completed. This is equal to about 80 per cent of the pipeline's planned nominal capacity of 890,000 b/d.

Because the terms of these contracts are known, the associated revenues can be reasonably estimated. Annual revenues associated with these contracts were estimated by the Conference Board to be $944 million based on the projected capital costs of the Project and the toll structure that would be applied. This revenue estimate only includes the fixed component of the toll. The variable component is primarily based on the electricity costs associated with shipping through the pipeline and is passed directly through to shippers. As such, the variable component would not have an impact on the labour or material inputs that the pipeline would use, or on the profits that it generates, and is not included when estimating the economic effects.

[8] Based on data from Statistics Canada CANSIM table 031-0002 and the Labour Force Survey.
[9] Based on data from Statistics Canada CANSIM table 379-0031 and the Labour Force Survey.

The 20 per cent of the pipeline's expected capacity that is not committed to firm long-term contracts will be available on a spot or non-firm basis once the Project is operational. We consider the additional economic and fiscal effects of non-firm sales under a different scenario later in this chapter. First, we present an analysis of the effects for the capacity that is committed to long-term contracts. Since the terms of the contracts require shippers to pay for their capacity whether or not they use it, they have a strong incentive to make use of it. As such, the operational economic and fiscal impacts associated with the long-term contracts can be considered the minimum effects associated with operating the pipeline.

For the purposes of this analysis we assume that the full 708,000 b/d of capacity will be covered by long-term contracts over the 20-year period. A portion of the capacity committed to long term contracts has the potential to become available for non-firm sales after 15 years. However, we assume that the relevant contracts will be renewed for an additional five year period; this is an option available in the contracts. Otherwise, we expect that Trans Mountain would attempt to find other firm contract customers for that capacity, which would have the same effect.

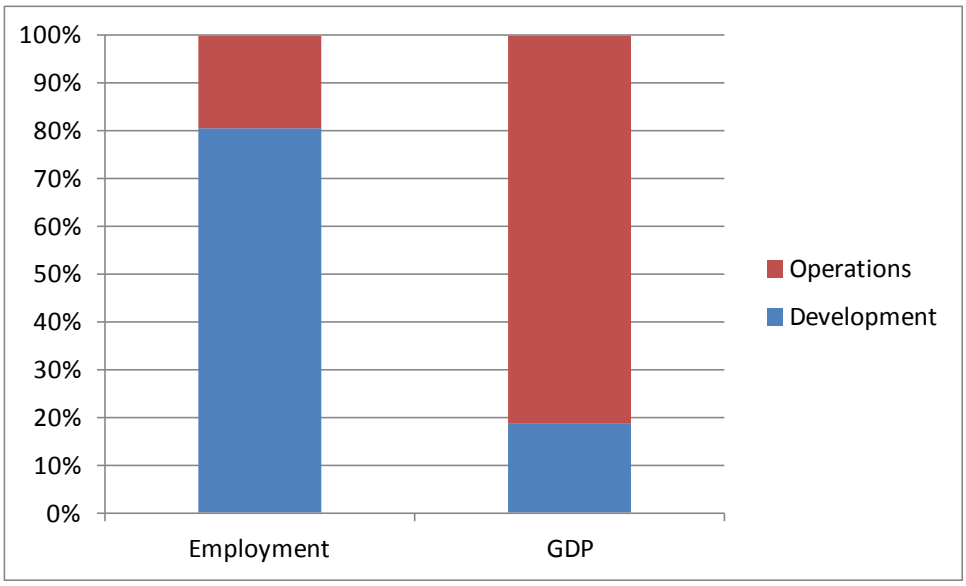
The other consideration when estimating the economic impacts of the pipeline's operations is that 300,000 b/d of capacity is already in place. The TMEP would expand this capacity to 890,000 b/d. However, even if the TMEP were not to proceed, the existing capacity would continue to operate. As such, we only consider the impact associated with the expanded operations rather than the existing pipeline. Information provided by Trans Mountain indicates that the revenues associated with the existing pipeline are approximately $300 million per year. Once this is removed from the revenues associated with the long-term contracts for the TMEP, the Project will generate a $644 million increase in annual revenues.

Based on annual revenue of $644 million, the TMEP will directly support 342 jobs per year, for a total of 6,841 person years of employment over the first 20 years of the pipelines operations. The majority of these positions will be found in British Columbia, which will account for 242 jobs per year or 71 per cent of the total, with the rest being located in Alberta. This reflects the location of pipeline related facilities, such as pumping stations and terminals, which will require employees to operate them.

In terms of GDP, the TMEP is expected to generate $469 million of GDP annually, or $9.4 billion over the first 20 years of its operations. The GDP results standout from the employment results in a couple of ways. First, Alberta's share of the direct GDP effects associated with pipeline operations is larger at 31.4 per cent, versus 29.3 per cent for employment. This reflects the fact that the average wages and salaries per employee in the oil pipeline industry in Alberta are higher than in British Columbia.

Secondly, the comparison of the GDP effects between the development and operational stages of the Project is very different than the employment effects. Operations will account for one-fifth of the employment effects, but 81 per cent of the total GDP effects associated with the development and operation of the project. (See Chart 17.) The reason why the GDP effects are so much larger is because the GDP per employee in the oil pipeline industry is so high. GDP per employee in the industry is very high because of the high levels of capital invested per employee, which results in high labour productivity.

Chart 17. The Direct Effects of Operations on GDP are Much Larger than for Employment (share of employment and GDP effects by project stage)



Source: The Conference Board of Canada.

3.2 Indirect Effects

As with the development phase, the TMEP will also generate indirect or supply chain effects once it is operational. An estimated 1,492 jobs will be supported by the pipeline in every year of operations. This is equivalent to 29,845 person-years of employment over the first 20 years of the Project's life. Thus, for every job created directly by the TMEP another 4.4 are supported indirectly. This is a high employment multiplier and it is largely a reflection of the small direct employment effects in the oil pipeline industry.

The opposite situation is apparent with the indirect GDP effects. The operation of the TMEP will support $136 million of indirect GDP annually, which is equivalent to only $0.29 for every dollar of direct GDP. This is a very low GDP multiplier and it reflects the high level of direct GDP that the oil pipeline industry generates.

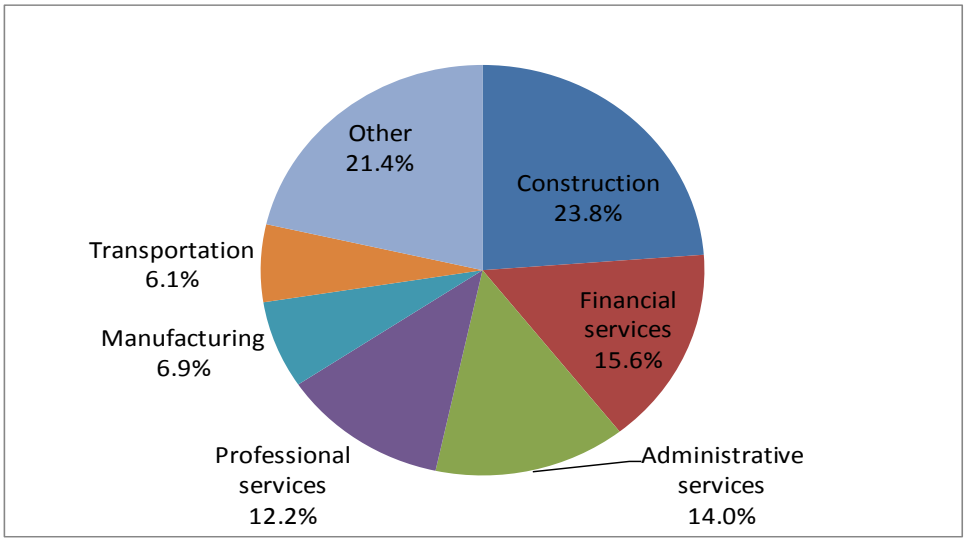
Although the number of indirect jobs supported by the operation of the TMEP is not particularly large in any given year, over the first 20 years of the pipeline's operations they actually exceed those supported by the development of the pipeline—29,845 person-years of employment versus 14,055. What is more, the indirect effects have a somewhat different industrial and regional mix. Regionally, the operational impacts are even more heavily focused in British Columbia., Sectors like construction and administrative services, which include activities like services to buildings and employment services, grow in importance.

3.2.1 Indirect Effects by Sector

The indirect employment effects that arise from pipeline operations are largely confined to six broad sectors. In order of size, they include construction, financial services, administrative services, professional services, manufacturing and transportation. Combined, these six sectors account for 79 per cent of the indirect employment effects. (See Chart 18.) The effects within some of these sectors are

similar to what was discussed as part of the development phase in Chapter 2, but in general the impacts on specific industries can be quite different for operations than for the development phase.

Chart 18. Key Sectors that Experience Supply Chain Effects from Operations (share of indirect employment effects from operations)



Source: The Conference Board of Canada.

Also notable is the importance of electricity as an input into the oil pipeline industry. Although it accounts for only 3.2 per cent of the supply chain employment effects, it accounts for 12.4 per cent of the indirect GDP effects. Like the pipeline industry, electricity generation is heavily capital intensive, which leads to it generating very large GDP effects, but limited employment effects. As such, although electricity is a major input into the oil pipeline industry, the employment impacts associated with this spending are small.

3.2.1.1 Construction

The TMEP is expected to support 355 indirect jobs annually in the construction sector once it is operational. The key reason for this will be ongoing maintenance and repairs. All of these jobs will be found in either British Columbia or Alberta, along the route of the proposed pipeline. The jobs will be heavily weighted towards British Columbia, which will account for 94 per cent of the total. The fact that more of the pipeline is located in British Columbia, there are more pump stations located there, and the more difficult terrain that the pipeline traverses in the province all contribute to this difference.

