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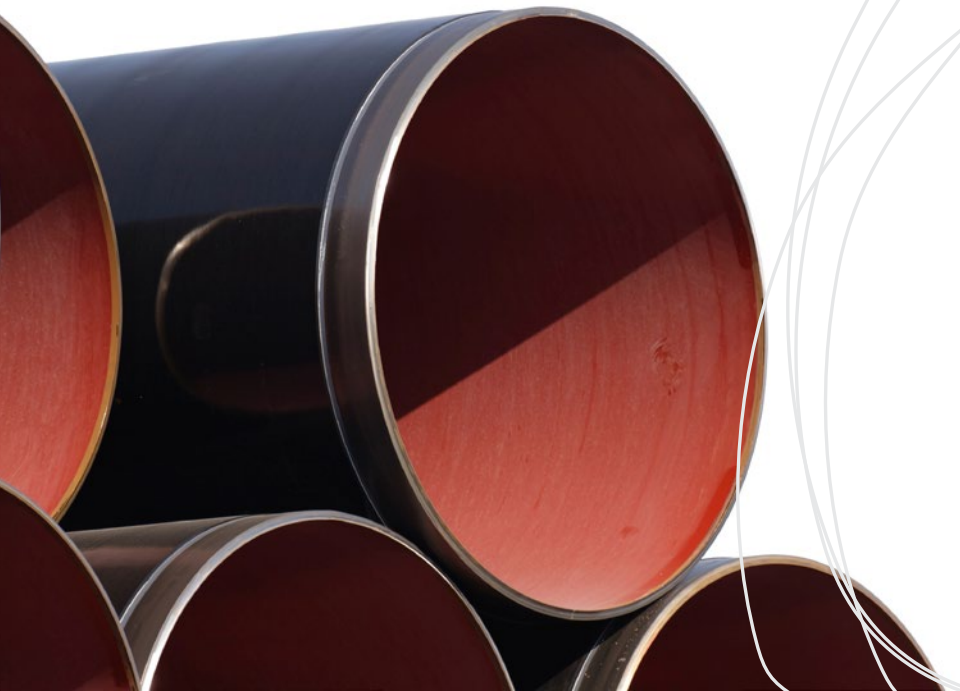
SEEKING TIDEWATER

Understanding the Economic Impacts of the Trans Mountain Expansion Project.



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Seeking Tidewater: Understanding the Economic Impacts of the Trans Mountain Expansion Project

Michael Burt and Todd Crawford

Preface

In recent years, Canadian benchmark oil prices have lagged behind those of their global peers, due to stagnant North American demand, rising North American production, and an oil transportation infrastructure connected primarily to the American Midwest. In response, there are four major pipeline projects under consideration that, if completed, would carry oil away from Western Canada. One of these—the Trans Mountain Expansion Project—would nearly triple the capacity of the existing pipeline from Edmonton, Alberta, to Burnaby, British Columbia. This report assesses the economic and government revenue impacts associated with the proposed expansion of the Trans Mountain pipeline.

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EXECUTIVE SUMMARY

Seeking Tidewater: Understanding the Economic Impacts of the Trans Mountain Expansion Project

At a Glance

- Discounts on Canadian oil prices versus international benchmarks are a symptom of the capacity constraints on Canada's oil transportation infrastructure and the need to add to that capacity.
- This report assesses three aspects of the economic impacts of the proposed Trans Mountain Expansion Project: the impacts of construction, operations, and higher prices for oil producers once the pipeline is operational.
- Combined, these impacts would generate 108,310 person-years of employment and a cumulative $18.5 billion in government revenues between 2012 and 2037.
- The largest job impacts would occur in British Columbia, while the largest fiscal impacts would occur in Alberta. However, all provinces would experience some impacts.

Oil is a global commodity, with a well-established transportation infrastructure. Global benchmark prices are therefore 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 those of our global peers. A combination of factors has contributed to this outcome: stagnant North American demand, rising North American production, and an oil transportation infrastructure that is largely confined to exporting Canadian production to the American Midwest. 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, if completed, would carry oil away from Western Canada. One of these—the Trans Mountain Expansion Project (TMEP, or the Project)—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 government revenue impacts associated with the proposed expansion of the Trans Mountain pipeline. We do this in three ways:

- by assessing the impacts associated with the initial investments required to build the pipeline and related infrastructure;
- by assessing the impacts associated with operating the pipeline once it is up and running;

- by 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 the 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. Adjusting for price increases, that is equivalent to $4.9 billion in 2012 dollars. Parts of the Project, such as planning and regulatory filings, have already begun; however, the bulk of the spending is expected to occur in 2016 and 2017, when construction activity peaks. For the purposes of our analysis, we exclude the financing costs; thus, we assess the economic impacts of $4.6 billion of expenditures in 2012 dollars.[2]

This spending would generate 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 would support 58,037 person-years of employment, with nearly half of those effects being direct, and the rest being indirect or induced. Most of the employment effects would occur in British Columbia (61.8 per cent) and Alberta (25.2 per cent), reflecting the location of the pipeline build. However, Ontario (8 per cent), Quebec (2.4 per cent), and the other Prairie provinces (1.9 per cent) would also experience job gains.

1 The Trans Mountain Expansion Application to the National Energy Board 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 Marine Terminal bid premiums, which do not reduce the total expenditures of the Project for the purposes of this report.

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

The Project-related economic activity would also support government revenue or fiscal effects at both the federal and provincial levels. We expect that development of the TMEP would generate a total of $1.2 billion in federal ($646 million) and provincial ($568 million) government revenues—equivalent to $27 for every $100 of investment. The largest fiscal impacts would be 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 would be distributed across the provinces on a per capita basis, British Columbia ($394 million) and Ontario ($307 million) would 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), would also experience fiscal benefits.

Impacts of the TMEP's Operational Phase

Once operational, the TMEP would also generate positive economic and fiscal impacts on an ongoing basis.

Once operational, the TMEP would 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; this scenario represents 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; it can be considered the maximum impact.

We expect that pipeline operations—including the direct, supply-chain, and induced effects—would support 50,273 person-years of employment, at a minimum; this figure would rise to 65,184 if the non-firm capacity is fully utilized. In this phase, British Columbia (60.2 per cent) and Alberta (20.5 per cent) would still experience the largest proportion 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), would also benefit from the employment impacts during the operational phase of the Project.

In terms of fiscal effects, we expect that the pipeline would generate between $2.5 and $3.3 billion in combined federal and provincial revenues over the first 20 years of operation. Corporate profit taxes would 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 would experience 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 raise the price Canadian oil producers receive for their product. At a minimum, shippers on the TMEP would have access to tidewater, giving them the ability to attract world prices for their product, rather than North American prices. However, a market study completed by IHS Global Canada Limited (the IHS study) found that the TMEP and other planned pipeline expansion projects would 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.[3]

As indicated in the IHS study, producers of conventional heavy oil and bitumen from the oil sands would 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 would 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 in the IHS study: a base case outlook, a high production outlook, and a low production outlook.

3 IHS Global Canada Limited, *Trans Mountain Expansion Project: Direct Written Evidence*.

In the IHS base case, oil company revenues would rise by $45.4 billion over the first 20 years of the pipeline's operations as a result of higher netbacks attributed to the market access provided by the TMEP. This would generate total fiscal benefits of $14.7 billion. The federal corporate income tax effects would account for $6.1 billion of these effects. The combined royalty and corporate income tax effect for Alberta would be $8.2 billion; for Saskatchewan, $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 operational impacts and the base case for assessing the impact of higher netbacks. Between 2012 and 2037, we

Table 1
Summary of the Economic and Fiscal Impacts of the TMEP
(cumulative effects, 2012–37)

	Using minimum operational effects and the base case for higher netbacks							
	Atlantic Canada	**Quebec**	**Ontario**	**Other Prairies**	**Alberta**	**British Columbia**	**Territories**	**Canada**
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 (2012 $ millions)	**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 (2012 $ millions)	**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	1401.8	2,351.0	861.9	8,868.9	804.9	19.7	14,720.0

Source: The Conference Board of Canada.

expect the Project would generate 108,310 person-years of employment. As well, it would produce $18.5 billion of fiscal benefits over the same period.

Beyond these economic and fiscal benefits, the TMEP would also provide important strategic benefits. In particular, by allowing significant volumes of Canadian oil to reach tidewater, Canadian production would no longer be landlocked inside the stagnant North American market. Many producers would then 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

Chapter Summary

- Discounts on Canadian oil prices versus international benchmarks are a symptom of the capacity constraints on Canada's oil transportation infrastructure. As a result, Canada is not getting the full economic and fiscal benefits from its non-renewable oil resources.
- In response, several pipeline projects have been proposed to carry oil away from Western Canada, including the Trans Mountain Expansion Project (TMEP), which would run from Edmonton, Alberta, to Burnaby, British Columbia.
- This report assesses three aspects of the economic impacts of the proposed Trans Mountain Expansion Project: the impacts of construction, operations, and higher prices for oil producers once the pipeline is operational.

Oil is a global commodity, with a well-established transportation infrastructure. Global benchmark prices are therefore 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 those of own global peers.[1] 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, if completed, would carry oil away from Western Canada. One of these—the Trans Mountain Expansion Project (TMEP, or the Project)—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 "Trans Mountain Expansion Project Description.") As part of this process, we examine multiple potential impacts, 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.

1 IHS Global Canada Limited, *Trans Mountain Expansion Project: Direct Written Evidence*.

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 provincial levels, 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 would benefit, with a focus on supply-chain and fiscal effects.

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, Washington state, and offshore. Trans Mountain currently supplies much of the crude oil and refined products used in British Columbia. The pipeline is operated and maintained by staff located at Trans Mountain's regional and local offices in Alberta (Edmonton, Edson, and Jasper) and British Columbia (Clearwater, Kamloops, Hope, Abbotsford, and Burnaby).

The Trans Mountain pipeline system has an operating capacity of approximately 47,690 cubic metres per day (300,000 barrels per day) using 24 active pump stations and 40 tanks. The expansion would increase the capacity to 141,500 cubic metres per day (890,000 barrels per day).

The proposed expansion would comprise the following:

- pipeline facilities that complete a twinning (or "looping") of the pipeline in Alberta and British Columbia, with about 987 kilometres 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, B.C., each capable of handling Aframax-sized tankers.

Source: Trans Mountain Pipeline.

