

Trade and Labour Migration Effects on the Oil-Macroeconomy Relationship

BY SAEED MOSHIRI

Oil has played a critical role in the economic performance of countries across the world for more than half a century. Although oil intensity has decreased in many countries through time, changes in oil prices still generate significant impacts on economic conditions. The effects of oil price changes on economic performance are not homogeneous across countries and depend on whether they are oil-exporters or oil-importers. A rise in oil prices alters the terms of trade in favor of the oil-exporting countries and causes harm to oil-importing countries. The outcome is inverse when oil prices fall. However, trade and labour migration may mitigate the adverse effects of the oil price shocks across the world. In this article, I first briefly review the oil-macroeconomy relationship concerning both oil-exporting and oil-importing countries and then present the case for trade and labour migration as factors easing the pain.

In general, changes in oil prices generate primarily supply-side effects on the economy of oil-importing countries and mainly demand-side effects on the oil-exporting countries. Specifically, rising oil prices increase production costs in the manufacturing sector of the oil-importing countries leading to a decline in output and productivity and to higher prices (Hamilton, 1999; Balke et al., 1999). This is what happened during the first and the second oil-price shock in 1973, when Arab countries cut their oil exports to Western countries due to their support of Israel during the war, and in 1979, when oil-supply fell because of the Iranian revolution. Most of the following economic downturns in the U.S. economy were also preceded with a hike in oil prices (Hamilton, 1999). Monetary policy can also influence how the oil price shock affects the oil-importing countries. Depending on the policy stance of monetary authorities (accommodative, restrictive or neutral), an increase in oil price will impact the economic growth and inflation rate of oil-importing countries differently. For instance, Bohi (1991) and Bernanke et al. (1997) argue that a contractionary monetary policy following an increase in oil prices is the main source of economic slowdown in oil-importing countries. Furthermore, oil price volatility can send ambiguous signals to monetary authorities which then choose a potentially wrong monetary policy, consequently lightening or intensifying the real effects of oil price shock on the economic performance of oil-importing countries (Brown and Yücel, 2002).

The impact of oil price changes on oil-importing economies is, however, not symmetric. That is, although higher oil prices may lead to an economic downturn, lower oil prices may not contribute to economic growth significantly. Studies by Mory (1993), Mork (1994), Ferderer (1996), and Hamilton (1996,

1999) provide empirical support for asymmetric effects of oil price changes on the US economy by showing that negative responses in economic activities to the increase in oil prices are stronger than positive responses to a decrease in oil prices. One possible mechanism that could explain the asymmetric effects of oil price shocks is monetary policy. Assuming that nominal wages are sticky downward, a decrease in oil price and the subsequent rise in productivity and economic activities should be accompanied by a real wage rise to make markets clear. Since nominal wages are not limited to adjusting upward, monetary authorities do not interfere in the market. However, monetary authorities usually run a counter-inflationary monetary policy when oil prices increase and, if nominal wages are sticky downward, real wages will not fall with reduced productivity. Consequently, unemployment will increase, aggregate consumption will fall, and economic activities will be retarded beyond the level that stems directly from the supply shock (Brown and Yücel, 2002). The empirical results on the role of monetary policy in explaining the asymmetric effects of oil price shock are, however, mixed (Tatom, 1993; Ferderer, 1996; Bernanke et al., 1997; Balke et al., 1999). Another channel for explaining the asymmetric impacts of oil price is an indirect effect of adjustment costs (Hamilton, 1988). Adjustment costs could stem from sectorial resource reallocation and coordination problems between several firms and have an indirect negative impact on economic activities with either oil price decrease or increase. Therefore, when oil prices increase, two direct and indirect negative impacts are in effect retarding economic activities. On the other hand, when oil prices decrease, the direct positive impact is offset by the indirect negative impact and, thus, results in asymmetric effects of oil price shocks.

