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SELECTED ISSUES

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Approved By
African Department

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EXECUTIVE SUMMARY

1.   This Selected Issues paper was prepared as background to the 2016 Article IV consultation with Tanzania. The Article IV discussions focused on how to sustain high growth and implement the new government's priorities while preserving fiscal sustainability. The paper benefited from the authorities' comments.

2.   Tanzania experienced macroeconomic stabilization and significant structural change over the last three decades, including two major waves of reforms, first in the mid-1980s and more importantly in the mid-1990s. Chapter I ("*Productivity, Growth, Structural Reforms, and Macroeconomic Policies in Tanzania")* shows that both reform waves were followed by total factor productivity (TFP) and growth spurts. Over the recent period, TFP growth decreased, which coincided with a less strong reform drive, and growth became more capital intensive. The paper suggests that a TFP-led growth model is superior and that vigorous reforms are needed to foster further structural transformation of the economy and sustain high productivity gains and investment. The paper also argues that fiscal and monetary policies can first and foremost contribute to macroeconomic stability, which is a prerequisite for maintaining economic growth. At the microeconomic level, through well-designed tax and spending policies, fiscal policy can boost employment, investment, and productivity.

3.   Raising more revenue and spending well will be critical to implement the new government's priorities while preserving fiscal sustainability. Chapter II ("*Tax Revenue Mobilization in Tanzania*") shows that the tax-to-GDP ratio, at about 12 percent, is low, even by low income countries' (LICs) standards. Using the peer analysis and stochastic frontier approach, the revenue gap in Tanzania is estimated at about 4 percent of GDP in 2009-13—and 2-3 percent of GDP considering the increase in the tax revenue ratio in 2015/16—, implying a significant potential to raise revenue. The analysis suggests that closing this gap requires comprehensive tax policy and administration reforms. On tax policy, broadening the tax base for VAT and corporate income tax, adjusting specific excise rates regularly, and developing property taxation are proposed. On tax administration, cleaning up the taxpayer registration and accounting, upgrading the IT system, and strengthening compliance risk management are suggested.

4.   Chapter III ("*Benchmarking and Efficiency of Public Spending in Tanzania*") provides an overview of public expenditure in Tanzania and its efficiency in a cross-country perspective, and shows that there is a significant room to improve public spending efficiency. Tanzania's total expenditure was below the average for LICs during 2010-14, and this finding broadly holds across expenditure categories, with the gap being larger for investment spending. The analysis suggests that Tanzania performs poorly in education and investment spending efficiency, while health spending efficiency appears to be in line with the average for LICs. Given Tanzania's social and development needs, improving spending efficiency would help reduce spending pressures. Proposed reforms include improving resource allocations in the education and health sectors and linking them to performance, and strengthening public investment management (PIM) institutions.

5. Tanzania could become a major producer and exporter of natural gas in the next decade. Developing recently discovered offshore natural resources would entail the largest investment ever made in Tanzania, amounting to about today's GDP, and potentially significant revenue from natural gas could play a critical role for the development of Tanzania, if well managed. Chapter IV ("*Offshore Gas Development—Exploring Price Sensitivity and Some Revenue Management Considerations")* updates earlier simulations of the fiscal impact of a potential development of the natural gas resources and extends the analysis by highlighting the sensitivity of results to natural gas prices. The paper also provides a comparison of the fiscal impact of various fiscal rules for managing the potential natural gas revenue. While low gas prices affect the profitability of the project, the government can improve the prospect of the investment taking place by completing reforms on the policy and regulatory framework and by engaging the investors in negotiations about the project.

PRODUCTIVITY, GROWTH, STRUCTURAL REFORMS, AND MACROECONOMIC POLICIES IN TANZANIA[1]

A.   From the mid-1980s to the mid-2000s

1.   Tanzania experienced macroeconomic stabilization and significant structural change over the last three decades. The country transformed from a largely agricultural, state-controlled economy to a more diversified, dynamic, and market-based one. Per-capita GDP (in nominal US$ terms) increased 2.7 times between 1995 and 2014 and labor productivity increased by nearly 85 percent. The share of agriculture in total output declined from 47 percent in 1995 to 23 percent in 2014, in favor of higher value-added manufacturing and services. This economic success was largely fostered by sound macroeconomic policies and waves of structural reforms that took place in the mid-1980s, and more importantly from the mid-1990s to the mid-2000s. These reforms aimed at reducing the role of the state in the economy, offered fertile ground for private sector development and FDI inflows, and were strongly supported by donors.

2.   The first wave of reforms began in the mid-1980s in response to weak growth, high inflation, and a balance of payments crisis. With the launch of the Economic Recovery Program in 1986, the exchange regime was gradually liberalized, first by introducing a crawling peg in 1986 and subsequently by full exchange rate unification, accompanied by the removal of restrictions on current account transactions and holdings of foreign currency. In parallel, export and import procedures were simplified, and tariff and non-tariff trade barriers reduced. Most domestic price controls were lifted by 1991, except for petroleum products and public utilities. To encourage private participation in the agriculture sector, marketing and distribution of agricultural crops was opened up to the private sector. However, the commitment to reform was not sustained, and by the mid-1990s the reform momentum had decreased significantly.

3.   The second and more important wave of reforms began in 1996, with stronger national ownership. A comprehensive privatization program was launched and by 2003 most of the underperforming manufacturing and commercial parastatals were restructured, liquidated, or privatized. In the financial sector interest rates were liberalized and banking supervision and regulation strengthened. Foreign banks were allowed to enter the Tanzanian market, while state-owned banks were restructured and privatized. Fiscal management was improved, with for instance the introduction of a cash budget system to constrain government spending. Revenue mobilization was also strengthened through tax policy reforms, including the introduction of VAT in 1998, and improved tax administration. In addition, increased public investment in infrastructure, including in the energy sector, provided a platform for productivity growth and expansion of exports. To strengthen the business environment, business licensing and registration were simplified, labor market policies were reformed, and property rights were strengthened. In response, donor support was also scaled up, which helped increase public investment and poverty alleviation efforts.

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[1] Prepared by Nikoloz Gigineishvili, Byung Kyoon Jang, and Hervé Joly.

4.   Macroeconomic performance was strongly correlated with the reform efforts during this period. The first wave of reforms helped lift average growth from 2.3 percent in 1981-85 to 5.5 percent in the second half of the 1980s. After declining to 1.8 percent in the early 1990s, the second wave of reforms was followed by a growth pickup to 4.3 percent in 1996-2000 and to 6.6 percent during 2001–2007. Growth became more broad-based and driven by services, construction, and low-technology manufacturing. A growth accounting exercise suggests that the main factor behind the evolution of growth (or labor productivity) during this period was total factor productivity (TFP). TFP growth was positive and high during the two reform phases, but negative in the early 1980s and early 1990s.

Table 1. Tanzania: Basic Growth Accounts					
(Annual average growth rates)					
	1981-85	1986-90	1991-95	1996-2007	2008-14
GDP	2.3	5.5	1.8	5.6	6.4
Capital 1/	0.9	1.0	1.4	1.2	2.7
Labor 1/	3.1	2.6	2.9	2.4	2.8
TFP	-1.6	1.9	-2.5	2.0	0.9
Source: IMF staff calculations.					
1/ Contributions to GDP growth.					

B.   The Recent Period

5.   Growth has remained strong in recent years and become more capital intensive. Real GDP growth remained high in 2008-14, averaging to 6.4 percent. The contribution of TFP growth, while still positive on average, has been much smaller than during the previous period. Lower TFP growth was offset by higher capital accumulation. Private investment increased from an annual average of 16.7 percent of GDP in 1996-2007 to 25.5 percent of GDP in 2008-14, with construction contributing to a significant part of this increase. Public investment increased from 4 to 6 percent of GDP on average during the same period, reflecting sustained efforts to address energy and transportation infrastructure gaps.

6.   A possible explanation for the lower TFP performance is a reform slowdown in recent years. While it is obviously difficult to compare precisely reform efforts over different periods, a number of arguments could support this claim. It needs to be recognized from the outset that the nature of the reforms has changed significantly. Reforms in the 1980s and 1990s were about liberalizing the economy; the reform needs were easy to identify and payoffs could be expected to be large given the extent of distortions. In other words, they were low-hanging fruits. The more

Figure 1. Tanzania: Macroeconomic Stabilization, Investment and Waves of Reforms

Real GDP growth
(Percent)

Inflation
(Percent)

Gross Capital Formation
(Percent of GDP)

Total Factor Productivity

Contirbution to Labor Productivity Growth
(Percent)

1st wave of reforms
1985-1990

Industry Regulations
Trade Liberalization
Agriculture Reforms

2nd wave of reforms
1995-2005

Industry Regulations
Labor Market
Business Regulations[1]
Infrastructure
Banking Reforms

[1]Business Regulations covers privatization, strengthening property rights, business licensing and registration, tax and PFM reforms.

Sources: Tanzania authorities, Penn World Tables, and IMF staff calculations.

recent reform priorities of the authorities are of a different nature: they aim, for instance, at improving public governance, human capital, infrastructure, and the business environment, and developing agriculture and the financial sector. They also require a broad range of measures (rather than a few big ones, as earlier) and sustained efforts over long periods.[2] Certain indicators suggest that recent progress has been limited in a number of priorities areas, with even a deterioration of certain aspects of public governance (e.g., control of corruption) and overall government effectiveness. Public financial management has deteriorated, as illustrated by the large accumulation of arrears in recent years, while revenue mobilization efforts stagnated. The business environment is still challenging, even by regional standards, with getting credit, paying taxes, and trading across borders reported as particularly black spots.

Figure 2. Tanzania: Governance and Doing Business Indicators

Tanzania: Country Policy and Institutions Assessment Index
(Average[1])

Source: World Bank, CPIA Index.
[1]The overall index was calculated as the simple average of all sub-indices.

Tanzania Governance Indicators[1]
(Percentile rank)

Source: World Bank, Worldwide Governance Indicators.
[1]Higher values are associated with better outcomes

Tanzania: Doing Business Indicators 2016 Ranking

Source: World Bank, Doing Business Indicators.

Doing Business 2016 Ranking

Source: World Bank, Doing Business Indicators.

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[2] This reform slowdown could also be partly linked to a more challenging external environment due to a series of shocks, such as the global financial crisis of 2007-09, the food and fuel price shocks of 2007 and 2011, and the energy crisis that followed the severe droughts in the summer of 2011. These events may have led to a diversion of human and financial resources towards addressing these pressing challenges.

C.   Considerations for the Medium Term

7.   Rekindling the reform momentum is desirable to sustain high growth. While higher
investment is welcome, particularly in a country with a low capital stock, a growth model relying
mostly on capital accumulation is inferior to, and less durable than, one also underpinned by TFP
improvements. As the capital stock builds up, the return on new investment diminishes, which
reduces the incentive to invest. This makes it increasingly difficult to sustain high levels of growth
through capital accumulation only. In emerging Asian countries that achieved high growth, TFP
growth contributed more to GDP growth than in Tanzania in recent years.

Table 2. Growth Accounts: Cross Country Comparison					
(Annual average growth rates)					
	Tanzania	Korea	China	Vietnam	Thailand
	2008-14	1981-90	1991-2000	2001-07	1981-90
GDP	6.4	9.0	9.1	7.4	7.5
GDP per labor	3.4	6.3	7.9	5.1	4.3
Labor input	3.0	2.6	1.2	2.3	3.2
Human capital	1.0	0.9	1.2	1.0	0.8
Capital per labor	5.6	7.5	8.7	8.3	3.9
TFP	0.9	2.8	3.7	1.2	2.3
Per capita GDP (US$)					
Beginning year	672	1,870	357	402	752
Ending year	1,029	6,513	954	920	1,571
Sources: IMF staff calculations; and Lee and Hong (2010).					

**8.   There seems to be considerable room for productivity improvements through
sustained structural and institutional reforms, which would support continued diversification
of the economy.** Reforms should continue to focus on modernizing agriculture, whose performance
over the past decade has been below expectations. Tanzania has a comparative advantage in this
sector given the availability of arable land. Agriculture still employs the vast majority of people, and
raising productivity in this sector will be critical to improve livelihoods and reduce poverty in rural
areas. Agriculture modernization would boost growth, but not prevent further diversification of the
economy. Higher productivity in this sector, beyond raising agricultural incomes, would also likely
free labor resources for other sectors of the economy, and could also foster the development of
certain industrial sectors, such as food processing. Improving the business environment for private
sector activities should also be a priority; this includes, among others, better energy and
transportation infrastructure and improving access to finance. Tanzania could also significantly
benefit from regional integration as the completion of the EAC common market, which remains
hampered by non-tariff barriers, would help attract capital and foster competition. This could also
leverage its natural geographic advantage as a potential trading hub on the East Africa coast.

**9.   Tanzania could become a major producer and exporter of natural gas in the next
decade**. Recently discovered offshore natural gas, assuming it is exploited, could lead to multi-
billion dollar foreign investment in the next 5-10 years and make Tanzania one of the largest

exporters of natural gas in the region by 2025. The availability of natural gas for the domestic market could lead to lower energy costs, which would foster the development of existing and new industries (e.g., resource-intensive ones, such as fertilizer manufacturing). With the exploration phase now over, urgent and coherent action is needed to facilitate reaching the investment decision, speed up the development phase and position Tanzania to benefit from this exhaustible resource. Of most importance is an enabling regulatory and policy environment that ensures a fair sharing of risk and reward between the investors and the government and a strong institutional framework that enforces collaboration across agencies to ensure alignment with the country's medium to long term development aspirations. Tanzania could indeed face significant challenges that are common to many resource-rich countries, such as real exchange rate appreciation, increase in labor costs and the price on non-tradable goods, crowding-out of investment in other sectors, difficulties in containing inefficient public spending, and inflationary pressures.

D.   Is There a Role for Fiscal Policy?

10.   Fiscal policy can be an effective tool to support economic growth through various channels (IMF (2015)). At the macroeconomic level, fiscal policy plays an important role in ensuring macroeconomic stability, which is needed to achieve and sustain growth. At the microeconomic level, fiscal policy can boost employment, investment, and productivity through well-designed tax and spending policies. Such policies include: Lowering the tax wedge and improving the design of labor taxes and social benefits (to strengthen work incentives in the formal sector); reducing distortions in corporate income taxation and limiting tax incentives to well-targeted and designed programs (to encourage private investment); efficient public investment, especially in infrastructure; and more equitable access to education and health care (to increase human capital accumulation, a key factor for growth). If growth-friendly reforms require fiscal space, revenue measures should focus on broadening the tax base and minimizing distortions; and expenditure measures should aim at rationalizing spending and improving efficiency.

11.   The fiscal measures included in the second wave of reforms broadly followed the principles detailed above and are likely to have positively affected growth (IMF (2015)). First, they signaled a move towards fiscal sustainability and transparency, creating a more favorable environment for private investment. The introduction of the VAT removed relative price distortions on business inputs. The reform package helped increase and redirect public investment from low to high priority areas. This may have helped crowd in private investment, specifically in the form of FDI. The introduction of the fiscal regime for natural resources increased transparency and predictability for investors and thus may also have positively impacted FDI inflows into this sector. Similarly, TFP may have been boosted by a number of measures, such as improvements in public financial management. The growth dividend of public capital spending indeed critically hinges on the quality of public investment management. Also, the public spending shift towards education may have helped increase the quality of workers' productive skills and stimulated the creation of new technologies.

12.   **Increasing revenue mobilization in an efficient way and the quality of spending should be priorities for fiscal policy in the coming years**. Raising more revenue will be critical to reconcile development priorities, which are likely to include higher spending on education, health, and infrastructure, with fiscal sustainability. The tax-to-GDP ratio, at about 12 percent, is particularly low in Tanzania, even by low-income country standards. Analytical work suggests that the revenue gap in Tanzania is about 4 percent of GDP. Closing this gap in an efficient manner will require comprehensive tax policy and administration reform, which should follow the above principles to be growth friendly (see Chapter II). Improving the efficiency of spending will also be desirable (see Chapter III). This will require forceful and sustained reforms to improve public financial management, governance, and more broadly government effectiveness. Weaknesses in public investment management also need to be addressed.

E.   Is There a Role for Monetary Policy?

13.   **While monetary policy's main contribution to growth is to ensure macroeconomic stability, it can also indirectly play a role through the development and stability of the financial system.** There is extensive empirical evidence showing that high and volatile inflation is bad for growth. Monetary policy's first and main contribution to growth, therefore, is to ensure that inflation remains moderate and limit its fluctuations, consistent with its ultimate objective. The transition to a more forward-looking, interest-based framework, which should increase the effectiveness of monetary policy in Tanzania, would help in this regard. The move to an interest-based monetary policy might also foster the development of important segments of the financial system, such as the interbank market. Finally, monetary policy in Tanzania plays an important role in ensuring financial stability, for instance by avoiding credit booms and busts.

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Annex 1: Methodology and Data Sources for Calculating Total Factor Productivity

The calculation of total factor productivity (TFP) assumes a Cobb-Douglas production function with constant returns to scale of the following form:

$$Y = C \cdot K^{\alpha}(L \cdot H)^{1-\alpha} \tag{1}$$

where Y is gross domestic product in constant prices, K is the real capital stock, L is employment, H is a human capital index (labor quality, average), C is a total factor productivity, and α is output elasticity of capital. Dividing equation (1) by L and log-linearizing yields:

$$y = c + \alpha k + (1-\alpha)h \tag{2}$$

where y, k ad h are real output, physical capital and human capital per worker respectively, expressed in logs. From (2), TFP per worker in a logarithmic form is derived as a residual:

$$c = y - \alpha k - (1-\alpha)h \tag{3}$$

Capital accumulation is determined by:

$$K_t = (1-\delta) \cdot K_{t-1} + I_t \tag{4}$$

where K_t is capital stock at time t, I_t is investment at time t, and δ is the depreciation rate assumed to be equal to 4 percent. I_t come from official national accounts statistics. The starting capital stock is calculated for 1978 as $K_{1978} = Y_{1978} \cdot \beta$, where β is a capital/output ratio set at 2.7, which is a median value across countries since 1970.