3.2.1.2 Financial Services

Since the financial services sector provides inputs into essentially every industry, it is a key component of the supply chains for many of them. However, with 232 jobs being indirectly supported in the financial services sector annually, it accounts for 15.6 per cent of the total employment effects associated with the operation of the TMEP. These impacts are concentrated among holding companies, investment services, banking, and insurance.

Regionally, the impacts in the financial services sector are more widely dispersed, with 29 per cent of the employment effects occurring outside of British Columbia and Alberta. Most of these effects occur in Ontario, particularly in the investment services and banking industries. These services tend to be more tradable and Ontario's well developed financial services sector means that businesses are more likely to make use of financial institutions that are located in that province.

3.2.1.3 Administrative Services

Administrative services businesses are primarily engaged in activities that support the day-to-day operations of other organizations. A total of 209 indirect jobs in the administrative services sector will be supported by TMEP operations each year. Key administrative industries that provide inputs into the oil pipeline industry include services to buildings (such as janitorial and pest control services), employment services, waste remediation, and security services.

Once again, the employment effects in the administrative services sector are concentrated in British Columbia (54.9 per cent), Alberta (21.8 per cent), and Ontario (17.3 per cent). The limited tradability of some services is a factor that restrains the impacts outside of British Columbia and Alberta. Most of the impacts in Ontario occur in the employment services industry, which has a higher degree of tradability.

3.2.1.4 Professional Services

A total of 182 professional service jobs are supported annually as a result of the supply chain effects associated with the operation of the TMEPs. However, the operating effects on the sector are very different than those associated with the development of the Project. Instead of the main effects occurring in the engineering industry, it is the computer services industry where the largest impacts occur, with 5.8 per cent of the total indirect employment effects occur in the computer services industry. Other industries within professional services that experience notable employment effects include engineering, accounting, and consulting.

Regionally, we see a similar pattern of the largest impacts occurring in British Columbia (41.2 per cent), Alberta (29.6 per cent), and Ontario (20.5 per cent). The impacts in the other provinces are very small, with Quebec accounting for nearly all of the remaining impact. Most of the professional services jobs that are supported outside of British Columbia and Alberta are computer services positions.

3.2.1.5 Manufacturing

The indirect impacts among the particular industries within the manufacturing sector associated with operations are similar to those for the development phase of the Project. Key manufactured inputs include architectural metals, boilers and tanks, and cement products. This reflects the need for ongoing maintenance and repairs on the pipeline's infrastructure over its useful life. However, the scale is smaller. Only 103 manufacturing jobs are expected to be supported annually by TMEP operations, equivalent to 2,020 person-years of employment over the first 20 years of operations. This is only about two-thirds of the manufacturing employment impacts that will occur during the development phase.

The diversity of the regional impacts within the manufacturing sector are also much less during the operating phase of the Project versus the development phase. British Columbia experiences the largest

impact (52 per cent), followed by Ontario (18.3 per cent), and then Alberta (14.8 per cent). The key reason for British Columbia accounting for a much higher share of the manufacturing effects during the operational phase is the change in the mix of manufactured inputs. For example, cement products, wood products and printing are all industries that experience a relative increase in their importance. Wood products produced in British Columbia are readily available, while the cement products and printing industries tend to be much more regionally focused than many other segments of the manufacturing sector.

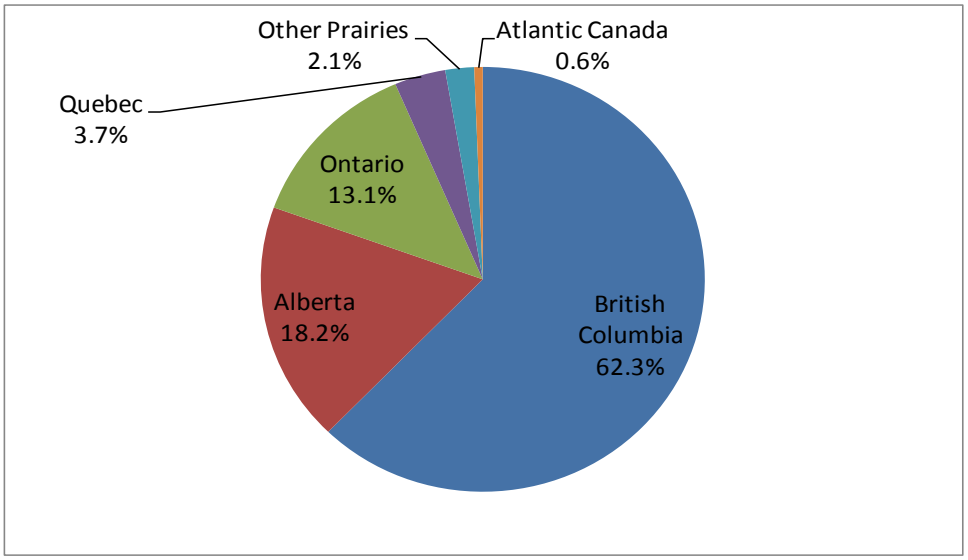
3.2.1.6 Transportation

The last major sector where considerable indirect employment effects occur as a result of TMEP operations is transportation, with 81 jobs being supported annually. Most of these jobs occur in the couriers and messengers, transportation support services, and trucking industries. The impact in the couriers and messengers industry reflects the standard day-to-day need for businesses to interact with other organizations. The impacts in the other transportation industries reflect the need to supply the TMEP with materials and supplies on an ongoing basis. The geographically dispersed nature of the pipeline also contributes to the need for transportation services. As well, the majority of the employment impacts occur in British Columbia, which accounts for 56 per cent of the total. Most of the remaining effects occur in Alberta (18.6 per cent) and Ontario (17.4 per cent).

3.2.2 Indirect Effects by Region

Nearly all of the indirect effects associated with operations of the TMEP occur in British Columbia, Alberta, or Ontario; only 6.5 per cent of the employment effects occur in other provinces. (See Chart 19.) The main reason for this is the importance of construction activity as an input into the oil pipeline industry, which by necessity is almost entirely conducted locally. Many of the other key inputs provided by sectors like administrative services and professional services require a local presence as well.

Chart 19. Supply Chain Employment Effects from Operations by Region (share of indirect employment effects from operations)



Source: The Conference Board of Canada.

3.2.2.1 British Columbia

British Columbia experiences the majority of the supply chain effects associated with the operation of the TMEP. A total of 932 jobs are expected to be supported annually in the province, equivalent to 18,641 person-years or 62 per cent of employment over the first 20 years of operations. This is more than double the supply chain impacts in British Columbia associated with developing the Project. Industries that experience notable supply chain effects in British Columbia include repair construction, services to buildings, holding companies, and electric power generation.

3.2.2.2 Alberta

Nearly 20 per cent of the employment supported by the supply chain effects associated with the operation of the TMEP occurs in Alberta. In total, 273 jobs will be supported in Alberta annually, equivalent to 5,460 person-years of employment over the first 20 years of operations. In comparison, the development of the TMEP will support 3,660 person-years of employment in Alberta. Industries that experience significant indirect effect in Alberta include computer services, holding companies, electric power generation, construction, and employment services.

3.2.2.3 Ontario

Ontario is the only other province to experience substantial supply chain effects as a result of TMEP operations, with 195 jobs being supported annually, or 3,895 person-years of employment over the first 20 years of operations. Again the indirect operational impacts in Ontario are actually larger than the development impacts. The largest impacts in Ontario include the computer and employment services industries. As well, several different types of financial services industries benefit including banking, investment services, and holding companies.

3.2.2.4 Other Regions

The indirect employment impacts associated with the operation of the TMEP are much more modest in the rest of the country. Across all of the other provinces the employment impacts total only 99 jobs annually, or 1,970 person-years of employment over 20 years. In some cases, such as Saskatchewan, the impacts of operations are actually less than those from the Project's development. This reflects the fact that a good portion of the pipe used to initially build the pipeline would be sourced in Saskatchewan according to the modelling results. The impacts are generally spread across a variety of industries, but the largest impacts in other regions occur in industries like computer services, investment services, and holding companies.

3.3 Induced Effects

As with the development phase of the Project, the wages earned in the direct and indirect jobs supported by TMEP operations will generate additional economic effects when they are spent. These induced effects add considerably to the total economic effects associated with TMEP operations. However, in the case of operations, the induced effects are smaller than the indirect effects. The opposite was true for the induced effects from the development phase.

The key reason for the difference is that the direct employment effects of operations are much smaller than for development. Even though the direct jobs in the oil pipeline industry are very high paying, there

are fewer of them. The end result is the labour income that results from direct and indirect employment during the operational phase is only $2.45 billion over 20 years of operations, versus $2.62 billion for the Project's development. Less labour income to spend results in smaller induced effects.

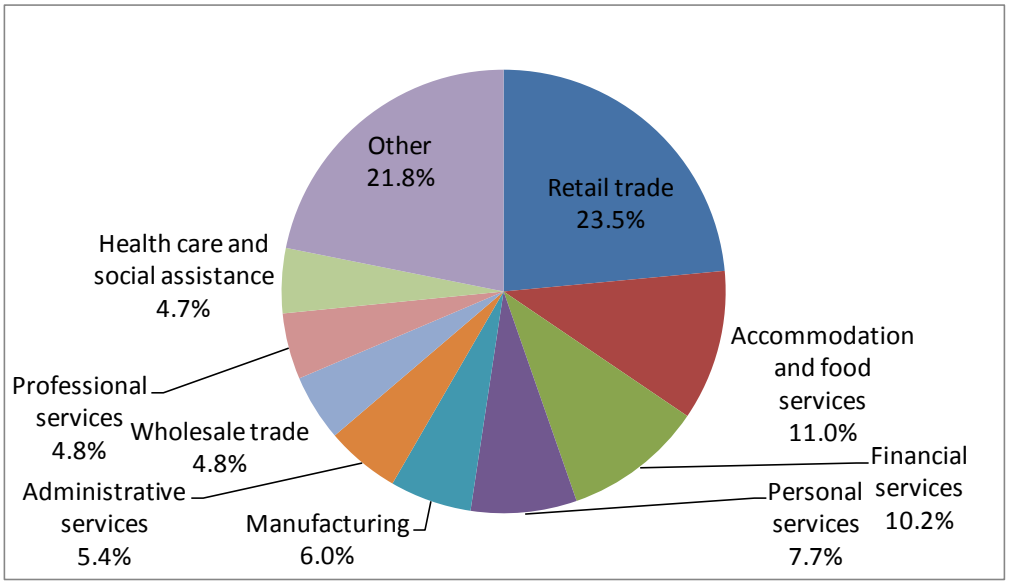
In total, 13,588 person-years of induced employment would be supported by pipeline operations over the first 20 years of operations, equivalent to 679 jobs per year. Thus, the combined direct, indirect, and induced employment impacts associated with pipeline operations will be 50,274 person-years over 20 years, or 2,514 jobs per year.

