

A COMPARATIVE ECONOMIC EVALUATION OF PETROLEUM FISCAL REGIMES IN THE EMERGING OIL PRODUCER COUNTRIES OF EAST AFRICA

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Overview

This paper applies a Discounted Cash Flow (DCF) method to carry out a comparative evaluation of the economic competitiveness of four existing petroleum fiscal regimes in East Africa. Economic measures are derived to determine the various fiscal regimes' performance under six criteria; i) The amount of government revenues; ii) Timing of government revenues; iii) Stability of government revenues; iv) Neutrality of the fiscal regimes; v) Progressivity/adaptability of the fiscal regimes; and vi) Contractor profitability. The paper proposes an alternative fiscal regime for comparison with these incumbent regimes. The alternative regime consists of a reduced effective royalty rate, state participation and ROR-based profit sharing.

The emerging oil producing countries of East Africa consist of Kenya, Mozambique, Tanzania and Uganda which share geographical and geological features including the offshore Rovuma basin and the onshore East African rift valley system. (Abeinomugisha and Obita, 2011). These countries are therefore likely to present alternative destinations for private capital, with individual countries seeking to gain competitive advantage via the design of their fiscal regimes. The comparative evaluation of existing fiscal regimes is meant to determine the status quo, while comparison with an alternative regime illustrates the benefits of introducing more progressive elements to the existing fiscal regimes. The Discounted Cash Flow (DCF) method of comparative economic analysis of petroleum fiscal systems have been applied in Blake and Roberts (2006), Tordo (2007), Daniel et al. (2010) and Cottarelli (2012) among others. However, no publication has been authored to rank the performance of fiscal regimes in East Africa.

The paper is organised as follows; after the introduction, section two describes the methodology, the data used and the assumptions; section three presents an analysis of the findings and results; and four provides the conclusions.

Methodology

Using a DCF method, the cash flows accruing to the project, government and contractor are derived and applied in determining indicators of the fiscal regimes' performance along six evaluation criteria. To enable comparative evaluation of the various indicators across fiscal regimes, six indices are constructed by taking the average of the indicators under each evaluation criteria. These include the Government Revenue Index (GRI), Front Loading Index (FLI), Revenue Stability Index (RSI), Contractor Profitability Index (CPI), Neutrality Index (NI) and the Progressivity Index (PI) and are used to rank the fiscal regimes' performance. An aggregate index - the East African Fiscal Regime Index (EFRI) is then determined as a simple average of the six indices to give an overall ranking of each fiscal system. One set of geological and cost assumptions is used across the four fiscal regimes to isolate the effect of the fiscal regimes.

The four Petroleum Sharing Contract (PSC) – based fiscal regimes under evaluation consist of similar key features including royalties, cost recovery caps, profit oil sharing, state participation and corporate income tax. However, a number of distinctions exist among the regimes. The Kenya and Tanzania PSCs under evaluation contain no royalties, while Mozambique and Uganda have royalty rates of 3% and 12.5% (>7500 bopd) respectively. Additionally, while Kenya, Tanzania and Uganda have profit oil sharing scales based on gross annual production, while Mozambique has profit oil sharing based on R factor. Another key distinction is that income tax under the Kenyan regime is taken out of the government's profit oil share. These are compared with an alternative fiscal regime that consists of a royalty rate, a high cost recovery cap, ROR-based profit sharing, state participation and corporate income tax.

To model the oil price uncertainty, Monte Carlo simulation is performed to generate future oil prices from the autoregressive process in Equation I, where y_t is the oil price in the current year and y_{t-1} is the price in the previous year.

$$y_t = 0.29 + 0.91y_{t-1} + e_t \text{ where } e_t \sim N(0,0.27) \quad \text{Equation I}$$

Results

Figure 1 illustrates the results of this analysis. The ranking of all incumbent regimes under the aggregate index (EFRI) is comparable, while the alternative regime ranks slightly higher. Of the incumbent fiscal regimes, those from Kenya, Tanzania and Uganda rank highly under the GRI and FLI while Mozambique’s fiscal regime ranks highest under CPI and NI. The alternative fiscal regime ranks highly under three of the criteria and moderately under the other three. This suggests that while Kenya, Tanzania and Uganda are more favourable to government objectives, and Mozambique to private investors’ objectives, none of the incumbent regimes offers significant balance between the competing objectives of government and investors. The results of the alternative regime suggest an attempt to create this balance.

A key observation is that the alternative ranks higher than the incumbent regimes under PI and RSI. This regime is therefore progressive in taxation and offers stable revenues for government under conditions of price and cost uncertainty. The regimes of Kenya, Tanzania and Uganda rank particularly low under these two criteria, illustrating key improvements that could be considered for these regimes to reduce the impact of cost and price variation shocks.

The performance of the alternative under the GRI and FLI is higher than that of Mozambique. This suggests that opportunity exists to improve the Mozambique regime in those aspects, without disadvantaging other performance criteria.

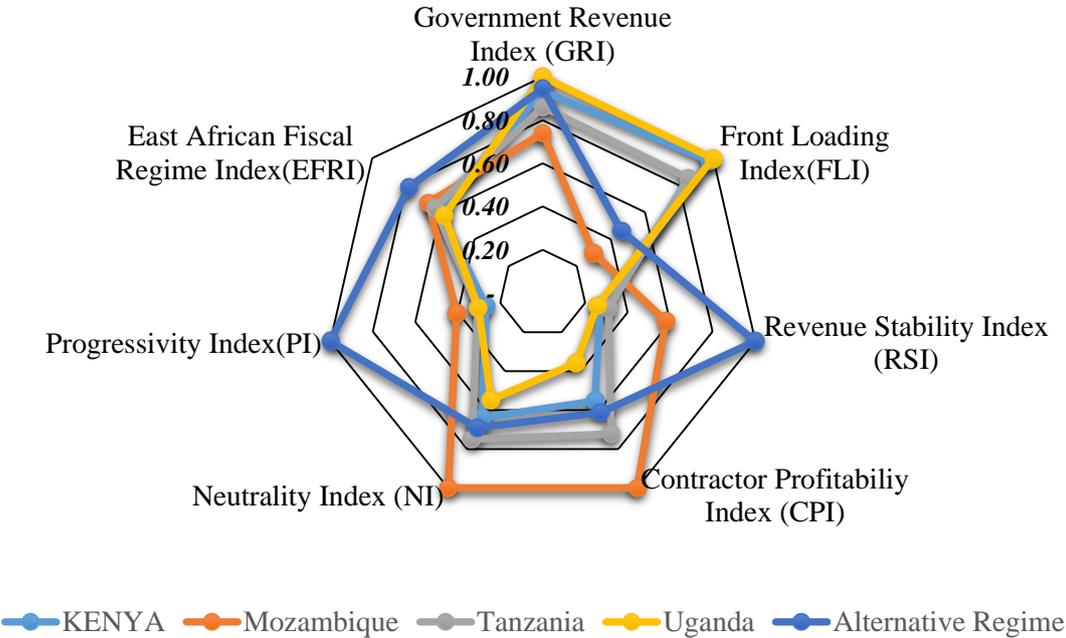


Figure 1: Comparative Analysis

Conclusions

This paper has demonstrated that opportunity exists for improvements in the petroleum fiscal regimes in East Africa. As the governments of these emerging oil producer countries seek to attract more investments to their countries in the face of price uncertainty, the use of fiscal regimes like the alternative proposed in this paper could offer some competitive advantages over the existing regimes.

References

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