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Paradox of plenty: Norway's macroeconomic policy dilemmas during the oil price crash, 2014-15

Sashi Sivramkrishna

ABSTRACT

Norway, a country at the top of global rankings in terms of gross domestic product (GDP) per capita and human development was also in an enviable position with large current account and fiscal surpluses, as well as a massive stock of public assets. Then came a shock; between June 2014 and early 2016 oil prices tumbled by more than 70 percent. As a major oil exporter, Norway's current account was severely impacted but could this actually draw Norway into a macroeconomic crisis? Couldn't it just fund its way out of the contractionary pressures building up in the economy using its stock of foreign currency reserves being held in a sovereign wealth fund? This article explores the fiscal and monetary policy challenges that Norway faced in preempting falling GDP growth and rising unemployment while at the same time, warding off a housing bubble going bust.

KEYWORDS

Norway; fiscal policy; monetary policy; sectoral financial balances; sovereign wealth funds

Facing a dramatic fall in oil prices between June 2014 and the end of 2015, Norway, a major oil exporter with large accumulated foreign exchange (FX) reserves chose to compensate the fall in effective demand with a massive dose of fiscal spending. Intuitively, it may seem that even if a country like Norway slipped into a recession it would not pose a great challenge to policymakers; after all, any adverse impact on output and employment could be compensated for by increased government spending drawn from the flow of income accruing on its accumulated FX surpluses¹ or if necessary, from its stock of FX denominated assets. The popular commentary at that time certainly seemed to think so. An extract from Bloomberg is a case-in-point:

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Color versions of one or more of the figures in the article can be found online at www.tandfonline.com/mpke.

¹The stock being so large, the returns would suffice.

Norway predicts it will for the first time need to withdraw cash from its \$820 billion sovereign wealth fund as Western Europe's biggest oil exporter uses a record chunk of its petroleum revenue to cover budget holes and stimulate the economy.²

In quite the same vein, the *Financial Times* reported:

An economic slowdown in Norway is forcing the government to dip into its vast oil savings for the first time as it cuts taxes in an attempt to boost faltering growth and accelerate its economic transformation.³

This opinion of popular commentators was not entirely misplaced as Norway itself had adopted a fiscal policy rule stipulating that any stimulus spending had to be financed by using its FX rather than simply drawing on its accounts at the central bank or what is commonly referred to as "printing money." Although economists often deliberate on the dangers of "printing money" in the context of current account deficits and exchange rate depreciation, relatively few contemplate on the macroeconomic challenges of funding fiscal spending from FX reserves. Norway's policy response and the dilemmas it faced during the period of crashing oil prices provides an opportunity to do so.

The Norwegian economy at the eve of the crisis

Norway's gross domestic product (GDP) per capita in nominal terms is amongst the highest in the world at close to US\$100,000 (World Bank 2016) and its rank is at the very top of the Human Development Index with an absolute score of 0.944 (UNDP 2015, 2). Its macroeconomic parameters are enviable with a considerable stock of public assets (negative public debt) along with a substantial current account surplus in the balance of payments, all at the same time. With low and stable inflation, the Norwegian economy was nothing short of a macroeconomic idyll.

Oil was discovered in the Norwegian continental shelf in 1969, by 1971 Norway was an oil producer and soon after, an oil exporter. The inflow of foreign exchange (hereafter \$⁴) took its toll on the Norwegian krone (NOK); in 1978, it reached an all-time high of 4.66 to the U.S. dollar. But Norway's learning was quick; it thereafter used oil revenues wisely to support growth and development while at the same time avoided both, the

²Mohsin, S., and Holter, M. "Norway to Start Withdrawals from Oil Fund to Plug Deficits/" *Bloomberg Business*, October 7, 2015. Accessed on November 3, 2015, <http://www.bloomberg.com/news/articles/2015-10-06/norway-budget-proposes-boosting-oil-spending-by-14-nrk-says>

³Crouch, D. "Slowing Economy Forces Norway to dip into Oil savings." *Financial Times*, October 7, 2015. Accessed November 3, 2015, <https://next.ft.com/content/52860dbc-6d09-11e5-8171-ba1968cf791a>

⁴This includes euro, yen, and sterling pounds in addition to U.S. dollars.

resource curse as well as the Dutch Disease.⁵ Although Norway's political institutions, social norms, and the legal system debilitated the resource curse (Larsen 2004), the Dutch Disease was preempted by investing most of the foreign exchange earnings in foreign assets through a sovereign wealth fund (SWF) called Government Pension Fund Global (GPFG). Since then, NOK never reached the 1978 exchange rate level. The closest call was when it almost touched 5 NOK/dollar in 2009 after the Great Recession of 2008 hammered the U.S. dollar. By 2014, systematic additions to GPFG enabled Norway to accumulate foreign currency denominated assets to the tune of some US\$825 billion or a staggering US\$174,000 per capita (SWFI nd). Barry Bosworth, economist at Brookings Institute, asserted that "Norway has done an excellent job of saving and investing a portion of its oil revenues for future generations."⁶ Although it is often claimed that GPFG "should benefit the society as a whole, including future generations"⁷ its purpose was to primarily isolate mainland Norway from oil revenues, financially at least.

Nonetheless, the growth of Norway has been nothing less than spectacular. The reason for this was articulated by Øystein Olsen, Governor of Norges Bank (Norway's central bank):

The ripple effects from activities on the continental shelf to the wider economy have been wide-ranging. A growing number of firms have targeted the oil industry. A state-of-the-art oil service industry has emerged. For many firms, the contracts on the Norwegian continental shelf have been a springboard to new export markets (Olsen 2015).

Norway benefitted more from real economy externalities of oil production than financial flows of foreign currency *per se*. Although just about 2 percent of total employment in Norway is directly in petroleum production, "the demand from the petroleum sector constituted about 12 percent of the GDP in 2012" (Holden 2013, 14), which in turn contributed to almost 11 percent of total employment not including "all the hoteliers, restaurateurs, cab drivers, and others who benefit from the prosperity that the oil windfall has brought."⁸

⁵The "resource curse" refers to the phenomenon wherein countries or regions endowed with natural resources end up with not just low rates of growth and underdevelopment but also exploitation and widespread poverty, stark inequalities, corruption and crime, pollution and environmental degradation, and so on. The Dutch Disease is more the economic consequence of exporting natural resources which leads to an appreciation of the domestic currency, inflation, increased imports and high wage costs. This ultimately destroys traditional industry and exports, making the country over-reliant on just the export of the natural resource.