Human capital index H and employment L are obtained from Penn World Tables (version 8), and the coefficient α is assumed to be equal to 0.31.

TAX REVENUE MOBILIZATION IN TANZANIA[1]

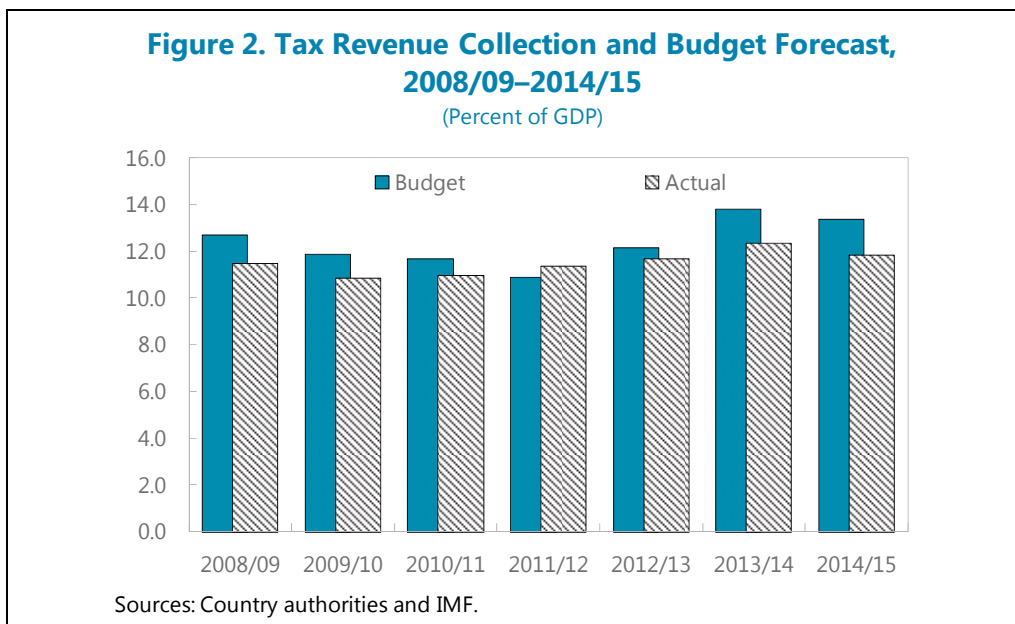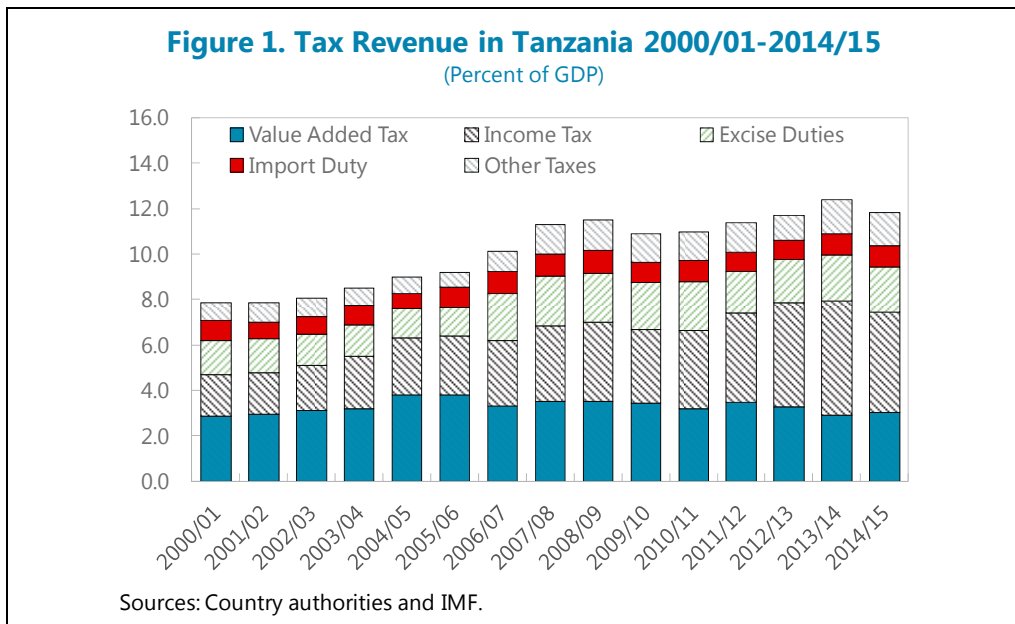## A.   Background and Recent Developments

1.   Revenue mobilization has been a long standing concern in Tanzania. In light of the country's large development needs, successive governments have placed revenue mobilization at the center of economic policies with the objective to support investment in education, health, and critical infrastructure while safeguarding fiscal sustainability. Reliance on domestic revenue mobilization has also emerged as a top priority because of the significant decline in donor support. Over the last 10 years, external grants dropped from 5.7 percent of GDP in 2004/05 to 1.2 percent of GDP in 2014/15. Further, the recent upward revision to GDP by about 30 percent uncovered a lower than previously thought tax-to-GDP ratio.

2.   Tax revenue performance improved until the late 2000s, but since then progress has been limited (Figure 1). Tax revenue to GDP ratio rose steadily from 8 percent of GDP in 2000/01 to reach a peak at 11.5 percent of GDP in 2008/09. The global financial crisis led to a slight dip in revenue, but although the revenue ratio recovered since then, it was barely back to the pre-crisis level in 2014/15. Income tax, excise, and other tax revenue increased significantly in the 2000s. Nord et al. (2009) suggest it was a consequence of structural reforms supported by a simplification of tax laws and regulations, notably with the 2004 Income Tax Act. However, VAT revenue stagnated at a low level, or even decreased during this period, owing to numerous exemptions—including the elimination of VAT on petroleum products in 2006—the reduction of the main rate from 20 to 18 percent in 2010, and compliance issues.

3.   Revenue collection has often fallen short of budget targets, complicating budget management. The shortfall has been predominantly driven by optimism in forecasts rather than actual performance per se. Figure 2 shows that except in 2011/12, the execution of the budget had to deal with a gap in revenue, making unavoidable a scaling back in planned expenditure programs in the course of the fiscal year to keep the budget deficit within target. Difficulties to reduce expenditure mid-year by sizeable amounts led to significant arrears accumulation.

4.   There is wide recognition among policy makers and stakeholders that Tanzania can do better in revenue collection. This paper aims to contribute to the policy debate by reviewing the level and structure of tax revenues in Tanzania and comparing them to peers; providing a quantification of Tanzania's tax capacity; identifying current issues and challenges in tax policy and administration; and finally discussing policy options for reforms.

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[1] Prepared by Roland Kpodar.

Figure 1. Tax Revenue in Tanzania 2000/01-2014/15
(Percent of GDP)

Sources: Country authorities and IMF.

Figure 2. Tax Revenue Collection and Budget Forecast, 2008/09–2014/15
(Percent of GDP)

Sources: Country authorities and IMF.

B.   Benchmarking of Tanzania's Revenue Performance

5.   Tanzania's tax-to-GDP ratio is low in comparison with peers and with respect to its level of development. Over the 2011-13 period, Tanzania had a tax-to-GDP ratio of 11.9 percent of GDP, well below the average of East African Community (EAC) countries and low-income countries (LICs), respectively at 13.1 percent of GDP and 14.7 percent of GDP (Figure 3). Tanzania had the second lowest tax ratio in the EAC, and also performed relatively poorly compared to other frontier economies such as Cote d'Ivoire, Ghana, and Senegal. Moreover, Tanzania's revenue collection also fell short of the level implied by its GDP per capita in a sample of LICs (Figure 4). It is worth delving into the specific tax categories to identify where Tanzania lags behind its peers.

6.   Tanzania's income tax revenue is not significantly out-of-line with peers, although one-off factors may partly explain this performance. Collection of direct income taxes appears to be in line with the LIC average, but while Tanzania's corporate income tax (CIT) ratio is comparable to the EAC average, revenue from the personal income tax is slightly below the average of the same group of countries (Figure 3). However, the relative performance of Tanzania in collecting CIT revenue may have been masked by temporary factors. Indeed, a one-off payment of capital gains on the sale of assets of a large energy company in 2013/14 provided a temporary boost to CIT revenue (about 0.4 percent of GDP). In addition, direct revenue from CIT remains low and hidden by the increase in recent years of revenue from withholding tax on goods and services, mainly related to contractor payments by mining and petroleum companies (0.5 percent of GDP).

7.   Tanzania's tax underperformance seems to have been mainly driven by weak indirect tax collection, notably on VAT. The low VAT collection is particularly striking (Figure 3). VAT revenue in Tanzania amounted to 3.3 percent of GDP in 2011-13, that is a full percentage point of GDP below the average of EAC countries (4.4 percent of GDP). This is almost equivalent to the entire gap between the overall tax revenue to GDP in Tanzania (11.9 percent of GDP) and the corresponding EAC average (13.1 percent of GDP). Performance of excise revenue has improved in recent years, and remains above the average of LICs, although it falls short of the EAC average.

8.   Reflecting the fairly advanced customs duty harmonization and liberalization process within the EAC, trade tax revenue is relatively modest. Trade tax revenue amounted to about 1 percent of GDP, slightly below the average of 1.2 percent of GDP for EAC countries, but quite far from the 2.7 percent of GDP for LICs (Figure 3). Low trade taxes are likely due to full trade liberalization within the EAC region, with a growing share of Tanzania's imports originating from EAC countries. However, inefficiencies in customs administration also weigh on low collection of trade taxes, suggesting that there is a potential to raise more revenue while proceeding with the trade liberalization agenda.

9.   Tanzania's low tax revenue performance is not due to low tax rates, but instead results from a low tax productivity. The CIT and VAT rates in Tanzania are comparable to the prevailing rates in many of its peer countries (Figure 5). However, measuring tax productivity by the revenue collected (in percent of GDP) for every one percentage point of tax rate reveals a significant gap, in

particular for the VAT (Figure 6). Tanzania has one of the lowest VAT productivity which appears to be linked to administrative inefficiency, compliance issues and policy gaps other than the rate (e.g., exemptions). The CIT productivity is close to the EAC average, but as pointed earlier, temporary factors may have played a role.

10.   The benchmark analysis shows that Tanzania's tax revenue performance has been weak, but does not address the question of Tanzania's tax capacity. The shortcoming of the benchmark analysis is that it does not control for country characteristics, and concluding that a country performs poorly relative to peers could be misleading if this outcome is fully explained by its level of development and structural characteristics that shape tax performance. Moreover, to guide reforms, the country's tax capacity (i.e., the maximum level of tax revenue it should be able to collect) is a more appealing and economically sensible target than the average tax revenue for a given country groups. The next section looks closely into these issues.

Figure 3. Cross–country Comparison of Tanzania's Tax Revenue performance, 2011-13
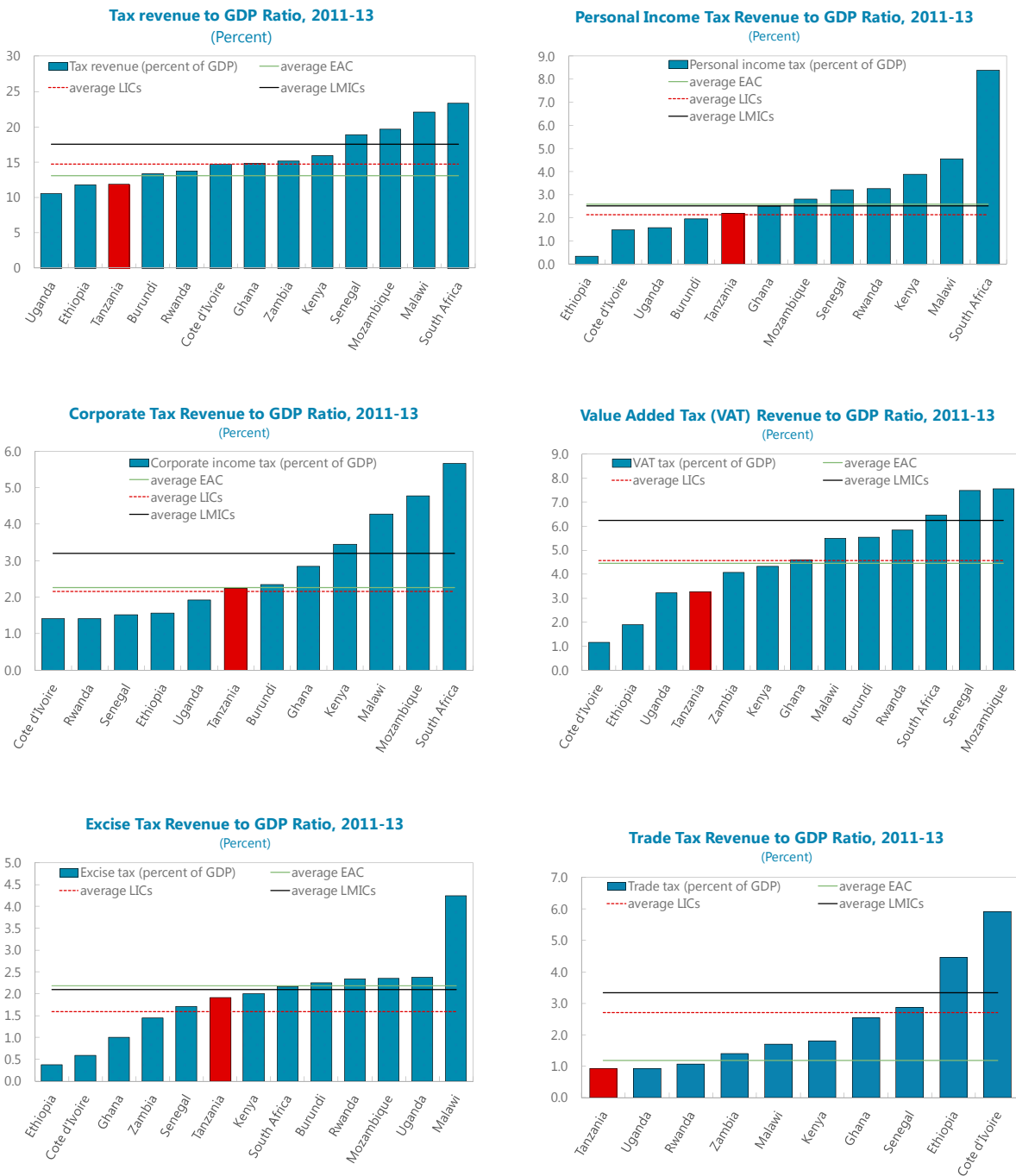
Sources: Country authorities; and IMF.

Figure 4. Tax Revenue and Income Level in Low-Income Countries, 2011-13
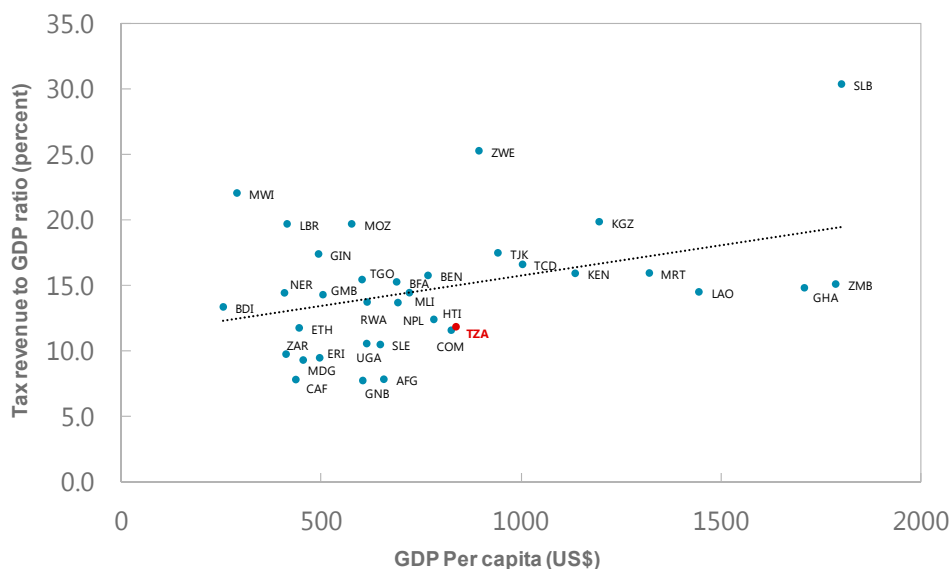
Sources: Country authorities and IMF.

Figure 5. CIT and VAT Rates in Tanzania and Other Countries, 2013

Value Added Tax (VAT) Rate, 2013
(Percent)

Corporate Income Tax (CIT) Rate, 2013
(Percent)

Sources: Country authorities and IMF.