The induced GDP effects are also considerable. For every $1 in GDP directly created as a result of the pipeline's operations, another $0.13 is supported by the induced effects, compared to $0.29 in supply-chain benefits. This represents a total GDP effect of $13.3 billion over the first 20 years of operations. Thus the combined development and operational GDP effects associated with the TMEP are $18.2 billion.

3.3.1 Induced Effects by Sector

In terms of the industries where the induced impacts occur, the mix is very similar to those discussed in Chapter 2. The same group of consumer oriented sectors, including retail trade, accommodation and food services, financial services, and personal services account for most of the effects. (See Chart 20.) The pattern of induced effects reflects how people spend their money, and that generally is not dependent on how they earn that money. The modest differences in the sectoral induced effects between the operational and development phases of the Project are caused by the different regional mix for the direct and indirect effects. Essentially, people's consumption patterns vary only modestly across regions.

Chart 20. Induced Employment Effects from Operations by Sector
(share of induced employment effects from operations)

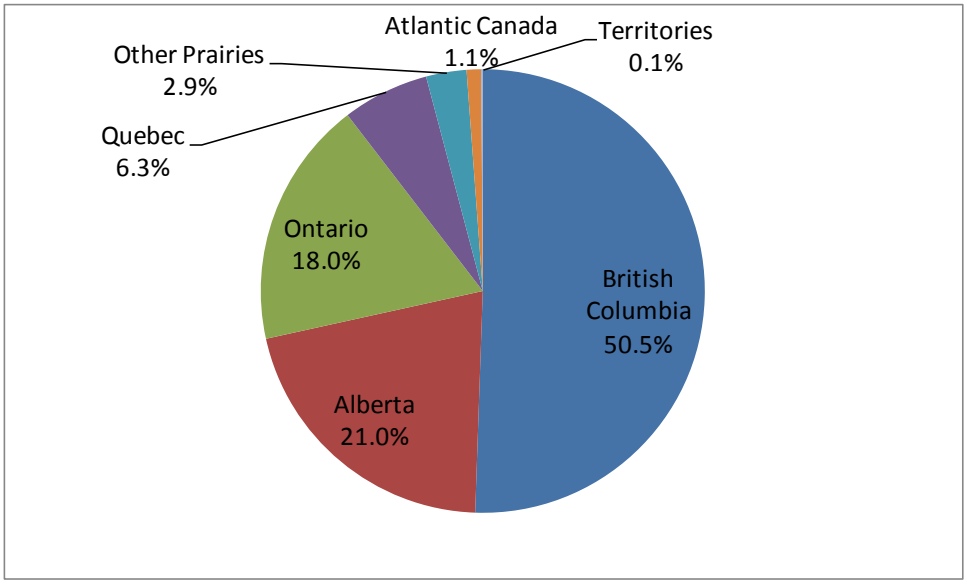


Source: The Conference Board of Canada.

3.3.2 Induced Effects by Region

The regional distribution of the induced effects is again similar to what occurs during the development phase of the Project. British Columbia (6,868 person-years) and Alberta (2,853 person-years) account for 72 per cent of the total effects. (See Chart 21.) However, since 87 per cent of the labour income generated by the direct and indirect effects is in those two provinces, this result is not surprising. The reason why the induced effects are more spread out geographically is because some of the things people buy in British Columbia and Alberta are sourced from other parts of the country.

Chart 21. Induced Employment Effects from Operations by Region
(share of induced employment effects from operations)



Source: The Conference Board of Canada.

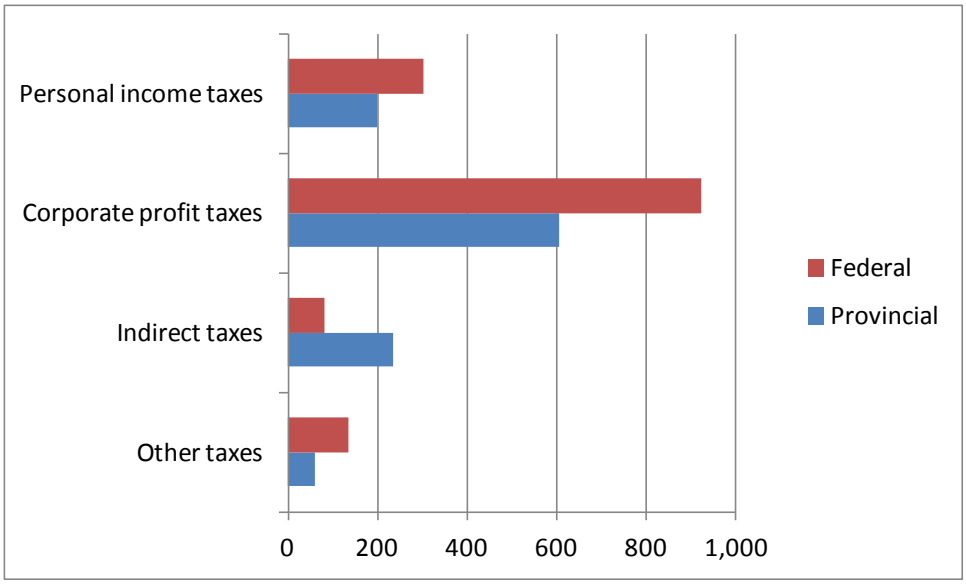
3.4 Fiscal Effects

The direct, supply chain, and induced effects associated with the operation of the TMEP also have fiscal implications at both the provincial and federal level. Over the first 20 years of its life, the TMEP is expected to generate $2.5 billion in federal and provincial government revenues. This is more than double the $1.2 billion in fiscal impacts associated with the development phase of the Project. The operational fiscal impacts are heavily weighted towards corporate income taxes, which account for 60 per cent of the combined provincial and federal fiscal impacts. (See Chart 22.) Personal income taxes and indirect taxes, such as sales taxes account for most of the remaining fiscal impacts.

The key reason for the large role of corporate taxes in the fiscal effects is the breakdown of the GDP effects for TMEP operations. As indicated previously, the oil pipeline industry generates a high level of GDP. Because of this, the direct GDP effects account for 70 per cent of the total operational GDP effects. At the same time, the oil pipeline industry is highly capital intensive, so most of the GDP generated by the industry comes in the form of depreciation of its assets and corporate profits. Since it is the income components of GDP, including corporate profits and labour income, that determine most of the fiscal

effects, the end result is that corporate profits in the oil pipeline industry are the key factor driving the results.

Chart 22. Corporate Income Taxes Account for Most of the Operations Related Fiscal Effects (tax revenues over 20 years of operations, millions of 2012$)



Source: The Conference Board of Canada.

3.4.1 Federal Impacts

The federal government will be the major beneficiary of the fiscal impact from TMEP operations, at $1.4 billion. This is equivalent to 0.6 per cent of federal government revenues in 2012. Corporate income taxes are the largest portion of this, at $925 million. This is followed by personal income taxes ($303 million) and indirect taxes ($83 million). Increased contributions to social security programs, such as employment insurance, are also significant, at $66 million.

Federal government revenues are equivalent to $11 for every $100 of GDP generated by the Project's operations. This is somewhat lower than the $13 of federal tax revenues for every $100 of GDP generated by the development phase of the Project. The key reason for this is the shift towards corporate profits as the main source of government revenue. The marginal tax rate on corporate profits is generally lower than the rate for personal income. As well, consumers pay sales taxes on the goods and services they buy, while businesses often get the sales taxes they pay refunded through input tax credits.

3.4.2 Provincial Impacts

In aggregate, the TMEP is expected to support $1.1 billion in provincial government revenues over the first 20 years of its life. This is equivalent to 0.3 per cent of total provincial revenues in 2012. At $607 million, corporate income taxes will account for the majority of the provincial fiscal effects. Indirect taxes (which include sales taxes) and personal income taxes account for most of the rest of the effects, at $237 million and $200 million, respectively.

In terms of the breakdown by province the largest benefits would accrue to British Columbia, which would receive 66 per cent of the total, or $727 million, which is equivalent to 1.7 per cent of British Columbia's 2012-13 revenues.[10] Alberta would receive most of the rest of the provincial fiscal effects, at $278 million, equivalent to 0.7 per cent of the province's 2012-13 revenues. Ontario ($60 million), Quebec ($18 million), Saskatchewan ($8 million), and Manitoba ($5 million) will experience much more modest fiscal effects. For the Atlantic provinces, the fiscal effects are very small. However, if we redistribute the federal fiscal effects across the provinces on a per capita basis, then all of the provinces will experience a larger effect. (See Table 4.)

Table 4. Summary of Fiscal Effects from TMEP Operations
(tax revenues over 20 years of operations, millions of 2012$)

	Direct Provincial Revenues	Per Capita Share of Federal Revenues	Total
British Columbia	727.0	191.8	918.8
Alberta	277.5	160.3	437.8
Ontario	59.9	560.2	620.1
Quebec	18.1	334.0	352.1
Other Prairies	13.8	97.3	111.0
Atlantic Canada	5.9	98.1	104.0
Territories	0.0	4.7	4.7
Total	**1,102.1**	**1,446.4**	**2,548.6**

Source: The Conference Board of Canada.