CHAPTER 2

Economic Impacts Associated With the Development of the Trans Mountain Expansion Project

Chapter Summary

- Excluding finance costs, the TMEP would cost an estimated $4.6 billion in 2012 dollars over the period 2012 to 2018.
- This spending would generate a total of 58,000 person-years of employment—28,200 directly and 29,800 through supply-chain impacts and the impacts of the wages that workers would earn.
- The investment would also generate $1.2 billion in government revenues, with $646 million accruing to the federal government and $568 million to provincial governments.
- British Columbia would be the largest beneficiary in terms of jobs and fiscal impacts, but Alberta and Ontario would also experience significant benefits.

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 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:

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 would occur in the construction industry; during the operational phase, all of the effects would 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 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 government revenue or fiscal impact associated with the other three economic effects, at both the federal and provincial levels.

In order to conduct this analysis, we used 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 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 B. The fiscal effects were estimated by the Conference Board. Trans Mountain Pipeline prepared the revenue and cost estimates associated with the construction and operation of the TMEP that were used to conduct the analysis.

Direct Effects

The bulk of the spending activity would likely take place in 2016 and 2017, when construction activity peaks.

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 filings, have already begun; thus, the development period is expected to last from 2012 to 2018. However, the bulk of the spending activity would likely take place in 2016 and 2017, when construction activity peaks. (See Table 2.)

For the purposes of the analysis, we used the price-adjusted figure, because inflation does not add to the economic value or to the jobs that would be supported by the Project. As well, we excluded the estimated financing costs associated with the Project 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 will be minimal. The result is that we assessed the economic impacts of $4.6 billion of expenditures in 2012 dollars.[1]

1 Unless otherwise noted, all subsequent dollar figures in the report are stated in 2012 dollars.

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

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.

Although only 63.6 per cent of the pipeline's length would 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 7.8 per cent of economy-wide construction spending in British Columbia in 2012, and 1.6 per cent in Alberta.[2] Factors affecting the regional mix of spending include the terrain that the pipeline would cover, the fact that portions of the new pipeline would consist of reactivated existing pipe, and the need to build new port facilities at the Westridge Marine Terminal in British Columbia.

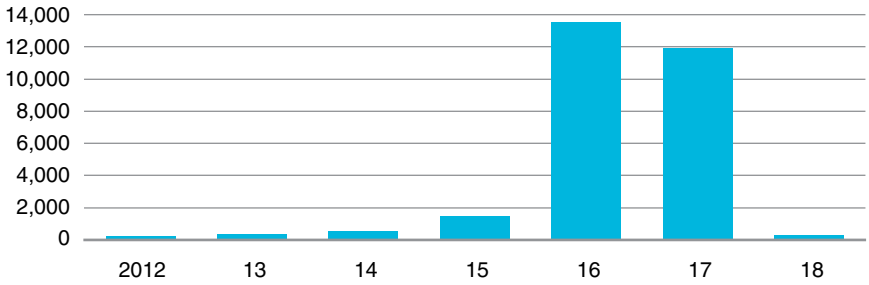
These expenditures would have a direct impact in both provinces. In terms of employment, the development of the pipeline would support 28,202 person-years of employment, with 20,675 of these jobs occurring in British Columbia and the rest in Alberta.[3] The timing of these employment impacts would coincide with changes in annual

2 Based on data from Statistics Canada CANSIM table 029-0024.

3 A person-year of employment is the amount of work that one person would normally do in a year. It is an average figure for each industry and takes into account the fact that some workers are part-time.

expenditures on the Project. For example, in 2012, the direct employment impact was estimated to be 206 people. But at the peak of construction in 2016, the employment supported by the Project would rise to 13,527 people. (See Chart 1.) At their peak, the provincial employment effects would be equivalent to 4.8 per cent of British Columbia's 2016 construction employment and 1.4 per cent of Alberta's.[4] (See "Will the TMEP Crowd Out Other Investment in Western Canada?")

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



Source: The Conference Board of Canada.

Will the TMEP Crowd Out Other Investment in Western Canada?

One of the assumptions embedded in an I/O model analysis is that there is sufficient capacity in an economy to undertake the work. Given that there is evidence of labour constraints in construction, particularly in Alberta,[5] there may be some concern that the TMEP will displace or "crowd out" other work. However, there are many reasons to believe that these fears are overblown.

4 The Conference Board of Canada, *Provincial Economic Outlook: Spring 2014*.

5 Burleton et al., *Jobs in Canada: Where, What and for Whom?*

In British Columbia (where nearly three-quarters of the construction jobs would be created), there is little doubt that sufficient capacity exists. For example, average wages in construction trades are below the national average and have experienced below-average growth over the past five years.[6] Also, construction spending on structures in the province fell in 2013 and is expected to fall again in 2014. As a result, we estimate that even if two liquefied natural gas projects and the TMEP were to all begin in 2016, total business investment in structures in the province would rise to about 6 per cent above its previous 2012 peak, which represents average annual growth of 1.4 per cent over this period.

In Alberta, there is evidence of capacity limitations in construction activity, but the province's construction labour force is growing by about 15,000 people per year. In short, through migration and training, builders in Alberta are finding the workers they need among the underemployed or unemployed elsewhere. Labour markets in most of Canada still remain well below full levels of employment.

The other important thing to note is the temporal and project-oriented nature of construction activity. Major projects have defined beginning and end dates that can change based on a variety of factors, including the availability of materials and personnel. Thus, new projects may change the work completion dates of other projects, but they won't necessarily change the stock of projects that are completed. Canada's construction workforce is mobile, and it should be able to adjust to the swings in activity caused by the TMEP, just as it has adjusted to other variations in the past.

In terms of GDP, we expect that the TMEP would directly generate cumulative GDP effects of $2.2 billion over the development period of the Project. Thus, for every $100 spent on the Project, $47 in GDP would be generated. This means that 47 cents of every dollar spent would go to wages and profits, primarily in the construction industry, while the other 53 cents would be spent on material inputs. The regional and temporal GDP impacts would be similar to those noted for employment,

6 See Statistics Canada CANSIM table 282-0070.

with British Columbia accounting for 70 per cent of the total and the rest occurring in Alberta. The GDP effects would peak in 2016 and 2017, when construction activity would be at its highest.

Indirect Effects

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

For every two jobs directly associated with the TMEP, one job would be supported indirectly among its suppliers.

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, one job would be supported indirectly among its suppliers. The GDP multiplier would be somewhat larger, with 58 cents of indirect GDP being supported by each direct dollar. The key reason for the higher GDP multiplier is that in most of the sectors where the largest indirect effects would occur, there's a high level of GDP per employee.

The indirect effects would be felt across the wide range of industries forming the supply chain linked to the TMEP. The supply-chain effects include both those on suppliers that would directly support the Project, as well as second- and third-order effects on suppliers that are farther down the supply chain. Although the majority of the indirect effects would occur in British Columbia and Alberta, all of the other provinces would experience some benefits. More than one-quarter of the indirect employment effects would 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 would benefit from the supply-chain effects resulting from the construction of the TMEP.

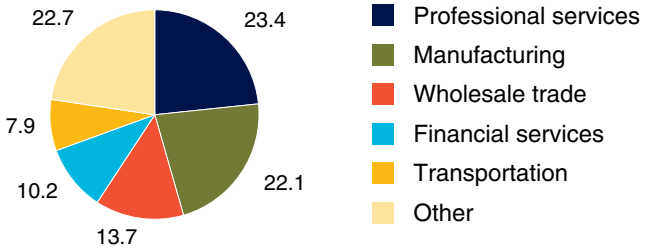
Indirect Effects by Sector

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 would be largely confined to five broad sectors: 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 would support a substantial number of high-paying jobs.

Chart 2

Key Sectors That Would Experience Supply-Chain Effects

(per cent; share of supply-chain employment effects)

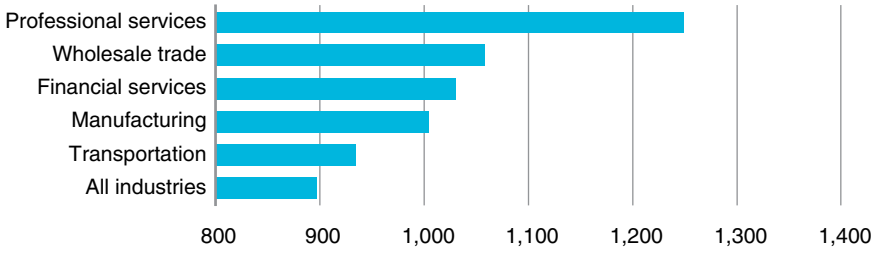


Source: The Conference Board of Canada.

Chart 3

Sectors That Would Be Most Affected by the TMEP's Development Pay Above-Average Wages

(C$; average weekly earnings in 2012, including overtime)



Source: Statistics Canada CANSIM table 281-0027.

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 the TMEP supporting 3,287 person-years of employment in the sector—or 719 for every $1 billion of inflation-adjusted investment—the largest supply-chain effects would accrue to this sector.

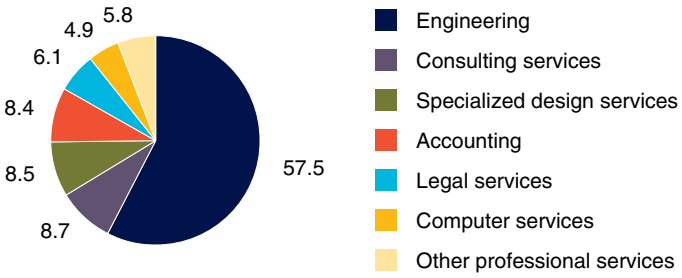
The single largest effects within this sector would occur in the engineering services industry.

The single largest effects within this sector would occur in the engineering services industry, with 1,890 person-years of employment (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 receive an important proportion of the supply-chain benefits. The benefits for the engineering industry would be large, accounting for 13.4 per cent of the total supply-chain effects associated with the development of the TMEP.

Chart 4

Engineering Would Account for Most of the Supply-Chain Effects in the Professional Services Sector

(per cent; share of supply-chain employment effects in professional services)



Source: The Conference Board of Canada.

Other industries within the professional services sector would also realize employment benefits. For example, every $1 billion in investment would generate 63 person-years of employment in consulting services.

Specialized design services (61 person-years) and accounting services (60 person-years) would also benefit. A variety of other professional services industries—everything from computer and legal services to advertising and public relations—would also be positively affected.