Figure 6. CIT and VAT Productivity in Tanzania and Other Countries, 2011-13

CIT Tax Revenue by Percentage Point of CIT Rate, 2011-13
(Percent of GDP)

VAT Tax Revenue by Percentage Point of VAT Rate, 2011-13
(Percent of GDP)

Sources: Country authorities and IMF.
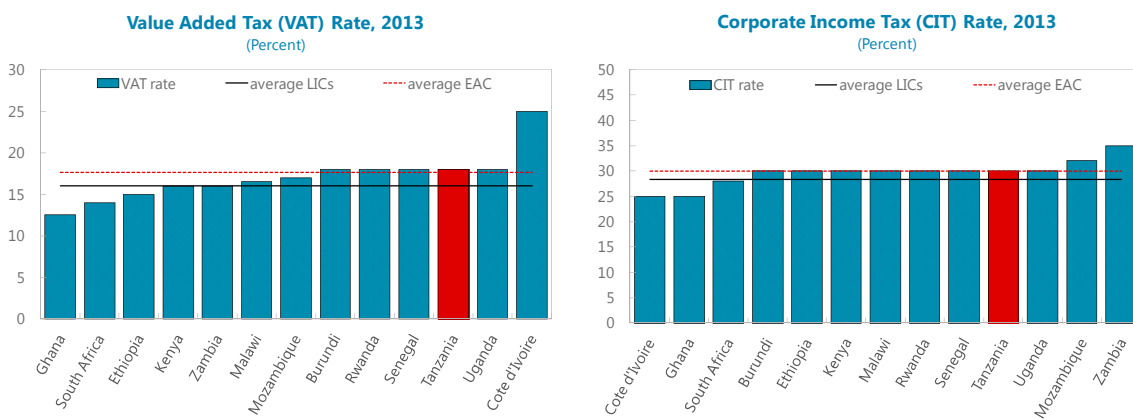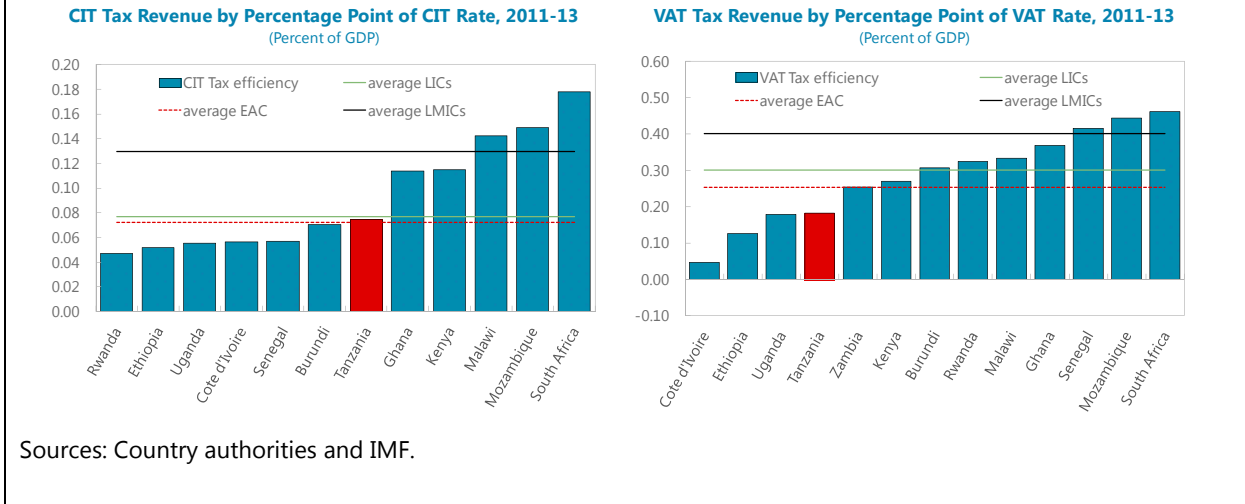
C.   Estimating Tax Revenue Capacity

11.   Two methods to estimate tax capacity are used in this paper: the "peer analysis" and the "frontier approach". The peer analysis relies on a standard cross-country regression to explain tax revenue performance by a number of observable characteristics thought to drive revenue collection, for instance the country's income per capita. The predicted tax revenue based on the country's current characteristics is an approximation of the tax capacity, and the difference with the actual revenue level is the combination of the tax policy gap and the tax gap (see Box 1 for basic concepts and definitions). The tax frontier approach is also a regression-based framework, but it aims to estimate the maximum tax revenue a country can achieve given its characteristics. The tax frontier is akin to a production function with the output being the tax revenue to GDP ratio, and the inputs being the country characteristics. The distance to the frontier captures administrative inefficiencies and policy choices (country's legislation, tax rates and exemptions).

Box 1. Basic concepts and definitions

Tax capacity is an estimate how much tax revenue a country should be able to collect given its economic, social, institutional, and demographic characteristics (Fenochietto and Pessino, 2010).

Tax effort is defined as the ratio between actual tax revenue and tax capacity. It reflects both efficiency in the collection of revenue as well as the country's own tax legislation.

Tax potential is often used interchangeably with tax capacity, but there is subtle difference. It is the maximum revenue level a country can obtain from the effective application of its current tax legislation. Some countries can be efficient in revenue collection, but still be below their tax capacity, reflecting policy choices. For example, a country might choose to have lower tax rates consistent with a low provision of public services.

The *tax policy gap* is the difference between tax capacity and tax potential, and arises from reduced tax rates, exemptions, allowances, deductions, tax amnesty schemes and so forth. Streamlining tax incentives and broadening the tax base help reduce the tax policy gap.

The *tax gap* is the difference between tax potential (tax owed) and actual tax revenue (tax paid). Sources of the tax gap include underreporting of tax liability, underpayment of reported taxes and nonfiling. The tax gap shrinks with improvement in compliance and a more effective tax administration.

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12.   The peer analysis and the frontier analysis are, however, conceptually different. The peer analysis assumes that countries are on average efficient in collecting their revenue, and compares how a country performs relatively to the average country in the sample. Therefore, by construction some countries will be above their tax capacity and others will be below.[2] In contrast, the tax frontier analysis explicitly models the "inefficiency" as a non-negative random variable associated with country-specific factors that prevent the country from achieving its tax capacity (for more discussions and details on the frontier analysis, see Fenochietto and Pessino, 2010). For each combination of inputs (country characteristics), the tax frontier analysis estimates empirically a "frontier" depicting the maximum level of revenue a hypothetical country, deemed the most efficient, would have achieved. The closer a country is to that frontier, the more efficient its tax system, or the higher its tax effort. By construction, the tax effort lies between zero and one. That said, one common limitation to both approaches is that, absent a measure of efficiency of tax administration and data on tax structure (e.g., effective tax rates), they are unable to inform policy recommendations on what part of the "tax gap" is due to weakness in tax administration or policy choices.

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[2] Basically, the combined tax policy and tax gap is the error term of the regression to explain tax revenue collection, and with the assumption that the error term has zero conditional mean under OLS (Ordinary Least Squares), this gap will be negative for some countries (meaning they are collecting above their capacity) and positive for others (those which are under their tax capacity).

13.   Building on a large set of empirical studies,[3] tax revenue is assumed to be a function of income per capita and a range of other variables common to these studies. These variables include the share of agriculture in value-added, trade openness, the old-age dependency ratio and the quality of institutions. The model specification is as follows:

$$T_{i,t} = \partial_0 + \Delta X_{i,t} + u_i + \varepsilon_{i,t}$$

where: T is tax revenue in percent of GDP; $X_{i,t}$ is a set of variables including GDP per capita, the share of agricultural value added, trade openness (the sum of exports and imports divided by GDP), old-age dependency ratio (the share of population older than 64 in the working-age population) and quality of institutions (a composite index calculated as the principal component of six governance indicators compiled by the World Bank: voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and control of corruption); u is the country specific effect; and ε is the error term.

14.   The literature documents well the rationale behind the factors bearing on a country's ability to collect taxes. Higher *income per capita* is likely to be associated with a larger tax base, more effective tax administration, better compliance, and hence higher tax revenue capacity. The *share of agriculture in value-added* is expected to be negatively correlated with tax revenue as agricultural products are often tax-exempted and because of the difficulty to tax where the sector is largely dominated by small producers. The relationship between *trade openness* and tax capacity is ambiguous: trade flows are easy to tax, which is positive for the tax capacity; but high trade flows are often related to trade liberalization, which reduces the capacity to raise tax revenue from trade. The *old-age dependency ratio* is a proxy of spending related to aging, notably pensions and health care. If these expenditures are high, they are likely to put pressure on the government to step up revenue collection. Finally, a low *quality of institutions* undermines revenue performance, in particular when prevalence of corruption is high (Tanzi and Davoodi, 1997; Ghura, 1998; Bird et al., 2004).

15.   To estimate the model, we rely on a sample of LICs with panel data covering the period 1994-2013. The sample consists of 32 LICs and the data are averaged over 5-year periods—to reduce short-term fluctuations in tax collection due to business cycles—leading to 4 observations per country during the period 1994-2013. Limiting the sample to LICs allows to reduce country heterogeneity and avoid an upward bias in tax capacity. Indeed, given that the coefficients to estimate Tanzania's tax capacity are influenced by the other countries in the sample, including emerging economies could overstate Tanzania's tax capacity—hence implying larger inefficiency—if the structural characteristic of all countries are not properly controlled for (for instance due to omitted variable bias).

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[3] See Ghura (1998), Gupta (2007), Davoodi and Grigorian (2007), Fenochietto and Pessino (2010 and 2013), Drummond and others (2012), and Torres (2014).

16.   The model is estimated using both the peer analysis and the frontier approach. This allows cross-checking the robustness of the result. The model also takes into account country specific effects to control for time-invariant unobservable characteristics that may influence tax performance. Based on the Hausman test, we select the fixed-effect estimator for the peer analysis. For the frontier approach we consider the approaches developed by Greene (2005) and guided by the Hausman test we retain Greene (2005)'s "true random effect estimator".

17.   The results from the peer analysis are broadly consistent with expectations (Table 1). The coefficient of GDP per capita is positive and strongly significant, suggesting that economic development is associated with better tax performance. Interestingly, trade openness also comes out significantly, probably reflecting the fact that revenue collection in many LICs still relies heavily on trade taxes. The results also provide evidence that good institutions stimulate tax collection. When the composite index of institutions is replaced by the corruption index, the result confirms earlier findings (e.g., Ghura, 1998) that corruption hampers revenue mobilization.[4] Although their coefficients have the expected sign, the share of agricultural value added and the old-dependency ratio are not statistically significant.[5] Overall, the model helps explains 40 percent of the variability in tax performance.

18.   Tanzania's tax capacity is estimated at 15.2 percent of GDP, suggesting that there is considerable scope to raise revenue in Tanzania. Using the coefficients in Table 1 and the average value of the explanatory variables in 2009-13, it is estimated that Tanzania could have achieved a tax to GDP ratio of 15.2 percent of GDP compared to the actual collection of 11.5 percent of GDP over the same period (Figure 7). This implies that tax administration inefficiencies, tax evasion and tax policy design cost up to 4 percentage points of GDP in revenue annually, and this gap has been relatively stable over the past several years (Figure 8). Nevertheless, in light of the increase in the tax revenue ratio in 2015/16, the gap has been reduced to 2.2 percent of GDP assuming an unchanged tax capacity.

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[4] The result is not shown here.

[5] We tested other variables thought to affect revenue performance, such as foreign aid (Gupta, 2007), size of the informal sector (Davoodi and Grigorian, 2007), education expenditure, GINI index and inflation (Fenochietto and Pessino, 2013), but without significant results.

Table 1. Regression Results of the Peer Analysis

Dependent variable: Tax revenue/GDP	
GDP per capita (log)	7.41
	[2.05]***
Trade openness	0.04
	[0.02]**
Share of agricultural in valued-added	-0.02
	[0.07]
Old-dependency ratio	0.36
	[0.60]
Quality of institutions	2.14
	[1.13]*
Constant	-34.12
	[13.99]**
Observations	112
Number of countries	32
R-squared	0.4
Tanzania's estimated tax capacity (percent of	15.2
Notes. Robust standard errors in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%	

Source: Country authorities and IMF staff estimates

Figure 7. Actual Tax Performance in Tanzania and Predicted Values

(Percent of GDP)

Sources: Country authorities and IMF staff estimates.
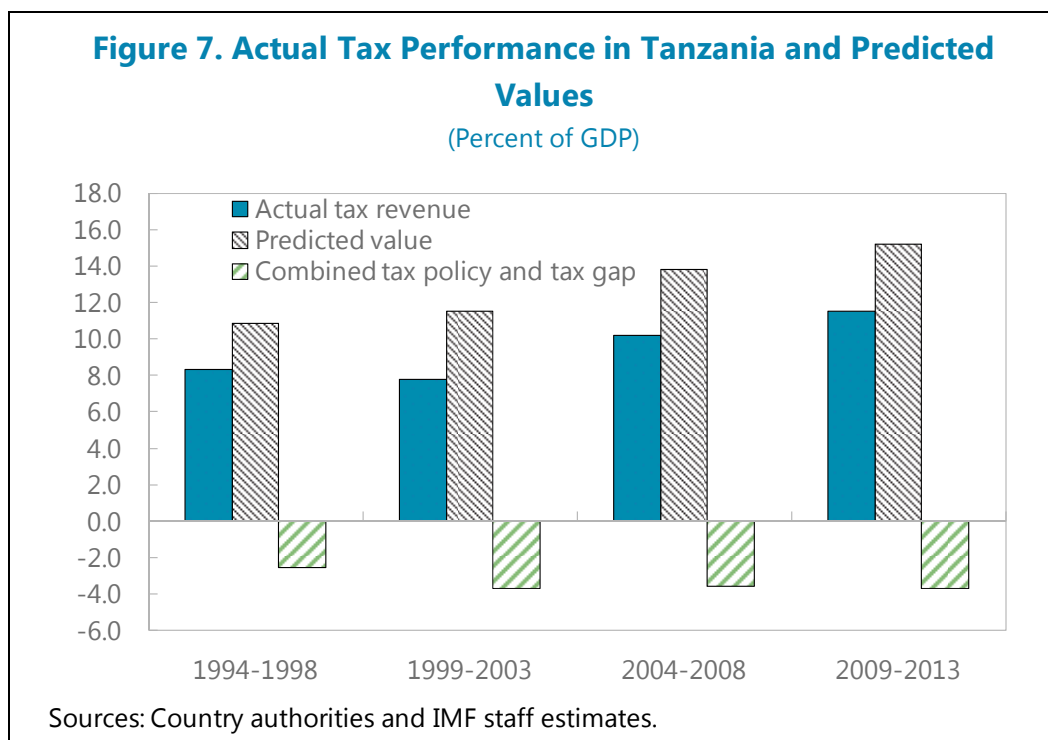
19.   The results of the frontier approach are broadly similar (Table 2).[6] The level of development and the quality of the institutional environment are positively and significantly associated with better tax collection. However, trade openness is no longer significant, although it retains the correct sign, while the share of agricultural value added in GDP comes out negatively correlated with revenue performance.

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[6] The coefficients are not directly comparable as the stochastic frontier approach requires the variables to be in log form.

Table 2. Regression Results of the Stochastic Frontier Approach

Dependent variable: Tax revenue/GDP	
GDP per capita (log)	0.235
	[0.129]*
Trade openness (log)	0.135
	[0.106]
Share of agricultural in valued-added (log)	-0.239
	[0.124]*
Old-dependency ratio (log)	0.258
	[0.242]
Quality of institutions (log)	0.304
	[0.116]**
Constant	0.928
	[0.944]
Observations	112
Number of countries	32
Tanzania's estimated tax capacity (percent of GDP)	15.8

Notes. Robust standard errors in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%

Source: Country authorities and IMF staff estimates

20.   Based on the efficiency score derived from the frontier approach, the combined tax policy and tax gap is estimated at 4.3 percent of GDP in 2009-13. The efficiency score implies an estimated tax effort of 72 percent as the estimated tax capacity amounts to 15.8 percent of GDP, compared to actual collection of 11.5 percent of GDP on average in 2009-13. Taking into account the recent improvement in tax revenue collection, the gap drops to 2.8 percent of GDP holding constant the tax capacity.

D.   Issues and Challenges

21.   The tax capacity analysis suggests there is considerable scope to raise tax revenue in Tanzania. Realizing this potential requires reviewing the existing tax system and identifying the main issues to be addressed with a view to designing a comprehensive tax policy and administration reform package. As an input into this, the IMF has undertaken a review of the tax policy regime and identified possible elements of a reform program to broaden the tax base in a more efficient and fair manner. In parallel, the recent tax administration diagnostic assessment (TADAT) provides a comprehensive diagnostic of tax administration.

Tax Policy Options

22.   The tax policy regime is reasonably well aligned with comparator countries in the region, both in terms of tax types and rates. However, there is room to broaden the tax base in a fair and efficient manner. Work is already underway at the technical level to reform the income tax for the mining and petroleum sector. This will provide more certainty for the taxation of the extractive sector but is not addressed in detail here. There is also only limited focus on the VAT since this tax has recently been overhauled following the implementation of a new VAT law in July 2015.

23.   Generous tax incentives undermine the CIT base. Tanzania offers extensive tax incentives for companies located in special economic zones (SEZ) and export processing zones (EPZ), including 10-year exemptions (holidays) from income tax, withholding taxes, property tax and other local government taxes and levies. While it is difficult to assess the magnitude of revenue forgone from the income tax holidays since tax exemption data only include indirect taxes, they do conflict with good tax policy principles and introduce a risk of income tax evasion through transfer pricing between resident companies located inside and outside the zones. There is a need to review these incentives and consider eliminating them.

24.   Accelerated tax depreciation allowances for some sectors and asset types are sources of distortion. An overly complex and generous depreciation schedule complicates tax administration and compliance as well as distorts incentives for investing. This could be modernized and simplified without undermining the incentives for investing in Tanzania. There is also scope to phase out the preferential dividend withholding tax rates and simplify the presumptive income tax for small businesses.