3.5 The Economic Effects of Non-Firm Transactions

All of the impacts discussed thus far in this chapter are based only on the transportation of volumes that are linked to long-term contracts. These can be considered the minimum economic and fiscal effects associated with the TMEP. There will be about 180,000 b/d of nominal capacity available for non-firm or spot transactions, and the degree to which this capacity is used will determine the amount of additional economic impacts. There are two key considerations concerning the effects of the non-firm capacity. The first is the toll that will be applied to any non-firm transactions. The second is the volumes that will be transported.

The tolls for non-firm capacity will be higher than for product shipped under the terms of long-term contracts. The non-firm toll will be based on a 10 per cent premium to the 15-year firm toll. However, those shippers who signed 20-year contracts receive a 10 per cent discount from the 15-year rate, and large volume shippers (those who contracted for 75,000 b/d or more) receive an additional 7.5 per cent discount.[11]

[10] Government of British Columbia. *June Update: Budget and Fiscal Plan 2013/14-2015/16.*
[11] Transmountain Pipeline. *TMEP Toll Application.*

Based on information provided by Trans Mountain,[12] the average fixed toll that will be applied under long-term contracts was estimated by the Conference Board of Canada to be $3.66, assuming no change in the capital costs associated with the Project. For non-firm shippers, the estimated toll is $4.59. The higher toll on non-firm capacity results in higher revenues on a per barrel basis up to 85 per cent capacity utilization of the TMEP. However, once capacity utilization exceeds 85 per cent, under the revenue sharing provisions of the contracts any additional revenues will be split on a 50/50 basis between shippers and Trans Mountain through reductions in the variable toll.[13] As such, the additional revenues to Trans Mountain from non-firm shipments depend on capacity utilization rates.

If we assume that the available non-firm capacity on the TMEP system is fully utilized over its first 20 years of operations, the calculated economic and fiscal effects based on that assumption represent the maximum potential impact associated with the Project. The reality is likely to fall somewhere in between the minimum and the maximum.

We can use the previously discussed modelling results for TMEP operations to determine the expected economic and fiscal impacts associated with the non-firm transactions. One of the benefits of using an I/O model is that its results are scalable. Since the model is based on a snapshot in time, the relative effects are fixed. Thus, higher revenues from non-firm volumes will result in a proportionate increase in the supply chain and induced effects, while the mix of regions and industries will be unaffected.

Based on an average toll rate of $4.59 per barrel, a non-firm capacity of approximately 180,000 b/d, and revenue sharing on capacity used above 85 per cent, we estimate the maximum annual revenues associated with non-firm capacity to be $191 million. This increases the total annual incremental revenues associated with TMEP operations to $835 million, a 30 per cent increase over the revenue estimated for the fixed contracts alone. Thus, the economic and fiscal impacts in the “maximum” scenario can be expected to be 30 per cent higher than in the “minimum” scenario.

Table 5 provides a summary of the minimum and maximum effects of TMEP pipeline operations over its first 20 years. In the maximum scenario, the combined direct, indirect, and induced employment effects increase from 50,723 to 65,184 person-years. As well, the GDP impacts rise from a cumulative total of $13.3 billion to $17.3 billion. Finally, the combined federal and provincial fiscal impact rises from $2.5 billion to $3.3 billion.

[12] The weighted average 2018 contract toll was determined by dividing initial year contract revenue by total contract volume.

[13] Transmountain Pipeline. *TMEP Toll Application.*

Table 5. Summary of the Regional Impacts of TMEP Operations (cumulative effects, 2018-2037)

	Atlantic Canada	Quebec	Ontario	Other Prairies	Alberta	British Columbia	Territories	Canada
	MINIMUM EFFECTS (LONG-TERM CONTRACTS)							
Employment effects (person-years)	**327**	**1,970**	**6,345**	**1,025**	**10,293**	**30,269**	**43**	**50,273**
Direct	0	0	0	0	2,005	4,836	0	6,841
Indirect	184	1,113	3,895	625	5,435	18,565	28	29,845
Induced	143	857	2,450	400	2,853	6,868	15	13,588
GDP effects (millions of 2012$)	**24.3**	**165.6**	**542.9**	**87.0**	**3,958.1**	**8,540.2**	**4.5**	**13,322.5**
Direct	0.0	0.0	0.0	0.0	2,947.9	6,427.8	0.0	9,375.7
Indirect	13.7	94.8	330.4	54.3	711.7	1,505.6	3.0	2,713.4
Induced	10.6	70.9	212.5	32.7	298.5	606.8	1.5	1,233.4
Fiscal Impact (millions of 2012$)	**104**	**352.1**	**620.1**	**111.1**	**437.8**	**918.8**	**4.7**	**2,548.6**
Direct Provincial Revenues	5.9	18.1	59.9	13.8	277.5	727.0	0	1,102.2
Per Capita Share of Federal Revenues	98.1	334.0	560.2	97.3	160.3	191.8	4.7	1,446.4
	MAXIMUM EFFECTS (INCLUDING SPOT VOLUMES)							
Employment effects (person-years)	**425**	**2,555**	**8,226**	**1,330**	**13,346**	**39,246**	**56**	**65,184**
Direct	0	0	0	0	2,600	6,270	0	8,870
Indirect	239	1,443	5,050	810	7,047	24,071	36	38,696
Induced	186	1,112	3,177	519	3,699	8,905	20	17,618
GDP effects (millions of 2012$)	**31.5**	**214.8**	**703.9**	**112.8**	**5,131.9**	**11,073.0**	**6.4**	**17,274.3**
Direct	0.0	0.0	0.0	0.0	3,822.2	8,334.2	0.0	12,156.4
Indirect	17.8	122.9	428.4	70.4	922.7	1,952.1	4.3	3,518.5
Induced	13.7	91.9	275.5	42.4	387.0	786.8	2.1	1,599.4
Fiscal Impact (millions of 2012$)	**134.8**	**456.5**	**804.0**	**144.1**	**567.6**	**1,191.3**	**6.7**	**3,305.1**
Direct Provincial Revenues	7.6	23.5	77.7	17.9	359.8	942.6	0.0	1,429.1
Per Capita Share of Federal Revenues	127.2	433.1	726.3	126.2	207.8	248.7	6.7	1,876.0

Source: The Conference Board of Canada.

3.6 Summary

Both the development and operational phases of the TMEP will generate economic and fiscal benefits. In general, the economic and fiscal effects associated with operating the pipeline will exceed those experienced during the construction phase of the Project, although the operational effects will be spread over a longer period of time. At a minimum, both phases of the Project are expected to support 108,310 person-years of employment and $3.8 billion in fiscal effects between 2012 and 2037. (See Table 6.) If the available non-firm capacity on the TMEP is fully utilized these effects increase to 123,221 person-years of employment and fiscal effects of $4.5 billion.

This chapter and the previous one discussed the economic and fiscal impacts associated with building and operating the TMEP. However, the pipeline is also expected to reduce the discounts on Canadian heavy oil that have been experienced in recent years. The higher received prices for producers, or "netbacks," will have additional fiscal implications for Canada. The next chapter discusses those impacts.

Table 6. Summary of the Regional Impacts of TMEP Development and Operations (cumulative effects, 2012-2037)

	Atlantic Canada	Quebec	Ontario	Other Prairies	Alberta	British Columbia	Territories	Canada
	MINIMUM EFFECTS (LONG-TERM CONTRACTS)							
Employment effects (person-years)	**617**	**3,372**	**11,004**	**2,124**	**24,926**	**66,132**	**135**	**108,310**
Direct	0	0	0	0	9,532	25,511	0	35,043
Indirect	326	1,714	6,235	1,270	9,095	25,164	97	43,900
Induced	291	1,659	4,769	855	6,298	15,458	38	29,368
GDP effects (millions of 2012$)	**46.0**	**285.8**	**951.5**	**185.5**	**5,360.5**	**11,329.2**	**15.7**	**18,174.2**
Direct	0.0	0.0	0.0	0.0	3,598.0	7,945.8	0.0	11,543.8
Indirect	24.5	147.5	538.1	115.7	1,105.7	2,020.3	12.0	3,963.9
Induced	21.5	138.2	413.4	69.8	656.8	1,363.1	3.7	2,666.4
Fiscal Impact (millions of 2012$)	**152.2**	**518.3**	**926.7**	**168.6**	**676.9**	**1,313.1**	**6.9**	**3,762.7**
Direct Provincial Revenues	10.3	35.2	116.4	27.9	445	1,035.7	0	1,670.5
Per Capita Share of Federal Revenues	141.9	483.1	810.3	140.7	231.9	277.4	6.9	2,092.2
	MAXIMUM EFFECTS (INCLUDING SPOT VOLUMES)							
Employment effects (person-years)	**714**	**3,957**	**12,886**	**2,429**	**27,978**	**75,110**	**148**	**123,221**
Direct	0	0	0	0	10,127	26,945	0	37,072
Indirect	381	2,044	7,390	1,455	10,707	30,670	105	52,751
Induced	333	1,913	5,496	973	7,144	17,495	43	33,398
GDP effects (millions of 2012$)	**53.2**	**334.9**	**1,112.5**	**211.3**	**6,534.4**	**13,862.1**	**17.6**	**22,126.0**
Direct	0.0	0.0	0.0	0.0	4,472.3	9,852.2	0.0	14,324.5
Indirect	28.6	175.6	636.1	131.8	1,316.7	2,466.8	13.3	4,769.1
Induced	24.6	159.3	476.4	79.5	745.3	1,543.1	4.3	3,032.4
Fiscal Impact (millions of 2012$)	**183.0**	**622.7**	**1110.6**	**201.6**	**806.7**	**1,585.6**	**8.9**	**4,519.2**
Direct Provincial Revenues	12.0	40.6	134.2	32.0	527.3	1,251.3	0.0	1,997.4
Per Capita Share of Federal Revenues	171.0	582.2	976.4	169.6	279.4	334.3	8.9	2,521.8