Unlike the experience of oil-importing countries, for oil-exporting countries, a hike in oil prices is considered good news. In an oil-exporting country, a windfall of oil revenues can improve the standard of living through increasing investment in physical and human capital and technology. This is particularly important as most of the oil-exporting countries are developing countries desperately in need of foreign capital to increase their economic growth. Nevertheless, the expected positive outcome of higher oil prices has not materialized and in some cases, economic conditions have worsened (Smith, 2004; Frankel, 2010). The traditional explanation

Saeed Moshiri is an Associate Professor in the Department of Economics, STM College, University of Saskatchewan Saskatoon, SK, Canada. He may be reached at smoshri@stmcollege.ca

for the detrimental effects of higher oil prices on the economic performance of oil-exporting countries is provided through the Dutch disease model (Corden and Neary, 1982). An oil boom will generate a de-industrialization process through an appreciation of exchange rates and resource movements, dampening the manufacturing sector in favor of non-traded sectors. Other studies have also examined the role of non-economic factors, such as political systems and institutions, to explain the poor performance of oil-exporting countries (Stevens, 2003, Mehlum et al., 2006).

In a more recent study, Moshiri (2015) shows that the oil price shock effects on many oil-exporting countries are asymmetric. That is, although lower oil prices hurt the economy by cutting oil revenues and spending, higher oil prices do not necessarily generate long-term growth. The asymmetric effects can be due to procyclical fiscal policy and the fixed-exchange rate policy in those countries (Husain et al., 2008; Frankel, 2010). Following a boom in the oil market, governments often increase spending dramatically on social programs and publicly-funded projects. In most cases, these large-scaled investment projects do not generate positive economic outcomes due to poor institutional quality, which leads to rent-seeking behavior and corruption. When oil prices fall, most of the unfinished projects stall due to lack of funding, and unemployment rises (Eifert et al., 2002; Farzanegan, 2011). Fixed exchange rate policies also work against the exports of non-oil products during the oil price fall. The oil reserve funds and international borrowing, which can be used to avoid volatility in economic activities arising from oil price changes, are also not often utilized effectively and borrowing may even exacerbate the condition by accumulating foreign debt.

Most studies on the oil-macroeconomy relationship have focused on a specific or a group of oil-importing or oil-exporting countries. However, with the rise in global trade and labour movements across the countries in recent decades, the dynamics of the relationship might have changed and, therefore, results focusing on countries in isolation might be misleading. The effects of the oil price shocks may spill over through trade or labour mobility between and within the countries. Failure to consider the spillover effects may thus lead to an overestimation of the overall effects of oil price shocks on the economy. Notwithstanding the rich literature on the relationship between oil price changes and macroeconomic performance, studies that include both oil-exporting and oil-importing countries and consider the spillover effects of the oil price shocks are limited. Only a few studies, such as Abeyesinghe (2001), Korhonen and Ledyeva (2008), and Husain et al. (2015), have examined the global impacts of oil price shocks, considering both oil-importing and oil-exporting countries. Abeyesinghe (2001) shows that even oil-exporting countries may not be able to escape the negative impact of high oil prices because

of the indirect effect through their trade with oil-importing countries. Korhonen and Ledyeva (2008) also show that although oil-exporting countries such as Russia and Canada benefit from higher oil prices, they also suffer indirectly through their trade with the oil-importing countries which are hit negatively. The oil-importing countries that are adversely affected by the higher oil prices may also benefit from trade with the oil-exporting countries.

The cross-country studies that include spillover effects between oil-exporting and oil-importing countries shed more light on the overall effects of oil price impacts on the economy than single country studies do. However, given the differences in the structures of the economies, institution qualities, and political systems in the sample countries, the aggregate level studies may also be subject to biased estimation results and misleading policy implications. Two recent studies have examined the mitigating impact of the intra-federal labour mobility on cases of Dutch disease using a state/provincial panel data. Raveh (2013) shows that although natural resource wealth is a curse in the cross-country analysis, it is a blessing at the provincial level and can lead the economy towards the so-called "Alberta Effect." He argues that the reduced factor mobility costs within federations could reverse, or at least alleviate, the Dutch disease symptoms at the intra-federal level. Beine et al. (2014) also addresses the question of whether Dutch disease symptoms could be overcome or at least mitigated through either interprovincial migration or international immigration flows of workers. They report that Dutch disease symptoms are observed in Canada in the form of a rise in the share of the non-tradable sector, but the immigration of workers into the booming provinces mitigates the effects of the Dutch disease. They also show that the mitigation effect is stronger with interprovincial migration flows and immigration flows associated with the temporary foreign worker programs. Moshiri and Bakhsimogaddam (2018) also investigate the effects of the oil price shocks on the Canadian economy. Canada is an interesting case study for the overall (direct and spillover) effects of the oil price shocks, because it includes autonomous oil-exporting and oil-importing provinces, which enjoy homogeneous institutional and political structures and the same monetary policy. Furthermore, trade and labour migrations take place between provinces without the barriers that exist among countries, even those in the same economic and political blocks. In this context, Canada can then be considered as a world including both oil-importing and oil-exporting countries, but with similar institutions and monetary system, free trade, and labour movement across the nations. Therefore, the oil price shock effects obtained from Canadian data will not be influenced by institutional and structural heterogeneities. Moreover, considering the interprovincial trade and labour movement across provinces will provide more accurate estimates of the spillover effects of the oil price shocks.

