



## Oil and economic development: Libya in the post-Gaddafi era

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### ABSTRACT

Libya experienced traumatic political and economic upheaval during 2011 arising from an eight-month-long civil war that cost thousands of lives, resulted in major economic dysfunction, destroyed part of the country's infrastructure, almost halted oil production, the country's major source of revenue generation and exports, as well as destroyed part of the sector's support infrastructure. While the civil war resulted in the ending of 42 years under Muammar Gaddafi rule, the economic legacy as represented by the costs of reconstruction efforts is enormous. While the freeing up of tens of billions of dollars of frozen assets may be the key to the country's short-term rehabilitation, longer-term reconstruction, growth and stability will fundamentally depend upon rehabilitating the country's oil sector. Interestingly, this rehabilitation will also have a wider global impact. This paper uses a deterministic dynamic macroeconomic model to analyse the effects upon key macroeconomic variables of a recovery in Libyan oil production to levels that existed prior to the revolution. Model simulation results indicate that additional oil revenue brings about: an increase in government revenue, increased government spending in the domestic economy, increased foreign asset stocks and increased output and wages in the non-oil sector. However, increased oil revenue may also produce adverse consequences, particularly upon the non-oil trade balance, arising from a loss of competitiveness of non-oil tradable goods induced by an appreciation of the real exchange rate and increased imports stimulated by increased real income. Model simulation results also suggest that investment-stimulating policy measures by the government produce the most substantive longer-term benefits for the economy.

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### 1. Introduction

The oil-rich countries, many of which can be classified as developing, experienced substantially increased revenue as a result of increased oil prices during the period of the late 1970s and early 1980s, and then after 2000. However, many natural resource-rich countries have achieved lower long-run economic growth rates when compared with non-natural resource producing and exporting economies (Auty, 2001; Sachs and Warner, 1995, 2001). This puzzling issue is described in the literature as the so-called “resource curse”<sup>2</sup>effect. This term was first coined by Auty (1993) to highlight the under-performance of resource abundant and extracting countries compared to non-resource abundant countries. Subsequent empirical studies confirmed an inverse correlation between economic growth and natural resource abundance among developing countries, but no obvious explanation for this finding has been found such as an important growth variable that is common in resource-poor countries but which is deficient in resource-abundant countries (Mikesell, 1997). For instance, the empirical study

by Sachs and Warner (1995) found that countries with a high resource export to GDP ratio over the period 1971–89 experienced a poorer economic growth performance. They used a simple endogenous economic growth model to try and explain this relationship. This study stimulated further literature of both a theoretical and empirical nature that also confirmed the existence of under-performance in terms of economic growth, and which aimed to shed further explanatory light on this result such as Auty (2001, 2004), Auty and Mikesell (1998), Brückner (2010), Cai (2009), Manzano and Rigobon (2001), Mikesell (1997), Neumayer (2004), Rodríguez and Sachs (1999), Ross (1999), Sachs and Warner (2001), Sala-i-Martin and Subramanian (2003), Stijns (2001a) and van der Ploeg and Poelhekke (2009).<sup>3</sup>

There is also extensive literature devoted to modelling and empirically analysing the effects of natural resource production upon the growth performance of small open economies over the short and long terms emphasising so-called Dutch disease effects.<sup>4,5</sup> A number of these theoretical studies emphasise that resource

<sup>3</sup> See also Stevens (2003) for an extensive review of the literature and key issues.

<sup>4</sup> A term first coined by the *Economist* in 1977. This is an approach to explaining the resource curse emphasising the declining competitiveness and productivity of the manufacturing and other tradable sectors arising from an appreciation of the real exchange rate in the wake of a resource boom.

<sup>5</sup> See Brahmhatt et al. (2010) for an extensive review of Dutch disease theory and empirical evidence.

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<sup>2</sup> The resource curse effect is also referred to as the Paradox of Plenty.

production affects the economy, specifically during the short run, through a number of channels including: resource movement; spending; income; wealth and exchange rate effects (see, for example, Buiters and Miller, 1981; Buiters and Purvis, 1982; Corden and Neary, 1982; Eastwood and Venables, 1982; Neary and van Wijnbergen, 1984). This literature was extended during the 1990s to capture long-run effects including capital stock accumulation (an additional wealth effect), foreign asset stock accumulation via the current account (a current account effect) and budgetary financing implications. Furthermore, the literature has also taken into account implications for adjustment arising from different exchange rate regimes (fixed or flexible) and the identification of optimal policy responses in a dynamic context with the objective of minimising the adverse effects of a resource boom on the non-resource sector (see, for example, Cox and Harvie, 2010; Harvie, 1993; Harvie and Gower, 1993; Harvie and Thaha, 1994).