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

Most of the professional services jobs supported outside of Alberta and British Columbia (65 per cent) would be in Ontario; the province would experience a disproportionate benefit in several industries. For example, even though Ontario would account for only 8 per cent of the total employment effects in professional services, it would account for 35 per cent of the effects in the computer services industry—a higher share than British Columbia or Alberta. Ontario would also receive a relatively high share of the effects in both 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 would accrue to British Columbia, Alberta, and Ontario.

Manufacturing

Manufacturing is another sector that would experience 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.

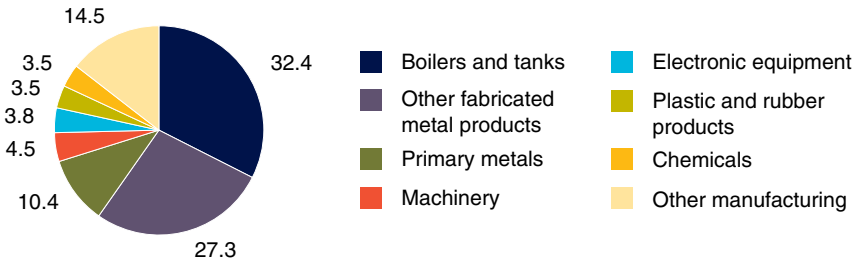
Key industries within the manufacturing sector that would realize the greatest benefits include makers of boilers and tanks, where 32.4 per cent of the manufacturing-related employment effects would be apparent. (See Chart 5.) Sizeable impacts would also be apparent among producers of other types of fabricated metal products (such as

architectural metal products) and primary metals (in particular, steel). For example, the economic activity associated with the producers of steel pipe (a major input into the Project) would be captured in the steel products industry. However, the manufacturers of a wide variety of other products—such as machinery, electronic equipment, plastic and rubber products, and chemicals—would also benefit.

Chart 5

Most of the Manufacturing Impacts Would Occur Among Producers of Fabricated Metal Products

(per cent; share of supply-chain employment effects in manufacturing)



Source: The Conference Board of Canada.

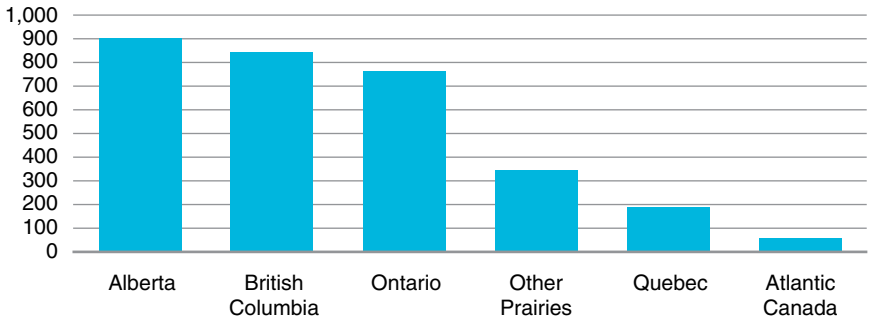
Compared with the impacts felt in the professional services industries, the regional impacts within the manufacturing sector would be more widely dispersed. Just 56 per cent of the associated jobs in the sector would accrue to Alberta or British Columbia, compared with 88 per cent in professional services. Among the sectors most affected by the TMEP, manufacturing is the one in which the largest benefits would occur outside of Alberta and British Columbia. The project would support 1,359 person-years of manufacturing employment outside of Alberta and British Columbia. (See Chart 6.)

One-quarter of all manufacturing-related jobs supported by the TMEP would originate in Ontario, which is not at all surprising, given that much of Canada's manufacturing sector is located in that province. In some industries, like iron and steel mills, more benefits would accrue to

Chart 6

Manufacturing Employment Effects Would Be Widely Dispersed Across Regions

(person-years of employment)



Source: The Conference Board of Canada.

Ontario (60 per cent) than to Alberta and British Columbia combined. The province would also do well in architectural and structural metals, steel products, and plastics.

Nearly 20 per cent of manufacturing jobs would be found outside of Alberta, British Columbia, and Ontario. Of these, nearly half would accrue to Manitoba and Saskatchewan. The remaining manufacturing employment effects would be concentrated in Quebec, where 190 person-years of employment would be expected.

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 wholesalers, and machinery and equipment wholesalers. Combined, these two industries would account for 73 per cent of the indirect benefits that we expect would 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 is wholesaling of electronic products, which would 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.

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 (24 per cent). However, for every $1 billion spent on the proposed pipeline, 97 person-years of employment in wholesaling would be supported outside those two provinces. As with all the other industries, the majority of those person-years would accrue to Ontario, but about 7 per cent of them would arise elsewhere.

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 would 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 would be concentrated in three main industries: 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 would 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 would experience above-average effects outside of Alberta and British Columbia. For example, 47 per cent

of all the indirect benefits in the banking industry would 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 these 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.

Transportation

The other sector that would 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 would be either in the trucking industry or in activities that support the trucking industry. This reflects the fact that there are logistical challenges involved in getting sufficient materials to the construction sites, given that the actual pipeline would span more than 1,000 kilometres. Rail transportation would also garner 12 per cent of the estimated employment effects, arising from the need to move some of the material inputs long distances across the country.

Again, British Columbia would derive the largest benefits associated with the transportation sector, as 36 per cent of the employment effects would be found there, the majority of them in trucking. The story would be similar for Alberta, which would garner 29 per cent of the benefits,

most of them in trucking as well. Still, 394 person-years of employment would be supported in other Canadian provinces —or 86 per $1 billion invested. Truck transportation would be 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 in the other Prairie provinces.

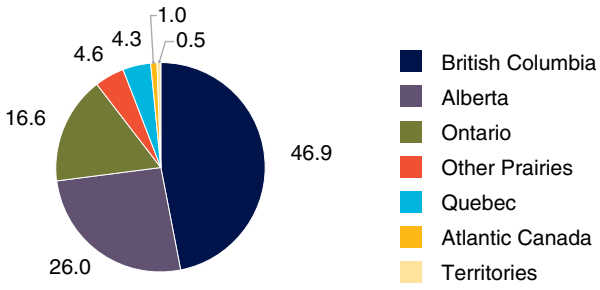
Indirect Effects by Region

Although the majority of the indirect impacts would occur in British Columbia and Alberta, every region in the country would 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, would occur in other regions of the country. (See Chart 7.) The mix of industries affected in each region could be very different. For example, manufacturing would account for more than half of the employment effects in the other 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

(per cent; share of construction-related indirect employment effects)



Source: The Conference Board of Canada.

British Columbia

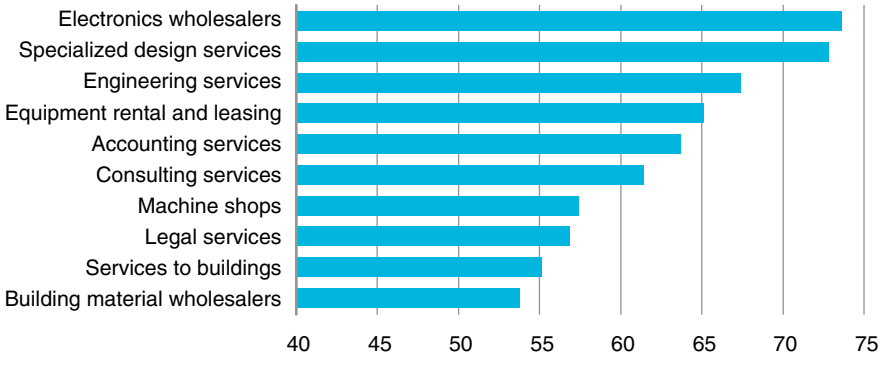
British Columbia would experience the largest supply-chain effects associated with the development of the TMEP. In total, 6,599 person-years of employment would be supported by the Project, equivalent to 46.9 per cent of the total supply-chain effects. Despite the fact that nearly half of the supply-chain effects would occur in British Columbia, the mix of sectors affected in the province would be somewhat different than in other provinces. Professional services would 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 would stand out in British Columbia, meaning those that would experience effects that are substantial in size and that account for an outsized share of the national impacts. For example, 67 per cent of the national impacts in the engineering industry would occur in British Columbia, accounting for a total of 1,275 person-years of employment. (See Chart 8.) Engineering would account for the largest impact by far in British Columbia. However, other industries with noticeable effects would include wholesalers of building materials, specialized design services, and equipment rental and leasing.

Chart 8

Key Industries That Would Experience Outsized Effects in British Columbia

(per cent; share of national supply-chain employment effects for selected industries)



Source: The Conference Board of Canada.

Alberta

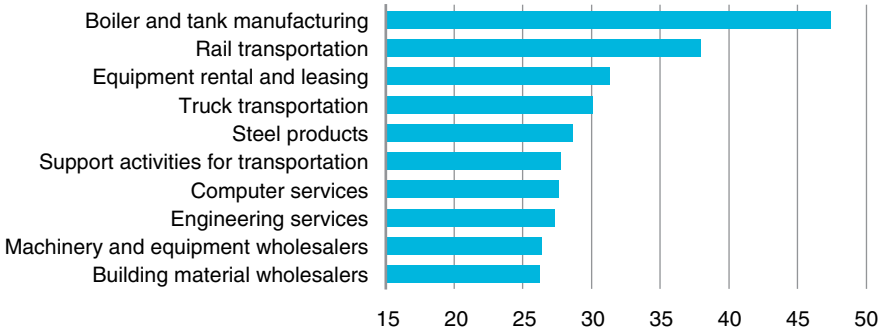
Much of the remaining indirect employment impacts would accrue to Alberta. In total, we expect that the development of the TMEP would support 3,660 person-years of employment in Alberta, which is equivalent to 26 per cent of the total national effects. The sector that would experience the single biggest impact in Alberta is manufacturing. Professional services and wholesale trade would be next in line. Alberta would stand out by accounting for an outsized share of the effects in the manufacturing and transportation sectors.

As in British Columbia, the largest employment impacts in Alberta would occur in the engineering services industry. However, Alberta would stand out in the manufacture of boilers and tanks. Nearly half of the employment effects in this industry would occur in Alberta. (See Chart 9.) Other industries where Alberta would do well include truck transportation, building material wholesaling, and rental and leasing of equipment.

Chart 9

Key Industries That Would Experience Outsized Effects in Alberta

(per cent; share of national supply-chain employment effects for selected industries)



Source: The Conference Board of Canada.