Like countries, Canadian provinces are subject to different demand side and supply side effects of the oil price shocks. For instance, high oil prices generate excess revenues for oil-exporting provinces, increasing aggregate demand. However, rising oil prices has adverse impacts on oil-importing provinces, because of increasing production costs, especially in the manufacturing sector. The standard Dutch disease effect may also be applicable, given the fact that the Canadian dollar moves with the oil prices. In addition to the direct demand and supply side effects in the two groups of provinces, interprovincial trade and labour migration can also influence how the oil price shocks affect the economy. When oil prices rise, the affluent oil-exporting provinces increase their imports from oil-importing provinces, alleviating the adverse supply side effect on oil-importing provinces. When oil prices fall, the beneficiary oil-importing provinces increase imports of oil and other commodities from oil-exporting provinces, easing the negative effects on the oil-exporting provinces. The labour movement would also have similar countercyclical effects in provinces, as labour moves from oil-importing provinces to oil-exporting provinces during oil booms and in the opposite direction when the oil market plummets (Helliwell, 1981; Raveh, 2013).

Figure 1 shows that per capita GDP in Canada and its two groups of oil-export and oil-import provinces along with the oil price trend for the period 1981-2012. The Canadian economy grew noticeably during the low oil prices in the 1990s and continued to grow, though at slower rates, during the sharp oil price increases in the 2000s. Figure 1 also shows that both oil-exporting and oil-importing provinces have been growing during different cycles of the oil prices, but the growth of oil-exporting provinces has been faster during the oil boom of the 2000s.

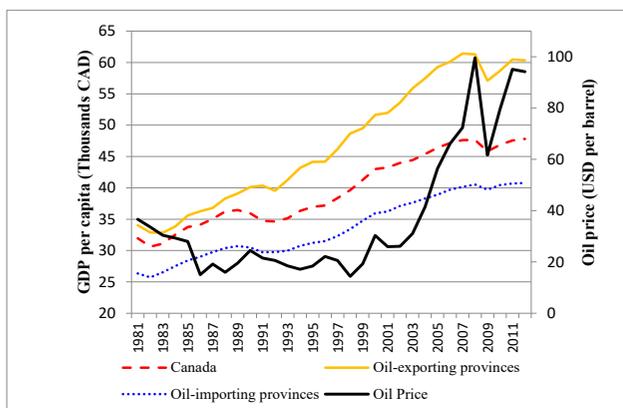


Figure 1- Oil prices and GDP per capita in Canada
Source: Statistics Canada, U.S. Department of Energy (EIA)

Figure 2 shows the interprovincial trade ratios in oil-exporting and oil-importing provinces. The trade ratios are much higher in the oil-exporting provinces, reflecting their lower total GDP compared to the oil-importing provinces, and have been increasing much

faster since 2000. Figure 3 also shows the net migration from the oil-importing to the oil-exporting provinces. The oil-importing provinces have experienced a net labour inflow during the oil bust in the 1980s and a net labour outflow during the oil boom beginning in the late 1990s.

