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ISLAMIC REPUBLIC OF MAURITANIA

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ISLAMIC REPUBLIC OF MAURITANIA

SELECTED ISSUES

January 14, 2015

Approved By
Middle East and Central Asia Department

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CONTENTS

MANAGING RESOURCE WEALTH IN MAURITANIA: CONSIDERATIONS FOR A FISCAL FRAMEWORK[1]

Mauritania, a multi-metallic commodity exporter, faces important medium-term fiscal policy challenges arising from volatile resource revenues and prospects for a significant mining expansion. Like other commodity exporters, Mauritania needs to avoid pro-cyclical fiscal policies and adopt rules that guide medium-term fiscal sustainability. The analysis of fiscal framework options reveals that a fiscal rule which targets a non-resource primary balance for long-term sustainability, designed to allow some frontloading of public spending on productive investment, would be appropriate for Mauritania under the assumption of a finite resource horizon. A fiscal rule targeting a structural resource balance would be appropriate in the scenario of long-lasting resources, possible under the assumption of favorable developments in the global commodity markets.

A. Context

1. Mauritania is a country rich in natural resources. Minerals currently make up more than 75 percent of total exports and contributed 11 percent of non-extractive GDP in 2013. Their contribution is expected to increase if more mining projects come on stream as planned in the next few years. At the same time, declining prices in the global commodity markets, with iron ore being the worst performing commodity in 2014, could have important implications for export earnings and government revenues in the short term. Whether the recent term-of-trade shock is temporary or sustained, natural resource management will pose significant challenges and require a well-adapted macro-fiscal framework.

2. Fiscal policy has been responsible and focused on fiscal consolidation, but important challenges lie ahead linked to price volatility, exhaustibility of resources, and effective use of resources. Although fiscal and external buffers were built up in the context of elevated commodity prices during 2011-13 and could help to smooth a temporary fall in prices, the economy is still vulnerable to terms-of-trade shocks. Moreover, prospects for significant mining expansion remain high should a rebound in commodity prices materialize. Reinforcing the fiscal framework is now urgent to support continued responsible fiscal policy while enhancing policy predictability, and improve governance in managing mining wealth. This paper analyzes several fiscal framework alternatives for Mauritania by drawing on recent analytical work on the management of resource wealth in resource-rich developing countries (IMF 2012b).

[1] Prepared by Oana Elena Luca.

B. Mauritania's Resource Wealth

3. Mauritania has an important extractive industries sector with significant reserves of iron ore, copper and gold. The country is the second largest producer of iron ore in Africa after South Africa. The sector is dominated by three major companies operating mines in production phase: the state company *Société Nationale Industrielle et Minière* (SNIM) which operates the iron ore mines at Zouérate; the Mauritanian Copper Mines (MCM) with main operations at Akjoujt; and TASIAST Mauritanie Limited with important gold exploration and extraction activities. Other mining projects are expected to come on stream in the next years if international market conditions allow (Table 1).[2] Phosphate reserves are also significant and, if developed, could considerably transform the resource sector of the country.[3]

Table 1. Main Mining Projects by Operational Status

Operating and planned projects	
SNIM Mineral(s): iron ore Ownership: State (78.35%); Industrial Bank of Kuwait, Arab Mining Company, Iraqi Fund for Foreign Development	*In production*. Currently producing at 13Mtpa, planning to ramp up production to 25Mtpa by 2021 and to 40Mtpa by 2025 with the development of the Tizerghaf project.
MCM Mineral(s): copper/gold Ownership: 100% MCM (a First Quantum subsidiary)	*In production*. Guelb Moghrein copper-gold mine, in commercial production since 2006. As of December 2013, the estimated mine life was of eight years, including stockpiles.
TASIAST Mineral(s): gold Ownership: Kinross Gold Corporation (100%)	*In production*. Peak production rate of 272Koz gold in 2013, with total production of 1.14Moz between 2008 and 2013. Proven and probable reserves of 9.6Moz.
ASKAF Mineral(s): iron ore Ownership: Glencore	*Prospective.* Production expected to begin in 2017 at 7.5Mtpa.
El Aouj Mining Company (EMC) Mineral(s): iron ore Ownership: SNIM (50%) and Glencore (50%)	*Prospective.* Phase I production projected to begin in 2019 at 9.5Mtpa, with a doubling in production in Phase II by 2023.
Other projects	
TAZADIT Mineral(s): iron ore Ownership: SNIM (65%), Inmetals (35%)	Prospective underground mine with US$250 million investment. Original plans to start development in 2014 and attain 2.5Mtpa peak production in 2017 are currently delayed.
TASIAST (expansion) Mineral(s): gold Ownership: Kinross Gold Corporation (100%)	Expansion strategy requiring US$1.6 billion in investment to ramp up processing capacity at 38Ktpd is to be decided at end 2015/beginning 2016. Should the expansion materialize, the project could produce at this higher rate until 2027.