⁶Kim, Susanna (2014), Why Norwegians are Millionaires and Americans are Paupers, *ABC News*, January 11, accessed on November 2, 2015, <http://abcnews.go.com/Business/norwegians-millionaires-norways-sovereign-wealth-fund/story?id=21488085>

⁷Poelzer, Greg (2015), What Crisis? Global Lessons from Norway for Managing Energy-Based Economies, February, Commentary, Macdonald-Laurier Institute, Canada, <http://www.macdonaldlaurier.ca/files/pdf/MLICommentaryPoelzer02-15-V7-WebReady.pdf>

⁸Klein, Matthew (2015), How Will the Oil Crash Affect Norway? *FT Alphaville*, February 17, accessed on November 13, 2015, <http://ftalphaville.ft.com/2015/02/17/2119329/how-will-the-oil-crash-affect-norway/>

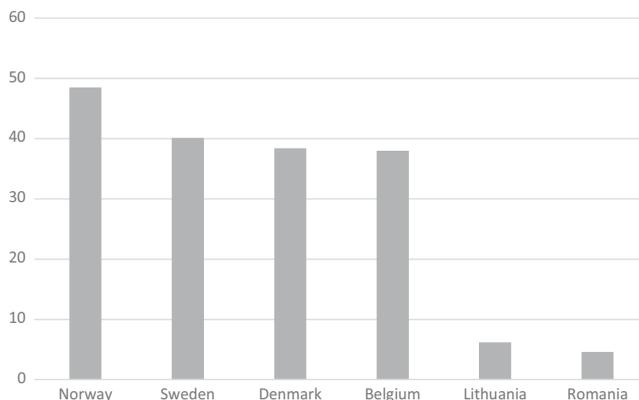


Figure 1. Average hourly labor costs (in euro).

Source: <http://www.thelocal.se/20140331/sweden-tops-eus-hourly-labor-costs>.

Between 2003 and 2013, petroleum investments increased more than 100 percent, from NOK 100 billion to some NOK 225 billion or more than 8% of Norway's GDP. At an average exchange rate of 6.5 NOK/dollar prevailing at that time, this works out to annual investments of more than US\$30 billion—for a country of about 5 million people, this was Norway's engine of growth. These investments benefitted several manufacturing and engineering companies so that almost 25 percent of mainland exports were from oil-related industries (Olsen 2015). Consider, for instance, Norway's service and supply industry that “supplies goods and services for all stages of the value chain, including seismic and engineering services and drilling rig equipment; valves, nuts and hoses for the shipyard industry; and advanced offshore supply and service vessels and subsea technology” (Norwegian Petroleum 2015). The industry includes more than 1,250 companies; with a turnover of more than NOK 500 billion, it is Norway's second-largest industry after the oil and gas.

A closer look, however, suggests that Norway may have not been able to completely insulate itself from the Dutch Disease. A major study by the International Labour Organization (ILO) reveals the gap between real wage growth and labor productivity growth in Norway is probably one of the highest in the world. Between 1999 and 2007, although labor productivity growth was just below 2 percent, real wage grew at approximately 2.6 percent. This trend, however, “worsened” between 2008 and 2011 labor productivity growth turned negative although real wages continued to grow at close to 2 percent. (ILO 2013, 14) The impact of this is reflected in Norway's labor costs, which is now significantly higher than other advanced countries in the European Area (Figure 1). Without corresponding increases in productivity, Norway's competitiveness has increasingly come under stress.

The onset of the Dutch Disease is more starkly visible in a “two-tier development in the manufacturing sector in Norway, with industries linked to oil and gas expanding and other industries shrinking” (IMF 2013, 9) in terms of market share. Traditional industries including paper and base metals like aluminum were rapidly losing ground in the global economic landscape. Since 1990, Norway lost 60 percent of its non-oil manufacturing share of world exports (ibid, 7). However, with high growth in real wages, Norway accomplished tremendous improvement in standards of living over the last few decades.

Then came the adverse shock; in June 2014 oil prices were at US\$110/barrel but over the next 18 months, slumped to sub-30 levels. With Iran coming into the fold of global suppliers after sanctions were lifted (on January 18, 2015), there were pointers at that time that the slide was far from over and oil prices could have dropped to an abysmal \$10 per barrel. Norway produced about half a barrel of oil per day per capita, exporting almost all of it, and accounted for almost 70% of its total goods exports in 2011 (ibid, 3). As oil prices began to decline, Norway’s non-oil sector once again came into focus as the country’s only hope of sustaining macroeconomic stability and growth. Although this article focuses on the policy challenges Norway faced until early 2016, the situation did ease thereafter. From lows of about US\$30 at the beginning of 2016, oil prices gradually reclaimed US\$50 levels by the end of the year. Crude oil prices since then have steadily risen and by June 2018 crossed US\$70/barrel. Nonetheless, there are important lessons to infer from Norway’s experience on the challenges to expansionary fiscal policy that is funded by drawing on a country’s FX reserves.

Deconstructing Norway’s fiscal policy rule

At the core of Norway’s strategy in managing its wealth from oil, and the Dutch Disease in particular, is its fiscal policy rule that stipulates,

Gradual phasing-in of oil revenues in the Norwegian economy in line with the expected real returns on the Government Pension Fund Global, estimated at 4 per cent.⁹ The fiscal rule permits spending more than the expected return on the Fund in a cyclical downturn, while the use of oil revenues should lie below the expected return when capacity utilisation in the economy is high (Royal Ministry of Finance 2012, 2).

The economic implications of this process are, however, not as obvious as it they may seem. What does it mean for a sovereign country that issues

⁹With the expected real rate of return on GPFG reduced from 3 percent to 4 percent, Norway’s fiscal spending would be further tightened. See OECD Economic Surveys, Norway, January 2018, accessed on June 23, 2018, <https://www.oecd.org/eco/surveys/norway-2018-OECD-economic-survey-overview.pdf>

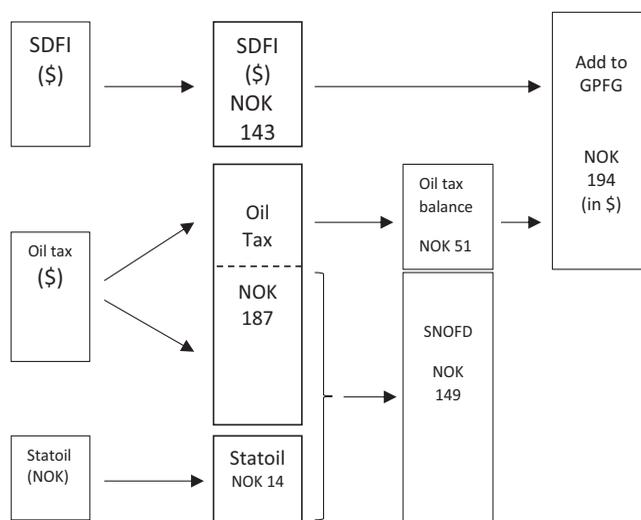


Figure 2. Funding Norway's structural non-oil fiscal deficit (SNOFD), 2013.

its own currency—and Norway does issue its own krone—to “fund” its budget from an SWF? After all, any economically sovereign country that “prints” its own currency could always fund its budget deficit. Norway’s decision to instead adhere to the fiscal rule gives rise to several interesting macroeconomic dilemmas; rather than enabling the use of fiscal policy as the primary countercyclical policy tool, it not only constrains the quantum of fiscal spending but adversely affects the foreign exchange rate thereby transferring the onus onto monetary policy to stabilize the economy. Furthermore, by not “printing” its own currency, Norway’s fiscal rule also restricts the amount and composition of financial asset accumulation of the private sector, which becomes especially important during a crisis when the private sector begins the process of deleveraging.

To understand these policy dilemmas that Norway faced, we must first analyze the effects of (a) the foreign exchange operation and (b) changes in reserve money with the banking sector when Norway phases-in oil revenues into the national budget.