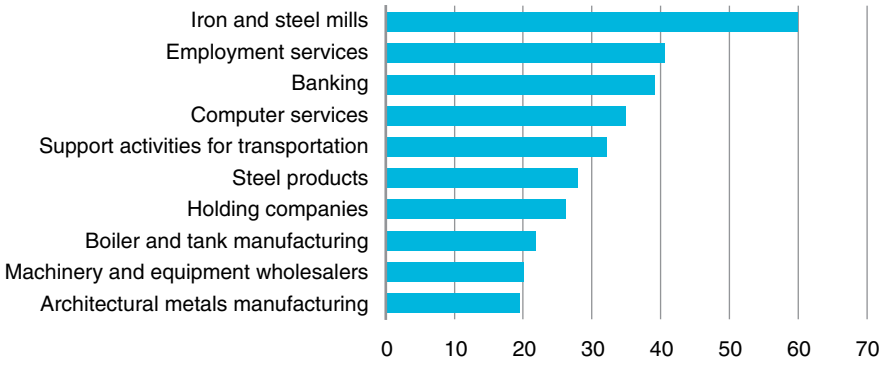
Ontario

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

Chart 10

Key Industries That Would Experience Outsized Effects in Ontario

(per cent; share of national supply-chain employment effects for selected industries)



Source: The Conference Board of Canada.

Other Prairies

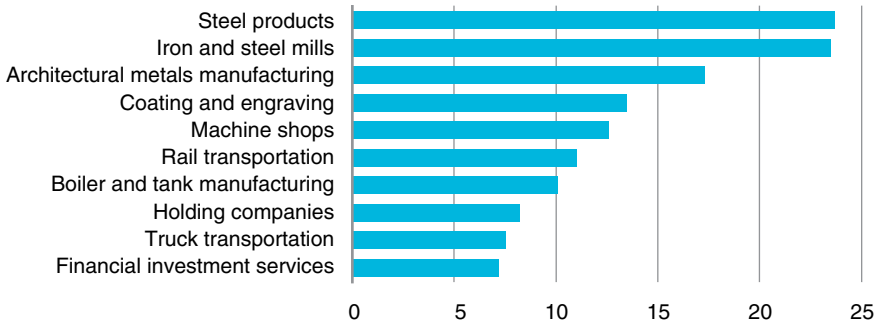
In the provinces beyond British Columbia, Alberta, and Ontario, the employment effects associated with the development of the TMEP would be smaller. Manitoba and Saskatchewan combined would see 645 person-years of employment supported by the Project, with the effects split evenly between the two provinces. As a result, the Other Prairies region would account for 4.6 per cent of the supply-chain effects. The key areas where the region would stand out include

manufacturing and transportation. We estimate that 53.9 per cent of the employment effects in Manitoba and Saskatchewan would be found in the manufacturing sector. Key types of manufactured products would 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 would be sourced from Saskatchewan.

Chart 11

Key Industries That Would Experience Outsized Effects in the Prairies

(per cent; share of national supply-chain employment effects for selected industries)



Source: The Conference Board of Canada.

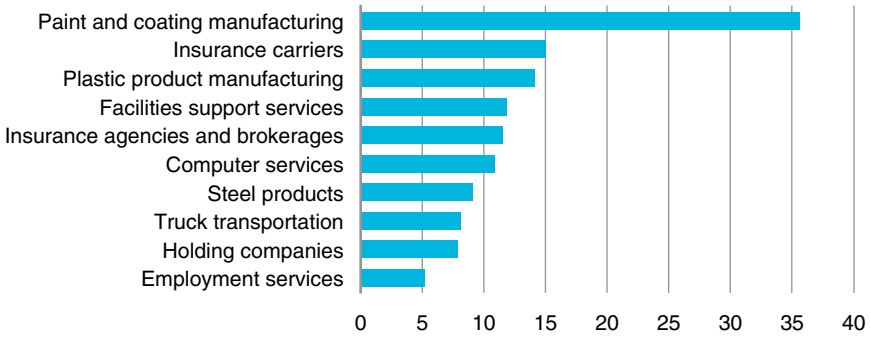
Quebec

The employment impacts in Quebec would be modestly smaller than those experienced in the Other Prairies region. A total of 601 person-years of employment would be supported in Quebec as a result of the development of the TMEP, equivalent to 4.3 per cent of the total. Quebec would see notable effects in manufacturing, components of financial and professional services, and transportation. For example, manufacturing of paints and coatings, insurance, truck transportation, and computer services would all experience outsized effects. (See Chart 12.)

Chart 12

Key Industries That Would Experience Outsized Effects in Quebec

(per cent; share of national supply-chain employment effects for selected industries)



Source: The Conference Board of Canada.

Atlantic Canada

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

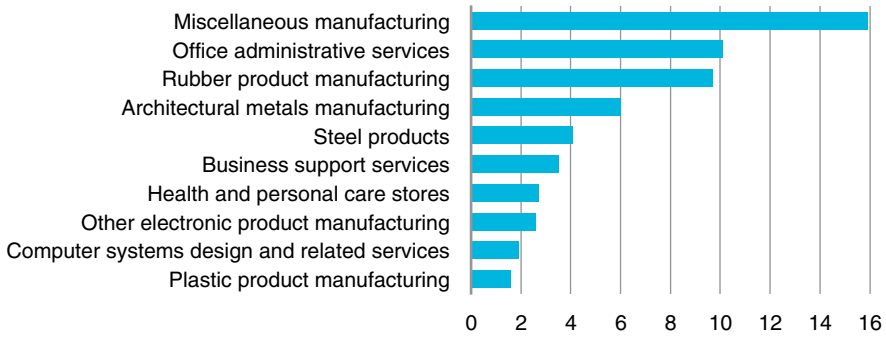
Induced Effects

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

Chart 13

Key Industries That Would Experience Outsized Effects in Atlantic Canada

(per cent; share of national supply-chain employment effects for selected industries)



Source: The Conference Board of Canada.

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 that would be created tend to be in high-wage industries, the spin-off effects would be substantial. Indeed, we estimate that the induced effects associated with developing the TMEP would 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 would be 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, we expect that the development of the TMEP would support 58,037 person-years of employment.

The induced GDP effects would also be considerable. For every dollar in GDP directly created as a result of the Project, another 66 cents would be supported by the income effects, in addition to 58 cents in

supply-chain benefits. Thus, in aggregate, the GDP effects associated with the development of the Project would be $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.

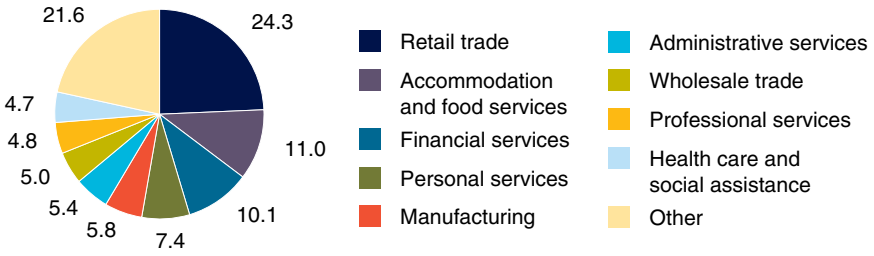
Induced Effects by Sector

The distribution of the induced employment effects across sectors is largely a reflection of how Canadian consumers spend their money. For example, the largest impact would be found in the retail sector: 3,831 person-years of employment, or 24.3 per cent of the total. (See Chart 14.) 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 would be widely varied, with impacts apparent in everything from furniture and home furnishings to home electronics, appliances, sporting goods, and hobbies.

Chart 14

Induced Impacts Would Affect a Range of Consumer-Oriented Sectors

(per cent; share of induced employment effects, by sector)



Source: The Conference Board of Canada.

Accommodations and food services is another consumer-oriented sector that would experience sizable benefits. A total of 1,729 person-years of employment, or 11 per cent of the total employment effects, would

occur in this sector. Other major sectors where sizable employment impacts would occur include financial services (1,589 person-years of employment), personal services (1,168), and manufacturing (918). The impacts in the financial services sector reflect people's need for things like chequing accounts and consumer financing. Examples of personal services include 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 would occur among makers of consumer goods, such as food and furniture.

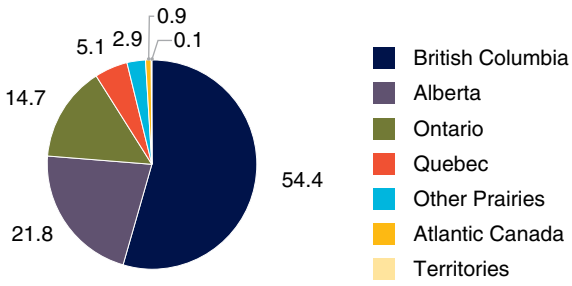
Induced Effects by Region

The regional distribution of the induced effects would be fairly concentrated. Some 76 per cent of the total benefits would accrue to British Columbia (8,590 person-years) and 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 would occur in those provinces, and the residents of those provinces who would benefit from the Project would spend most of their income there. The induced impacts across the rest of the provinces would largely reflect their shares of the direct and indirect effects.

Chart 15

Induced Impacts Would Occur Primarily in British Columbia and Alberta

(per cent; share of induced employment effects, by sector)



Source: The Conference Board of Canada.

The three main types of government revenues that would be affected by the Project are personal income taxes, corporate income taxes, and indirect taxes.

The sectoral mix of the induced effects would be 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 would be some variations across the provinces. For example, although Ontario would receive 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 would accrue there. Ontario would also experience an outsized share of the effects in the manufacturing sector.

Similarly, Manitoba and Saskatchewan combined could 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 would buy as a result of the induced impacts would need to be grown somewhere, and the Prairies would supply some of that food. Quebec would stand out in terms of its manufacturing sector. Quebec would experience induced effects of 801 person-years of employment (5 per cent of the total), but it would experience 15.3 per cent of the employment effects in the manufacturing sector.