The Libyan economy is no exception to that of other resource abundant countries. Although Libya has been a considerable producer of crude oil since the 1960s, it displays lower economic and social indicators when compared with other developing oil and non-oil producing economies. The country's lack of transparency, inefficient government institutions, widespread corruption and misuse of its oil revenue contributed to the under-performance of its economic growth and development. This recently resulted in traumatic political and economic upheaval arising from an eight-month long civil war that led to the ending of 42 years of dictatorship under Muammar Gaddafi in October 2011. The cost of the war was enormous with up to 30,000 lives lost,<sup>6</sup> major economic dysfunction, destruction of the country's infrastructure, reduced oil production, the country's major source of revenue generation and exports, from 1.6 million barrels per day before the war to 50,000 barrels a day during it as well as destroying much of the sector's support infrastructure.<sup>7</sup>

The economic legacy of the conflict, specifically in terms of the cost of reconstruction, is enormous. While the freeing up of tens of billions of dollars of frozen assets may be the key to the country's short-term reconstruction efforts, longer-term reconstruction, growth and stability will fundamentally depend upon rehabilitating the country's oil sector. Libya's oil industry and the revenue it generates, therefore, holds the key to rebuilding the country's infrastructure and improving the longer-term economic well-being of its population. Oil accounted for about 40 percent of the country's total economic output and 95 percent of its export earnings before the onset of the war. Rehabilitating this sector and getting oil production back to prewar levels have become an economic priority to the Libyan authorities, boosting government revenue and exports and intensifying the need to identify how best the authorities use the oil windfall through fiscal policy for the sustained growth and development of the economy (Barnett and Ossowski, 2002; Brahmabhatt et al., 2010; Davis et al., 2003; Gelb and Associates, 1988).

In this paper a dynamic general equilibrium macroeconomic model is developed for Libya to evaluate the effects of rehabilitation of oil revenue, arising from increased oil production, upon key macroeconomic variables. It takes into consideration the impact of expanded oil revenue upon the non-oil trade balance, foreign asset stock, physical capital stock, human capital stock, imported capital stock and non-oil production. Model simulation results indicate that additional oil revenue brings about: an increase in government revenue, increased government spending in the domestic economy, increased foreign asset stocks and increased output and wages in the non-oil sector. However, increased oil

revenue may also produce Dutch disease consequences, particularly upon the non-oil trade balance, arising from a loss of competitiveness of non-oil tradable goods induced by an appreciation of the real exchange rate and increased imports stimulated by increased real income. Model simulation results also suggest that investment and productivity stimulating policy measures by the government produce the most substantive longer-term benefits for the economy.

The paper proceeds as follows. Section two provides an overview of the domestic and global importance of the Libyan energy sector. Section three discusses the theoretical framework utilised in this paper, with emphasis placed upon a fixed exchange rate combined with control over capital mobility. Section four discusses the parameter values used for the simulation analysis. Section five presents the results of various oil rehabilitation simulation scenarios, while section six concludes and identifies policy implications.

## 2. The domestic and global importance of the Libyan energy sector

The energy sector outlook in Libya is of considerable contemporary importance not only for future domestic development, but also for the global economy in general and the European Union in particular. The Libyan economy has been heavily dependent on the oil sector since the early 1960s. As Table 1 indicates the significance of oil for the economy stems from: its role as a major source of government revenue, contributing 91 percent of total government revenue in 2007, oil exports contributed more than 90 percent of total exports over the period 1970–2007, and a major share of national income is derived from oil production. The oil sector is also expected to generate substantive future revenue, essential for the reconstruction of the economy, its infrastructure and the attainment of sustainable growth. How effectively these will be obtained will critically depend on the new government implementing sound policies aimed at maximising the benefits from current and future oil revenue. Such policies need to focus upon increasing productivity through increased investment in infrastructure (physical capital), human capital and technology acquisition in the non-oil output sector (Collier et al., 2009; Davis et al., 2003; Gylfason and Zoega, 2002; Hartwick, 1977; Morrison and Schwartz, 1996; Stijns, 2001b). The benefits for the non-oil sector arising from physical, human and imported capital stock (technology) accumulation induced by oil sector revenue could be substantial in terms of employment and growth generation. Critical to this, however, is the need to rapidly rehabilitate the oil sector and its production to pre-civil war levels.<sup>8</sup>

The energy sector outlook in post Gaddafi Libya is also important for the global economy in general and for European countries in particular, as the majority of Libyan crude oil and natural gas in the past has been sold to Europe. Libya was the world's fourth largest crude oil producer when oil production reached its peak of 3.3 million barrels per day in 1970 (see Table 2). This high level of production, however, declined remarkably during the early 1970s and into the late 1980s when it reached its lowest level of 0.9977 million barrels per day in 1985. This was mainly due to: political factors such as the process of nationalisation and government participation in the oil industry

<sup>8</sup> In this regard there are a number of current obstacles. First, Libya's oil industry relies on three main basins for its production – Sirte, Murzuk and Palagian. Sirte is by far the most important, accounting for about 80 percent of the country's total production. However, this basin is subject to: security issues having been heavily mined during the civil war which will take time to clear, key personnels are likely to be reluctant to return to this relatively dangerous area until this is complete, pumps used to extract the oil are old and have seized up requiring the need to re-drill, and much of the support infrastructure was looted during the war. The Murzuk and Palagian basins present fewer problems as they are newer and more secure. The pipeline between Murzuk and Tripoli, however, was damaged during the war and will take time to replace. Due to this uncertainty there have been varying estimates as to how quickly the country can return to pre-civil war levels of oil production.

<sup>6</sup> Accurate figures on the number of fatalities is not known, however estimates have variously put the number of those killed at between 2,000–30,000 people.

<sup>7</sup> In October 2011 the Chairman of Libya's National Oil Corporation, Nouri Berouin, told Reuters that daily oil production had risen to 430,000 barrels a day.

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