Figures 2 and 3 schematically present the foreign exchange operations in the process of using oil revenues to fund the budget; the numbers shown (in NOK) are from Norway’s 2013 and 2014 national budgets respectively (Norwegian Ministry of Finance 2014, 2015). There are three principal sources of oil revenues to the Norwegian government; from sale of its own petroleum—the State Direct Financial Interest (SDFI); second, dividends received from Statoil multinational oil company in which the Norwegian government has a 67 percent stake; and third, from taxes paid by other oil and gas companies. In pre-2014 years, \$ from SDFI were usually transferred directly to GPFG *in toto* and without conversion of \$ revenues into NOK.

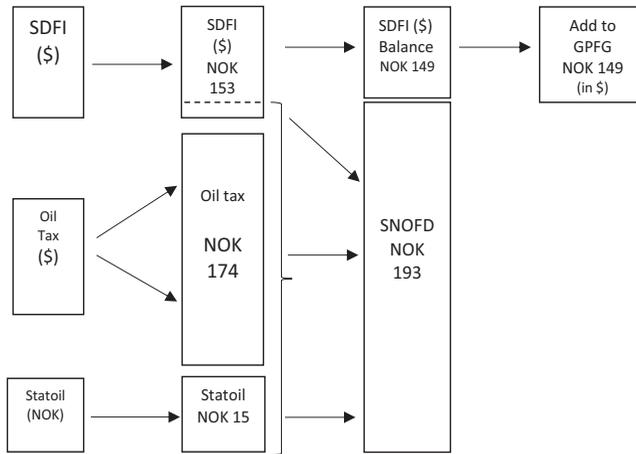


Figure 3. Funding Norway’s structural non-oil fiscal deficit (SNOFD), 2014.

Statoil dividends were transferred to the government¹⁰ in NOK from Statoil’s bank accounts. Lastly, although the oil and gas companies earned revenues in \$ from oil sales in foreign markets they settled their tax obligations to the Norwegian government in NOK by selling \$ to banks to procure the necessary amount of NOK. The Norwegian government “used” a portion from these revenues received from Statoil and oil taxes to cover mainland Norway’s structural non-oil fiscal deficit, SNOFD. The leftover cash (NOK) if any is then converted back into \$ and added to GPFG.

In 2013, while SDFI revenues worth NOK 143 billion were transferred directly to GPFG in \$ (without conversion into NOK and re-conversion into \$), oil company tax revenues were converted into NOK 187 billion¹¹ (Norwegian Ministry of Finance 2014). Along with Statoil’s revenues of NOK 14 billion, a total (cash flow) of NOK 344 billion in oil revenues was received by the government (i.e. excluding NOK 143 billion of SDFI revenue). The government ran a structural non-oil fiscal deficit (total expenditure minus revenue receipts in mainland Norway¹²) of approximately NOK 150 billion, which meant that NOK 51 billion¹³ had to be re-converted from NOK into \$ and then added to GPFG. From these flows we can infer that the supply of \$ to the market was NOK 187 billion (conversion of oil company \$-taxes to NOK) while \$ demanded (for deposition into GPFG) was only NOK 51 billion worth. This excess supply of

¹⁰More precisely, the government’s account in Norges Bank.

¹¹Figures from “Estimated Accounts 2013” have been used. Only net cash flow from petroleum activities (not accrued revenue from petroleum activities) are considered. Numbers mentioned have also been rounded off.

¹²Stated in the budget report as “revenue excluding petroleum revenue.”

¹³NOK 51 b = NOK 187 b + NOK 14 b – NOK 150 b.

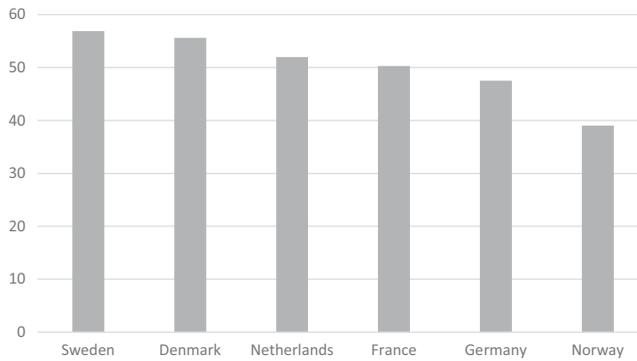


Figure 4. Personal Income Tax Rate (%) in Norway, 2014. Source: www.tradingeconomics.com. Personal Income Tax Rate is a tax collected from individuals and is imposed on different sources of income like labor, pensions, interest and dividends. The benchmark used refers to the Top Marginal Tax Rate for individuals.

\$(= NOK 136 billion) actually exerts pressure on NOK to appreciate in forex markets.¹⁴

It would seem obvious that the sharply falling oil prices and its adverse impact on Norway's exports would automatically cause the NOK to depreciate. Instead, with non-oil fiscal deficit increasing, phasing-in of oil revenues *ceteris paribus* actually exerts pressure on NOK to appreciate as compared to good times when non-oil deficits are lower. In other words, increased supply of \$ to the market for the Norwegian government to obtain NOK (to fund domestic spending) and lesser subsequent demand for \$ for reconversion and deposition in GPFC, exerted pressure on the NOK to appreciate. This can be seen from figures for 2014¹⁵ (Norwegian Ministry of Finance 2015) after the oil-price slump had begun and necessitating a larger non-oil fiscal deficit. Figure 3 delineates this effect clearly as the excess supply of \$ increases with lower levels of re-conversion of NOK into \$ for deposition into GPFG. This would happen even if tax revenues from oil companies are falling (which would *ceteris paribus* lead to a fall in conversion of \$ into NOK and lesser appreciation of NOK) because the Norwegian government would resort to sale of \$ from SDFI to meet the requirement of NOK to fund the deficit. In the extreme case (which did not arise in 2014–15) where revenues from SDFI also turn out to be inadequate, the government would could begin converting the \$ returns accruing in GPFG or even a portion of accumulated stock of assets to fund the SNOFD. This gives rise to an interesting corollary; increasing non-oil fiscal deficit puts pressure on NOK to appreciate relative to a situation of lower non-oil fiscal deficits as long as \$ are converted into NOK to “fund” the

¹⁴The final exchange rate of NOK, however, depends on several other factors including international interest rate differential, capital flows, current account balance of mainland Norway, and so on.

¹⁵See Footnote 11 for figures used and rounding off.

deficit. This is because higher non-oil fiscal deficits results in a larger excess supply of \$, providing the Norwegian government with more NOK for its spending.

In spite of the increasing non-oil fiscal deficit after the oil slump, when both oil revenues as well as the non-oil budget are considered, Norway continues running a fiscal surplus. This surplus which is the sum of net addition of oil revenues to GPFG plus revenues from interest and dividends accruing from existing GPFG investments is essentially net accumulation of financial assets by the Norwegian government (ostensibly on behalf of its citizens). Correspondingly, these financial assets are financial liabilities of the rest of the world to Norway.