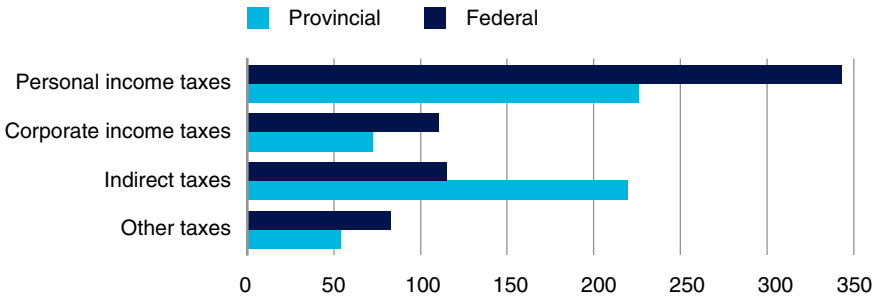
Fiscal Effects

The direct, supply-chain, and induced effects associated with the development of the TMEP would also have positive fiscal implications at both the provincial and federal levels. The three main types of government revenues that would be affected by the Project are 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.

We expect that the $4.6 billion in spending associated with the development of the TMEP would 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 an anticipated

$3.3 billion in wages and salaries and $1.4 billion in corporate profits generated by the development of the TMEP, the largest fiscal impacts would be found in personal and corporate income taxes. (See Chart 16.)

Chart 16
Personal Income Taxes Would Account for the Largest Share of the Fiscal Effects
(2012 $ millions, tax revenues)



Source: The Conference Board of Canada.

Federal Impacts

The federal government would experience the largest impact, even larger than that of Alberta and British Columbia combined. In aggregate, the development of the TMEP would 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 would come from higher personal income tax revenues. Other major sources would include corporate income taxes (17.2 per cent) and GST inflows (14.4 per cent).

Another source of revenues would be 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 would be generated.

Since fewer people would be unemployed, government payments of employment insurance would also be reduced, providing an additional benefit not included here.

Provincial Impacts

In aggregate, we expect that the TMEP would 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 would account for nearly half of the provincial fiscal effects. Indirect taxes (which include sales taxes) and corporate income taxes would account for most of the remaining 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) would experience much more modest fiscal effects. For the Atlantic provinces, the fiscal effects would be very small.

The improved federal finances would eventually filter down to all of the provinces through transfers and other program expenditures.

The economic impacts are based on the assumption that any fiscal benefits are saved by governments and not reinvested in the economy. Still, we can assume that the federal fiscal benefit could be shared out regionally on a per capita basis. The improved federal finances would eventually 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 would be greater 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 of the federal fiscal benefits, or $250 million, compared with a direct provincial fiscal impact of $57 million. The exceptions would be British Columbia and Alberta, where the direct provincial impact would be bigger than the estimated federal transfers.

Summary

We expect that the development of the TMEP would result in $4.6 billion in investment spending, which would have positive economic and fiscal effects. For example, the combined direct, indirect, and induced employment effects would support 58,037 person-years of employment. (See Table 3.) As well, the combined GDP effects of the Project would be $4.9 billion, equivalent to $1.06 for every dollar of investment. Finally, this economic activity would support an estimated $1.2 billion in federal and provincial government revenues. British Columbia would be the largest beneficiary for all of these effects, but economic activity and government revenues would also experience a considerable boost in Alberta and Ontario. In the rest of the provinces, the overall economic and fiscal effects would be smaller, although impacts by region for some industries would be sizable.

Table 3
Summary of the Economic and Fiscal Impacts of TMEP Development
(cumulative effects, 2012–37)

	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 (2012 $ millions)	**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 (2012 $ millions)	**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	0.0	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 Project

Chapter Summary

- At a minimum, the TMEP would be expected to generate $644 million per year in revenue once operational—$835 million per year if the pipeline were fully utilized.
- Over the first 20 years of operation, the pipeline would generate a minimum of 50,300 person-years of employment (2,500 jobs annually), as well as $2.5 billion in federal and provincial fiscal impacts ($127 million per year).
- British Columbia would be the largest beneficiary in terms of jobs and fiscal impacts, but Alberta and Ontario would also experience significant benefits.

The nature of the oil pipeline industry dictates that the scale of the effects associated with the operational phase of the Project would be very different from those associated with 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.[1] This means that a pipeline project involves large upfront costs during its development stage. The subsequent operational stage, however, 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 of the oil pipeline industry are generally very small, it still generates considerable GDP effects. Several factors 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, it has a very high ratio of GDP per employee; at $783,703 per employee, this amount is nearly nine times the average for all industries.[2]

As well, since pipelines are expected to have extended lives, the cumulative impact over that extended time period can be significant. This chapter assesses the economic and fiscal impacts of TMEP operations over a 20-year time horizon. Although the expected life of

1 Based on data from Statistics Canada CANSIM table 031-0002 and the Labour Force Survey.

2 Based on data from Statistics Canada CANSIM table 379-0031 and the Labour Force Survey.

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 Pipeline has firm contracts in place.

Direct Effects

The assessment of the employment and GDP effects of TMEP operations is based on the incremental revenues that we expect the Project would generate. Thirteen shippers have entered into binding 15- and 20-year contracts to ship a total of about 708,000 barrels of oil per day 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 barrels per day (b/d).

On net, annual revenues associated with long-term contracts were estimated by the Conference Board to be $644 million.

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 includes only 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 on directly to shippers. As such, the variable component would not have an impact on the labour or material inputs that the pipeline would use, nor on the profits that it would generate, and was not included when estimating the economic effects.

The 20 per cent of the pipeline's expected capacity that is not committed to firm long-term contracts would 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 they use it or not, 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 would be covered by long-term contracts over the 20-year period. A portion of the capacity committed to long-term contracts could become available for non-firm sales after 15 years. However, we assume that the relevant contracts would be renewed for an additional 5-year period; this is an option available in the contracts. Otherwise, we expect that Trans Mountain Pipeline 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 consider only the impact associated with the expanded operations rather than with the existing pipeline. Information provided by Trans Mountain Pipeline 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 would generate a $644-million increase in annual revenues.

On net, long-term contracts for the TMEP would directly support 342 jobs per year.

Based on annual revenues of $644 million, the TMEP would directly support 342 jobs per year, for a total of 6,841 person-years of employment over the first 20 years of the pipeline's operations. The majority of these positions would be found in British Columbia (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 require employees to operate them.

In terms of GDP, we expect that the TMEP would generate $469 million of GDP annually, or $9.4 billion over the first 20 years of its operation. The GDP results stand out from the employment results in a couple of ways. First, Alberta's share of the direct GDP effects associated with

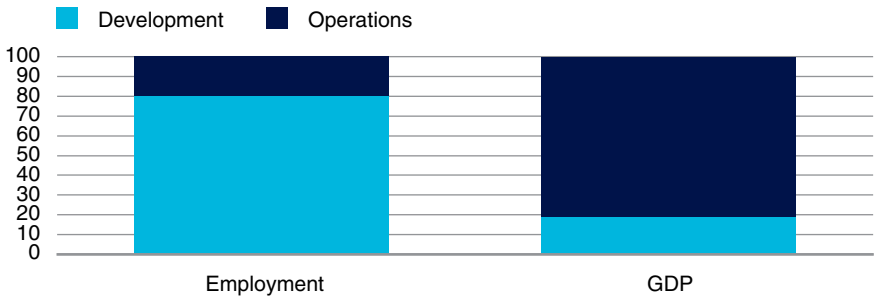
pipeline operations would be larger (31.4 per cent) than its share of the effects related to employment (29.3 per cent). This reflects the fact that the average wages and salaries per employee in the oil pipeline industry are higher in Alberta than in British Columbia.

Second, the direct GDP effects are much larger in the operations stage than during the development phase, while the opposite is true for employment. Operations would account for one-fifth of the employment effects but for 81 per cent of the total GDP effects associated with the development and operation of the Project. (See Chart 17.) The GDP effects are so much larger because the GDP per employee in the oil pipeline industry is so high, due to the high level of capital invested per employee, which results in high labour productivity.

Chart 17

Direct Effects of Operations Would Be Much Larger on GDP Than on Employment

(per cent; share of employment and GDP effects, by project stage)



Source: The Conference Board of Canada.

Indirect Effects

As it would during the development phase, the TMEP would also generate indirect or supply-chain effects once it is operational. An estimated 1,492 jobs would be supported by the pipeline in every year of its operation. 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

For every job created directly by the TMEP, another 4.4 would be supported indirectly.

directly by the TMEP, another 4.4 would be supported indirectly, a total of 1,492 jobs annually. 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 pattern is apparent with the indirect GDP effects. The operation of the TMEP would support $136 million of indirect GDP annually, which is equivalent to only 29 cents for every dollar of direct GDP. This very low GDP multiplier reflects the high level of direct GDP that the TMEP would generate.

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

Indirect Effects by Sector

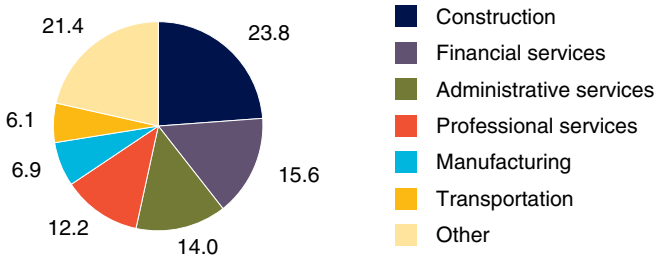
The indirect employment effects that arise from pipeline operations would be largely confined to six broad sectors: construction, financial services, administrative services, professional services, manufacturing, and transportation. Combined, these sectors would account for 79 per cent of the indirect employment effects. (See Chart 18.) The effects within some of these sectors would be similar to those discussed as part of the development phase in Chapter 2, but the impacts on specific industries could be quite different in the operations phase.

Also notable is the importance of electricity as an input into the oil pipeline industry. Although it would account for only 3.2 per cent of the supply-chain employment effects, it would account for 12.4 per cent of the indirect GDP effects. Like the pipeline industry, electricity generation is heavily capital-intensive; it generates very large GDP effects but

Chart 18

Key Sectors That Would Experience Supply-Chain Effects From Operations

(per cent; share of indirect employment effects from operations)



Source: The Conference Board of Canada.

limited employment effects. As such, although electricity is a major input into the oil pipeline industry, the employment impacts associated with this spending would be small.

Construction

We expect that the TMEP would support 355 indirect jobs annually in the construction sector once it is operational. Most would be related to ongoing maintenance and repairs. All of these jobs would be found in either British Columbia or Alberta, along the route of the proposed pipeline. For several reasons, the jobs would be heavily weighted toward British Columbia (94 per cent of the total): more of the pipeline would be located there, as would more pump stations, and the pipeline would traverse more difficult terrain in British Columbia.