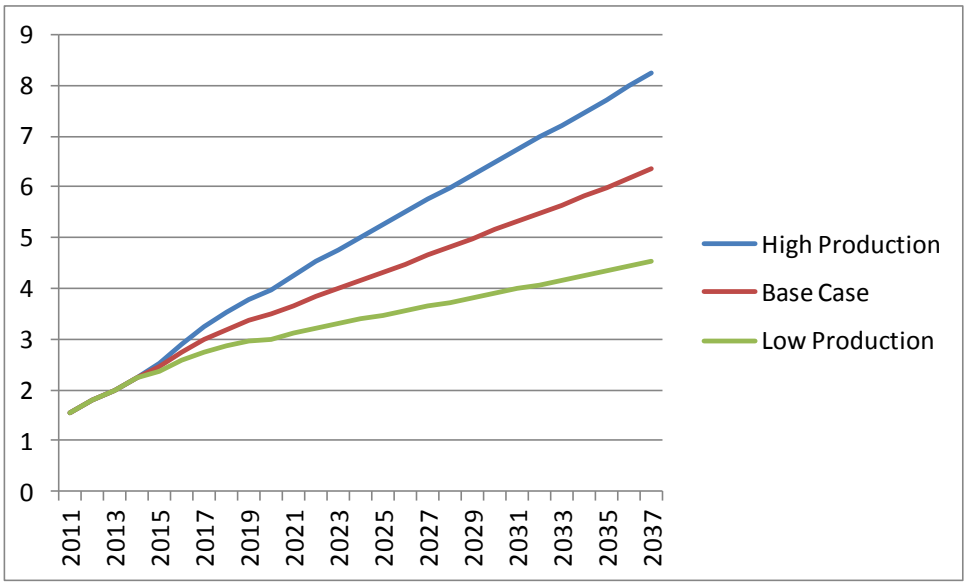
Source: The Conference Board of Canada.

Chapter 4: The Fiscal Impacts of Higher Netbacks for Canadian Oil Producers

In addition to the economic and fiscal impacts outlined in the previous two chapters, there are other implications associated with the development of the TMEP. One of these is the potential for Canadian oil producers to obtain a higher price for their product. The IHS Global Canada Ltd. (IHS) study concludes that the TMEP will help to alleviate the discounting of Canadian crude experienced in recent years and will contribute to higher prices received or "netbacks" for Canadian producers.[14]

IHS developed three different production cases for Western Canadian oil production.[15] (See Chart 23.) In all three cases, it is assumed that the Keystone XL pipeline will be built in 2015. In addition, IHS models the price impact of TMEP, Energy East, and Northern Gateway all being completed in 2017/2018 versus a world where they are not built. In every case, the construction of these pipelines results in higher netbacks for all producers of heavy oil (both conventional and diluted bitumen) in Western Canada.

Chart 23. Western Canadian Oil Production Could Take Different Paths
(Western Canadian heavy oil supply, millions of barrels per day)



Source: IHS.

These higher netbacks would lead to higher revenues, and in turn higher profits, which would have real economic consequences, such as increased dividend payments or business investment. As well, there will be fiscal implications in terms of higher royalties and corporate income taxes paid to federal and provincial governments. It is important to note that these benefits will arise regardless of whether or not oil production or investment increases beyond what is currently expected – higher prices alone are

[14] Kelly, Steve. *Trans Mountain Expansion Direct Evidence.*
[15] Kelly, Steve. *Trans Mountain Expansion Direct Evidence.*

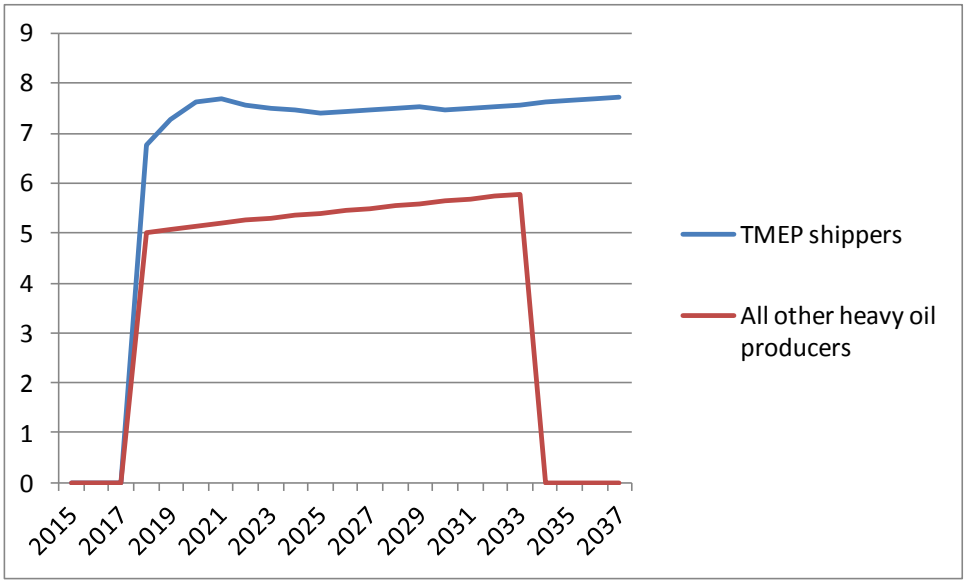
enough to drive positive economic impacts for the Canadian economy. In this study we do not consider the economic effects associated with how producers may make use of higher netbacks. Instead, the rest of this chapter discusses the industry revenue and fiscal implications of higher netbacks associated with pipeline capacity additions in each of the cases.

4.1 The Base Case

In the IHS base case, significant volumes of heavy oil are projected to begin flowing through the TMEP, Energy East, and Northern Gateway pipelines in late 2017. The resulting alleviation of the oversupply situation at Cushing leads to an increase in netbacks for all conventional heavy oil and oil sands producers operating in Western Canada, not just those producers that ship via the TMEP. This situation will persist until 2034, when IHS expects an oversupply situation at Cushing to resume.[16]

According to IHS, shippers of heavy oil on the TMEP will receive additional netback benefits from the market access provided by the TMEP, beyond the general industry benefits expected for all heavy oil producers. Heavy oil shippers on the TMEP that sell into California Asian markets are expected to garner higher prices for their products. This will mean a higher netback of about $7-8 per barrel versus the $5-6 per barrel that other heavy oil producers will experience.[17] (See Chart 24.) As well, this benefit will persist beyond 2033.

Chart 24. Estimated Higher Netbacks for Oil Producers as a Result of Increased Pipeline Capacity (price premium attributable to pipeline additions, US$ per barrel, 2012$)



Source: IHS.

[16] Kelly, Steve. *Trans Mountain Expansion Direct Evidence.*

[17] In the IHS study, these benefits would be realized on volumes shipped to Asia and priced against Middle East crude imported into the region. The benefits for TMEP shippers are based on half of the TMEP firm commitments (equal to 707,500 B/D ÷ 2 = 353,750 B/D) being priced in China rather than in the U.S. Gulf Coast for the period 2018 to 2037.

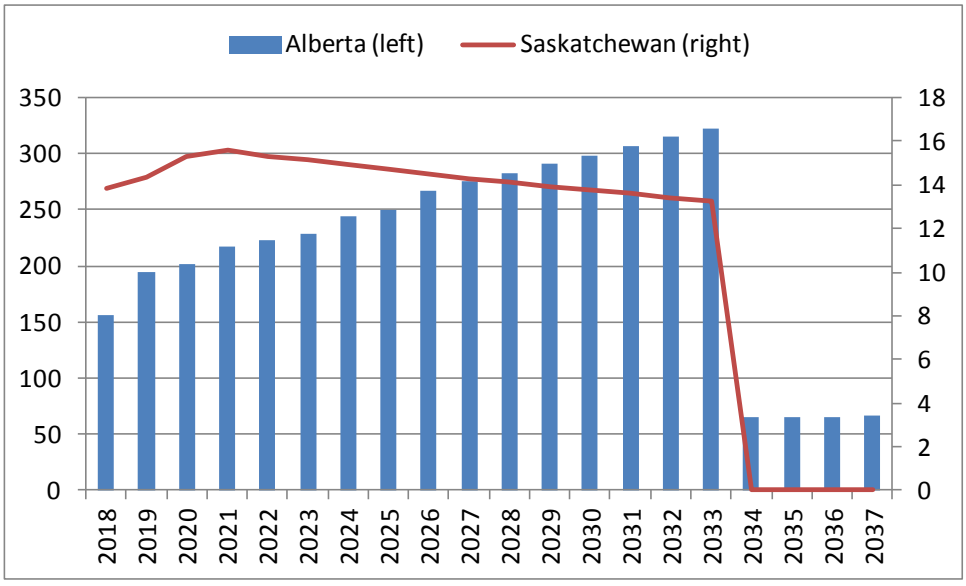
However, not all of the benefits experienced by heavy oil and bitumen producers are attributable to the market access provided by the TMEP. The results are dependent on all three planned pipelines being completed in the 2017/2018 timeframe. As such, IHS attributes 26.6 per cent (equivalent to TMEP's share of the combined assumed capacity additions) of the general industry benefits to TMEP. Thus, TMEP is expected to increase producer revenues by $45.4 billion over the first 20 years of its operations, with $37 billion being attributable to general industry benefits and an additional $8 billion being attributable to TMEP enabling heavy oil shipments to Asia.

4.1.1 Fiscal Impacts: Royalties

Because the TMEP would increase the netbacks for producers without any attendant increase in producers' operating costs, both revenues and profits would be expected to rise by $45.4 billion. This will have implications for the royalties and corporate income taxes that oil producers pay. In the case of royalties, we estimate that Alberta and Saskatchewan will experience a combined increase in royalties of $4.6 billion over the first 20 years of pipeline operations.