The implications of Norway's fiscal rule on bank reserves and public debt

Norway's fiscal rule is often considered prudent (Daniel 2007, 11) but the fundamental question is whether conversion of \$ into NOK to fund the non-oil fiscal deficit really necessary? Put differently, how do (economically) sovereign countries that do not have such flows of oil revenues fund fiscal deficits? Do they, for instance, sell dollars from their foreign exchange reserves to fund its fiscal deficit? Certainly not; the essential difference in the Norwegian strategy and the conventional "printing money" option lies in the implications of government spending on bank reserves.

A short detour into the economics of money is necessary at this point.¹⁶ Sovereign nations, even those without oil revenues, can create unlimited quantities of their own money—this money comes into existence when the government spends. However, in a modern economy this does not happen through "printing" of currency but rather through creation of reserves by the central bank. Government spending results in an injection of reserve money into the banking system. This state money or reserve money is required by the banking system to settle interbank claims as well as claims of the state on the private sector. Excessive expenditure by the state may, however, result in more money with the private sector which can exert inflationary pressure on prices. The government would have to drain the economy of disposable income (with non-banking private sector) through taxes.¹⁷ Reserves then flow from banks back to the central bank. The draining of excessive reserves is important for an additional reason; excess reserves in the banking system would push interest rates in interbank

¹⁶The argument that follows here is drawn from a post Keynesian perspective or, more specifically, Modern Money Theory (MMT). However, it is interesting to note that Norges Bank propounds a very similar view. See, for instance, Norges Bank (2011).

¹⁷Taxes serve other important purposes like reducing inequalities, diverting resources, etc. From a monetary standpoint we do not consider them here.

money markets down, perhaps all the way down to a lower bound like the reverse repo rate. To ensure that the central bank is able to maintain interest rates at the target level, more reserves will have to be drained out—here, instead of taxation, the central bank can resort to sale of bonds. When banks and other institutions purchase these bonds, reserve money flows back to the central bank and the interest rate moves back up to its target level. The sale of bonds is essentially a monetary policy operation to maintain interest rates and not a fiscal policy instrument to fund deficits (Wray 2012; Tymoigne and Wray 2013). At the same time, government bonds or national public debt enables the private sector to hold interest-yielding, low-risk financial assets or claims over on the government.

From this basic understanding of reserve money flows induced by government budgets, it is possible to compare the difference between Norway's fiscal rule and a country where the fiscal deficit is not funded through sale of dollars. As discussed above, oil companies must pay their taxes to the Norwegian government in NOK (say, x). For this they first convert \$ to NOK-deposits in banks. When taxes are remitted to the government, reserves in the banking system will fall to the extent of taxes (x). From this amount, the government may use an amount (say, y) to fund the non-oil fiscal deficit. When spent, reserves in the banking system will increase by the same amount (y). Finally, the government will re-convert the remaining amount ($x - y$) back into \$. When these \$ are bought by the government, banks will receive the amount ($x - y$) as NOK-reserves. In this way, the total amount of reserves drained from the system on account of the oil tax (x) goes back into the banking system as spending (y) and re-purchase of $$(x - y)$.¹⁸ On account of Norway's fiscal rule that mandates use of oil revenues, deficit spending does not cause any change in reserves with the banking system (Aamodt 2012, 2014).

Consider now a situation where the government does not fund its deficit from \$ revenues. Government spending injects reserves into the banking system (x).¹⁹ To preempt inflation, the government would need to drain the system with taxes (say, t). However, excess reserves remaining in the system ($x - t$) may drive interest rates below the target level so that government may have to resort bond sales (b). If, however, the government were to achieve the same condition as Norway (i.e. no change in bank reserve position) we must have $t + b = x$. Therefore, by funding its non-oil fiscal deficit from oil revenues, Norway can avoid additional²⁰ tax (t) as well as bond sales (b). As seen in Figure 4 and 5 this difference is clearly reflected

¹⁸i.e. $x = (x - y) + y$.

¹⁹This is true even if the government deficit is funded through bond sales. See Juniper et al. (2013).

²⁰Taxes are nonetheless required as part of the non-oil budget.

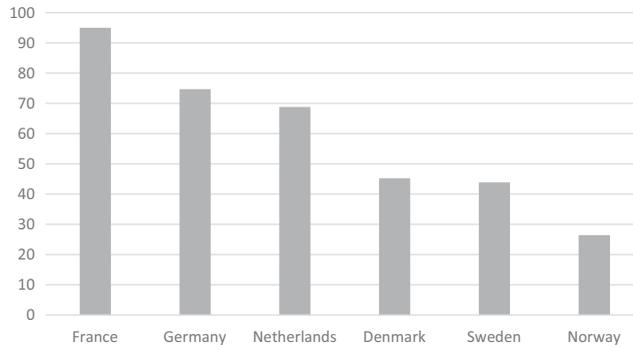


Figure 5. Government Debt to GDP Ratio, 2014. Source: www.tradingeconomics.com.

in lower marginal tax rates, as well as in domestic government debt of Norway vis-à-vis some other high-income countries.

The low quantum of government bonds in circulation, however, restricted Norway's monetary policy options; in particular, a quantitative easing (QE) program to lower yields through aggressive bond purchases by the central bank. Moreover, this scarcity of government bonds also impacted the composition of net financial asset accumulation by the domestic private sector. We will return to these issues later in the article.

The impact of the 2014-15 fall in oil price on Norway

In March 2015, the Governor of Norges Bank emphatically declared, “we are about to leave behind us 15 golden years” (Olsen 2015). Although Norway's trade surplus declined by more than 41 percent between November 2014 and November 2015 (Statistics Norway 2015a), the immediate concern of the oil crisis was with respect to investment demand in mainland Norway, its engine of growth. A decline in the price of oil led to a sharp drop in investments related to the oil industry. Growing at an average rate of some 14 percent annually between 2011 and 2013, investment demand after the oil crash declined sharply as major oil producers shelved investments in new and ongoing projects. Statoil, for instance, cut planned investments in the giant Johan Sverdup oilfield by 12 percent from the original level and further cuts at that point of time were likely.²¹ Overall, nominal oil investment was down by 20 percent after the oil price crash.²² The scenario looked bleaker with every fall in oil prices.

The tone of reports on Norway's economic situation changed drastically through 2015. In January 2016 Planet Energy News declared;

²¹Market Watch, “Statoil Sees Spending Cut at Johan Sverdrup Field,” January 18, 2015. Accessed on January 22, 2016, <http://www.marketwatch.com/story/statoil-sees-spending-cut-at-johan-sverdrup-field-2016-01-18>

²²Mohsin, S. and Holter, M., “Norway Faces 20% Drop in Oil Investment after Prices Slump,” *Bloomberg Business*, November 24, 2015. Accessed on November 27, <http://www.bloomberg.com/news/articles/2015-11-24/norway-oil-companies-to-deepen-spending-cuts-amid-sub-50-crude>

Norway's oil "industry is in a crisis now, we can't deny that," Bente Nyland, director general of the Norwegian Petroleum Directorate, told Bloomberg ... The financial crisis was nothing compared to this," said Teodor Sveen Nilsen, an analyst at Swedbank. "Exploration activity will drop. It's not good for Norway and not good for the Norwegian shelf."²³