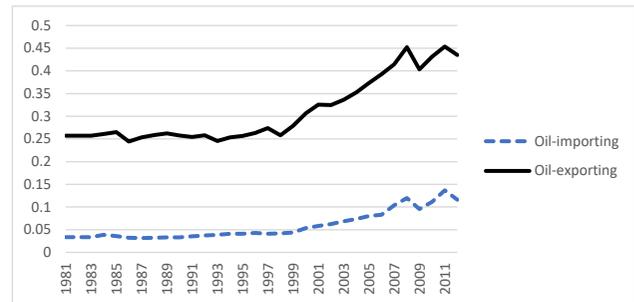


Figure 2- Trade Ratios in oil-importing and oil-exporting Provinces

Trade ratio is the sum of exports and imports as a ratio of GDP.
Source: Statistics Canada, CANSIM Table 384-0038, 384-0002 and 384-0003.

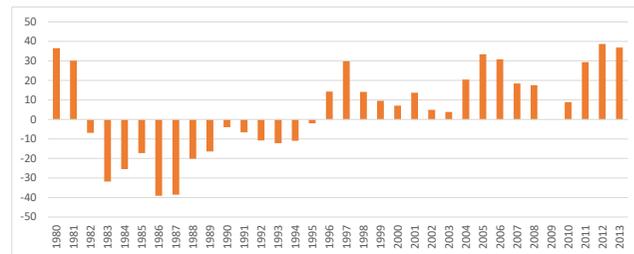


Figure 3- Net Migration from oil-importing to oil-exporting Provinces (1000 persons)

Source: Statistic Canada, CANSIM, Tables 384-0038 and 051-0019.

Moshiri and Bakhshimogaddam (2018) use a panel VAR model to tease out the impacts of the oil price shocks on the Canadian economy considering the trade and migration factors. The main variables included in the model are per capita GDP growth rate, interest rate, exchange rate, and oil price shocks. For a robustness check, they also include other variables such as investment ratio, government spending ratio, and real exchange rate. The results of the study show that oil price shocks do not have an overall significant effect on the Canadian economy. Nevertheless, the effects are heterogenous across the two groups of oil-importing and oil-exporting provinces. While oil-exporting provinces benefit from higher oil prices, oil-importing provinces suffer. However, interprovincial trade and labour migration have been able to mitigate those direct effects on the provinces. The results of the counterfactual exercise show that the responses of the economy when trade and labour spillovers are considered are different than those when the spillover variables are absent. Specifically, the long-run (5-year horizon) effect of oil price shocks on GDP growth rate of oil-exporting provinces in the presence of the trade spillover is higher by 0.23 percent, and

the negative effect on oil-importing provinces is lower by 0.1 percent. The impulse response differences are also similar when labour migration spillover (0.23 percent and 0.12 percent for the oil-exporting and the oil-importing provinces, respectively) is used. As an alternative way to gauge the spillover impact, the oil shock - GDP growth nexus is also examined in two different periods with low and high trade ratios and labour movements. As Figure 2 shows, the trade ratio has been low and stable between 1981-2000 (25 percent on average) and began to rise markedly afterward (35 percent on average). Furthermore, Figure 3 shows that the net labour migration from the oil-importing to the oil-exporting provinces has shifted from negative to positive in the late 1990s and stayed the same since then. These data provide a form of natural experiment to get an insight about the importance of interprovincial trade and labour migration in the oil-macroeconomy relationship.

The results of the state/provincial studies may also be applicable to oil-exporting and the oil-importing countries in the global context. A new study by Moshiri and Kheirandish (2018) estimates the direct and spillover effects of the oil-price changes on 30 major oil-exporter and oil-importer countries. The sample data shows that more than 70 percent of the total exports of oil-exporters flows to major oil-importers in the developed countries and more than 40 percent of the total exports of oil-importers flows to major oil-exporters in the developing countries. The results of the study also indicate that while higher (lower) oil prices are harmful for oil-importing (oil-exporting) countries, international trade mitigates the direct effects significantly. That is, the boons of higher oil prices for oil-exporting countries spills over to oil-importing countries, and similarly, the positive impacts of lower oil prices on oil-importing countries flow to oil-exporting countries through their trade. Although this study does not specifically examine the international labour migration effect, empirical studies for the federated countries suggest that labour movement across the countries can similarly dampen the adverse effects of the oil price shocks on both groups of countries.