At $4.3 billion, Alberta will garner most of these royalty benefits, reflecting the fact that the province accounts for most of the heavy oil production in Western Canada. This corresponds to an annual average of $217 million, which for comparison purposes, is equivalent to about 4 per cent of all oil royalty payments in Alberta in fiscal year 2012-13.[18] However, the benefits will be highest during the 2018-2033 period, when every barrel of diluted bitumen and conventional heavy oil receives a higher price. (See Chart 25.)

Chart 25. Higher Netbacks Will Increase Royalty Collections
(provincial royalty collections due to higher netbacks, millions of 2012$)



Source: The Conference Board of Canada.

[18] Government of Alberta. *Budget 2013: Fiscal Plan Tables.*

Saskatchewan will also see higher royalty payments, although the gains will be commensurately lower in line with the province's lower production levels. Over the period 2018 through 2033, we estimate that the province would collect an additional $230 million in royalty payments as a result of higher netbacks from the TMEP. However, since we do not expect any Saskatchewan oil to actually move through the TMEP, Saskatchewan producers will not experience any benefits after 2033.

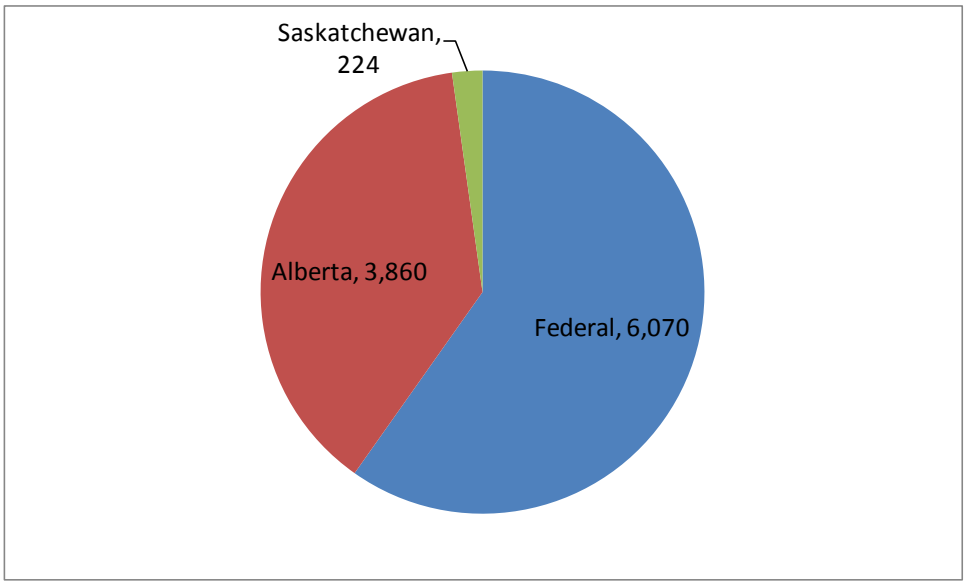
4.1.2 Fiscal Impacts: Income Taxes

Higher profits for oil producers as a result of higher netbacks will also generate significant corporate income tax effects at both the federal and provincial level. Income taxes are applied after royalties are deducted, but the direct link between higher prices and higher profits means that the provincial and federal tax rates are being applied to a sizeable increase in profits. We expect the corporate tax effects to be even larger than the royalty impacts, at $10.2 billion between 2018 and 2037.

Again, as the largest producer, Alberta will garner a sizeable share of this total figure, at $3.9 billion over the same period. Saskatchewan will also benefit, but the fiscal impact will be much smaller at $224 million over the same period. The fact that Saskatchewan heavy oil production is only about one-tenth that of Alberta's and that the ratio is shrinking is one factor. As well, Saskatchewan only garners benefits between 2018 and 2033, when all Canadian heavy oil producers are expected to benefit from higher prices as a result of the TMEP.

As the sole producers of heavy oil and diluted bitumen in Canada, Alberta and Saskatchewan derive all of the benefit from higher provincial tax revenues. But the entire country will also benefit from higher federal corporate income tax collections, which are projected to be larger than those that accrue to Alberta and Saskatchewan combined. (See Chart 26.) Between 2018 and 2037 federal corporate income tax collections are expected to be $6.1 billion higher as a result of the higher netbacks that result from the TMEP. Since federal revenues tend to be distributed back to the provinces on a per capita basis, this will generate significant benefits for all of Canada's regions.

Chart 26. Higher Netbacks Will Result in Sizeable Corporate Income Tax Benefits
(corporate income tax effects due to higher netbacks, millions of 2012$, 2018-2037)



Source: The Conference Board of Canada.

Thus, in the base case, the cumulative fiscal benefits of the TMEP are considerable. Canada as a whole derives an additional $14.7 billion in fiscal revenues between 2018 and 2037. Alberta captures the largest share of this benefit. The combined royalty and provincial corporate income tax effects in the province total $8.2 billion over a 20-year period, or $410 million per year, which is equivalent to 1.1 per cent of provincial revenues in fiscal year 2012-13.[19] But the benefits are not confined to Alberta. Saskatchewan directly garners $454 million of the total fiscal effects between 2018 and 2037, while the rest will be spread across the provinces as part of federal disbursements.

4.2 The Low Production Case

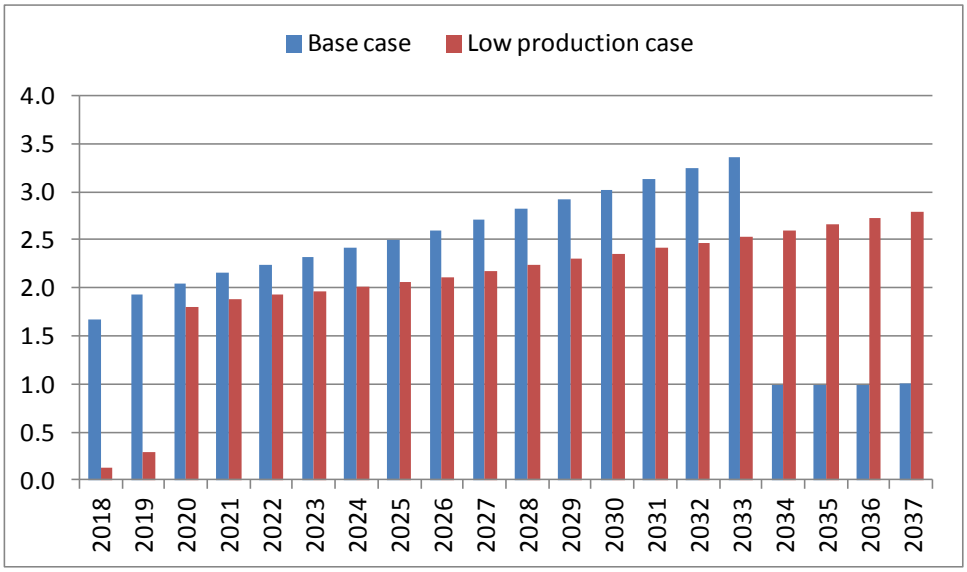
The IHS low production scenario assumes bitumen production is lower than in the base case, but conventional heavy production remains unchanged. In terms of higher netbacks, the key difference between the base case and the low production case is how long it takes for the available supply of oil to again exceed the existing pipeline capacity. In the base case this occurred in 2034, but this is not expected to happen before the end of the forecast period in the low production case. Also of note in the low production case is that the benefit of higher netbacks for non-TMEP shippers does not start until 2020.

In any given year before 2034, the total royalties and corporate income tax collections associated with heavy oil production will be lower in the low production case. Less production leads to lower revenues and profits, and thus lower royalties and corporate income tax collections. However, since the higher netback effects of the TMEP persist for a longer period of time in the low production scenario, IHS estimates oil industry revenues attributable to TMEP to be $41.9 billion. (See Chart 27.) This is only modestly lower than in the base case.

Chart 27. Higher Netbacks Due to TMEP Will Contribute to Higher Oil Producer Revenues

[19] Government of Alberta. *Budget 2013: Fiscal Plan Tables.*

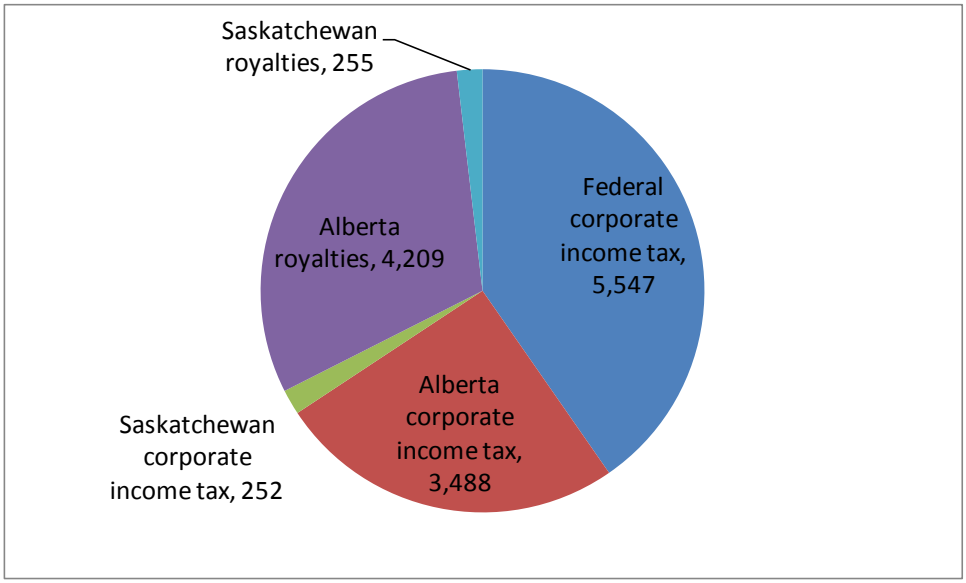
(increase in oil producer revenues attributable to TMEP, billions of 2012$)



Source: IHS.

