Energy Policy 96 (2016) 446–457

Contents lists available at ScienceDirect

Energy Policy

journal homepage: www.elsevier.com/locate/enpol

Resource revenue management and wealth neutrality in Norway☆

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HIGHLIGHTS

- A review of resource revenue management in Norway is presented.
- A model of Ricardian equivalence is formulated for a resource-rich economy.
- Econometric results are provided for LT equilibrium ST dynamics.
- Results suggest modest substitution between government and household saving.

ARTICLE INFO

Article history:
Received 18 December 2015
Received in revised form
9 May 2016
Accepted 14 June 2016
Available online 22 June 2016

Keywords:
Oil revenues
Resource wealth
Saving
Fiscal policy

ABSTRACT

An important idea behind the Norwegian oil fund mechanism and the fiscal spending rule is to protect the non-oil economy from the adverse effects of excessive spending of resource revenues over the Government budget. A critical assumption in this respect is that public sector saving is not being offset by private sector dis-saving, which is at stake with the hypothesis of Ricardian equivalence. Based on a framework of co-integrating saving rates, this model provides an empirical test of the Ricardian equivalence hypothesis on Norwegian time series data. Although the model rejects the strong-form presence of Ricardian equivalence, results indicate that the Norwegian approach does not fully succeed in separating spending of resource revenues from the accrual of the same revenues.

1. Introduction

Economic research on the macroeconomics of resource wealth typically sorts the effects on the non-oil economy in two main groups. The first group relates to *resource movement* effects, which stem from the allocation of domestic resources out of traditional manufacturing and into (booming) resource-based industries. The second group relates to *spending* effects, which are linked to expenditures based on resource revenues, and especially over government budgets (cf. Corden et al., 1982; Corden, 1984).

A common line of defense against the spending effects is to promote policy guidelines and rules to separate the spending of resource revenues over government budgets from the accrual of the same revenues. This is also the main idea behind the Norwegian oil fund mechanism and the fiscal policy rule. The Government Pension Fund - Global (GPFG) represents a floodgate behind which resource revenues accumulate, and the fiscal policy rule represents a flexible valve, where the flow rate is tuned to restrict the annual inflow of oil revenues on the government budget to 4% of total capital on the GPFG.

A premise for the Norwegian oil fund mechanism is that spending decisions among households and businesses in the mainland economy do not respond to changes in the net wealth position of the government. Such a premise is at stake with the Ricardian Equivalence Hypothesis (REH), which implies that the net wealth position of the government enters directly into decisions on consumption and investment spending in the private sector.

In its strongest form Ricardian equivalence implies that any change in the net financial position of the government will be fully offset by a compensating adjustment in household saving, due to consumption smoothing preferences. However, empirical research has so far failed to produce support for such a strong and direct link between government and private saving (Ricciuti, 2003). Still, elements of forward-looking optimisation in the private sector will imply a partial adjustment of household saving to changes in the government net financial position.

A discrepancy between government and households in the pattern of consumption and saving may stem from differences in view when it comes to spending of petroleum revenues. Such a

☆The author is grateful for comments and suggestions from Torfinn Harding, Steinar Holden, Ola Kvaløy, and Øystein Thøgersen.

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http://dx.doi.org/10.1016/j.enpol.2016.06.026
0301-4215/

variance in perspective may reflect a lack of credibility and transparency in resource management policies, which in turn has the potential of reducing the efficiency of monetary and fiscal policies (Medina and Soto, 2014).

Assessing the relationship between wealth accumulation in government and households, this study adds insight to the literature on macroeconomic effects of resource wealth (cf. Arezki and Brückner, 2010; van der Ploeg 2011, Harding and Ploeg, 2011). So far, empirical studies of Ricardian equivalence have been linked to countries characterised by budget deficits and debt dynamics in the public sector (e.g., Ricciuti, 2003; Galí et al., 2007; de Mello, Kongsrud and Price, 2004; Coenen and Straub, 2005; Röhn, 2010). The aim of this study is to investigate corresponding mechanisms for a country where the government runs substantial budget surpluses, and also accumulate financial wealth on behalf of the private sector.