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. With 232 jobs indirectly supported annually, the financial services sector would account for 15.6 per cent of the total employment effects associated with the operation of the TMEP. These impacts would be concentrated among holding companies, investment services, banking, and insurance.

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

Administrative Services

Administrative services businesses are engaged primarily in activities that support the day-to-day operations of other organizations. TMEP operations would support a total of 209 indirect jobs in the administrative services sector 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 would be 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 would restrain the impacts outside of British Columbia and Alberta. Most of the impacts in Ontario would occur in the employment services industry, which has a higher degree of tradability.

Professional Services

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

Regionally, we would 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 would be very small, with Quebec accounting for nearly all of the remaining impact. Most of the professional services jobs that would be supported outside of British Columbia and Alberta would be computer services positions.

Manufacturing

Key manufactured inputs would include architectural metals, boilers and tanks, and cement products.

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

The regional impacts within the manufacturing sector would also be much less diverse during the operating phase of the Project than during the development phase. British Columbia would experience the largest impact (52 per cent), followed by Ontario (18.3 per cent) and Alberta (14.8 per cent). British Columbia would account for a much higher share of the manufacturing effects during the operational phase due to the change in the mix of manufactured inputs. For example, cement products, wood products, and printing are all industries that would experience a relative increase in importance. Wood products would be readily available in British Columbia, and the cement products and printing industries tend to be much more regionally focused than many other segments of the manufacturing sector, so imports from other provinces would not be needed.

Transportation

The last major sector where considerable indirect employment effects would occur as a result of TMEP operations is transportation, with 81 jobs supported annually. Most of these jobs would occur in the couriers and messengers, transportation support services, and trucking industries. These impacts reflect two needs: the need for businesses to interact with other organizations on a day-to-day basis and the need to provide materials and supplies for the TMEP on an ongoing basis. The geographic expanse of the pipeline would also contribute to the need for transportation services.

As well, the majority of the employment impacts would occur in British Columbia, accounting for 56 per cent of the total. Most of the remaining effects would occur in Alberta (18.6 per cent) and Ontario (17.4 per cent).

Indirect Effects by Region

Nearly all of the indirect effects associated with TMEP operations would occur in British Columbia, Alberta, or Ontario.

Nearly all of the indirect effects associated with TMEP operations would occur in British Columbia, Alberta, or Ontario; only 6.5 per cent of the employment effects would 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, would be almost entirely conducted locally. Many of the other key inputs provided by sectors like administrative services and professional services would require a local presence as well.

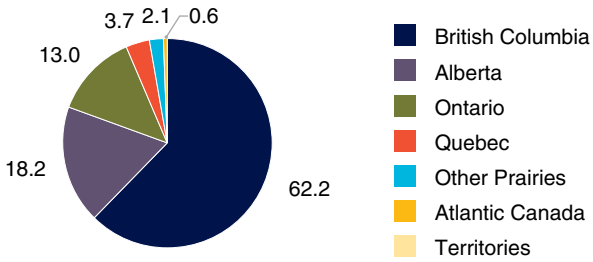
British Columbia

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

Chart 19

Supply-Chain Employment Effects From Operations, by Region

(per cent; share of indirect employment effects from operations)



Source: The Conference Board of Canada.

Alberta

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

Ontario

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

Other Regions

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

Induced Effects

In the operation phase of the Project, the induced effects would be smaller than the indirect effects.

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

The key reason for the difference is that the direct employment effects of operations would be much smaller than those associated with development. Even though the direct jobs in the oil pipeline industry would be very high-paying, there would be fewer of them. This would result in a lower dollar value for labour income stemming from direct and indirect employment during the operational phase; $2.45 billion over 20 years of operation, versus $2.62 billion over the seven years of the Project's development. And less labour income to spend yields smaller induced effects.

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

The induced GDP effects would also be considerable. For every dollar in GDP directly created as a result of the pipeline's operations, another 13 cents would be supported by the induced effects, compared with 29 cents in supply-chain benefits. This represents a total GDP effect of $13.3 billion over the first 20 years of operation. The combined development and operational GDP effects associated with the TMEP would be $18.2 billion.

Induced Effects by Sector

In terms of the industries that would benefit from the induced impacts, the mix would be very similar to that discussed in Chapter 2. The same group of consumer-oriented sectors—including retail trade, accommodation and food services, financial services, and personal services—would account for most of the effects. (See Chart 20.) The pattern of induced effects would reflect how people spent their money, and that generally is not dependent on how they earn that money. For the sectors, the modest differences in the induced effects associated with the operational and development phases of the Project would be due to the different regional mix for the direct and indirect effects. Essentially, people's consumption patterns vary only modestly across regions.

Induced Effects by Region

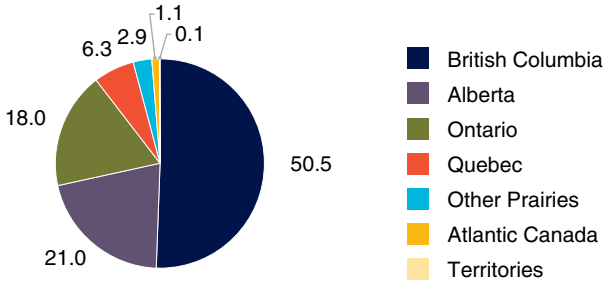
The regional distribution of the induced effects again would be similar to that which occurred during the development phase of the Project. British Columbia (6,868 person-years) and Alberta (2,853 person-years) would account for 72 per cent of the total effects. (See Chart 21.) This result is not surprising, given that 87 per cent of the labour income generated by the direct and indirect effects would be in those two provinces. The

induced effects would be more spread out geographically because some of the things people buy in British Columbia and Alberta are sourced from other parts of the country.

Chart 20
Induced Employment Effects From Operations, by Sector
(per cent; share of induced employment effects from operations)

Source: The Conference Board of Canada.

Chart 21
Induced Employment Effects From Operations, by Region
(per cent; share of induced employment effects from operations)



Source: The Conference Board of Canada.

Fiscal Effects

The direct, supply-chain, and induced effects associated with the operation of the TMEP also would have fiscal implications at both the provincial and federal levels. Over the first 20 years of its life,

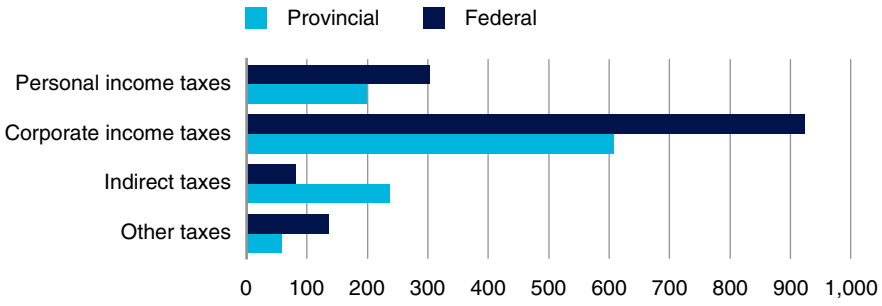
We expect the TMEP to support $2.5 billion in provincial and federal government revenues over the first 20 years of its life.

the TMEP would generate an estimated $2.5 billion in federal and provincial government revenues—more than double the $1.2 billion in fiscal impacts associated with the development phase of the Project. The operational fiscal impacts would be heavily weighted toward corporate income taxes, which would 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, would account for most of the remaining fiscal impacts.

Chart 22

Corporate Income Taxes Would Account for Most of the Operations-Related Fiscal Effects

(2012 $ millions; tax revenues over 20 years of operation)



Source: The Conference Board of Canada.

Corporate taxes would account for the lion's share of government revenues due to 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 the income components of GDP—including corporate profits and labour income—determine most of the fiscal effects, corporate profits in the oil pipeline industry are the key factor driving the results.

Federal Impacts

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

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

Provincial Impacts

In aggregate, we expect the TMEP 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 would account for the majority of the provincial fiscal effects. Indirect taxes (which include sales taxes) and personal income taxes would account for most of the rest of the effects, at $237 million and $200 million, respectively.

The breakdown by province would be as follows:

- The largest benefits would accrue to British Columbia: 66 per cent of the total, or $727 million. This is equivalent to 1.7 per cent of British Columbia's 2012–13 revenues.[3]

3 Government of British Columbia, *June Update*.

- 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) would experience much more modest fiscal effects.
- For the Atlantic provinces, the fiscal effects would be very small.

However, if we redistribute the federal fiscal effects across the provinces on a per capita basis, then all of the provinces would experience a larger effect. (See Table 4.)

Table 4
Summary of Fiscal Effects From TMEP Operations
(2012 $ millions; tax revenues over 20 years of operation)

	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.

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 would be linked to long-term contracts. These can be considered the minimum economic and fiscal effects associated with the TMEP. There would also be about 180,000 b/d of

nominal capacity available for non-firm or spot transactions; the degree to which this capacity is used would determine the amount of additional economic impacts.

There are two key considerations concerning the effects of the non-firm capacity:

- the toll that would be applied to any non-firm transactions;
- the volumes that would be transported.

The tolls for non-firm capacity would be higher than those for product shipped under the terms of long-term contracts. The non-firm toll would be calculated by adding a 10 per cent premium to the 15-year firm toll. However, shippers that signed 20-year contracts would receive a 10 per cent discount on the 15-year rate, and large-volume shippers (those that contracted for 75,000 b/d or more) would receive an additional 7.5 per cent discount.[4]

Based on information provided by Trans Mountain Pipeline,[5] the Conference Board estimated the average fixed toll that would be applied under long-term contracts at $3.66 per barrel, assuming no change in the capital costs associated with the Project. For non-firm shippers, the estimated toll would be $4.59 per barrel. The higher toll on non-firm capacity would result in higher revenues on a per-barrel basis up to 85 per cent capacity utilization of the TMEP. However, once capacity utilization exceeded 85 per cent, under the revenue-sharing provisions of the contracts, any additional revenues would be split evenly between shippers and Trans Mountain Pipeline, through reductions in the variable toll.[6] As such, the additional revenues to Trans Mountain Pipeline from non-firm shipments would depend on capacity utilization rates.

4 Trans Mountain Pipeline, *TMEP Toll Application*.

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

6 Trans Mountain Pipeline, *TMEP Toll Application*.

If we assume that the available non-firm capacity of the TMEP system would be fully utilized over its first 20 years of operation, the calculated economic and fiscal effects based on that assumption would represent the maximum potential impact associated with the Project. The reality would likely lie somewhere 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 fixed industrial structure, the relative effects are fixed. Thus, higher revenues from non-firm volumes would result in a proportionate increase in the supply-chain and induced effects, while the mix of regions and industries would be unaffected.