The impact of the decline in investment demand caused a sharp decline in Norway's GDP growth rate from 2.4 percent in 2014 to about 1.25 percent in 2015.²⁴ The unemployment rate also showed a sharp increase by more than a percent from about 3.25 percent in June 2014 to 4.6 percent in January 2016²⁵, the highest in a decade. In 2015, some 35,000 jobs were cut in the oil industry alone.²⁶

With the oil industry in doldrums, Norway's policy focus had to shift to its mainland economy to ensure that the impact of the oil crisis was dampened. However, adherence to the fiscal rule meant that any increase in non-oil fiscal deficits put pressure on NOK to appreciate. This by itself negatively impacted mainland exports and reduced current account surplus, throwing Norway into a vicious circle of slowing growth and appreciation of NOK. A monetary policy response through lowering of the interest rate was therefore deemed necessary to depreciate the NOK and stimulate mainland exports, enhance non-oil investment demand and boost Norway's competitiveness through a reduction in high labor costs.²⁷

Between December 2014 and September 2015, Norges Bank cut rates from 1.5 percent down to 0.75 percent. Further cuts were expected in 2016. It is important to recognize that NOK had depreciated more on account of reduction in interest rates than decline in oil exports per se. The instantaneous reaction of NOK to the rate cut made this relationship clear;

The quarter-point cut immediately resulted in a further weakening of the Norwegian krone, which had been trading at below NOK 8.2 to the US dollar earlier this week.

Within minutes of the announcement of the interest rate cut, it suddenly cost NOK 8.45 to buy one US dollar.²⁸

To an extent, cuts in interest rates helped mainland Norway's exports (mainly fish, chemical products and machinery) to increase by almost 5

²³Planet Energy, "Norway Declares Crisis in Oil Industry as Devaluation Continues," January 18, 2016. Accessed on January 24, <http://planetenergynews.com/2016/01/18/norway-declares-crisis-in-oil-industry-as-devaluation-continues/>

²⁴Focus Economics, *GDP in Norway*, n.d., <https://www.focus-economics.com/country-indicator/norway/gdp>

²⁵Durden, T., "Norway Pushes Panic Button: 'We're in a Crisis Now, We Can't Deny That,'" *Zero Hedge*, January 15, 2016. Accessed on January 22, 2016, <http://www.zerohedge.com/news/2016-01-15/norway-pushes-panic-button-were-crisis-now-we-cant-deny>

²⁶Pandey, A., "Norwegian Krone Tumbles to 13-Year Low after Central Bank Slashes Interest Rate," *International Business Times*, September 24, 2015. Accessed on November 23, <http://www.ibtimes.com/norwegian-krone-tumbles-13-year-low-after-central-bank-slashes-interest-rate-2111914>

²⁷A depreciating NOK would reduce labor cost in dollar terms.

²⁸Norway's News in English, "Krone Falls on Interest Rate Cut," September 24, 2015. Accessed on November 25, 2015, <http://www.newsinenglish.no/2015/09/24/krone-falls-on-interest-rate-cut/>

percent between November 2014 and November 2015 (Statistics Norway 2015a). The tourism and hotel business was also a beneficiary of these cuts (Strautiņš 2015). The question that arose at that point of time was how much further could Norway go with interest rate cuts from the level of just 0.75 percent? A Norwegian economist warned “then we have no tools left, except for fiscal policy, as interest rates are very, very low.”²⁹

However, three monetary policy options still existed for Norway at the beginning of 2016; first, quantitative easing, second, intervention in the FX market to depreciate the krone and third, lowering interest rates. Under a QE program, the central bank injects reserves into the system by buying securities in the market from banks, pension funds and insurance companies. Apart from additional liquidity in the market, the price of securities would rise and with it, yields fall. The objective of QE in the U.S. post-recession was to influence long-term interest rates so as to increase private sector direct spending as well as re-direct savings from bonds to the stock market which in turn would indirectly stimulate spending through the wealth effect. Several questions about the efficacy of QE had been raised from the U.S. experience. In a world of endogenous money,³⁰ banks create money and mere pumping of reserves does not mean banks will loan them out. Lending ultimately depends on demand for credit and quality of borrowers; it is demand-driven and not supply-constrained. Furthermore, when bonds are sold by financial institutions to the central bank, proceeds from sales may be used to reduce debt (repair balance sheets) rather than make new loans (Lavoie 2015, 229). Similarly, although QE incentivizes buying stocks by increasing opportunity cost of holding bonds, stock purchases ultimately depend on expectations of corporate performance and will not automatically happen simply because returns on bonds are lowered. But more than these issues, the problem for Norway was the low level of existing public debt (see Figure 5), perhaps one of the lowest in the developed world, which limited the overall extent of QE possible.

The second option for Norges Bank was to depreciate NOK through direct intervention in the forex market. However, such forex market intervention was consequently not a preferred policy option of the Norwegian central bank:

Norges Bank has the capacity to intervene in the foreign exchange market, but normally the Bank will not use interventions ... Norges Bank has not intervened in the foreign exchange market since January 1999. (Norges Bank 2006)

²⁹Milne, R., “Norway Cuts Interest Rates to Record Low,” *Financial Times*, June 18, 2015. Accessed on November 20, 2015, <http://www.ft.com/cms/s/0/4802d964-1599-11e5-8e6a-00144feabdc0.html#axzz3xgeOLj4P>. The economist quoted was Hilde Bjørnland of BI Business School in Oslo, Norway.

³⁰The literature on endogenous money theory is extensive. It has now been endorsed by the Bank of England. A recent study by Michael McLeay et al. (2014) provides a useful summary.

The final monetary policy option open to Norges Bank was to set the target interest rate down to zero and possibly even go further into negative territory.³¹ With the European Central Bank (ECB) taking deposit rates into negative territory in September 2015,³² and Norway's Scandinavian neighbors, Sweden and Denmark having done so earlier, many economic commentators were certain that it was only a matter of time before Norway followed suit.

[Olsen] hinted at the prospect of negative rates in future when he said the bank's reserve rate, a less important instrument than the policy rate, had been set to minus 0.25 per cent for the first time.³³

The idea behind negative interest rates is to discourage saving by households and accumulation of reserves by banks and to induce spending and lending respectively. Two concerns arise from reduction of interest rates; first, the impact of low interest rates on spending and inflation and second, fueling asset bubbles. The interest rate cuts by the Norges Bank and consequent depreciation of NOK had already triggered price inflation in Norway. In September 2015 it touched 3.1 percent,³⁴ breaching the nominal anchor of 2.5 percent. With further cuts and depreciation of NOK likely, rising import costs were also expected to fuel inflation. However, priorities of Norges Bank were clear—increasing investment and growth to alleviate unemployment.

[Olsen] emphasized the bank has a flexible inflation target and needs to take into account output and employment as he battles a slowdown that risks stalling Scandinavia's richest economy.³⁵

This was the situation in September 2015; by the end of the year depressed oil prices would halve, exacerbating Norway's macroeconomic policy predicament.³⁶ Meanwhile, Norway had to contend with another threat that added to its policy dilemmas of an appreciating NOK and the countervailing monetary policy strategy of keeping interest rates low; a housing bubble going bust that even threatened to drag the country into a recession. The 2008 global financial crisis was a reminder of the impending

³¹This will work only in cashless economy, else people may hoard cash.