Abbreviations: Mtpa: million metric tons per year; Ktpd: thousand metric tons per day; Koz: thousand ounces; Moz: million ounces
Source: SNIM, MCM, Kinross

[2] A new quartz mining project is not included in the analysis because sufficient information was unavailable at the time of writing this report.

[3] A lack of transport infrastructure currently hinders the development of the phosphate mine.

4. Production of minerals is set to expand in the medium to long term. Investment in the sector has been growing at a remarkable rate and is projected to keep the growth of extractive GDP at 11 percent per year, on average, during 2015-20. The production of iron ore alone is expected, relative to 2013 levels, to more than double in the next five years and increase by five times in the next 10 years if mining expansion plans materialize. SNIM has announced plans to ramp up production to 25 million metric tons per year (Mtpa) by 2021 and to 30Mtpa by 2025. The El Aouj mine, a joint venture between SNIM and Glencore, is further expected to bring capacity of 9Mtpa on stream by 2019, and could double it by 2023. Production from the Glencore-operated Askaf project, planned to commence by early 2017, could contribute additional 7.5Mtpa of iron ore.

5. Oil and gas exploration investments could contribute to identifying additional resource reserves. Promising commercial discoveries in 2001 at the Chinguetti oil field have been consistently revised downwards, and Mauritania is producing nowadays less than 5,000 barrels per day (Mbpd), well below original projections of 60Mbpd. Nevertheless, Mauritania's largely unexplored land and sea terrain is deemed to have considerable potential, and in recent years the government has granted oil exploration contracts. Frontier explorers like Premier Oil, Kosmos Energy, Chariot Oil and Gas, and Tullow Oil are actively engaged in oil exploration offshore. Prospects for natural gas exploitation could also be significant, as indicated by the 2012 commercial discovery made in the Chinguetti field by Tullow Oil. If the development of the Banda Gas project in the Chinguetti field goes ahead, it could produce up to BTU60 billion per day over 20 years (World Bank, 2014).

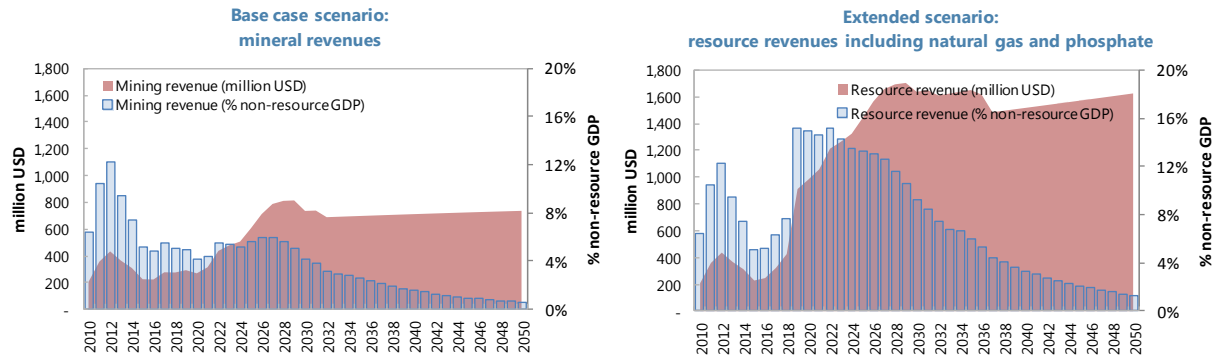
6. The contribution of natural resources to government revenue is significantly smaller than their share in exports. Receipts from minerals and petroleum contribute 26 percent to Mauritania's budget, and are expected to decline in the medium term. This is partly the effect of a mining fiscal regime that has been designed to create an attractive environment for investment (Rota-Graziosi 2014). Existing mines operate under generous fiscal concessions, and new projects coming on stream under the 2012 Mining Code will generate corporate income tax only after initial investments are recovered and a three-year allowable tax holiday is exhausted.[4]