We estimate that the maximum annual revenues associated with non-firm capacity would be $191 million.

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 that the maximum annual revenues associated with non-firm capacity would be $191 million. This would raise 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, we expect that the economic and fiscal impacts from operations in the “maximum” scenario would be 30 per cent higher than in the “minimum” scenario.

Table 5 provides a summary of the minimum and maximum effects of the TMEP’s pipeline operations over its first 20 years. In the maximum scenario, the combined direct, indirect, and induced employment effects total 65,184 person-years, an increase from 50,273 person-years in the minimum scenario. As well, the GDP impacts rise from a cumulative total of $13.3 billion to $17.3 billion. Lastly, the combined federal and provincial fiscal impact climbs from $2.5 billion to $3.3 billion.

Table 5
Summary of the Regional Impacts of TMEP Operations
(cumulative effects, 2018–37)

	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 (2012 $ millions)	**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 (2012 $ millions)	**104.0**	**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 (2012 $ millions)	**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 (2012 $ millions)	**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.

Summary

Both the development and operational phases of the TMEP would generate economic and fiscal benefits. Overall, the economic and fiscal effects associated with operating the pipeline would exceed those experienced during the construction phase of the Project, although the operational effects would be spread over a longer period of time. At a minimum, both phases of the Project would support an estimated 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 of the TMEP were fully utilized, these effects would increase to 123,221 person-years of employment and fiscal effects of $4.5 billion.

Both this and the previous chapter discussed the economic and fiscal impacts associated with building and operating the TMEP. However, we expect that the pipeline would also reduce the discounts on Canadian heavy oil that have been experienced in recent years. The higher prices received by producers, or “netbacks,” would have additional fiscal implications for Canada. Those impacts are discussed in the next chapter.

Table 6

Summary of the Regional Impacts of TMEP Development and Operations

(cumulative effects, 2018–37)

	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 (2012 $ millions)	**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 (2012 $ millions)	**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	0.0	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 (2012 $ millions)	**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 (2012 $ millions)	**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

Fiscal Impacts of Higher Netbacks for Canadian Oil Producers

Chapter Summary

- New pipeline capacity would lead to higher prices or “netbacks” for oil producers by alleviating the oversupply situation in the interior of North America.
- Since the TMEP is just one of several projects, only a portion of the expected higher netbacks can be attributed to it. However, in the base case, oil producer revenues are expected to be $45 billion higher as a result of the TMEP.
- Higher oil revenues will generate $14.7 billion in provincial and federal fiscal impacts in the form of higher royalties and corporate income tax collections.
- Alberta will be the largest beneficiary of the fiscal benefits from higher netbacks, followed by Ontario, Quebec, and British Columbia.

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 study concludes that the TMEP would help to alleviate the discounting of Canadian crude experienced in recent years and would contribute to higher prices received or "netbacks" for Canadian producers.[1]

The IHS study developed three different production cases for Western Canadian oil production.[2] (See Chart 23.) In all three cases, it is assumed that the Keystone XL pipeline will be built in 2015. As well, the price impact is based on the assumption that the three proposed pipeline projects—the TMEP, Energy East, and Northern Gateway—will be completed by late 2017 (versus a world where none of them are built). In every case, the construction of these pipelines would result in higher netbacks for all producers of heavy oil (both conventional and diluted bitumen) in Western Canada.

These higher netbacks would lead to higher revenues and, in turn, to higher profits, which would have real economic consequences, such as increased dividend payments or business investment. As well, there would 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 would arise regardless of whether oil production or investment increases beyond what is currently expected; higher prices alone would be enough to drive positive economic impacts for the Canadian economy. In our analysis, we do not consider the economic effects associated with producers' anticipated use of higher

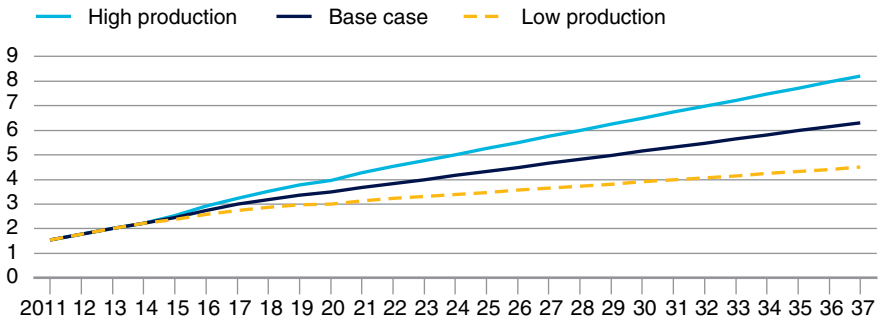
1 IHS Global Canada Limited, *Trans Mountain Expansion Project: Direct Written Evidence*.

2 Ibid.

Chart 23

Western Canadian Oil Production Could Take Different Paths

(millions of barrels per day; Western Canadian heavy oil supply)



Source: IHS.

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.

Base Case

In the IHS study's 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.[3]

According to IHS, shippers of heavy oil via 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 or Asian markets are expected to garner higher prices for their products.

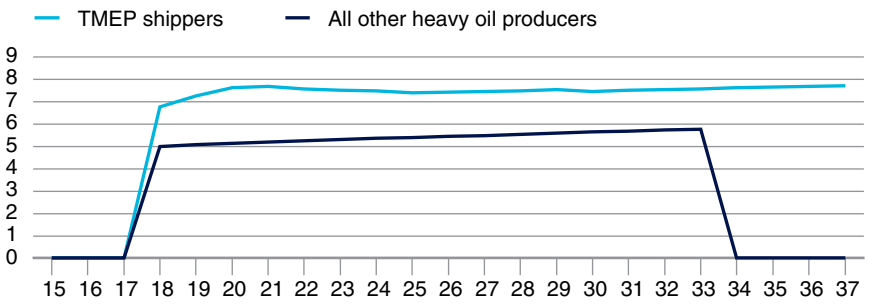
3 IHS Global Canada Limited, *Trans Mountain Expansion Project: Direct Written Evidence*.

This will mean a higher netback of about $7 to $8 per barrel versus the $5 to $6 per barrel that other heavy oil producers will experience.[4] (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

(US$ per barrel; 2012 $; price premium attributable to pipeline additions)



Source: IHS.

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 2017–18 time frame. As such, IHS attributes 26.6 per cent (equivalent to the TMEP's share of the combined assumed capacity additions) of the general industry benefits to the TMEP. Thus, the TMEP is expected to increase producer revenues by $45.4 billion over the first 20 years of operation, with $37 billion being attributable to general industry benefits and an additional $8 billion attributable to the TMEP enabling heavy oil shipments to Asia.

4 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's firm commitments (equal to 707,500 barrels per day ÷ 2 = 353,750 barrels per day) being priced in China rather than in the U.S. Gulf Coast for the period 2018 to 2037.

Fiscal Impacts: Royalties

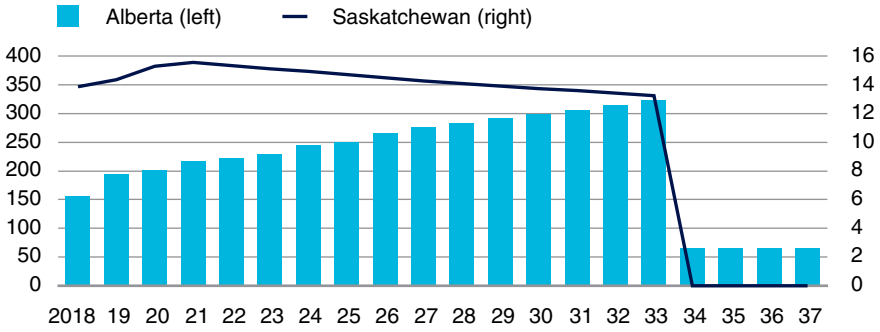
Because the TMEP would increase the netbacks for producers without any attendant increase in producers' operating costs, both revenues and profits would be expected to rise by $45.4 billion. This would have implications for the royalties and corporate income taxes that oil producers pay. In the case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

At $4.3 billion, Alberta would garner the majority 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 2012–13.[5] However, the benefits would be highest during the 2018–33 period, when every barrel of diluted bitumen and conventional heavy oil would receive a higher price. (See Chart 25.)

Chart 25

Higher Netbacks Would Increase Royalty Collections

(2012 $ millions; provincial royalty collections due to higher netbacks)



Source: The Conference Board of Canada.

5 Government of Alberta, *Budget 2013*.

Saskatchewan would also see higher royalty payments, although the gains would be commensurately lower, in line with the province's lower production levels. Over the period 2018–33, 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 would not expect any Saskatchewan oil to actually move through the TMEP, Saskatchewan producers would not experience any benefits after 2033.

Fiscal Impacts: Income Taxes

In addition to royalties, higher netbacks would also generate significant corporate income tax effects.

Higher profits for oil producers as a result of higher netbacks would also generate significant corporate income tax effects at both the federal and provincial levels. 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 would be applied to a sizable increase in profits. We expect that the corporate tax effects would be even greater than the royalty impacts, at $10.2 billion between 2018 and 2037.

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

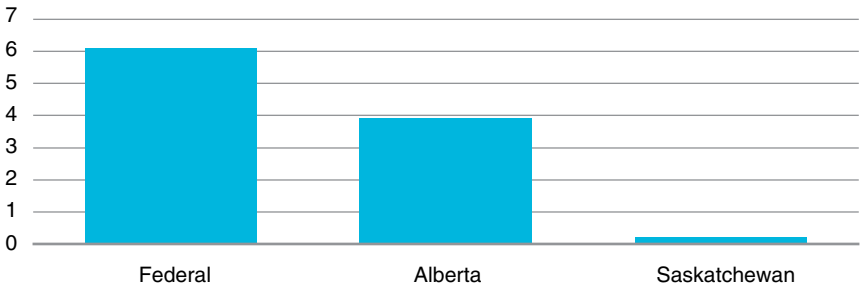
As the sole producers of heavy oil and diluted bitumen in Canada, Alberta and Saskatchewan would derive all of the benefit from higher provincial tax revenues. But the entire country would also benefit from higher federal corporate income tax collections, which we project would be larger than those that would accrue to Alberta and Saskatchewan combined. (See Chart 26.) Between 2018 and 2037, we expect that federal corporate income tax collections would be $6.1 billion higher

as a result of the higher netbacks coming from the TMEP. Since federal revenues tend to be distributed back to the provinces on a per capita basis, this scenario would generate significant benefits for all of Canada's regions.