³²Deposit rates are -0.3 percent presently. See Blackstone, B., "ECB Cuts Rates, Announces Stimulus to Combat Low Inflation," *Wall Street Journal*, September 4, 2014. Accessed on December 2, 2015, <http://www.wsj.com/articles/ecb-cuts-interest-rates-in-surprise-move-1409832304>

³³Sunday Morning Herald (2015), Norway Cuts Rates to Cope with 'New Era for the Economy', September 25, accessed on December 12, 2015, <http://www.smh.com.au/business/markets/norway-cuts-rates-to-cope-with-new-era-for-the-economy-20150925-gjures.html>

³⁴Norway's News in English (2015), Norges Bank: No Rate Interest Cut, November 5, accessed on December 5, 2015, <https://www.newsinenglish.no/2015/11/05/norges-bank-no-interest-rate-cut/>

³⁵Mohsin, Saleha (2015), Oil Risk Blows Up Inflation Goal as Norway Targets Krone, *Bloomberg Business*, September 24, accessed on December 2, 2015, <http://www.bloomberg.com/news/articles/2015-09-24/oil-risk-blows-up-inflation-goal-as-norway-steps-up-currency-war>

³⁶To reiterate, although the situation has steadily improved since then with rising oil prices we have focused attention on Norway's policy challenges during the period of crisis.

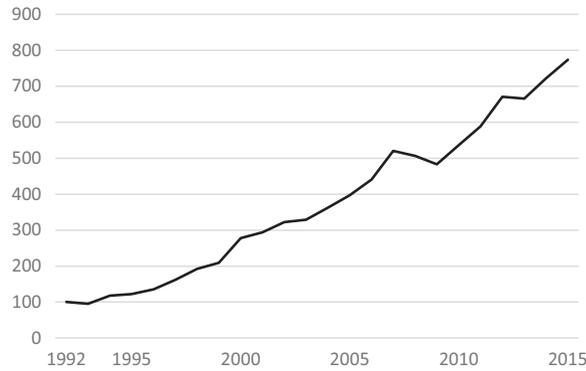


Figure 6. Multi-dwelling House Price Index, Norway. Source: Statistics Norway, <https://www.ssb.no/statistikbanken/SelectVarVal/saveselections.asp>. 1992 = 100

dangers of such an asset bubble bursting and the importance of macroeconomic policy to contend with them.

Norway's housing bubble

The inception of Norway's housing bubble can be traced back to the early 1990s when property prices began to rise with its booming oil economy. Even the Great Recession of 2008 did not dampen the housing bubble; prices in fact appreciated more than 50 percent between 2009 and 2015 (Figure 6). The growing threat of an unsustainable property bubble even prompted the IMF (in 2012) to cut Norway's growth forecast.³⁷ However, housing prices continued relentlessly on its upward path not just during the oil price boom (2009 to 2013) but even when oil prices began falling in 2014. The housing boom was sustained primarily by local households—only a small portion of investments came from cross-border investors (Kneip 2012). The reason for the bubble has been widely studied (Tranøy 2008); amongst them were Norway's stable economy, low interest rates (Hott and Jokipii 2011), low inflation, low volatility, booming investment, rising incomes, and high standard of living.

The fear that negative interest rates would set off further speculation in housing was well founded; both Denmark and Sweden had experienced this downside of negative rates. Apartment prices escalated by some 60 percent in Copenhagen soon after Danish interest rates went negative in 2012.³⁸ A greater worry for these countries, including Norway, was the growing levels of household debt that underlay the bubble. Debt to disposable income

³⁷Reuters (2012), IMF Cuts Norway Growth Forecast on Housing Bubble Fears, February 2, accessed on December 16, 2015, <http://www.reuters.com/article/norway-imf-idUS09E8C201B20120202>

³⁸Weinberg, C., "In Copenhagen, Apartment Prices Jump 60% After Rates Go Negative," *Bloomberg Business*, October 21, 2015. Accessed on December 24, <http://www.bloomberg.com/news/articles/2015-10-21/60-house-price-surge-in-copenhagen-adds-to-bubble-drum-beat>

ratio in the first quarter of 2015 stood at 228.8 percent (Statistics Norway 2015b), whereas young Norwegians of age 30 had an average debt equivalent to three times their disposable income.³⁹

As we know from the 2008 subprime crisis in the United States, build-up of household debt can trigger a bust in the housing bubble. Household debt cannot be sustained forever; at some point households will have to repair their balance sheets. This may in turn trigger the desire for increased savings and a corresponding cut in consumption spending, plunging the Norwegian economy into recession (Olsen 2015). The solution to diffusing the bubble was to raise interest rates as well as letting NOK appreciate. But these options ran counter to the stipulated monetary policy of low interest rates to trigger investment demand, raise GDP growth and employment. Norway's tradeoff in many ways seems similar to a deficit-ridden country and this in spite of public assets of more than a million NOK per capita.

Having highlighted several elements of Norway's policy dilemmas we now attempt to draw a more holistic picture of Norway's crisis and inter-connected implications of its policy response by putting these parameters together using the sectoral financial balances (SFB) model.

The SFB model

The SFB model developed by the post Keynesian economist, Wynne Godley, builds on the double entry accounting axiom that every debit has a corresponding credit or for every asset there must be a corresponding liability. These fundamental accounting axioms must hold true, an identity or a truism. If we divide an economy into three sectors, namely, the private domestic sector, the domestic government sector, and external (consisting of both private and government) sector then net financial asset accumulation across these sectors must sum to zero. Therefore,

$$(T - G) + (S - I) + (M - X) = 0 \quad (1)$$

where G = government expenditure, T = tax revenues, S = private sector savings, I = private sector investment, M = imports, and X = exports.⁴⁰ Note that a current account surplus (deficit) where $X - M > 0$ ($X - M < 0$) implies outflow (inflow) of capital from (into) the domestic economy and accumulation of liabilities (assets) by foreigners. Rewriting equation (1) we get,

³⁹Olsen quoted in Klein, M., "How Will the Oil Crash Affect Norway?" *FT Alphaville*, February 17, 2015. Accessed on November 13, 2015, <http://ftalphaville.ft.com/2015/02/17/2119329/how-will-the-oil-crash-affect-norway/>

⁴⁰Though we usually speak of imports and exports, these include goods and services, as well as nontradable items on the current account.