25.   Revenue collections from personal income tax remain low, with likely significant underreporting of non-wage income including capital income and gains. Taking into account the high payroll taxes imposed in addition to the personal income tax that kick in at low levels of income, labor taxes are relatively regressive and reforms could reduce the tax burden on low income earners. Aligning the effective tax on labor with the lower level in neighboring countries would also reduce disincentives for formal sector employment; the main constraint is how to accommodate any associated revenue loss. There is room to increase withholding rates on interest and dividend payments to individuals.

26.   VAT collection has suffered from creeping exemptions, compliance issues and a weak refund mechanism. A notable exemption is the exclusion of fuel products from the VAT tax base. The new VAT law has broadened the tax base by removing some exemptions, although there may still be some room for further base-broadening measures. It would be particularly pertinent to review the experience with exemptions that were added to the VAT law before the legislation was finally approved by parliament. The fact that businesses continue to push for these exemptions is an indication that the VAT refund mechanism does not work satisfactorily. One constraint on paying VAT refunds is the funding mechanism whereby currently the VAT revenue is remitted to the Treasury on a gross basis, and in turn the Tanzanian Revenue Authority (TRA) is required to request

budget allocations to pay VAT refunds. This budget arrangement does not properly reflect the nature of the VAT, which is really a net revenue-based tax.

27.   Excise duty rates need to be adjusted regularly for inflation to protect their real value. The excise law provides the government with the power to adjust excise rates yearly at a minimum by the inflation rate, but this provision is not consistently applied. Also, there may be merit in further increasing the excise duties on alcoholic beverages, cars and other motor vehicles to bring these closer to the levels in neighboring countries. Further, the tax differential between the excise duty on imported and domestically produced non-alcoholic beverages can be a source of distortion as an excise tax is typically meant to correct for an externality and not intended to achieve a protectionist objective. There may also be merit in introducing for some excisable commodities a mixed excise duty regime combining specific and ad valorem rates as a shield against undervaluation.

28.   Property tax remains an underutilized source of revenue particularly for the rapidly growing urban centers. Combined efforts are required to expand the property cadastre, improve the valuation method, and provide more flexibility to increase the property tax rate in some municipalities.

Tax Administration Options

29.   The TADAT assessment identified strengths and weaknesses in tax administration in Tanzania. A strong identification process for registration of individuals using biometric technology, extensive information provided to taxpayers through various channels, and electronic payment of tax obligations are among the main strengths. However, there are a number of weaknesses that need to be addressed to improve tax compliance and revenue performance. These include a weak tax administration IT system, a low reliability of the taxpayer registration database and taxpayer accounts, a weak refund mechanism and a lack of effective risk management.

E.   Conclusion

30.   Tanzania's tax revenue performance falls short of that of comparator countries and Tanzania's own tax capacity. The benchmark analysis shows that Tanzania's tax-to-GDP ratio is below the average of EAC countries and LICs, with weakness in VAT revenue being the most pronounced. Using the peer analysis and stochastic frontier approach, Tanzania's tax performance is estimated at about 4 percentage points of GDP below tax capacity in 2009-13, implying that there is a significant potential to raise revenue to finance critical social and growth-enhancing expenditure, while preserving fiscal sustainability. At unchanged tax capacity, this gap declines to 2-3 percentage points of GDP as a result of the improvement in the tax revenue ratio in 2015/16.

31.   Closing the tax policy and tax gap will require sustained and deep reforms, both in tax policy and tax administration. Although the new VAT law is a good step forward, more needs to be done to further streamline exemptions and improve the refund mechanism. There is also

significant revenue mobilization potential through the elimination of corporate income tax holidays and exemptions, the regular adjustment of specific excise rates, and development of property taxation. In the areas of tax administration, the need to step up reforms is pressing. Areas for policy actions include cleaning up the taxpayer registration and accounting, upgrading the IT system and strengthening compliance risk management.

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BENCHMARKING AND EFFICIENCY OF PUBLIC SPENDING IN TANZANIA[1]

A.   Background

1.   Tanzania has large development needs. In line with the objectives of the Development Vision 2025, the Second National Strategy for Growth and Reduction of Poverty (MKUKUTA II) aimed at accelerating growth, alleviating poverty, improving living standards, and fostering good governance and accountability. The strategy required raising investment spending from 6.4 percent of GDP in 2009/10 to 9.6 percent of GDP by 2014/15.

2.   Actual development spending has remained below MKUKUTA II targets. In fact, the investment spending ratio has declined during the implementation period of MKUKUTA II, reaching 5.8 percent of GDP in 2014/15 (including an estimated 1.4 percent of GDP of payment arrears on investment projects), about two thirds of the target. Disappointing revenue performance, declining donor assistance, and difficulties in securing nonconcessional financing were among contributing factors. This investment shortfall may have contributed to lower than expected growth during 2009/10-2014/15 (6.6 percent on average, against a targeted range of 8-10 percent).

3.   Improving spending efficiency could help create fiscal space. Reducing inefficiency in spending implies that the country can achieve the same output with fewer resources or achieve higher output with the same resources. Improving spending efficiency helps ensure value of money, reduce waste of resources, and maintain fiscal discipline. However, although some short-term savings could be achieved, the process of improving the efficiency of public spending takes time and typically requires deep reforms to secure long-term gains.
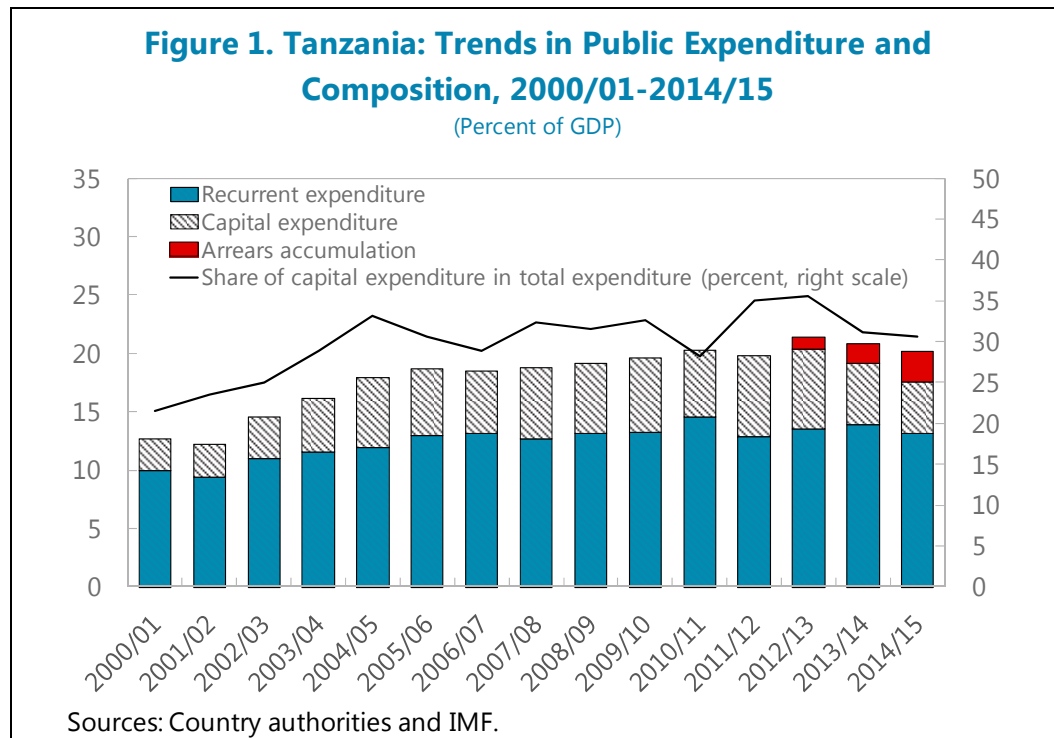
4.   This paper attempts to benchmark Tanzania's public expenditure and identify areas where there is scope to improve expenditure efficiency. It documents recent trends in public spending in Tanzania and then compares them to that of other East African Community (EAC) countries, the average for low-income countries (LICs) and the average for lower middle income countries (LMICs). Further, using the data envelopment analysis (DEA) methodology, the paper assesses public spending efficiency, focusing on education, health and public investment.

B.   Trends in Public Spending and Cross-country Comparisons

5.   After an increase in the early 2000s, public expenditure has broadly stabilized as a share of GDP (Figure 1). Government spending increased significantly from 12.6 percent of GDP in 2000/01 to about 19 percent of GDP in 2005/06 as the authorities ramped up priority spending to meet the Millennium Development Goals (MDGs). Buoyant revenue and strong donor assistance helped scale up spending. Expenditure broadly stabilized as a share of GDP from the mid-2000s, and during the last

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[1] Prepared by Roland Kpodar.

three years, headline expenditure numbers point to some consolidation. However, once recent arrears accumulation is accounted for, the expenditure decline is much more limited.

Figure 1. Tanzania: Trends in Public Expenditure and Composition, 2000/01-2014/15
(Percent of GDP)

Sources: Country authorities and IMF.

6. **Expenditure composition has deteriorated lately**. After accounting for arrears accumulation on investment projects, the share of development expenditure fell from 35.5 percent of total expenditure in 2012/13 to 30.7 percent in 2014/15. The ratio of capital expenditure to GDP has also declined significantly. This development reflects two factors: (i) unrealistic budgeting in recent years, which required adjusting expenditure in the course of the fiscal years (with most of the adjustment falling on capital expenditure); and (ii) lower concessional project financing (Figure 2), partly offset by external nonconcessional loans.[2] Goods and services spending is the largest contributor to current spending, followed by the wage bill (Figure 3). The interest bill has started to rise recently, reflecting debt accumulation,[3] a shift towards more market debt, and exchange rate depreciation.

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[2] This financing has generally been earmarked for investment projects and is reflected in the authorities' fiscal data in domestically financed projects.

[3] Public debt rose by 10 percentage points of GDP in the last five years to reach 38.3 percent of GDP in June 2015. Part of the increase reflects the large exchange rate depreciation recorded in 2014/15.

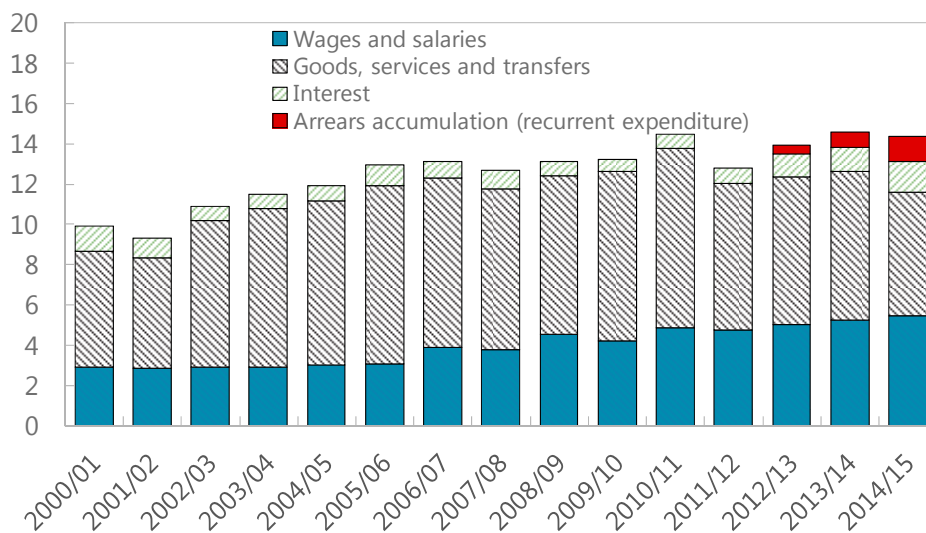**Figure 2. Tanzania: Financing of Development Expenditure, 2000/01-2014/15**
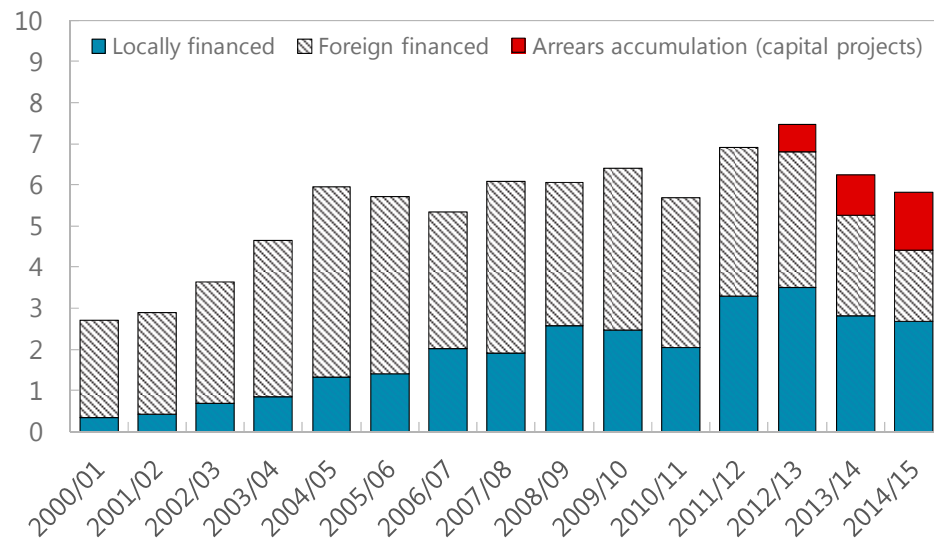
(Percent of GDP)

Sources: Country authorities and IMF.

Figure 3. Tanzania: Composition of Current Expenditure, 2000/01-2014/15

(Percent of GDP)

Sources: Country authorities and IMF.

7. **Public spending is generally lower in Tanzania than in comparator countries** (Figure 4).[4] In 2010-14 Tanzania had the second lowest public spending level in the EAC region after Uganda, with the average public spending standing at 19.5 percent of GDP, about 5 percentage points below the EAC average. Development expenditure was the lowest in the EAC and significantly below the EAC average. Looking at the composition of recurrent expenditure, Tanzania spent less on goods and services, but not on wages that are in line with the EAC average. Taking the average of LICs and LMICs as a benchmark also suggests that public spending is relatively contained in Tanzania.

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[4] Given the lack of cross-country data on arrears accumulation, this comparison relies on cash expenditure.

Figure 4. Public Expenditure in Tanzania in a Cross-Country Perspective, 2010-14

Government Total Expenditure, 2010-14
(Percent of GDP)

Current Public Expenditure, 2010-14
(Percent of GDP)

Public Capital Sepnding, 2010-14
(Percent of GDP)

Share of Current Expenditure in Total Expenditure, 2010-14
(Percent)

Wages and Salaries, 2010-14
(Percent of GDP)

Expenditure on Goods and Services, 2010-14
(Percent of GDP)

Sources: Country authorities and IMF.

C.   Public Spending Efficiency in Tanzania

8.   Public spending on health, education and infrastructure is assessed using the data envelopment analysis (DEA) approach. This methodology allows capturing of the relative efficiency of a country in translating public spending (inputs) into measurable outcomes (outputs). The frontier is estimated based on best performer countries with similar levels of inputs—countries that maximize output for a given level of inputs, or minimize the use of inputs for a given output level—and then countries are ranked according to how far they are from the "efficient frontier". The resulting efficiency score lies between 0 and 1, with 1 being the score for the most efficient countries. For a given country, the distance to the frontier is the output increase that could be achieved with the same inputs should the country be at the efficiency frontier—or alternatively the reduction in inputs that could be achieved while leaving output unchanged. The DEA approach has the advantage of being simple and easy to implement and of not requiring assumptions regarding the production function. However, it does not perform well in the presence of outliers and unlike the stochastic frontier approach, it is more difficult to control for a large number of variables.[5] To reduce country heterogeneity we focus the analysis on a sample of LICs (34) with data available for the period 2010-14.[6] Data permitting, we also replicate the analysis for the period 2000-04 to assess whether public spending efficiency has worsened or improved over time. The DEA model adopted is an output-oriented model with variable returns to scale.[7]

Health spending

9.   Public health spending per capita has stagnated since 2009, but health outcomes have improved. Public health spending per capita increased almost threefold between 2005 and 2009, before leveling off in recent years (Figure 5). This coincided with a steep increase in private health spending, thus enabling Tanzania to record steady gains in health outcomes. Indeed, infant mortality more than halved in 2000-13 and health-adjusted life expectancy (HALE) rose by 10 years.[8]
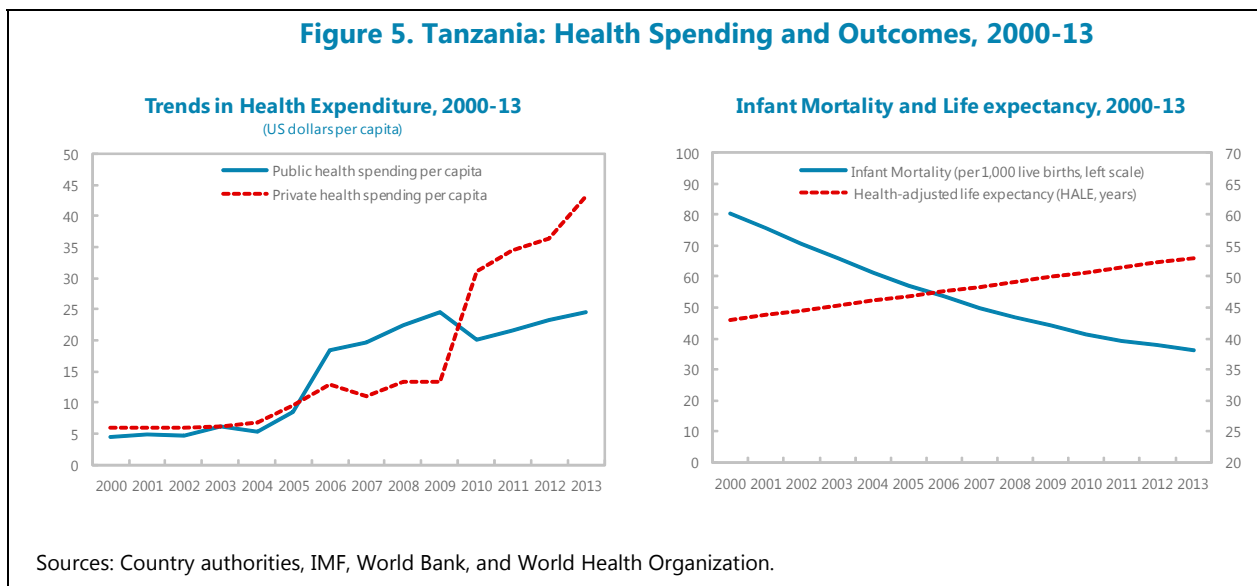
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[5] For a discussion on efficiency frontier approaches, see Gupta and Verhoeven (2001), Herrera and Pang (2005), and Grigoli and Kapsoli (2013).