7. Mauritania's resource horizon is uncertain and two scenarios can be used to estimate the size of future resource revenues. Under *the baseline scenario*, which is consistent with the assumptions in the staff report that all currently planned mining projects (Table 1) come to execution, mining revenue will be large in nominal terms, even though they will decline as a share of

[4] The Mining Code of 1999, under which most existing companies acquired their licenses, established a royalty payment of 1.5 percent on the sales value of iron ore and 3 percent on gold and copper; 30 percent corporate income tax after a three-year tax holiday; and 16 percent withholding on dividends. Revisions made in 2008, increasing the iron ore royalty to 2 percent while reducing the income tax rate to 25 percent and the withholding on dividends to 10 percent, were preserved in the new Mining Code of 2012. The latter introduced progressive royalty rates linked to prices, and implemented a 10 percent unpaid state participation. In practice, however, mining companies currently operate on the basis of negotiated terms with important variations from the applicable general legislation.

non-resource GDP in the long run (Figure 1, left panel)**.** Projections using the FARI modeling framework[5] indicate that the government revenue from mining alone over the next 20 years (that is, between 2015 and 2034) could amount to US$10 billion or 2.6 times the country's 2013 non-resource GDP. Under an *extended scenario*, which illustratively incorporates projected receipts from the upstream section of the Banda Gas project[6] and hypothetical development of the phosphate reserves, the magnitude of revenue (calculated in nominal undiscounted value) could amount to 4.5 times the country's 2013 non-resource GDP (Figure 1, right panel). The revenues accrued to the government under this scenario could be even higher if global commodity prices recover and make commercially viable the development of new projects.

Figure 1. Resource Revenue Projections



Source: IMF staff estimates.

C. Considerations for Strengthening the Fiscal Framework

8. Mauritania has made marked progress in its fiscal policy formulation, but important challenges ahead highlight the importance of reinforcing the fiscal framework. With the support of the ECF arrangement (2010-13), the authorities managed to adopt a more prudent fiscal stance and improved the policy space. By the beginning of 2014, fiscal and external buffers had been strengthened thanks to progress in revenue mobilization, windfall donor assistance in the past, and oil fund accumulations.[7] Nevertheless, fiscal policy has not been sufficiently pro-active to address the challenges raised by resource revenues, and while the authorities' efforts on fiscal consolidation have translated in improvements in the non-resource primary balance, this has remained relatively high (13 percent of non-resource GDP in 2014). During 2014, the significant

[5] For a detailed explanation of the FARI modeling framework, see IMF (2012a) and Daniel (2010).

[6] The Banda Gas project could yield, over a period of 20 years, US$2.6 billion in government revenue from upstream activities (gas production) in the form of profit gas and corporate income tax (World Bank 2014).

[7] The oil fund was established in 2006 and, despite the decline in production, has grown in recent years on account of higher oil prices.

terms-of-trade shock has weakened fiscal buffers and external debt has maintained an upward trend reaching an elevated 73½ percent of GDP.