Table 1. Norway's sectoral financial balances, 2006–2017

Year	(G - T)	(X - M)	(S - I)	GDP growth rate %
2006	-18	17.2	-0.8	2.4
2007	-17.1	14.2	-2.9	2.9
2008	-18.7	17.8	-0.9	0.4
2009	-10.3	13.1	2.8	-1.6
2010	-11	12.4	1.4	0.6
2011	-13.4	14.6	1.2	0.96
2012	-13.8	12.4	-1.4	2.75
2013	-11.3	10	-1.3	0.74
2014	-9.1	8.5	-0.6	2.24
2015	-6	7.2	0.8	1.25
2016	-5.7	7.5	1.8	1
2017	-5.6	7.1	1.5	—

Sectoral financial balances are % of gross domestic product (GDP). Domestic private sector net financial asset accumulation (S - I) is computed from Equation (2). Sources: (G - T) and (X - M) from www.tradingeconomics.com; GDP growth rate from http://www.indexmundi.com/norway/gdp_real_growth_rate.html; (G - T) and (X - M) for 2015-2017 from Nicolaisen (2015); and growth rate forecast 2015 and 2016 from <https://www.focus-economics.com/country-indicator/norway/gdp>.

$$(S - I) = (G - T) + (X - M) \quad (2)$$

Equation (2) establishes that net asset accumulation of the private sector must entail a corresponding accumulation of liabilities by at least one of the two sectors; the government and/or the foreign sector. In the case of Norway, a current account surplus ($X - M > 0$) implies that a fiscal surplus ($G - T < 0$) is still compatible with net financial asset accumulation by the domestic private sector. However, when the extent of fiscal surplus exceeds the current account surplus, the domestic private sector must turn to accumulating net financial liabilities. In other words, although Norway could be a net creditor to the rest of the world, the Norwegian domestic private sector could be accumulating net financial liabilities (debt) if government surpluses are sufficiently large. This, for instance, is evident from Table 1 when the Norwegian private sector began leveraging between 2006 and 2008 and again between 2012 and 2014.

This The SFB equation can also be mapped on to a 4-quadrant (Q-1 to Q-4) graph as in Figure 7. The line SI_0 drawn at an angle of 45° through the origin is a set of points where $(S - I) = 0$. All points to the right (left) of the SI line are points where $S - I > 0$ ($S - I < 0$), that is, the domestic private sector is accumulating a positive quantity of net financial assets (liabilities). Each of the dashed lines parallel to the SI line are possible combinations of fiscal and current account balances that yield a certain level of net financial asset accumulation by the domestic private sector; for example, SI_1 yields 1 percent net financial asset accumulation, whereas points on SI_{-1} imply a 1 percent net financial accumulation of liabilities by the domestic private sector.

A limitation of the SFB equation is that it does not establish cause and effect. However, because it is an identity that must hold true, desired or

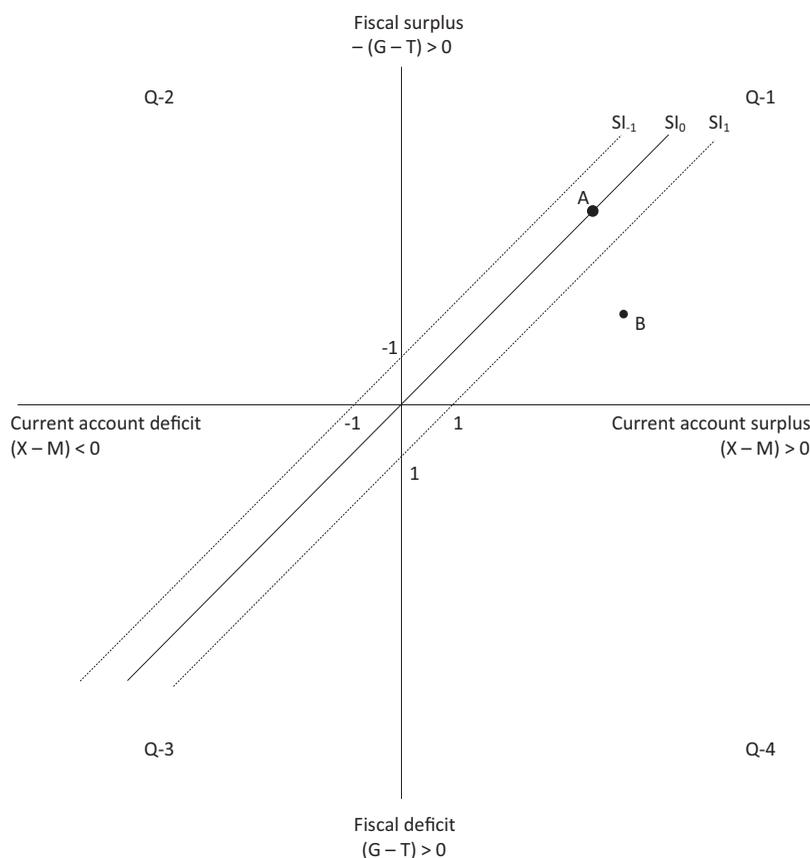


Figure 7. The SFB template.

exogenously induced changes in a sector's financial balances will have cyclical repercussions on the economy; the feedback to the equation working through changes in income.

Changes in Norway's SFB

Table 1 above summarizes Norway's SFB (illustrated in Figure 8) and annual real GDP growth rate between 2006 and 2014 along with forecasts for the years 2015 and 2016. Over the years, the desire of the foreign sector to accumulate liabilities as seen in Norway's current account surplus has been met by net financial asset accumulation by the Norwegian government in GPFG. At the same time, the domestic private sector also desired to leverage their incomes and accumulate financial liabilities. Institutions like the Norwegian State Housing Bank (Husbanken 2011) supported household sector investment through provision of "start loan, housing allowance, and housing grant ... [so] that more people [were] able to obtain their own place to live either as a home owner or a tenant." This

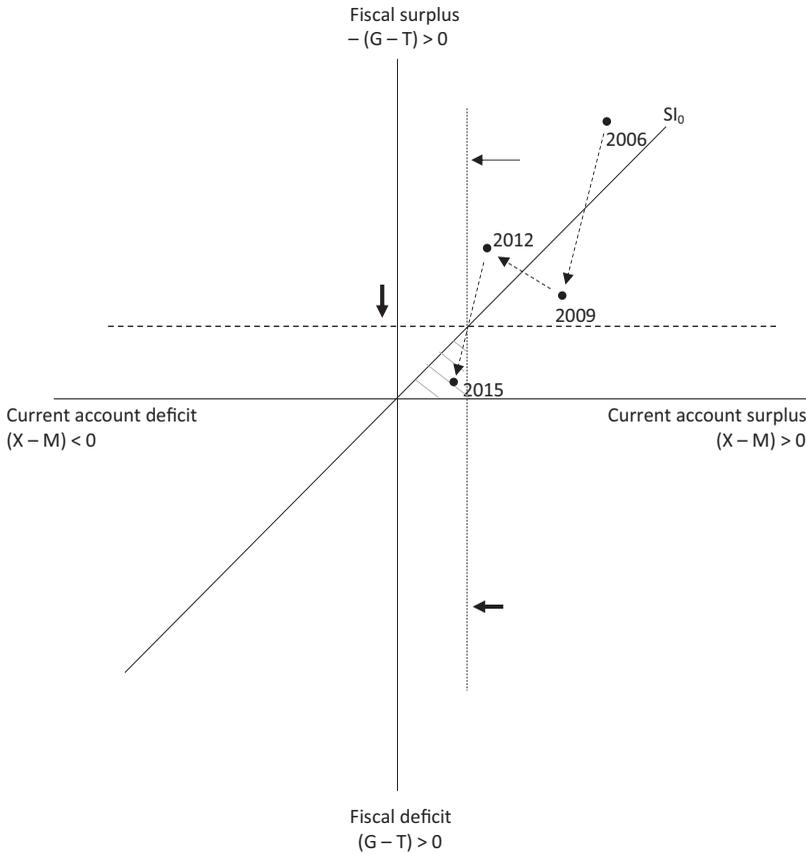


Figure 8. Norway's Changing SFB.

trend was broken in the aftermath of the 2008 crisis when net financial asset accumulation turned positive or, in other words, a period of deleveraging by the domestic private sector. As can be seen from [Table 1](#), private sector net financial asset accumulation turned sharply positive in 2009 to almost 3 percent of GDP. In [Figure 8](#), this is shown as a movement to a point below SI_0 . Once GDP growth accelerated in 2012, the domestic private sector returned to net accumulation of financial liabilities (i.e, a movement to a point above SI_0).