The results of these studies have important policy implications in national and global contexts, specifically in our current condition, as sanctions and restrictions on trade and immigration are the active policy agenda in the United States. Resuming sanctions on Iran's oil exports and its financial institutions after the recent unilateral exit of the U.S. from the 5+1 nuclear deal will generate an adverse supply shock causing harm to major oil-importing countries in developed and emerging economies, such as China and India, and thus hindering world economic growth. Moreover, restrictions on trade and labour migration will also intensify the negative impacts of the higher oil prices on industrialized and fast-growing emerging economies. On the contrary, stronger trade relationships and labour movement between the oil-

importing and the oil-exporting countries will enhance the positive effects of oil price shocks and dampen their negative effects on the economies of both groups.

References

- Abeysinghe, Tilak, 2001. Estimation of Direct and Indirect Impact of Oil Price on Growth. *Economic Letters*, 73, 147-153.
- Balke, N. S., Brown, S. P. A., and Yücel, M. K., 1999. Oil price shocks and the U.S. economy: where does the asymmetry originate? Research Paper No. 99-11, Federal Reserve Bank of Dallas.
- Beine, M., Coulombe, S., and N. Vermeulen, W., 2014. Dutch Disease and the Mitigation Effect of Migration: Evidence from Canadian Provinces. *The Economic Journal*, 125 (December), 1574-1615.
- Bernanke, B. S., Gertler, M., and Watson, M., 1997. Systematic monetary policy and the effects of oil price shocks. *Brookings Papers on Economic Activity*, 1997 (1), 91-157.
- Bohi, D. R., 1991. On the macroeconomic effects of energy price shocks. *Resources and Energy*, 13 (2), 145-162.
- Brown, S., and Yücel, M., 2002. Energy Prices and Aggregate Economic Activity: An Interpretative Study. *The Quarterly Review of Economics and Finance*, 42, 193-208.
- Corden, W. M., and Neary J. P., 1982. Booming Sector and De-Industrialization in a Small Open Economy. *Economic Journal*, 92, 825-848.
- Eifert, B., A. Gelb, and N. B. Tallroth, 2002. The Political Economy of Fiscal Policy and Economic Management in Oil Exporting Countries. World Bank Policy Research Working Paper 2899.
- Farzanegan, M. R., 2011. Oil Revenue Shocks and Government Spending Behaviour in Iran. *Energy Economics*, 33, 1055-1069.
- Ferderer, J. P., 1996. Oil price volatility and the macroeconomy: a solution to the asymmetry puzzle. *Journal of Macroeconomics*, 18, 1-16.
- Frankel, J. A., 2010. The Natural Resource Curse: A Survey. NBER working paper 15836.
- Fried, E. R., and Schultze, C. L., 1975. Higher Oil Prices and the World Economy: Overview. In Fried & Schultze (Eds.), Washington, D.C.: The Brookings Institution.
- Hamilton, J. D., 1988. A neoclassical model of unemployment and the business cycle. *Journal of Political Economy*, 96, 593-617.
- Hamilton, J. D., 1996. This is what happened to the oil price-macroeconomy relationship. *Journal of Monetary Economics*, 38, 15-220.
- Hamilton, J. D., 1999. What is an oil shock? University of California San Diego, November.
- Hamilton, J. D., and Herrera, A. M., 2000. Oil shocks and aggregate macroeconomic behavior: the role of monetary policy. University of California San Diego, June.
- Helliwell, J. F., 1981. Using Canadian oil and gas revenues in the 1980s: Provincial and federal perspectives. In *Oil or Industry*, edited by Baker, T. and Brailovsky, V. Academic Press.
- Husain A. M., Tazhibyeva, K., and Ter-Martirosyan, A., 2008. Fiscal Policy and Economic Cycles in Oil-Exporting Countries. IMF Working Paper, WP/08/253.
- Husain A.M., Arezkei R., Breuer P., Haksar V., Helbling T., Medas p., and Sommer M., 2015. Global Implications of Lower Oil Prices. IMF Staff Discussion Note, SDN/15/15.
- Karaki, Mohammad, 2017. Oil Prices and State Unemployment Rates. Department of Economics School of Business Administration, Lebanese American University.

(continued on page 50)