9. Mauritania's fiscal framework must address complex fiscal policy objectives. As in any other country, a first objective is to ensure *long-run fiscal sustainability*, that is, the government must be able to sustain spending, tax, and other fiscal policies in the long term without risking to default on liabilities or expenditure commitments. In resource-rich countries, this requires including resource revenues in the inter-temporal budget constraint. A second objective of the fiscal framework for Mauritania, as for other resource-rich countries, is to manage *resource revenue uncertainty and volatility*. Although the focus is usually on prices, production volumes and costs are also uncertain and can lead to volatility. If revenue volatility is high and persistent, precautionary financial savings should be built to smooth revenues and expenditures.[8] A third objective for the fiscal framework is *debt management*. Natural resource wealth may increase the capacity to borrow as it increases the capacity to service debt. This needs to be managed wisely and integrated into a comprehensive debt management strategy. Borrowing against future revenue, sometimes even before production commences, reduces fiscal flexibility later and may lower the creditworthiness of the country. Fourth, especially in countries with limited resource reserve horizons, issues of *exhaustibility and intergenerational equity* considerations also need to be addressed by the fiscal framework. As well, s*trengthening fiscal policy predictability and institutions* is a critical objective of the fiscal framework.

10. With these multiple objectives, the appropriate fiscal anchor depends on whether the resource revenue is temporary or long-lasting, and whether the economy is scarce or abundant in capital. Two elements are critical for determining the length of the resource horizon. First, mineral assets in the ground cannot be transformed into needed financial and physical assets above the ground if commodity prices are not high enough to make the development of the resource commercially viable (i.e. by meeting the investors' breakeven price). Thus, while a country may have significant mineral reserves potential, only commercially exploitable reserves can be included in the accounting of the resource wealth. Second, the weight of resources in total government revenue is important. The structure of the fiscal regime for extractive industries determines when and how much resource revenue flows into the budget. A long resource horizon implies that the contribution of resources to the budget is significant and can be sustained over a long period of time.[9] Table 2 provides examples of this taxonomy for several resource-rich countries, by drawing on recent analytical work at the IMF (2012b).

[8] Fiscal savings would be accumulated when prices are high, and drawn on them to meet budget expenditure (according to a pre-determined fiscal rule) when prices are low.

[9] Government revenues from extractive industries vary significantly across countries (IMF 2012b). A rule of thumb for determining whether their contribution is significant and sustained could be, in the case of mining producers, if resource revenues represent more than 15-20 percent of total budget revenues over a period of 30 years or more.

11. When the resource horizon is short, issues of resource exhaustibility become critical for the fiscal framework. For Mauritania, in the baseline scenario resource revenues are projected to average 5 percent of non-resource GDP over the next decade and then gradually decline as the process of economic diversification takes place. This relatively low and declining contribution of resource revenue can be regarded as a scenario in which the resource horizon is short (less than 30 years), and government consumption must be smoothed over time to address issues of sustainability and intergenerational equity. In this case, fiscal policy is recommended to be anchored to a non-resource primary balance rule, where the non-resource primary deficit is set in line with a long-run sustainability benchmark that takes into account the finiteness of the resource wealth.

Table 2. Guiding Matrix for Fiscal Frameworks: Objectives and Fiscal Anchors

Country-specific Decision Matrix		Resource Revenue			
		Long-lasting (>30 years)		Short-term (<30 years)	
		Objectives	Examples	Objectives	Examples
Capital Scarcity (Infrastructure gaps; development needs)	High	Macroeconomic stability Managing volatility Development	Nigeria Iraq Peru Mongolia	Macroeconomic stability Sustainability/exhaustibility Development	Bolivia Ghana
		Rule: Flexible structural balance perhaps with front-loaded investment		*Rule: Flexible PIH-based non-resource primary balance with front-loaded investment*	
	Low	Macroeconomic stability Managing volatility	Saudi Arabia Kuwait Qatar Chile	Macroeconomic stability Sustainability/exhaustibility	UK Netherlands Norway
		Rule: Structural balance perhaps with expenditure growth cap		*Rule: PIH-based non-resource primary balance*	

Source: IMF (2012).