The decline in exports and current account balance (Statistics Norway 2015c) triggered by the sharp decline in oil prices was an exogenous shock to Norway. As Governor Olsen pointed out, the contagious impact of this has been on investment in both, oil and non-oil sectors;

Lower demand for goods and services from the petroleum sector has spillover effects on the mainland economy ... weaker growth prospects may reduce the willingness of mainland firms to invest. (Olsen 2015)

Forecasts of Norges Bank (Nicolaisen 2015) showed that from 2015 onwards, the fall in Norway's fiscal surplus was likely to exceed the fall in

current account surplus (see last three rows of Table 1). From Equation (2) this means that the domestic private sector would begin deleveraging, turning from a position of net financial liability to asset accumulation, just like what happened in 2009 (a point below SI_0). Although, as mentioned above, the SFB model does not establish causality, we attempt to articulate how this adjustment could take place and its implications for the Norwegian economy.

The fall in exports and investment demand would have continued to contagiously impact industrial production and manufacturing (Statistics Norway 2015d, 2015e), and consequently GDP growth (Royal Ministry of Finance 2016). These changes would further induce changes in endogenous variables, such as savings, tax collections, and imports, necessitating further adjustments in income. Figure 8 demarcates the policy space available for Norway—the shaded area; if current account surpluses continued to shrink (the vertical dotted line moves leftwards) and the domestic private sector began deleveraging (desires a higher level of net financial asset accumulation) then the government would have had to be willing to accommodate these changes by running smaller surpluses (larger non-oil fiscal deficits) as shown by the bold arrows.

But Norway faced several macroeconomic challenges in implementing such an accommodative fiscal policy. First, its fiscal rule requires “funding” of non-oil deficits with sale of \$ so that any reduction in fiscal surplus (coming from an increase in non-oil fiscal deficit) puts pressure on NOK to appreciate. Second, even if oil revenues fell to zero, as long as the fiscal rule stipulates that the non-oil fiscal deficit is to be funded from GPF, Norway would have “at worst” reached a balanced budget (i.e., zero fiscal deficits). In this case, there was no fiscal policy space available for Norway to accommodate domestic private sector deleveraging; the maximum net financial asset accumulation by the domestic private sector is entirely dependent on its current account surplus.⁴¹ With oil exports falling, Norway desperately needed to boost its non-oil exports to accommodate private sector deleveraging. Unfortunately, Norway’s non-oil trade balance was in deficit for decades and stood at 7 percent of GDP in 2013 (IMF 2013, 3). The reversal to a non-oil trade surplus would not have been easy in the context of a global slowdown as well as Norway’s high labor costs and declining competitiveness. Finally, massive deleveraging by the household sector was an imminent possibility at the start of 2016. The disruption of a deleveraging episode could have been further heightened by the fact that “non-financial assets accounted for about half of the total household

⁴¹In Figures 7 and 8, a balanced government budget would mean moving along the X-axis. Only a current account surplus can ensure domestic private sector net financial asset accumulation, that is, a point on an SI line that lies below SI_0 .

assets in Norway. If non-financial assets are evaluated at market prices, the share of illiquid assets rises to nearly 80 percent of household financial assets” (IMF 2013, 15). The danger of stagnating growth and rising unemployment could have meant a sharp decline in household sector investment in housing. It was therefore imperative for the Norwegian government to contain negative sentiments from taking over even as consumer confidence is plummeted from 18.6 in 2014-Q3 to -4.1 in 2015-Q3. (EFTA 2015, 145).

With self-imposed limitations on fiscal policy, Norway turned to monetary policy by cutting interest rates and “forcing” a depreciation of NOK. This by itself could have boosted non-oil investment and, at the same time, the resulting sharp depreciation of NOK could have encouraged non-oil exports (increase current account surplus). The exchange rate depreciation was further expected to reduce real wage in Norway and bolster international competitiveness. If this re-allocation of resources from the oil sector to the tradable non-oil sector took place, there was a good chance that Norway would have seen a revival in GDP growth. However, given the global economic landscape at that time, this positive scenario seemed rather overoptimistic. In particular, worldwide capital expenditure in the upstream oil and gas industry fell by some 23 percent in 2015;⁴² an industry in which Norway had a strong presence. Norway’s fiscal rule by constraining the non-oil fiscal deficit had limited the policy space to counter the adverse oil price shock. Perhaps the best situation Norway could hope for was a rebound in oil prices, which was indeed what happened; 2016 saw oil prices almost doubling.

Conclusion

We have attempted to analyze Norway’s macroeconomic policy dilemmas arising from an exogenous shock of a dramatic oil price slump between June 2014 and early 2016. Our analysis reveals that “funding” the non-oil deficit from oil tax revenues or GPFM could not have really bailed Norway out of the crisis. In fact, as shown by the SFB model, without the possibility of running an overall budget deficit, the fiscal policy space available to Norway was constrained to the small shaded area in Figure 8. Perhaps Norway could have considered delinking the fiscal deficit from \$ revenues. By running fiscal deficits, “funded” by issuance of national government debt, it would have also allowed the domestic private sector to increase its net financial asset accumulation outside the private sector and/or the foreign sector while pursuing their deleveraging goals. In other words, the

⁴²Statista, Upstream oil industry capital expenditures worldwide from 2010 to 2017, accessed on June 24, 2018, <https://www.statista.com/statistics/654847/global-upstream-oil-industry-capex/>

policy space available to Norway could have extended into the fourth quadrant in Figure 8, even if it continued to run a current account surplus. Norwegian households were instead compelled to hold risky real assets rather than low-risk government financial assets. These insights have been drawn from the SFB equation.

Does this mean that oil revenues have not served Norway in any way? As we have already seen above the oil and gas sector did spark off an investment boom in Norway but success ultimately came from sound political choices, public investment in health and education, social equality, and a supportive investment environment. As an aside and for sake of completeness it is important to point out one difference that Norway enjoys from \$ earnings that other countries may not, at least to the same degree. The government can use its stock of \$ to buy goods and services in the international market without buying \$ in the market and depreciation of NOK. But then what could Norway buy without hurting its own domestic industry? Perhaps its large foreign currency reserves may only be useful in an emergency situation. But here again foreign countries might resist any massive spending by Norway as it would impact their domestic inflation and exchange rates.

Finally, Norway's macroeconomic policy dilemmas teach us an important lesson; stabilization policy can prove to be equally challenging at both ends of the macroeconomic spectrum. Surplus fiscal and current account balances accompanied with large FX reserves pose their own set of challenges when dealing with macroeconomic crises.

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