[6] The country sample varies with data availability.

[7] In an output-oriented model, the objective is to assess by how much output could be expanded without altering the quantities of inputs. The assumption of variable returns to scale implies that production technology may exhibit increasing, constant and decreasing returns to scale. With constant returns to scale, output will change by the same proportion as inputs are changed.
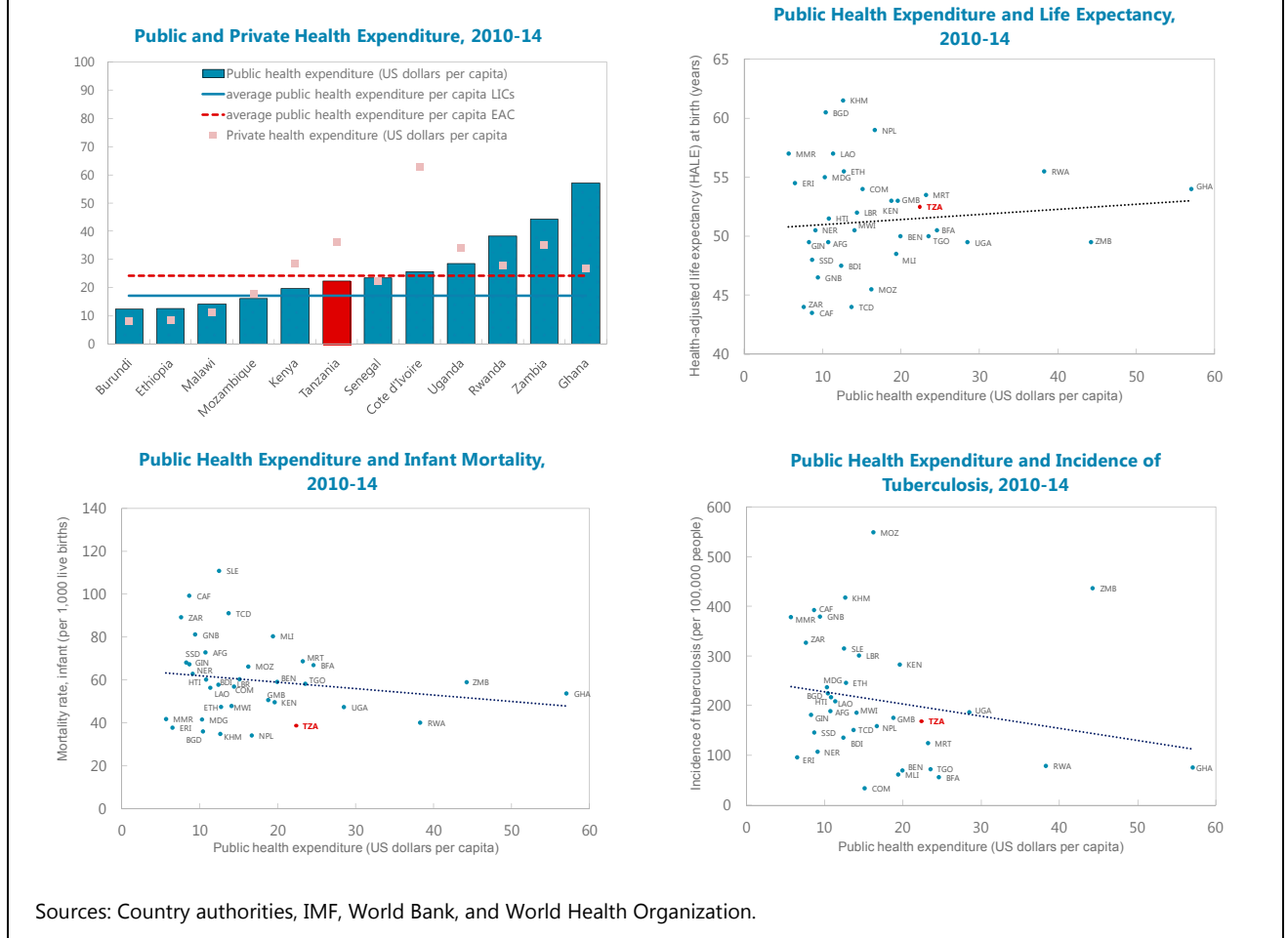
[8] The HALE estimates the number of healthy years an individual is expected at birth to live by subtracting the years of ill health, weighted according to severity, from overall life expectancy. Data are provided by the World Health Organization (WHO).

**Figure 5. Tanzania: Health Spending and Outcomes, 2000-13**

Trends in Health Expenditure, 2000-13
(US dollars per capita)

Infant Mortality and Life expectancy, 2000-13

Sources: Country authorities, IMF, World Bank, and World Health Organization.

10.   Tanzania's health outcomes are marginally better than in LICs with similar level of health spending per capita. Public health spending per capita in Tanzania is above the average for LICs, but slightly below that for the EAC (Figure 6). In contrast, private health spending per capita in Tanzania is above the EAC average. In terms of outcomes, Tanzania performs better than other LICs with similar level of public health spending; it has a relatively lower infant mortality and incidence of tuberculosis, while the HALE is line with that of the average LIC.

Figure 6. Health Spending and Outcomes in Tanzania and Comparator Countries, 2010-14

Public and Private Health Expenditure, 2010-14

Public Health Expenditure and Life Expectancy, 2010-14

Public Health Expenditure and Infant Mortality, 2010-14

Public Health Expenditure and Incidence of Tuberculosis, 2010-14

Sources: Country authorities, IMF, World Bank, and World Health Organization.

11.   The results from the DEA model indicate that there is scope to improve efficiency of health spending in Tanzania (Figure 7). We adopt a two inputs–one output model, with the output indicator being the HALE as this represents a broader measure of the health status of a country. Regarding the inputs, we include public health spending per capita, but also private health spending per capita, which varies significantly across countries and could bias the results if excluded. The efficiency score for Tanzania is 0.86 in 2010-14, implying that the HALE could have been 14 percent higher (53 years to 60.4 years) if there were no inefficiencies and the current health spending level is maintained. Tanzania's efficiency score is in line with the sample average, though it has slightly improved over time from an estimated efficiency score of 0.82 in 2000-04.[9]

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[9] The generally high efficiency scores in the sample could reflect the fact that in many LICs, public health expenditure is in large part funded by donors through grants and loans. In some cases, direct donor interventions bypass the budget, suggesting that actual public health expenditure may be higher than observed in the data.
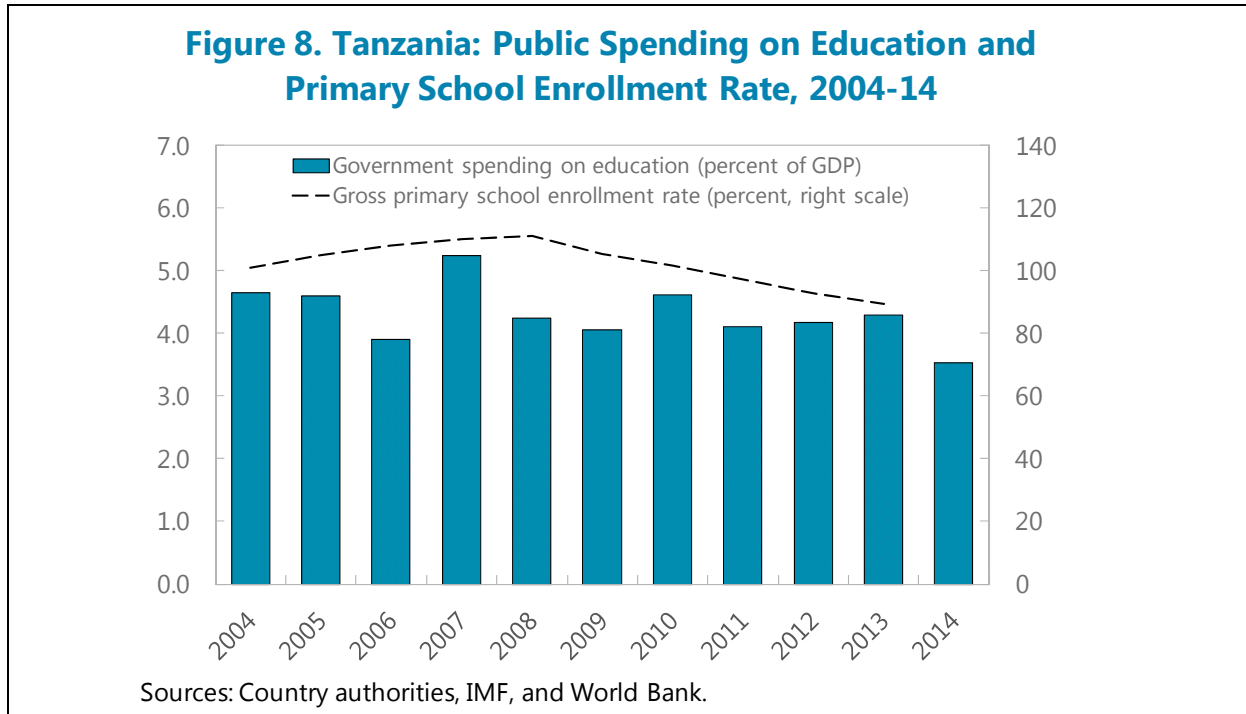
Figure 7. Efficiency Score of Health Spending per Capita

Source: IMF staff estimates.
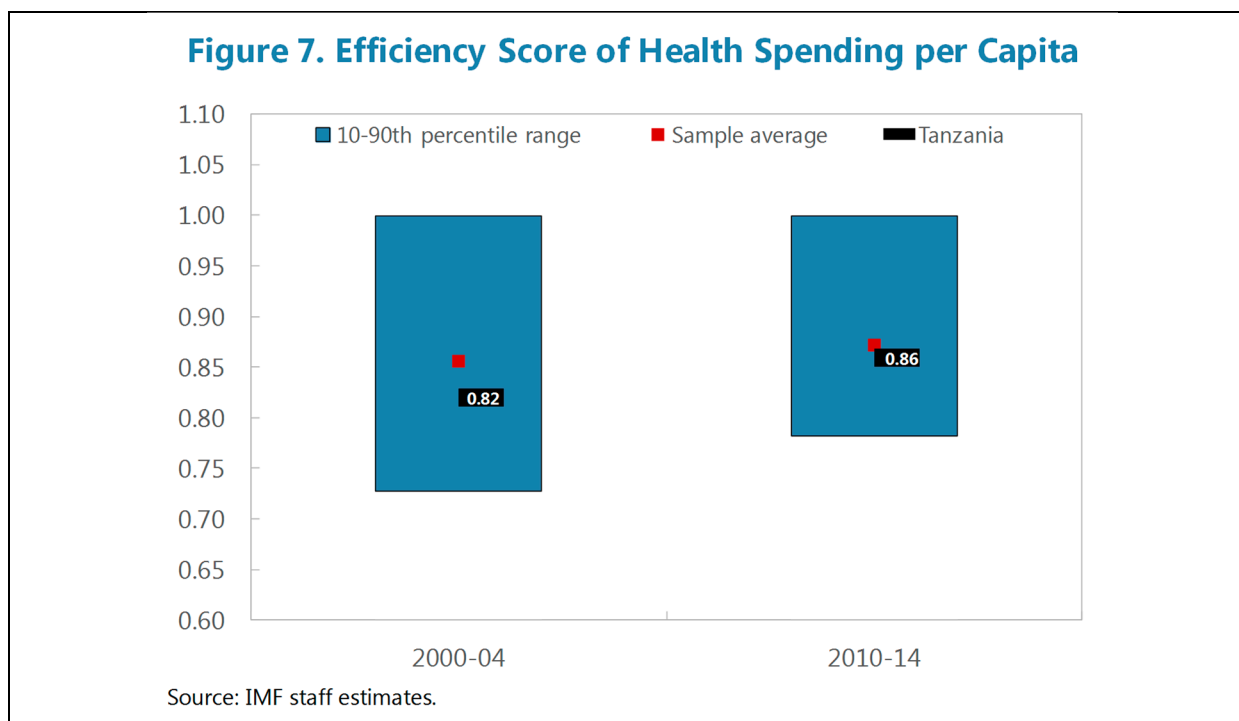
12.   Misallocation of resources and a weak health information system seem to be sources of inefficiencies in health spending. The 2008 audit report of the Controller and Auditor General (CAG) found that allocation of resources for primary health care was not well aligned with demand and performance. The workload varies significantly across health care centers, with many of them having a rather low number of visitors per day. In addition, resources for drugs are distributed more or less equally among healthcare centers without taking into account their needs. Further, poor supervision and lack of reliable information management system prevent the adequate monitoring of health indicators and health center performance to identify those that are not efficient and suggest remedial actions. Low-productivity staff and a high degree of absenteeism are also areas of concerns. These findings are corroborated by the latest service delivery indicators (World Bank, 2016a) which highlight the inequitable geographic distribution of service quality, a shortage of qualified staff and low caseload levels of healthcare facilities.

Education spending

13.   Government spending on education contracted in the last few years, while performance in education sector indicators has been mixed. Education expenditure declined from 4.6 percent of GDP in 2010 to 3.5 percent of GDP in 2014, which coincided with a deterioration in the gross primary school enrollment rate. The latter dropped from about 102 percent in 2010 to 89.5 percent in 2013, after a steady increase from the 2000s thanks to the universal primary education policies (Figure 8). The primary school completion rate also fell from 89.5 percent to 75.9 percent in 2010-13. On the positive side, gross secondary school enrollment improved slightly from 31.6 percent to 33 percent during the same period, and so did gross tertiary school enrollment rate that rose from 2.1 percent to 3.6 percent. Nevertheless,

the increasing share of education spending devoted to higher education has lately raised equity and efficiency concerns as this leaves less room for primary education spending which tends to benefit more the poor.

Figure 8. Tanzania: Public Spending on Education and Primary School Enrollment Rate, 2004-14

Sources: Country authorities, IMF, and World Bank.

14.   Education spending in Tanzania is broadly in line with most comparators, but outcomes are on the low side (Figure 9). Tanzania's education spending is comparable to the average for LICs, but slightly below that for EAC countries. Plotting education spending and gross school enrollment rates for LICs shows that Tanzania performs more poorly than other LICs with similar level of spending regardless of the level of education considered (primary, secondary or tertiary), thus pointing to significant inefficiencies in education spending. It should be noted that the gross school enrollment rate is more an indicator of coverage than performance, and it is better to use the net enrollment rate, the completion rate or a standardized test score (such as the Program for International Student Assessment). However, data on those indicators are lacking for a large number of LICs.

Figure 9. Public Education Spending and Outcomes in Tanzania and Comparator Countries, 2010-14

Sources: Country authorities, IMF, and World Bank.

15.   The DEA model confirms that Tanzania ranks very low in the efficiency of education spending compared to peers (Figure 10). A one input (total public education spending)[10]–three outputs (primary, secondary and tertiary enrollment rates) model was run to assess how efficient countries are in achieving better results for all grades combined. However, the composition of education spending matters for outcomes and varies over time, reflecting country priorities. For this reason, we also ran a one input–one output model specific to each level of education (primary, secondary and tertiary) with the input being the level of education spending (in percent of GDP) for that level and the output being the corresponding enrollment rate. The results reveal that Tanzania lies at the bottom of the distribution in terms of efficiency of overall education spending. Looking at each level separately, inefficiencies cost up to a third of the output for primary and secondary education, and much more (3/4) for tertiary education.

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[10] Private education spending is not included due to a lack of data. Since education is primarily financed by public funds in LICs, this omission should not significantly affect the results.

Figure 10. Efficiency Score of Education Spending, 2010-14
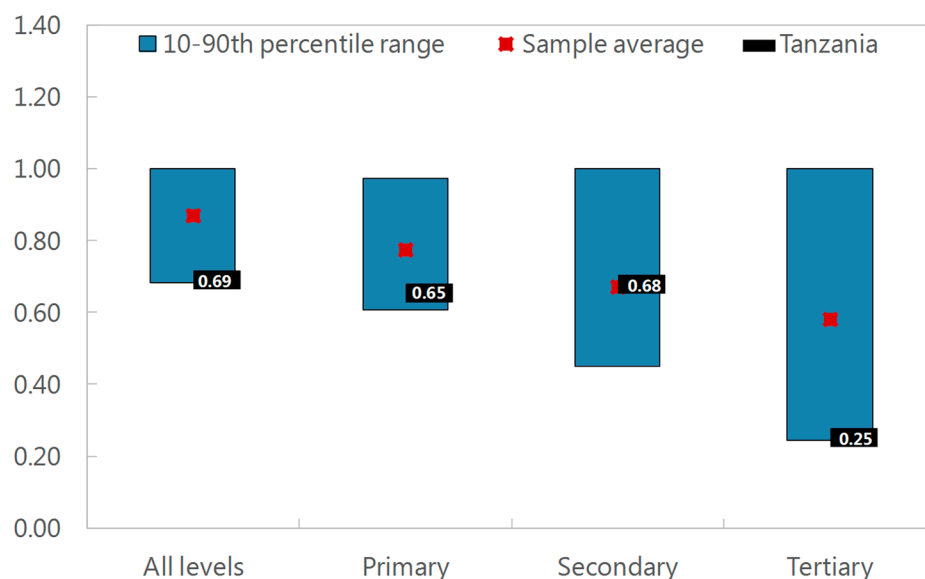
Source: IMF staff estimates.