In total, government revenues are expected to be $13.8 billion higher between 2018 and 2037 as a consequence of the higher netbacks that result from TMEP. Corporate income taxes will again account for the largest share of this total at $9.3 billion. (See Chart 28.) The federal government will experience the largest share of corporate income tax collections (59.7 per cent), followed by Alberta (37.6 per cent), and Saskatchewan (2.7 per cent).

Chart 28. Federal Corporate Income Taxes Experience the Highest Fiscal Impact
(fiscal impacts due to higher netbacks, millions of 2012$, 2018-2037)



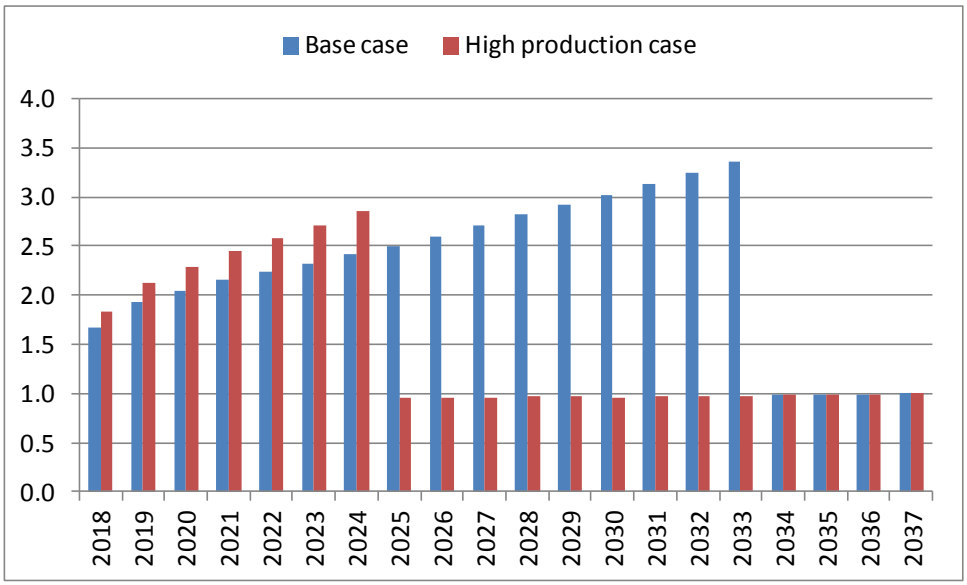
Source: The Conference Board of Canada.

Alberta's royalty collections will be $4.2 billion higher as a result of the higher netbacks over the TMEP's first 20 years of operations. Saskatchewan also benefits from the higher netbacks on conventional heavy oil. Over the same period, its royalty collections are expected to be $255 million higher. Unlike the base case, because the benefits for non-TMEP shippers will persist through the end of the forecast period, Saskatchewan will experience benefits through to 2037.

4.3 The High Production Case

In the IHS high production scenario bitumen production is expected to expand more quickly than in the base case, but conventional heavy production remains unchanged. In terms of higher netbacks, again the key difference in IHS's analysis is how long it takes before the available supply of oil exceeds the existing pipeline capacity. In the base case this occurred in 2034, but in the high production case this occurs much sooner, in 2025. As a result, IHS estimates that total oil producer revenues from higher netbacks attributable to TMEP between 2018 and 2037 as a result higher netbacks to be only $29.7 billion. Thus, the fiscal benefits associated with higher netbacks are the lowest in this scenario. (See Chart 29.)

Chart 29. Higher Netbacks Due to TMEP Will Contribute to Higher Oil Producer Revenues (increase in oil producer revenues attributable to TMEP, billions of 2012$)

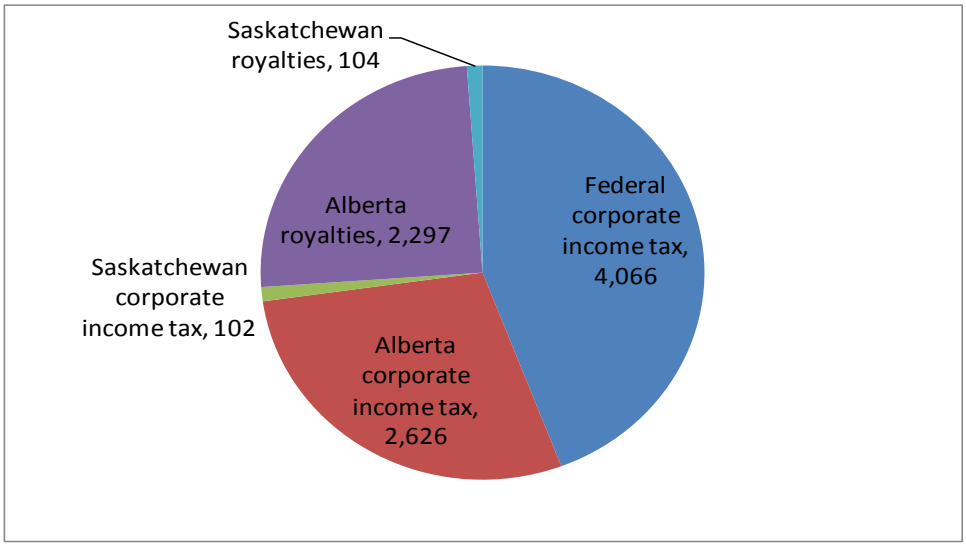


Source: IHS.

Nevertheless, the fiscal benefits are still significant in this case. In total, government revenues are expected to be $9.2 billion higher between 2018 and 2037 as a result of the higher netbacks that the market access provided by the TMEP will generate. Corporate income tax collections will account for $6.8 billion of this figure, with the federal government garnering the largest share at $4.1 billion, followed by Alberta ($2.6 billion) and Saskatchewan ($102 million). (See Chart 30.) Royalty payments

account for the rest of the fiscal effects from higher netbacks, with Alberta's royalties being $2.3 billion higher and Saskatchewan's being $104 million higher.

Chart 30. Summary of the Fiscal Impact in the High Production Case
(fiscal impacts due to higher netbacks, millions of 2012$, 2018-2037)



Source: The Conference Board of Canada.

4.4 Summary

The construction and operation of the TMEP and other pipelines is expected to result in higher netbacks to Canadian oil producers. One result of these higher netbacks is higher royalty and corporate income tax payments in the provinces of Saskatchewan and Alberta, as well as at the federal level. In the base case we expect these fiscal benefits to total $14.7 billion over the first 20 years of the pipeline's operations. (See Table 7.) This figure ranges between $9.2 billion in the high production case and $13.8 billion in the low production case.

Table 7. Summary of the Fiscal Impacts of Higher Netbacks
(cumulative effects, 2018-2037)

	Atlantic Canada	Quebec	Ontario	Other Prairies	Alberta	British Columbia	Territories	Canada
	Base Case							
Total Impact (millions of 2012$)	**411.8**	**1,401.8**	**2,351.0**	**861.9**	**8,868.9**	**804.9**	**19.7**	**14,720.0**
Provincial Corporate Income Tax	0.0	0.0	0.0	223.8	3,860.2	0.0	0.0	4,084.0
Per Capita Share of Federal Corporate Income Tax	411.8	1,401.8	2,351.0	408.2	672.7	804.9	19.7	6,070.0
Royalties	0.0	0.0	0.0	230.0	4,336.0	0.0	0.0	4,566.0
	Low Production Case							
Total Impact (millions of 2012$)	**376.4**	**1,281.1**	**2,148.5**	**880.5**	**8,311.6**	**735.5**	**18.0**	**13,751.7**
Provincial Corporate Income Tax	0.0	0.0	0.0	252.5	3,487.8	0.0	0.0	3,740.3
Per Capita Share of Federal Corporate Income Tax	376.4	1,281.1	2,148.5	373.0	614.8	735.5	18.0	5,547.3
Royalties	0.0	0.0	0.0	255.0	4,209.0	0.0	0.0	4,464.0
	High Production Case							
Total Impact (millions of 2012$)	**275.8**	**938.8**	**1,574.6**	**478.9**	**5,373.3**	**539.1**	**13.2**	**9,193.8**
Provincial Corporate Income Tax	0.0	0.0	0.0	101.6	2,625.7	0.0	0.0	2,727.3
Per Capita Share of Federal Corporate Income Tax	275.8	938.8	1,574.6	273.4	450.6	539.1	13.2	4,065.5
Royalties	0.0	0.0	0.0	104.0	2,297.0	0.0	0.0	2,401.0

Source: The Conference Board of Canada.

Chapter 5: Conclusion

Canadian benchmark oil prices have lagged considerably behind their global peers in recent years. Ultimately this means that Canada is not getting the full fiscal and economic benefits associated with exploiting its non-renewable oil resources. In response, there has been growing interest in developing new oil transportation infrastructure in North America. There are currently four major pipeline projects under consideration that would move oil away from Western Canada if completed, including the TMEP.

If approved, the TMEP will generate economic and fiscal benefits. These benefits will occur in three key areas. The first is during the development stage of the Project, when the pipeline is being developed and built. The second comes during the operational period of the Project, with economic impacts associated with running and maintaining the pipeline. The last comes from the expectation that the TMEP will lead to higher netbacks for producers of heavy oil in Western Canada. All three of these effects will generate economic and fiscal impacts.

Development phase—Including the direct, supply chain, and induced effects, the spending during the development phase of the Project will support 58,037 person-years of employment, and $1.2 billion in federal ($646 million) and provincial ($568 million) government revenues. As the sites where the pipeline will be built, British Columbia and Alberta will account for the majority of these impacts. However, other provinces, and in particular Ontario, will benefit through supply chain effects and the redistribution of federal government revenues to the regions.

Operational phase—We estimate the operational impacts of the pipeline over its first 20 years of service under two scenarios, a minimum scenario based on the existing long-term contracts, and a maximum scenario based on the non-firm capacity in the pipeline being fully utilized. At a minimum, we expect pipeline operations to support 50,273 person-years of employment, and this figure rises to 65,184 if the non-firm capacity is fully utilized. In terms of fiscal effects, pipeline operations are expected to support between $2.5 and $3.3 billion in combined federal and provincial revenues, considerably above those from the development phase. British Columbia and Alberta enjoy the lion's share of these benefits; however, other provinces do benefit through supply chain effects and the redistribution of federal government revenues to the regions.