12. When resource flows are long-lasting, the focus of the fiscal framework should be on managing price uncertainty and investment in growth-supporting projects in the short to medium term. In the upside scenario of expanded production, resource revenues in Mauritania could become large, averaging 11 percent of non-resource GDP over the next decade and sustained over a long period of time , increasing the budget's exposure to volatility from global commodity markets. At the same time, the fiscal space could increase markedly. Addressing absorptive capacity constraints and mitigating risks associated with diversion of resources to non-productive expenditure should become priority objectives of the fiscal policy. In this scenario, fiscal policy is recommended to be anchored to a primary structural balance rule, where the resource component of budget revenue is calculated on the basis of cyclically-adjusted ("structural") prices rather than actual commodity prices.

13. A solid fiscal framework must be accompanied by fiscal institutions that support and reinforce the budget's role as the main instrument to conduct fiscal policy. This requires

strengthening public financial management systems by developing a credible medium-term framework for budget formulation, improving the public investment process, and enhancing fiscal transparency. The authorities' efforts on this front in the last years go in the right direction and could be accelerated once investment capacity is increased. The possible use of resource funds (primarily for smoothing purposes but also taking into account intergenerational equity considerations, and designed to mirror the fiscal rule) should reinforce the fiscal policy framework, and not be implemented as a separate policy tool. The resource revenue flows and the resource funds should be integrated in the budget process and the public financial management framework, with no parallel spending program.

D. Illustrative Simulations for Mauritania

14. In this section, simulations help assess fiscal policy paths under different resource horizons, investment plans, and external environment assumptions in Mauritania. Mauritania is a capital-scarce country with an uncertain resource horizon. Using the IMF toolkit for designing fiscal rules in resource-rich developing countries (IMF 2012b), it is possible to test both intergenerational equity models (which are appropriate for short resource horizons and link fiscal sustainability benchmarks to variants of the permanent income hypothesis approach) and price-based rule models (which focus on long resource horizons and aim at smoothing resource revenue volatility).

Sustainability analysis

15. A key fiscal indicator for analyzing the fiscal stance in resource-rich developing countries with short resources horizon is the non-resource primary balance (NRPB). This indicator, calculated as non-resource revenues less primary expenditure,[10] identifies the impact of government operations on domestic demand in isolation from resource revenues. The level of the NRPB can be used as benchmark for a sustainable level of spending that takes into account the future resource revenue. Three frameworks that link the sustainable level of spending to the future resource revenue are particularly relevant: the permanent income hypothesis (PIH), the modified PIH, and the fiscal sustainability framework (FSF).

16. The PIH framework allows for a constant NRPB deficit over time, limited to a perpetual return on the net resource wealth. The resource wealth can be thought of as the net present value (NPV) of the future stream of financial revenue that the state derives from the exploitation of the resource. The revenue includes production royalties, taxes on profits, withholding on dividends and state participation, as well as any other payments directly related to the extractive activities, calculated annually over the life of the resource. Assuming that the initial budget position is sustainable and that the economic conditions described in Box 1 hold, the PIH rule provides a fiscal space of 0.65 percent of non-resource GDP (Figure 2, upper left panel). This level of spending

[10] Primary expenditures are expenditures net of interest payments and income.

is considered sustainable because it finances the deficit in perpetuity, beyond the depletion of the mineral resource in the ground. The government's inter-temporal budget constraint is satisfied because, at this level, the NPV of non-resource primary deficits equals the NPV of the future resource revenue flows.

17. The modified version of the PIH framework allows for a deviation from the constant NRPB deficit target to accommodate temporary frontloading of capital spending. The PIH approach could be an excessively tight fiscal benchmark in developing countries with a relatively certain extraction horizon, high investment needs, and proven capacity to absorb an acceleration of public spending on capital assets. In a modified PIH (MPIH) framework, transformative investment in human and infrastructure capital could be frontloaded in the medium term in anticipation of future resource revenues to enhance potential economic growth. However, in order to satisfy the inter-temporal budget constrain, fiscal adjustment would be required later on, particularly if the scaling up of public investment does not result in higher growth. For Mauritania, simulations indicate that a nominal increase in public investment of 18 percent relative to the baseline in the next five years would require an adjustment of 0.34 percent of GDP on average between 2020 and 2030 (Figure 2, upper right panel). This adjustment is necessary in order to rebuild financial assets to a level that can support budgetary needs in the long run, at the same level as those under the traditional PIH approach. With this calibration, the inter-temporal budget constraint is satisfied: the NPV of the investment frontloading equals the NPV of the future adjustment and the overall effect on wealth remains unchanged (under the assumption of no spillover growth effects from higher spending in the short term).