16.   The 2010 Public Expenditure Review (World Bank, 2011) identifies inefficiencies in the education sector. Besides the major issue of low quality of primary education, the misallocation of human resources is persistent as reflected in the large disparities of students to teacher ratios across districts. Districts already well served are being given additional resources while the marginal impact would have been higher in disadvantaged districts. A high absence rate among teachers is also an issue.[11] Tertiary education would have the largest share of the education budget in a few years if current trends continue, thus overtaking primary education, even though only 4 percent of the population will go to university. Increasing resources are being devoted to student loans, but these loans are not well targeted. Moreover, a low repayment rate and weak enforcement of eligibility conditions threaten the affordability and sustainability of the system.

Public investment

17.   Tanzania's infrastructure gap is large. Close to half of the population still has no access to safe water (Table 1) and progress has been lacking on this front since the 2000s (van den Berg and others (2009)). In the EAC region, LICs and LMICs on average, a larger share of the population has access to improved water sources than in Tanzania. Despite sustained efforts to improve rural electrification, access to electricity in Tanzania lags behind that of LICs and LMICs on average, although it is in line with

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[11] A more recent study (World Bank, 2016b) confirmed that teacher absenteeism is a major challenge, but also many of them lack the necessary skills to teach while there are significant gags in the availability of required infrastructure in primary schools.

the EAC average. Electricity generation per capita is lower than elsewhere.

Table 1. Selected Quantitative and Qualitative Indicators of Infrastructure, 2010-14					
	Access to improved water source (share of population)	Access to electricity (share of population)	Electricity Generation (Kwh/capita)	Quality of roads	Quality of overall infrastructure
Tanzania	53	15	93	3	3.1
EAC	67	15	125	3.4	3.5
LIC's	67	28	215	3.1	3.2
LMIC's	86	77	1172	3.5	3.8

Sources: Country authorities, World Bank, and World Economic Forum.

18.   Infrastructure quality is perceived to be low. The quality of roads and overall infrastructure has stagnated during the last few years at an average score of 3 on a scale of 1 to 7 (with 7 being the best) according to a quantitative and survey-based index compiled by the World Economic Forum (WEF) in its Global Competitiveness Report. Although Tanzania's score is comparable to that of LICs, its remains lower than the average score in the EAC region and LMICs (Table 1). Moreover, Tanzania's rank for the quality of overall infrastructure has worsened considerably from 75 out of 125 countries in the 2006/07 Global Competitiveness Report to 117 out of 144 countries in the 2014/15 Global Competitiveness Report, suggesting that other countries have improved faster the quality of their infrastructure.

19.   The efficiency scores point to large inefficiencies in public investment spending (Figure 11). The assessment of the efficiency of public investment was carried out with a one input–one output model, whereby the input is the public capital stock per capita (in constant 2005 international dollars)[12] and the output is either the WEF indicator of road quality or that of overall infrastructure quality.[13] The results suggest that Tanzania ranks low in the efficiency of public investment, with the efficiency gap implying that Tanzania could have improved the quality of roads and overall infrastructure by about 35 percent with the same level of public investment.[14,15]

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[12] Data are provided by the IMF at http://www.imf.org/external/np/fad/publicinvestment/.

[13] We also run a one input (public capital stock per capita)–three outputs (access to water, electricity and quality of overall infrastructure) model with similar results.

[14]This result is broadly in line with the finding of IMF (2015) using a larger sample (over 100 countries) and a hybrid indicator taking into account the coverage and quality of infrastructure networks.

[15] Everything else being equal, Tanzania's rank on overall infrastructure quality would have improved from 117 to 63 out of 144 countries included in the 2014/15 WEF Global Competitiveness Report.

Figure 11. Efficiency Score of Public Investment Spending

Source: IMF staff estimates
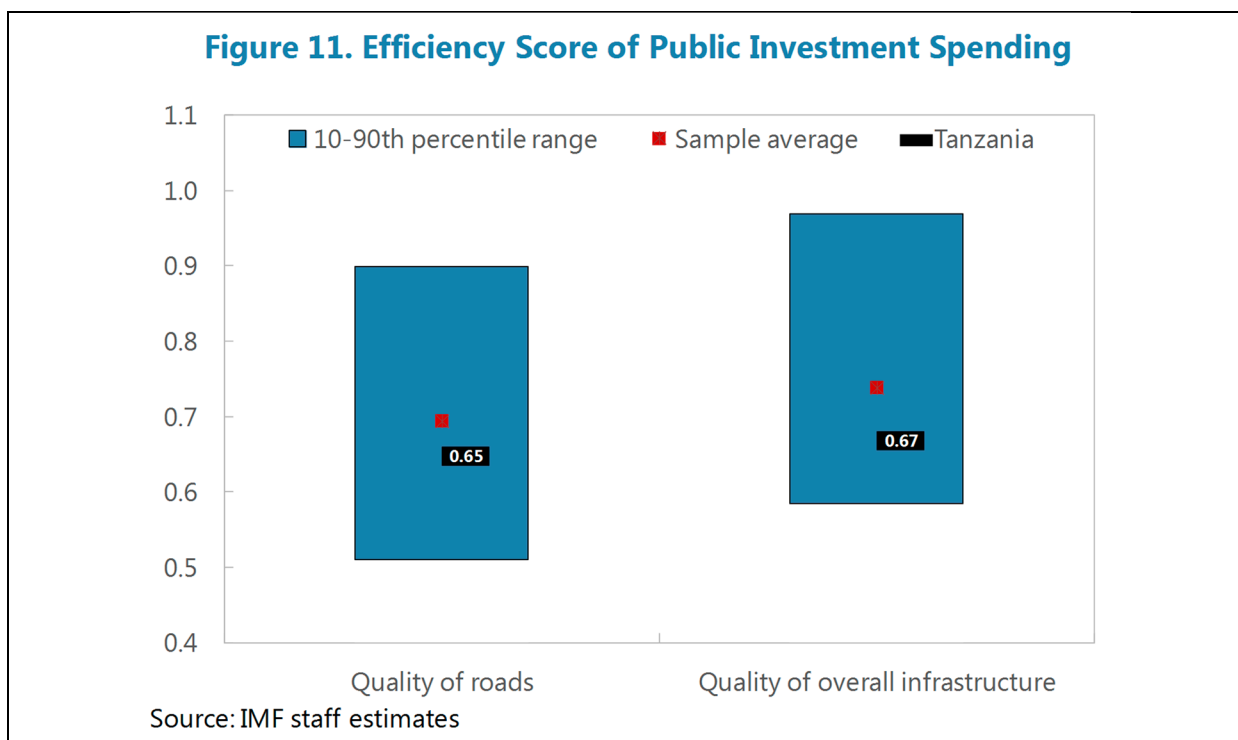
20.   As in many developing countries, weaknesses in public investment management (PIM) institutions likely explain the efficiency gap. These include poor selection of development projects, inadequate provision for operation and maintenance expenditure, weak coordination among public institutions involved in project phases, lack of clear linkages with various strategic plans, and limited capacity for project appraisal, procurement, management and project evaluation (Planning Commission, 2015). The recent completion of the public investment manual is an attempt to tackle some of these issues. The new Public Investment Management Assessment (PIMA) framework developed by IMF (2015) provides a comprehensive assessment of the strengths and weaknesses of the PIM practices at three key stages of the investment cycle: planning, allocation and implementation. In addition to the weaknesses above, the PIMA has identified other shortcomings in PIM in Tanzania, including a weak medium term expenditure framework (MTEF) capturing multi-year commitments that are not necessarily aligned with the Five Year Development Plan (FYDP), limited information on projects' cost-benefit analysis when they are conducted, low predictability of cash releases for execution of investment projects, and limited power of the Ministry of Finance in the selection and approval of PPPs.

D.   Conclusion

21.   Public spending in Tanzania is relatively low compared to other countries. Tanzania's total expenditure was below the average for EAC countries, LICs and LMICs during 2010-14, and this finding broadly holds across expenditure categories with the gap being larger for investment spending. A key factor behind this is the lackluster performance in domestic revenue mobilization. While the composition of spending does not seem out of line, it translates into a relatively low level of investment expenditure.

To achieve the government objective of scaling up priority spending, increased revenue mobilization is critical while the composition of spending should be more tilted towards investment.

22.   There is a significant room to improve public spending efficiency. Tanzania performs poorly in education and investment spending efficiency, while health spending efficiency appears to be in line with the average for LICs. Considering Tanzania's social and development needs, public health, education and infrastructure spending may need to be stepped in the future. In this context, improving spending efficiency would help reduce the risk that such spending pressures become major source of fiscal stress. Options for reforms could include improving staff quality and the allocation of resources in the education and health sectors—while linking them to performance— and strengthening PIM institutions.

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OFFSHORE GAS DEVELOPMENT—EXPLORING PRICE SENSITIVITY AND SOME REVENUE MANAGEMENT CONSIDERATIONS[1]

1.   Tanzania has made significant natural gas discoveries in deep offshore waters during the last three years.[2] Developing these gas resources would entail the largest investment ever made in Tanzania, amounting to about today's GDP. The size of the gas resources would largely exceed domestic needs, and therefore would likely require a predominantly export-oriented project (involving liquefied natural gas (LNG) development) to attract international investors. None of the potential investors has yet reached a decision on whether to proceed with the development of the gas resources. The outgoing parliament in July 2015 approved new legislation to guide the sector including a Petroleum Act and an Oil and Natural Gas Revenue Management Act. Nonetheless, delays in allocating land for the LNG facility and the limited engagement in negotiating a host government agreement have shifted back the expected time for the final investment decision, which is now unlikely to be taken before 2020 or thereabout. The collapse in natural gas prices has added an additional element of uncertainty. At current prices, the profitability of the potential project is substantially reduced compared with a few years ago.

2.   This paper updates earlier simulations of the fiscal impact of a potential development of the offshore natural gas resources and extends the analysis by highlighting the sensitivity of results to natural gas prices.[3] Given the significant uncertainty about key issues (e.g., likely development and operational cost, project design, and fiscal regime), the figures presented here should not be interpreted as projections. Rather these are illustrative simulations under specific assumptions about the project's scale and timing and best guesses about the fiscal regime (Annex 1). The paper also provides a comparison of the fiscal impact of possible fiscal rules for managing the potential natural gas revenue.

A. Price Sensitivity of Project Profitability and Government Revenue

3.   Natural gas prices in Asia (Japan) for LNG deliveries have declined sharply since mid-2015 (Figure 1)**.** In addition to the spillover from the collapse in oil prices, this may indicate that the fragmentation in natural gas prices between Asia, Europe and the U.S. is beginning to decline (perhaps in anticipation of increased exports of LNG from the U.S.). To illustrate the sensitivity to gas

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[1] Prepared by Thomas Baunsgaard.

[2] In addition, Tanzania has two existing producing gas fields in onshore/near-shore areas that are used for electricity generation, and with the potential for scaling-up of production in the near term. This will require improvements in the payment record of Tanesco to reestablish its credibility as a gas off-taker.

[3] See *Tanzania: Fiscal Implication of Offshore Natural Gas*, Selected Issues Paper, IMF Country Report no. 14/121 (http://www.imf.org/external/pubs/ft/scr/2014/cr14121.pdf).

prices, the simulations of an LNG project have been run for a wide range of gas prices. To compare f.o.b. prices ex-Tanzania to the c.i.f. prices for gas deliveries in Japan, a discount factor needs to be applied covering transport and other costs at the delivery point (assumed at about $2-3/mmBtu).[4] Current LNG prices for delivery in Japan therefore amount roughly to ex-Tanzania prices at about $5-6/mmBtu. At those prices, simulations suggest that the post-tax internal rate of return on the illustrative project would be below 10 percent. Gas prices (ex-Tanzania) would have to increase to about $8-10/mmBtu (equivalent to about US$12-14/mmBtu for deliveries in Japan) before the investment generates an internal rate of return of 13 percent and higher (at least under the specific simulations presented here).

Figure 1. Global Natural Gas Prices, 2000–2016
(US dollars/mmBtu)

Source: WEO GAS.

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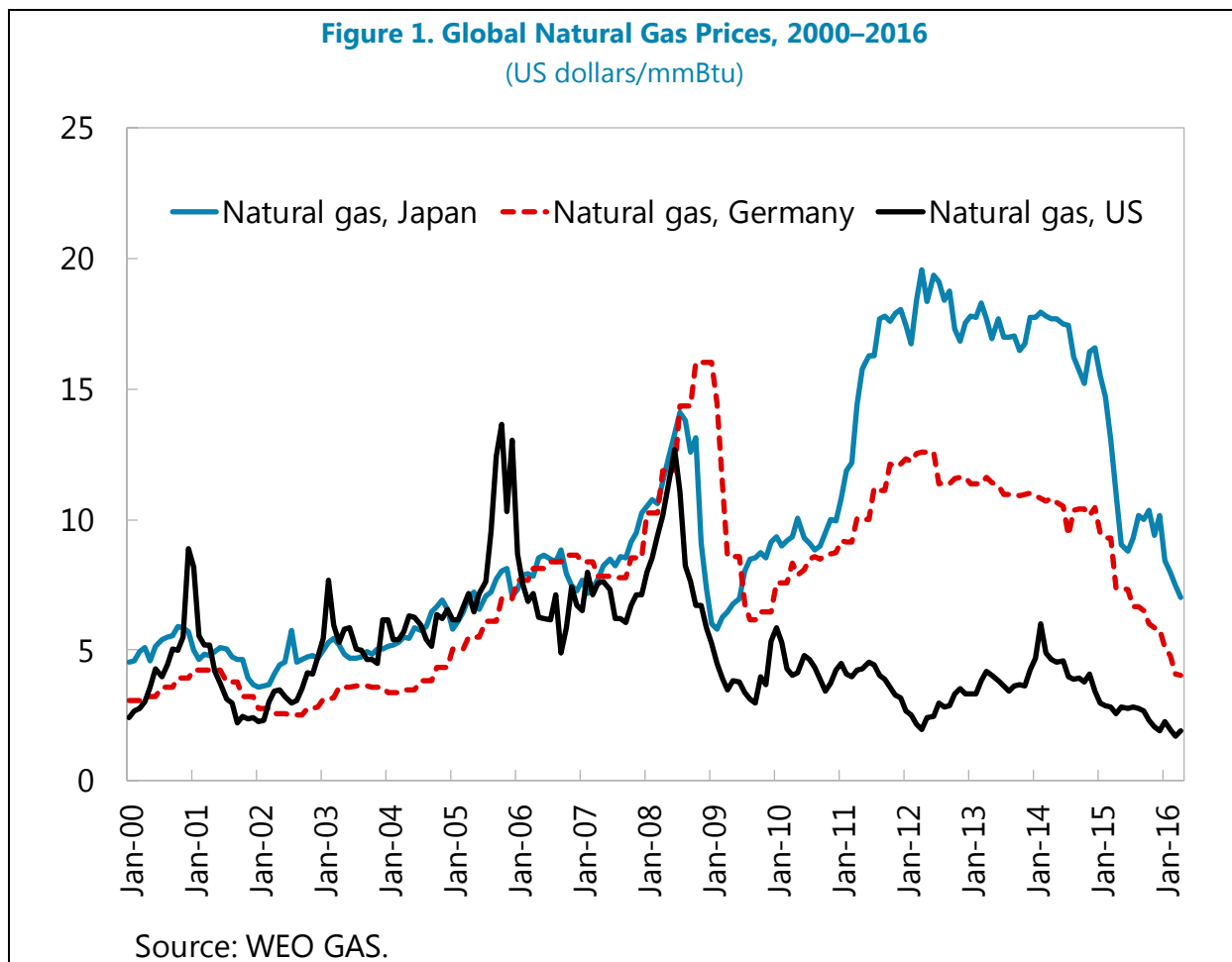
[4] One million British thermal units (mmBtu) is a measure of energy intensity in fuel approximately equal to 1,000 cubic feet of gas.