Higher netbacks—We estimate the fiscal impacts of higher netbacks under the three different cases developed by IHS. In the base case we expect these fiscal benefits to total $14.7 billion over the first 20 years of the pipeline's operations. The federal corporate income tax effects account for the largest share of these effects at $6.1 billion. The combined royalty and corporate income tax effect for Alberta is $8.2 billion, and for Saskatchewan it is $454 million. The cumulative fiscal effect ranges between $9.2 billion in the high production case and $13.8 billion in the low production case.

Table 8 summarizes the economic and fiscal impacts associated the TMEP using the minimum operating impacts and the base case for assessing the impact of higher netbacks. Between 2012 and 2037, the

Project is expected to generate 108,310 person-years of employment. As well, the Project will produce $18.5 billion of fiscal benefits over the same period.

Table 8. Summary of the Economic and Fiscal Impacts of the TMEP (cumulative effects, 2012-2037)

	Atlantic Canada	Quebec	Ontario	Other Prairies	Alberta	British Columbia	Territories	Canada
	Using Minimum Operational Effects and the Base Case for Higher Netbacks							
Employment effects (person-years)	**617**	**3,372**	**11,004**	**2,124**	**24,926**	**66,132**	**135**	**108,310**
Project development	289	1,402	4,659	1,099	14,632	35,864	92	58,037
Project operations	327	1,970	6,345	1,025	10,293	30,269	43	50,273
GDP effects (millions of 2012$)	**46.0**	**285.8**	**951.5**	**185.5**	**5,360.5**	**11,329.2**	**15.7**	**18,174.2**
Project development	21.7	120.1	408.6	98.5	1,402.4	2,789.1	11.2	4,851.7
Project operations	24.3	165.6	542.9	87.0	3,958.1	8,540.2	4.5	13,322.5
Fiscal Impact (millions of 2012$)	**564.0**	**1,920.1**	**3,277.7**	**1,030.5**	**9,545.8**	**2,118.0**	**26.6**	**18,482.7**
Project development	48.2	166.2	306.6	57.5	239.1	394.3	2.2	1,214.1
Project operations	104.0	352.1	620.1	111.1	437.8	918.8	4.7	2,548.6
Higher netbacks	411.8	1,401.8	2,351.0	861.9	8,868.9	804.9	19.7	14,720.0

Source: The Conference Board of Canada.

Appendix A: Resume and Professional Qualifications of Glen Hodgson

Employment History

The Conference Board of Canada

Senior Vice-President and Chief Economist – November 2006 to present
Vice-President and Chief Economist – September 2004-November 2006

- Member of executive team.
- Lead a management group of seven directors and forty staff.
- Responsible for economic forecasting of the Canadian, provincial, metropolitan, U.S. and international economies, and for numerous economic analysis contracts annually.
- Also responsible for international development projects delivered for clients.
- Lead spokesman for the Conference Board via presentations, articles and media.

Export Development Canada (EDC)

Vice-President and Deputy Chief Economist – October 2001 to September 2004

- Co-led a group of approx. 55 staff (with six team leaders) analyzing and forecasting major global and Canadian economic trends and assessing economic, political, environmental and other international business risks.
- A lead spokesman for EDC via presentations, articles and media.

Vice-President, Policy and International Relations – 2000-2001
Director, Government and International Relations – 1998-2000
Director, Government Relations and Corporate Policy – 1994-1998

- Reporting to the President, directed a policy staff that grew progressively to eighteen.
- Responsible for many facets of EDC's business strategy and policy, and related domestic and international legislation and regulation.
- Managed the corporation's relationship with its stakeholders in Canada and internationally.

Department of Finance, Government of Canada

Senior Chief, International Finance and Development Division -- 1993-1994

- Co-directed a group of twenty responsible for the Canadian Government's international financial priorities and interests (G-7 financial issues, export credits, debt rescheduling, foreign aid policy, multilateral financial institutions, etc.)
- Provided Budget advice on national defense, foreign aid and international finance.

Departmental Secretary, Deputy Minister's Office -- 1991-92

- Acted as Executive Assistant to the Deputy while directing a staff of 12.
- Helped to manage the Department's relationship with the Minister of Finance, his staff and with other departments and agencies
- Coordinated multiple Federal Budgets; developed the Department's Corporate Plan.

Chief, International Development Finance -- 1988-91

- Directed a group of seven responsible for: Canada's membership in the IMF, World Bank, EBRD and the other regional development banks; foreign aid budgetary and policy issues; and export financing issues.

Economist, International Programs Division -- 1982-84

- Responsible for country risk analysis, debt rescheduling, export and development financing.

International Monetary Fund

Advisor/Assistant to the Executive Director for Canada, Ireland and the Caribbean on the Board of Directors -- 1984-88

- Advisor to the Canadian Executive Director on IMF lending, policy and administration.
- Represented the Executive Director in IMF Board discussions and on country missions.

Education

Ph.D. Candidate in Economics (ABD), McGill University, 1981

M.A. in Economics, McGill University, 1981

B.A. (Honours), University of Manitoba, 1978

Publications – Over 200 publications; full list available separately upon request.

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Appendix C: Input/Output Models

Input/output (I/O) models are economic models that describe how goods and services flow through an economy. There are two key elements in an I/O model, geography and commodities. Commodities represent particular goods or services, and the I/O model encompasses information regarding which industries produce these commodities and how they are used; either as inputs into other industries, consumed domestically, or exported. The geography element tracks where production takes place, and how different commodities are traded across provincial and international boundaries.

One of the uses for I/O models is to calculate the economic impacts associated with different types of economic activity. Because the model describes how the supply chains work, we are able to "shock" the I/O model and observe how the impact feeds through the economy. "Shocks" are inputs into the model and can take different forms. For example, the effects of the TMEP's operations in this report are measured using a "gross output" or revenue shock. Essentially we increase the revenues of the oil pipeline industry by a certain amount and observe the results. The shock associated with the development of the TMEP was implemented in a different way. We increased the demand for different types of commodities that will be used in the project, such as pipe, tanks, and construction labour.

The I/O model used in this analysis is produced and maintained by Statistics Canada. Statistics Canada updates the I/O tables used by the model annually as parts of the Canadian System of National Accounts (CSNA). The CSNA is a system of integrated statistical accounts consisting of four main components: input-output accounts (national and provincial), income and expenditure accounts (national and provincial), balance of payments and the financial and wealth accounts. The I/O tables cover all economic activities conducted in the market economies of each province and territory, encompassing persons, businesses, government and non-governmental (non-profit) organizations, and entities outside its jurisdiction that give rise to imports or exports (inter-provincially or internationally).

To compile the I/O accounts, Statistics Canada obtains source data from all relevant surveys as well as administrative sources such as tax records, professional and industry organizations, and non-government institutions every year for each province and territory. In the process of preparing statistical estimates, data from various sources are confronted, analysed by subject-matter experts and used to compile estimates that are consistent with all other estimates in the System and provide a valid and coherent statistical picture of the subject matter. Consistency is a key feature of the statistics produced by the Accounts.

The result is that Statistics Canada's I/O model is the most comprehensive description of how economic activity flows through the Canadian economy. The model describes the flows for more than 700 different commodities and 300 different industries across all provinces and territories. The model solutions include both "open" results, which summarize the direct and indirect impacts of a shock, and "closed" results, which summarize the combined direct, indirect, and induced impacts. Key outputs from the model that can be used to describe the results of a shock include employment, GDP, labour income,

gross output, and international trade. The results described here used Statistics Canada's 2009 I/O model, the most current available at the time of the analysis.

Key Assumptions

Although I/O models can be useful tools for understanding the economic impacts associated with particular projects, it is also important to understand that a number of assumptions are embedded in the results. The following section discusses some of these major assumptions.

Fixed Production Patterns

The tables that underlay the I/O model are based on the supply chain relationship in the Canadian economy at a fixed point in time; in this particular case 2009. As such, the model results do not factor in how things like changes in relative prices for different inputs, productivity, and technology can impact supply chains over time. As well, trade flows do not take into account external factors, such as changes in exchange rates, the emergence of new trading partners, or changes in trade policy.

This assumption is also pertinent in the discussion of the induced effects. The model assumes fixed consumption and savings patterns for consumers over time. In reality, spending and saving patterns are influenced by a variety of factors including economic circumstances and demographics. As a result, the farther you look forward in time using an I/O model the less likely it is that the model accurately describes future economic activity.

Lack of Supply Constraints

Another key assumption embedded in the I/O results is that there are no supply constraints on the economy. This means that the model results assume that all of the inputs needed to conduct the shock are readily available, and that the modelled project will not be competing with others for resources. In reality, if a project is of significant size it may lead to higher prices and/or wages as the new project will draws resources away from other activities.

This is particularly pertinent in the discussion of the induced effects. The induced effects assume that the people employed as a result of the direct and indirect effects would otherwise be unemployed, but at least some of them would likely find other employment, though their pay may be less. Thus, including the induced effects likely overstates the total economic effects; however, not including them would definitely understand the total economic effects.

Industry Homogeneity

I/O models typically assume that all firms within an industry are characterized by a common production process. In practical terms, the model reflects an industry average, thus Trans Mountain's operations and business practices are assumed to be the same as other oil pipeline operators such as Enbridge or TransCanada. If Trans Mountain's production structure is significantly different from the industry average than the economic impact results may be different from what is characterized here.

Industry homogeneity also assumes a constant return to scale for all businesses in an industry; in other words the model assumes a linear relationship between inputs and outputs. In practice, many industries experience at least some economies of scale, which means there is an optimal scale at which businesses should operate. Thus, in the model each extra dollar of revenue or investment is assumed to result in the same relative increase in economic activity. In reality, that may not be strictly true.

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