Based on 33 years of time series data from the Norwegian economy, the REH is tested through the estimation of a dynamic single-equation econometric model. In this model, the strong form of REH should imply perfect substitution between government saving and household saving. According to the estimated model, an increase in the saving rate for the government of one percentage point will reduce the household savings rate by 0.2% points. Consequently, the strong form of REH is not supported by this study. However, the results still suggest that some of the accumulation of petroleum revenues in the GPFG will be offset by reduced saving in the household sector. The implication is that the Norwegian model of revenue management does not fully succeed in separating the accumulation of oil and gas revneues from the expenditures of the same revenues. For policy design, these results would call for an even higher degree of prudence in fiscal policies than implied by the current spending rule,[1] possibly combined with policies to stimulate wealth accumulation in the private sector. Both these elements are reflected in today's economic policies.[2]

Based on developments over the last 10 years, transmission mechanisms of oil-related impulses to the Norwegian mainland economy are reviewed in Chapter 2. To illustrate key mechanisms behind the REH, a simple dynamic optimisation model of consumption is sketched out in Chapter 3, as a background for the subsequent review of previous theoretical and empirical research. Chapter 4 presents the specification, estimation and testing of an econometric model of private saving, followed by presentation and discussion of results, before some concluding remarks are offered in Chapter 5.

2. Oil in the Norwegian economy

Oil and gas activity in Norway is approaching its 50th anniversary. From a sober start in the mid-1960s, oil and offshore activities have gradual assumed the role of a growth engine for the Norwegian economy, and an important source of income and wealth accumulation both for the government and for the private sector. As opposed to resource-rich countries elsewhere in the world, Norway was blessed with the institutional quality of an industrialised western democracy already at the outset. Consequently, politicians were early in grasping the strategic opportunities and challenges of resource wealth for the wider development in economics, welfare and social conditions.

National control of the oil and gas resources formed the basis for law and regulation. Industrial policies were designed to secure domestic industrial activity and employment, so that resources activity and revenues could benefit the broader requirements of economic and social development. Economists were offered a key role in the plans and policies for the new industry. A white paper submitted to the parliament in 1973 [3] points out a range of mechanisms which were studied in the academic literature at the time. Examples include resource revenue management on the government budget, a shift of input demand from traditional manufacturing to the oil and gas sector, as well as additional challenges related to structural adjustment and competitiveness both in the ramp-up phase and in an eventual reversion phase.

In 2013, value-added from petroleum activities in Norway made up 22% of mainland GDP and export of oil and natural gas totalled 49% of total exports. Nearly 30% of government revenues originate in oil and gas activities, and nearly every third NOK of total capital expenditures finds its way into oil and gas activities.

The research literature on transmission mechanisms for resource activities typically sorts the main effects in two channels, namely *resource movement* effects and *spending* effects. This mindset originates in the early academic research which was inspired by the experience from the Netherlands during the 1960s, when large revenues from natural gas contributed to an erosion of general competitiveness (real appreciation), and a crowd-out of traditional exports. Corden (1984) provides a survey of the early literature on booming sectors and Dutch Disease, whereas Frankel (2012) and van der Ploeg (2011) represent broader overviews of recent research on macroeconomic challenges related to resource wealth.

2.1. Resource movement

In the booming phase, the oil and gas sector attracts resources that would otherwise have served as input in non-oil industries and activities. The implied effects on prices, income and competitiveness are referred to as resource-movement effects, and are triggered when oil and gas companies demand labour, goods, and services from the mainland economy for real investment and operations on the Norwegian Continental Shelf (NCS). Spending effects are directly relevant for petroleum-specific supplier industries, but indirectly also for traditional manufacturing and service industries who market their products and services to companies within the oil and gas industry (e.g., Eika and Martinussen, 2013).

The left-hand panel of Fig. 1 illustrates that demand from the petroleum sector has increased from 9.1% of mainland GDP in 2004–14.8% in 2014. In terms of manufacturing value-added, the surge in oil and gas activity has offered substantial support to the ship-building and machinery industries, at the expense of other export-oriented industries – as illustrated in the right-hand panel of Fig. 1. The implied migration of resources from traditional manufacturing towards production of supplies to the oil and gas sector, illustrates an important transmission channel for oil-related shocks to the mainland economy. This resource movement effect entails a stimulus to mainland GDP, higher employment and

[1] According to the homepage of the Norwegian Ministry of Finance (http://www.fin.dep.no), "fiscal policy shall be geared towards a gradual and sustainable increase in the use of petroleum revenues. Over time, the structural, non-oil budget deficit shall correspond to the expected real return on the GPFG, estimated at 4%. This rule should not be used mechanically, however, and considerable emphasis should be placed on stabilising economic fluctuations."

[2] The first is catered for by the practice that has developed in the application of the fiscal spending rule, where the structural, non-oil budget deficit consistently has been limited to 3% of the market value of the GPF. The second concern is covered by supportive measures for private property investment, as well policy efforts to support saving among young adults for housing investments.

[3] Stortingsmelding 25, 1973–1974; "Petroleumsvirksomhetens plass i det norsk samfunn" (White Paper 25, 1973–1974: "The position of the petroleum activity in the Norwegian society").