Figure 2. Tanzania: Illustrative LNG Project, Internal Rate of Return at Varying Natural Gas Prices
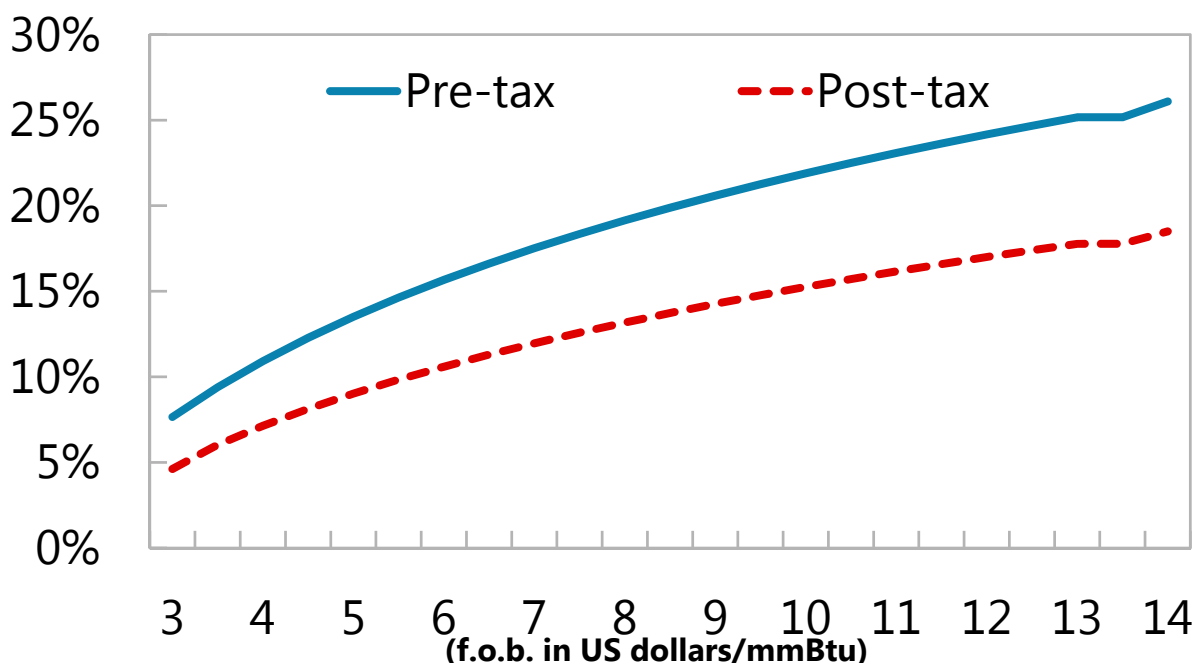
Source: IMF staff estimates.

4.   The fiscal regime for the petroleum sector in Tanzania is moderately progressive and therefore the government's share of revenue increases with gas prices. A useful measure of the fiscal impact is the government take (usually referred to as the average effective tax rate for the project); it is calculated as the cumulative ratio of all government revenue from the project relative to the project's net cash flow. At low gas prices, the effective tax rate is relatively modest (58 percent, in undiscounted terms); at higher prices, the average effective tax rate converges to 67 percent (Figure 3). The government take is also sensitive to the allocation of profits between the different parts of the project. This is so because the effective tax rate in the midstream part of the project (i.e., pipelines, gas processing plant, and liquefaction plant) is lower than in the upstream part (where the economic rents from the gas resources are taxed more heavily). As an example, Figure 3 shows the corresponding decline in the average effective tax rate if the regulatory cap on the rate of return in the midstream is raised from 8 percent to 12 percent.

Figure 3. Tanzania: Illustrative LNG Project, Average Effective Tax Rates at Varying Natural Gas Prices [1]
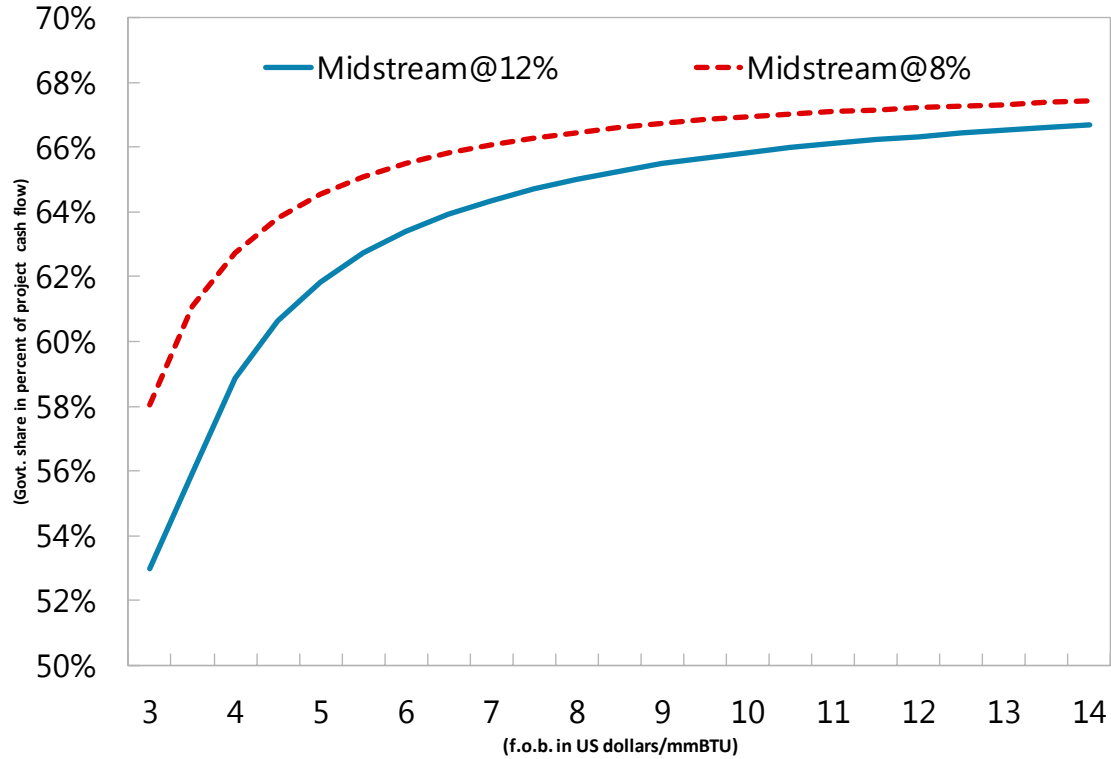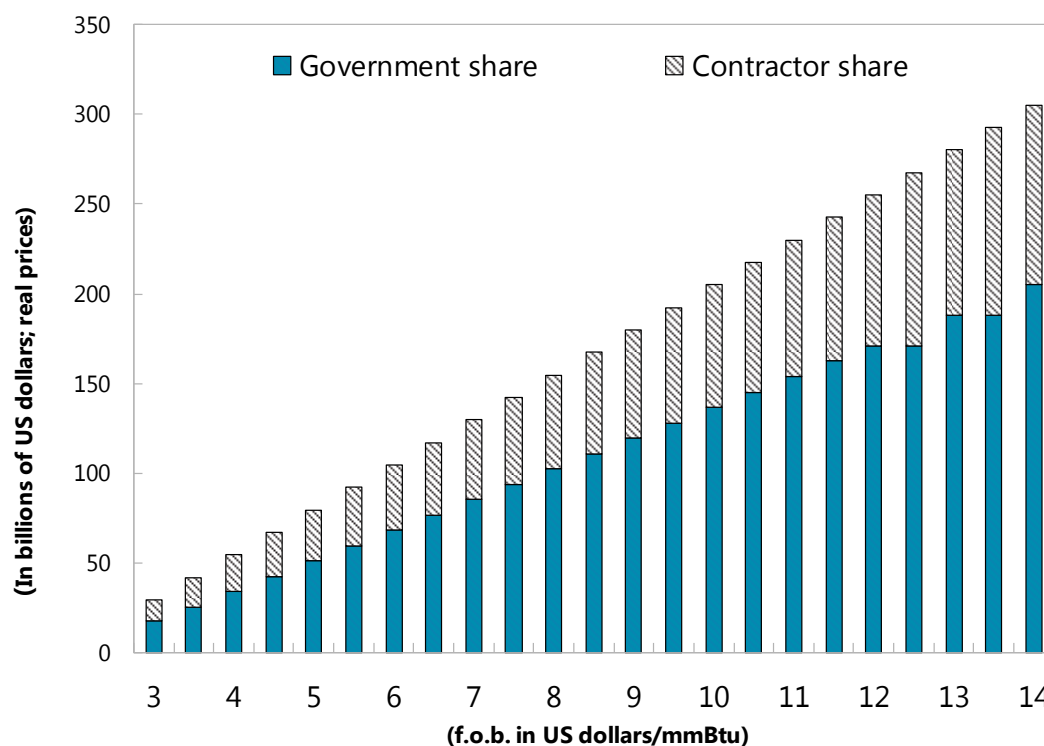

Sources: IMF staff estimates.

[1]Compares the effective tax rates with the return in the midstream capped through a regulatory mechanism at 8 and 12 percent

5.   The fiscal impact of a potential natural gas project is also very sensitive to prices. At current gas prices, the aggregate government revenue in real terms cumulated over the life of the project would amount to about US$60 billion (assuming the investment takes place at such prices). Government revenue at higher gas prices could reach as much US$200 billion cumulatively over several decades. These simulations show how significant the additional fiscal revenue could be, but also how sensitive they are to gas prices.

Figure 4. Tanzania: Illustrative LNG Project, Sharing of Cumulative Project Cashflow at Varying Natural Gas Prices

Source: IMF staff estimates.

B. Some Revenue Management Considerations

6.   As part of the government's preparation for natural gas, the parliament approved a fiscal framework for the management of oil and gas revenue in July 2015. A commendable feature of this framework is that potential oil and gas revenue would be integrated into the fiscal and budget framework. Moreover, while the legislation establishes a resource fund, it is designed to reinforce the fiscal framework rather than fragmenting it. Most importantly, the resource fund will be used to finance the budget and will not have a parallel spending authority. Areas of the legislation that raise more question relate to the envisaged financing of the national oil company and the transparency provisions that could be strengthened.

7.   The revenue management legislation codifies a fiscal rule. This fiscal rule would simultaneously guide the allocation of potential oil and gas revenue between saving and spending while capping the budget deficit excluding net gas revenue ("non-gas deficit"). The fiscal rule implies that natural gas revenue of up to 3 percent of GDP can be spent annually to finance a non-gas budget deficit of similar magnitude, while gas revenue above 3 percent of GDP in any year will be saved.[5] The saved gas revenue can be used to finance future non-gas deficits of up to 3 percent of

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[5] Conceptually, the deficit cap should be relative to non-petroleum GDP, albeit the legislation does not make this distinction.
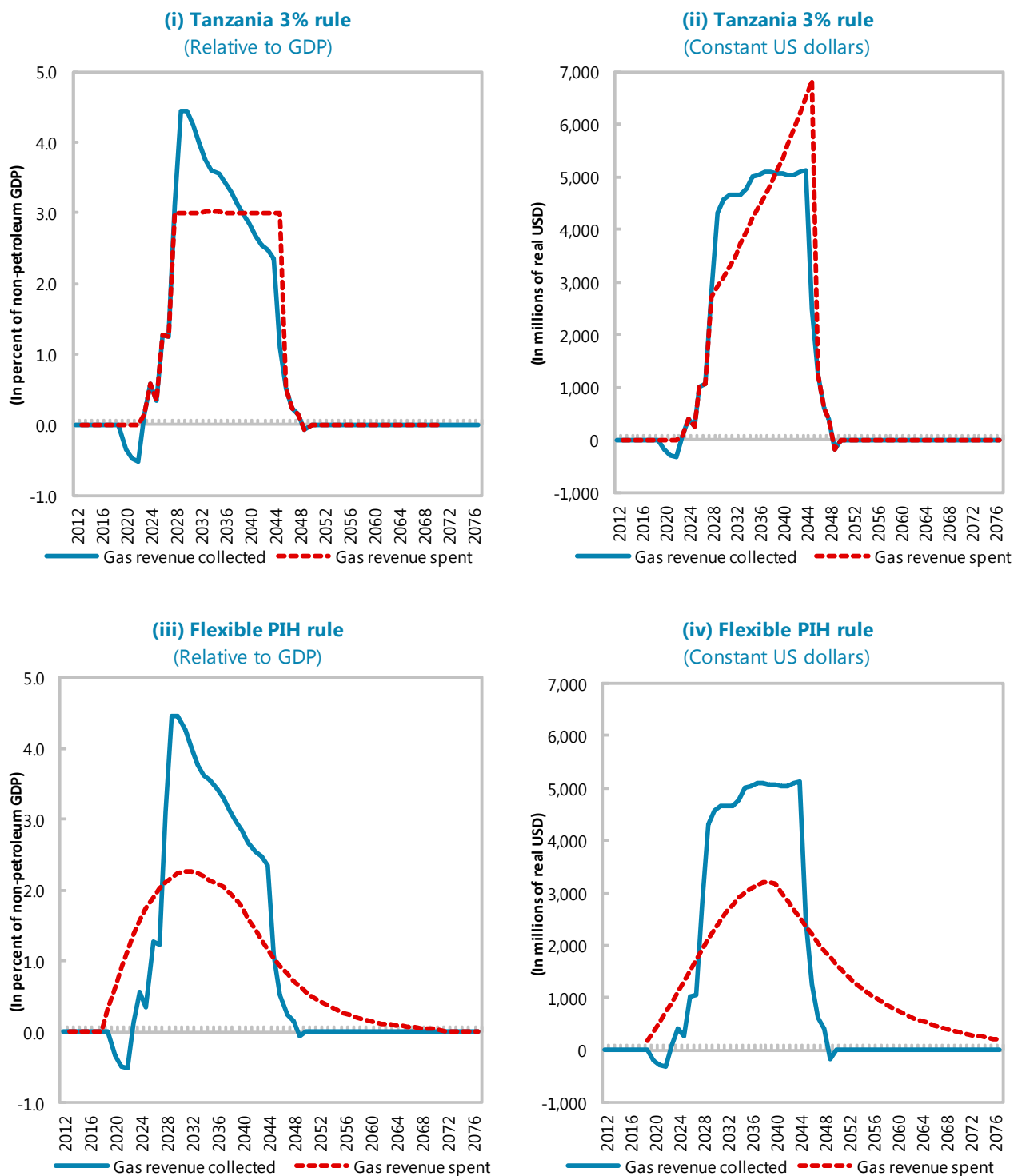
GDP until exhaustion. There is also a ceiling on the annual increase in recurrent expenditure (equal to nominal GDP growth) and a ceiling of 40 percent of GDP on the level of total expenditure.

8.   The fiscal rule is relatively simple to understand and explain while implying a cautious approach to managing the potential gas revenue. On the downside, the rule is also inflexible and could lead to abrupt swings in either financing or expenditure. For example, if annual gas revenue reaches 3 percent of GDP, this source of funding for the budget would replace all domestic and external borrowing under the rule. Conversely, when annual gas revenue and saved financial assets are eventually exhausted, budget financing would immediately adjust upwards by up to 3 percent of GDP, and if this is not possible, expenditure would have to be reduced. The fiscal rule also precludes any gradual scaling-up and front-loading of development spending (public investment and social spending) funded by gas revenue. Finally, the rule has been set very early, although there is considerable uncertainty as to the scale of the gas revenue (if it materializes). This raises the risk that the rule lead to a fiscal stance that is excessively tight (if revenue proves very large) or too loose (if revenue is on the lower side) relative to a benchmark for the sustainable use of gas revenue.

9.   While it may be too early to determine an optimal fiscal rule, it is still instructive to assess how various options would perform (Figure 5). As an illustrative example, an alternative could be a fiscal rule for Tanzania derived from the permanent income hypothesis (PIH) with flexibility to scale up development spending in a gradual and sustainable manner given the large development needs in Tanzania.[6] Under this rule, the amount of gas revenue that would be spent annually through the budget would be capped by the notional return on gas wealth, calculated as the sum of net financial assets (accumulated from gas revenue saved in the form of financial assets) and the expected future revenue from the gas in the ground. The PIH fiscal rule can be made flexible by accommodating a gradual front-loading of spending to address development priorities in a capital-constrained economy like Tanzania. To preserve fiscal sustainability, any frontloading of spending of gas revenue must be offset by reduced future spending of gas revenue. The desirable path of fiscal spending of natural gas revenue can be determined by various factors including model-based estimates of the optimal spending path. However, it may also reflect an assessment of infrastructure and other development spending priorities as well as the extent of bottlenecks on absorption and capacity for public investment management. Strong institutional safeguards should be built into the operational design of the rule around any upfront use of revenue to guard against risk of unsustainable overinvestment.

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[6] In the simulations, it is assumed that fiscal spending will gradually begin at the time of development of the LNG project, but before revenue from natural gas actually starts flowing. Given the inherent uncertainty about the fiscal revenue generated by the project, an alternative would be to only start associated fiscal spending after the revenue materializes (a 'bird-in-hand' approach). This would be at the expense of delaying benefits from investment and other development spending.

Figure 5. Tanzania: Illustrative Fiscal Policy Rules for Natural Gas Revenue[1]

(i) Tanzania 3% rule
(Relative to GDP)

(ii) Tanzania 3% rule
(Constant US dollars)

(iii) Flexible PIH rule
(Relative to GDP)

(iv) Flexible PIH rule
(Constant US dollars)

Source: IMF staff estimates.
[1]Simulates fiscal revenue from a 3-train LNG project (total gas resources of 28.5 tcf). The natural gas price is assumed fixed in real terms at US$7/mmBtu (ex-Tanzania, fob).

10.   The two fiscal rules have a different macro-fiscal impact. The flexible PIH rule allows for a temporary increase in the non-gas deficit to accommodate a gradual scaling-up of development spending, whereas the fiscal rule adopted by the authorities maintains a more stable path for the non-gas deficit (Figure 6).[7] Given the differences in the fiscal stance, the net financial wealth position under the two rules will also differ with the 3 percent fiscal rule leading to a larger accumulation of financial assets, but at the expense of missing out on productive investment.

11.   Under both the simulated fiscal rules, the overall deficit during the development phase of the LNG project initially widens. This reflects that the net gas revenue stream from the LNG development is negative during the development phase.[8] In addition, under the PIH-based fiscal rule, there is some frontloading of gas revenue-funded spending before production starts. After gas production starts in 2025 or thereabout, the overall fiscal balances improve as some of the gas revenue is saved in the form of financial assets. A flexible and front-loaded PIH rule allows for relatively large non-gas deficits for about two decades, which then are gradually being reduced until they eventually reach the debt stabilizing levels.