Chart 26

Higher Netbacks Would Result in Sizable Corporate Income Tax Benefits

(2012 $ billions; increase in corporate income tax collections due to higher netbacks; 2018–37)



Source: The Conference Board of Canada.

Thus, in the base case, the cumulative fiscal benefits of the TMEP would be considerable. Canada as a whole would derive an additional $14.7 billion in revenues between 2018 and 2037. Alberta would capture the largest share of this benefit. The combined royalty and provincial corporate income tax effects in the province would 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 2012–13.[6] But the benefits would not be confined to Alberta. Saskatchewan would directly garner $454 million of the total fiscal effects between 2018 and 2037, while the rest would be spread across the provinces as part of federal disbursements.

6 Government of Alberta, *Budget 2013*.

Low Production Case

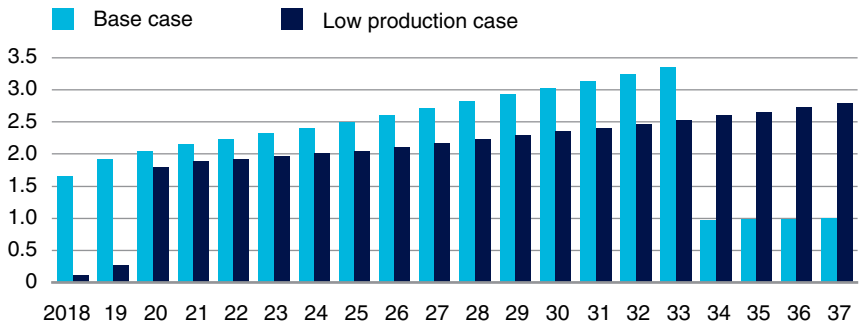
The IHS low production scenario assumes that bitumen production is lower than in the base case, but conventional heavy production remains unchanged. In terms of higher netbacks, the key difference between the base case and the low production case is the length of time it takes the available supply of oil to exceed the existing pipeline capacity. In the base case, this occurred in 2034, but it 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 would not start until 2020.

In any given year before 2034, the total royalties and corporate income tax collections associated with heavy oil production would 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 would persist for a longer period of time in the low production scenario, IHS estimates oil industry revenues attributable to the TMEP to be $41.9 billion over the period 2018 to 2037. (See Chart 27.) This is only modestly lower than in the base case.

Chart 27

Higher Netbacks Due to TMEP Would Contribute to Higher Oil Producer Revenues

(2012 $ billions; annual increase in oil producer revenues attributable to TMEP)



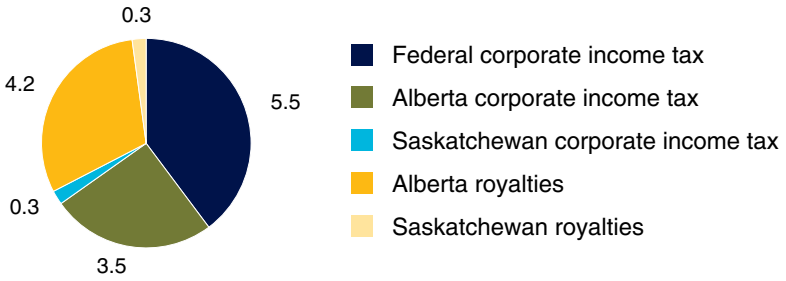
Source: The Conference Board of Canada.

In total, we expect that government revenues would be $13.8 billion higher between 2018 and 2037 as a consequence of the higher netbacks that would result from the TMEP. Corporate income taxes would again account for the largest share of this total, at $9.3 billion. (See Chart 28.) The federal government would 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 Would Experience the Highest Fiscal Impact in the Low Production Scenario

(2012 $ billions; cumulative fiscal impacts due to higher netbacks; 2018–37)



Source: The Conference Board of Canada.

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

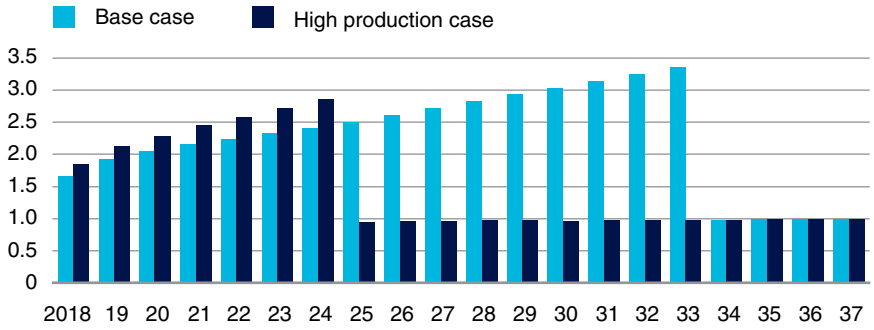
High Production Case

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 the length of time 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, it occurs much sooner—in 2025. As a result, IHS estimates that total oil producer revenues from higher netbacks attributable to the TMEP between 2018 and 2037 would be only $29.7 billion. Thus, the fiscal benefits associated with higher netbacks are the lowest in this scenario. (See Chart 29.)

Chart 29

Impact of Higher Netbacks Would Be Smallest in the High Production Scenario

(2012 $ billions; annual increase in oil producer revenues attributable to TMEP)



Source: The Conference Board of Canada.

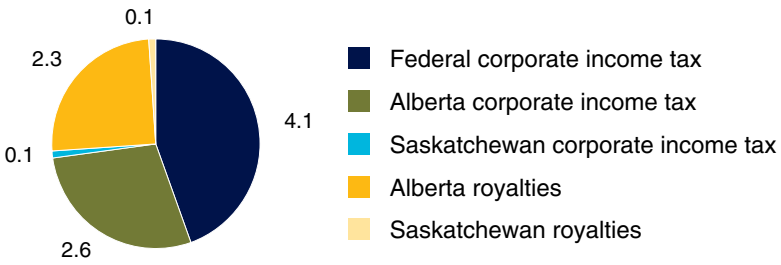
Nevertheless, the fiscal benefits are still significant in this case. In total, we expect that government revenues would be $9.2 billion higher between 2018 and 2037 as a result of the higher netbacks generated by the market access attributed to the TMEP. Corporate income tax

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

Chart 30

Federal Corporate Income Taxes Would Experience the Highest Fiscal Impact in the High Production Scenario

(2012 $ millions; cumulative fiscal impacts due to higher netbacks; 2018–37)



Source: The Conference Board of Canada.

Summary

We expect that the construction and operation of the TMEP and other pipelines would result in higher netbacks to Canadian oil producers. One outcome of these higher netbacks would be higher royalty and corporate income tax payments, both at the provincial (Saskatchewan and Alberta) and federal levels. In the base case, we expect that these fiscal benefits would 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, 2018–37)

	Atlantic Canada	Quebec	Ontario	Other Prairies	Alberta	British Columbia	Territories	Canada
Base case								
Total impact (2012 $ millions)	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 (2012 $ millions)	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 (2012 $ millions)	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

Chapter Summary

- The construction of the TMEP would generate three distinct types of economic impact: the impacts during the development phase; the impacts during the operational phase; and the impacts of higher prices for oil producers once the pipeline is operational.
- Combined, these three impacts are expected to generate 108,300 person-years of employment and $18.5 billion in government revenues between 2012 and 2037.
- The largest job impacts would occur in British Columbia, while the largest fiscal impacts would occur in Alberta. However, all provinces would experience some fiscal and employment impacts.

Canada's benchmark oil prices have lagged considerably behind those of our 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 would be derived from:

- the development stage of the Project, when the pipeline is being developed and built;
- the operational period of the Project, when the pipeline is being run and maintained;
- higher netbacks for producers of heavy oil in Western Canada, stemming from the TMEP.

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

Between 2012 and 2037, the Project would be expected to generate 108,310 person-years of employment.

Operational phase—We estimated 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 that pipeline operations would support 50,273 person-years of employment, and this figure would rise to 65,184 if the non-firm capacity were to be fully utilized. In terms of fiscal effects, pipeline operations would be 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 would reap the lion's share of these benefits; however, other provinces would benefit through supply-chain effects and the redistribution of federal government revenues to the regions.

Higher netbacks—We estimated the fiscal impacts of higher netbacks under the three different cases developed in the IHS study. In the base case, we expect that these fiscal benefits would total $14.7 billion over the first 20 years of the pipeline's operations. The federal corporate income tax effects would account for the largest share of these effects, at $6.1 billion. The combined royalty and corporate income tax effect for Alberta would be $8.2 billion, and for Saskatchewan, $454 million. The cumulative fiscal effect would range 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 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 would be expected to generate 108,310 person-years of employment. As well, it would 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, 2012–37)

	Using minimum operational effects and the base case for higher netbacks							
	Atlantic Canada	**Quebec**	**Ontario**	**Other Prairies**	**Alberta**	**British Columbia**	**Territories**	**Canada**
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 (2012 $ millions)	**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 (2012 $ millions)	**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

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APPENDIX B

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: commodities and geography. **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 consumed domestically as inputs into other industries, or exported. The **geography** element tracks where production takes place and how different commodities are traded across provincial and international boundaries.

One use 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 they can take different forms. For example, the effects of the TMEP's operations in this report were measured using a "gross output" or revenue shock. Essentially, we increased the revenues of the oil pipeline industry by a certain amount and observed 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 would be used in the Project, such as pipes, 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 part 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 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 (interprovincially or internationally).

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

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 were obtained using Statistics Canada's 2009 I/O model, the most current model 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 important to be aware 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 underlie 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 reflect the way things like changes in relative prices for different inputs, productivity, and technology can affect 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 to the discussion of the induced effects. The model assumes fixed consumption and savings patterns among consumers over time. In reality, spending and savings 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 draw resources away from other activities.

This is particularly relevant to the discussion of induced effects. That discussion assumes 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 might be less. Thus, including the induced effects likely overstates the total economic effects; however, not including them would definitely understate 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 Pipeline's operations and business practices are assumed to be the same as those of other oil pipeline operators, such as Enbridge or TransCanada. If Trans Mountain Pipeline's production structure is significantly different from the industry average, then 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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