C.   Main Recommendations

12.   While lower gas prices affect the profitability of the project, the government can improve the prospect of the investment taking place by completing the implementation of reforms on the policy and regulatory framework and by engaging the investors in negotiations about the project. In particular, the authorities should:
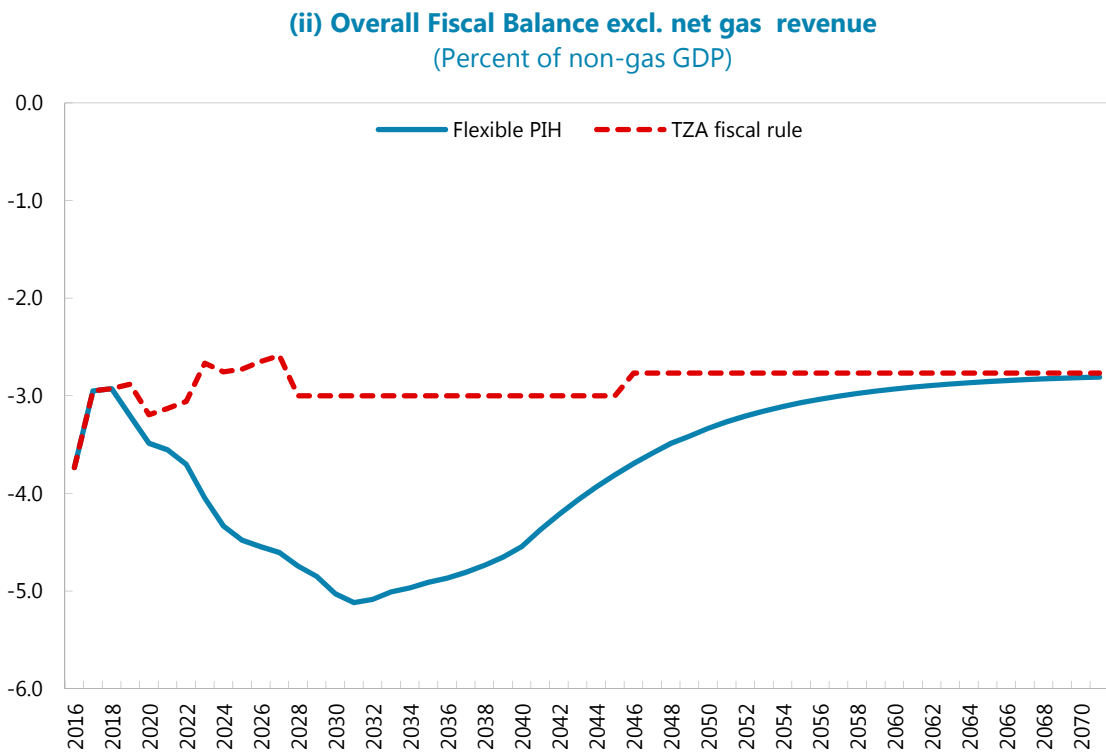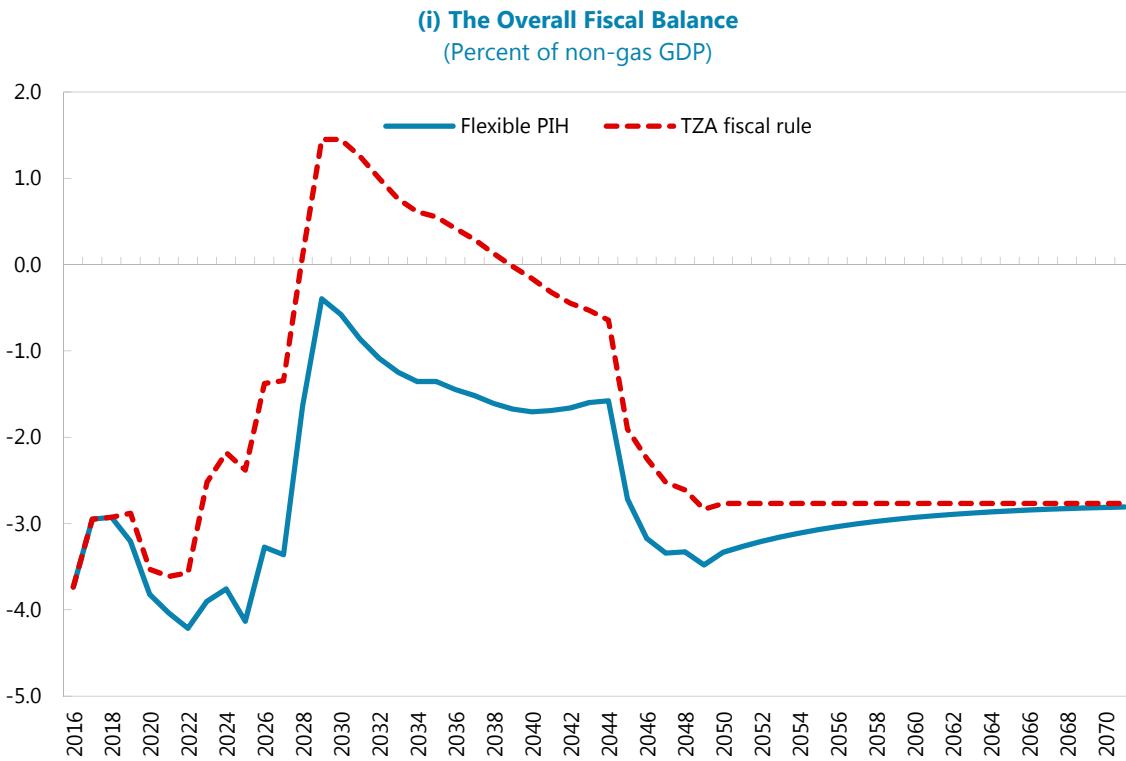
- Implement amendments to the Income Tax Act introducing a special chapter for the taxation of mining and petroleum, after appropriate consultation with stakeholders has been completed.

- Review the experience with the petroleum sector legislation introduced in July 2015 to address any residual inconsistencies (including potential conflicts with the income tax legislation).

- Engage the potential investors in negotiations to provide a framework for the companies to reach a final investment decision.

- Use models for project simulations including tools developed by the IMF for both fiscal regime and revenue simulations as well as macro-fiscal framework simulations.

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[7] The simulations assume that the long-term fiscal deficit in the debt sustainability framework remains a desirable basis for fiscal policy in the absence of any additional natural gas revenue. This implies that the fiscal deficit converges to slightly below 3 percent of GDP and the primary deficit to about 0.5 percent of GDP. Spending financed by natural gas revenue under the various fiscal rules is added to the baseline spending path.

[8] It is assumed that the government will be an equity participant in the project development phase phasing cash-calls related to the development spending.

- To prepare for the eventual management of gas revenue, initiate a broader discussion about policy options to build up a national and political consensus. Consider various options for the formulation and calibration of the fiscal policy rule.

**Figure 6. Tanzania: The Budget Impact of Potential Fiscal Rules[1]**

(i) The Overall Fiscal Balance
(Percent of non-gas GDP)

(ii) Overall Fiscal Balance excl. net gas revenue
(Percent of non-gas GDP)

Source: IMF staff estimates.
[1]Simulates fiscal revenue from a 3-train LNG project (total gas resources of 28.5 tcf). The natural gas price is assumed fixed in real terms at US$7/mmBtu (ex-Tanzania, f.o.b.).

Annex 1. Project and Fiscal Assumptions

1. **Based on publicly available information on gas discoveries in the deep offshore blocks 1–4 (Figure A1), it is assumed that an LNG project would extract about 29 trillion cubic feet of gas**. It is possible that further exploration could eventually lead to an increase in the available gas resources (which are significantly lower than in neighboring Mozambique).

Figure A1. Tanzania: Estimated Natural Gas Resources
#### (Trillions of cubic feet)
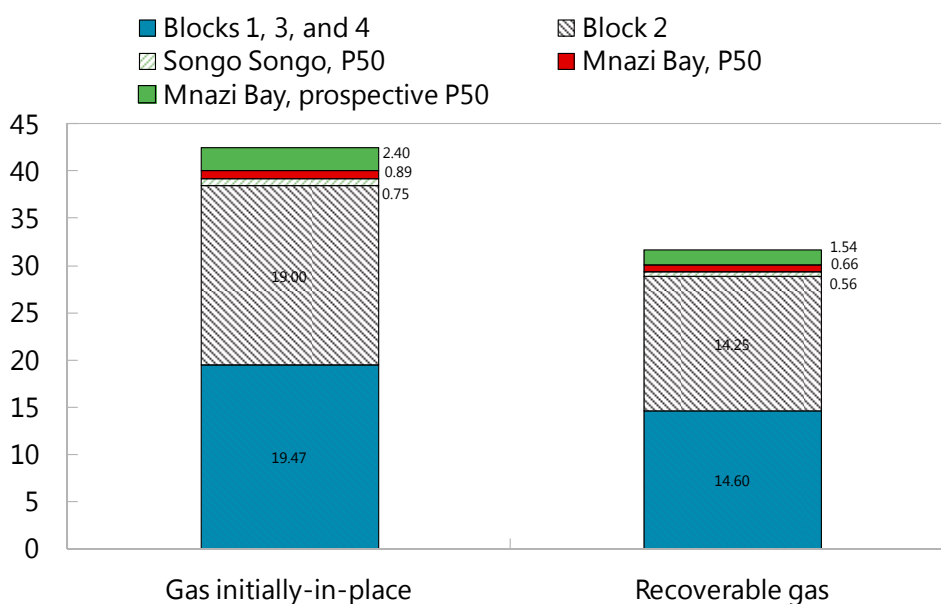
Sources: Company reports and press releases.

2. **Total investment cost for the LNG project is assumed at about US$44 billion** (Figure A2). This includes up to US$3 billion spent on exploration in the four offshore blocks, an estimated US$20 billion to develop the "upstream" (drilling and reservoirs), and another US$21 billion for the "midstream" (pipelines, gas processing plant, and liquefaction plant). It is assumed that there will be no further significant exploration activities until the final investment decision is reached in 2020 (or thereabout). The development phase would then start in three offshore blocks feeding gas to an onshore three-train LNG facility. The development phase would be completed by 2028 although the first production of LNG would start earlier (2023 or 2024) under these assumptions.[1]

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[1] Compared to the earlier simulations published in 2014, the share of development costs for the mid-stream has been reduced with a corresponding increase in the share of the upstream. The overall development cost of the project is also lower now. This reflects the incorporation of additional public information based on presentations by the potential investors.

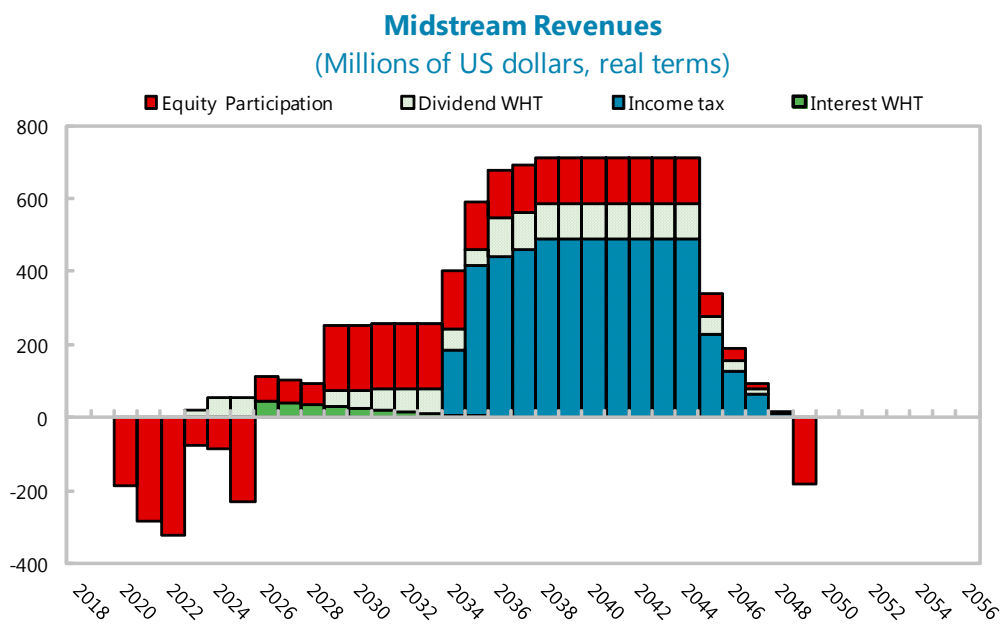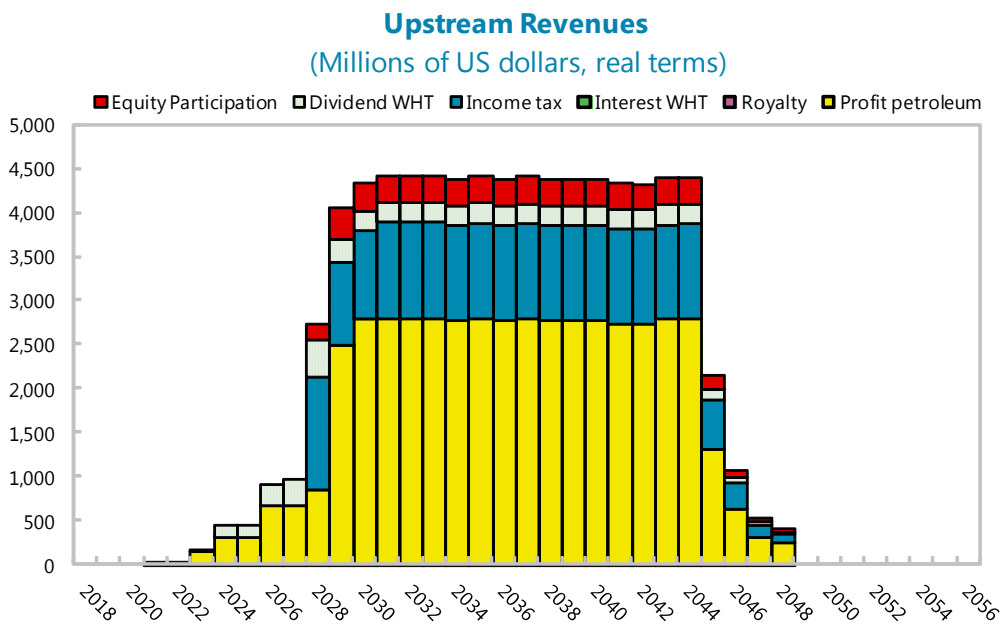## Figure A2. Tanzania: Exploration and Development Cost Assumptions

(Millions of US dollars, real terms)
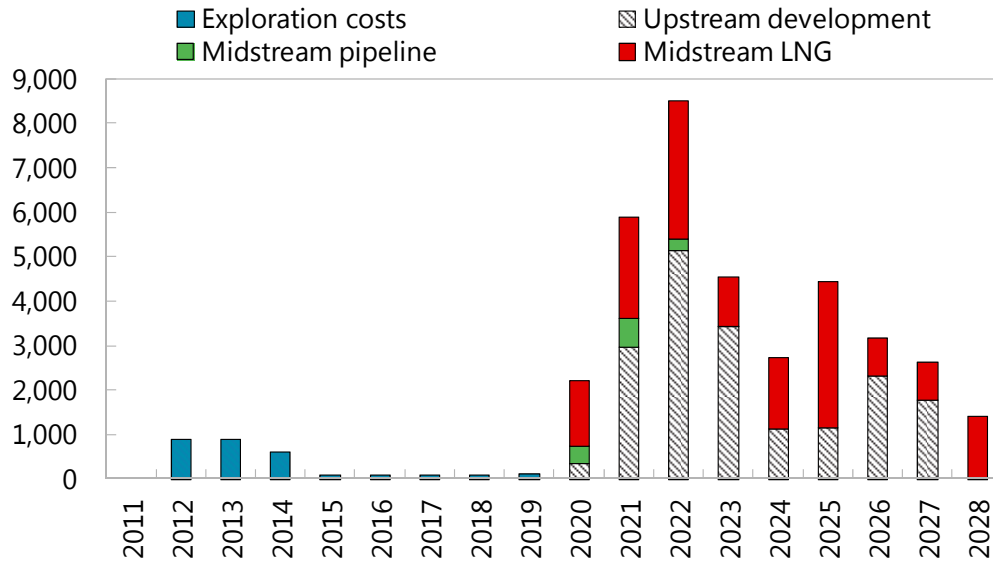
Source: IMF staff estimates.

3.   **The fiscal regime in Tanzania is a hybrid of production sharing and income tax with government equity participation**. In the upstream, the simulations assume that the production of gas will be taxed through the fiscal arrangement in the production sharing agreements for each block and the income tax regime. The production sharing arrangement is assumed to use a six-tier profit gas sharing based on the volume of daily production. The midstream is assumed to be taxed through the ordinary income tax regime (with a corporate income tax rate at 30 percent and interest and dividends withholding taxes at 10 percent; capital depreciation assumed on a straight line basis over 10 years). It is assumed that the government will be an equity participant in the project, financed in the upstream by an equity carry-arrangement and in the midstream on a fully funded basis (with government equity shares at 11–12 percent). The government would regulate the midstream by applying a regulatory cap on the rate of return on investment. The baseline assumption is that this would be capped at 8 percent (the sensitivity to this can be easily explored).

Figure A3. Tanzania: Simulated Revenue Composition from LNG Project[1]

Upstream Revenues
(Millions of US dollars, real terms)

Legend: Equity Participation ▪ Dividend WHT ▫ Income tax ▪ Interest WHT ▪ Royalty ▪ Profit petroleum

Midstream Revenues
(Millions of US dollars, real terms)

Legend: Equity Participation ▪ Dividend WHT ▫ Income tax ▪ Interest WHT ▪

Source: IMF staff estimates.
[1]Assumes real gas prices (f.o.b.) at US$7 per mmBtu.