18. The Fiscal Sustainability Framework (FSF) is a variation of the modified PIH that incorporates ex-ante expectations that the initial public investment has important spillover effects on economic growth. The FSF allows for an initial drawdown of government resources for investment in growth-enhancing capital, but later stabilizes the NRPB at a level inferior to that under the PIH or the modified PIH. Even if the long-run NRPB level is lower under the FSF, the primary expenditure can be stabilized at a higher level because the initial investment has multiplying effects on the economy, leading to higher growth and non-resource revenues (Figure 2, middle left panel). The net wealth stabilization depends on the non-resource growth assumptions—a stark contrast with the PIH and MPIH frameworks that focus on preserving the full amount of financial wealth and do not include non-resource growth spillovers (Figure 2, bottom left panel).

Box 1. Sustainability Analysis: Underlying Assumptions

The simulations in Figure 2 compare fiscal policy under three alternative fiscal sustainability rules anchored in the NRPB. The period of analysis spans 36 years, from 2015 through 2050. Several assumptions underpin these simulations:

- *Real non-resource GDP* is assumed to grow at a constant rate of 6.4 percent, and *nominal non-resource GDP* at a rate of 11.8 percent (under the PIH and modified PIH rules). Inflation stays constant at 5.1 percent throughout the period. (The rates reflect long-term averages currently used in the macro framework agreed between IMF staff and the authorities.)
- *Non-resource revenue* (excluding grants) is assumed to stay constant, as share of non-resource GDP, at 23 percent.
- The annual *resource revenue* flows are derived from the FARI fiscal forecasting model, which calculates the fiscal payments for individual mines taking into account underlying project economics and then aggregates the flows across the sector (Figure 1). Commodity prices come from the October 2014 WEO which assumes that the iron ore price converges to US$85 per metric ton in the long-term.
- The *mineral wealth* is calculated as the net present value of government revenues from minerals through 2050 (as of end of 2014) under the base case scenario (of neither phosphate nor natural gas development). Using a discount rate of 12.5 percent, equivalent to the market return of an asset on the equity market, the mineral wealth is of MRO 1,336 billion at the beginning of 2015 (the equivalent of 1.15 the non-resource GDP of the country in 2013). From 2015 on, the net mineral wealth at the end of each year is calculated taking into account both the net financial savings accumulated from mineral operations during the year and the net present value of future expected mineral revenues.
- The *traditional PIH* rule assumes that the NRPB remains constant over time and is financed with the rate of return on the remaining net mineral wealth at the end of each year. In the baseline scenario, the NRPB deficit corresponding to the PIH sustainability benchmark is of 0.65 percent of non-resource GDP.
- The *modified PIH* rule allows for an increase in public investment spending of MRO 1,081 billion over five years, between 2015 and 2019, the equivalent of 18 percent of the country's 2013 non-resource GDP. During this period, the NRPB reaches a maximum deficit of 2.9 percent of non-resource GDP. The fiscal consolidation is assumed to take place over a period of 10 years starting in 2020, when the NRPB runs at surpluses of up to 0.9 percent. By 2031, when the fiscal adjustment is concluded, fiscal policy returns to the PIH benchmark of -0.65 percent of non-resource GDP.
- The *Fiscal Sustainability Framework*, which incorporates the positive impact of higher public investment on growth, generates a fiscally sustainable path that is consistent with a lower level of the NRPB deficit, at 0.25 percent of the non-resource GDP.

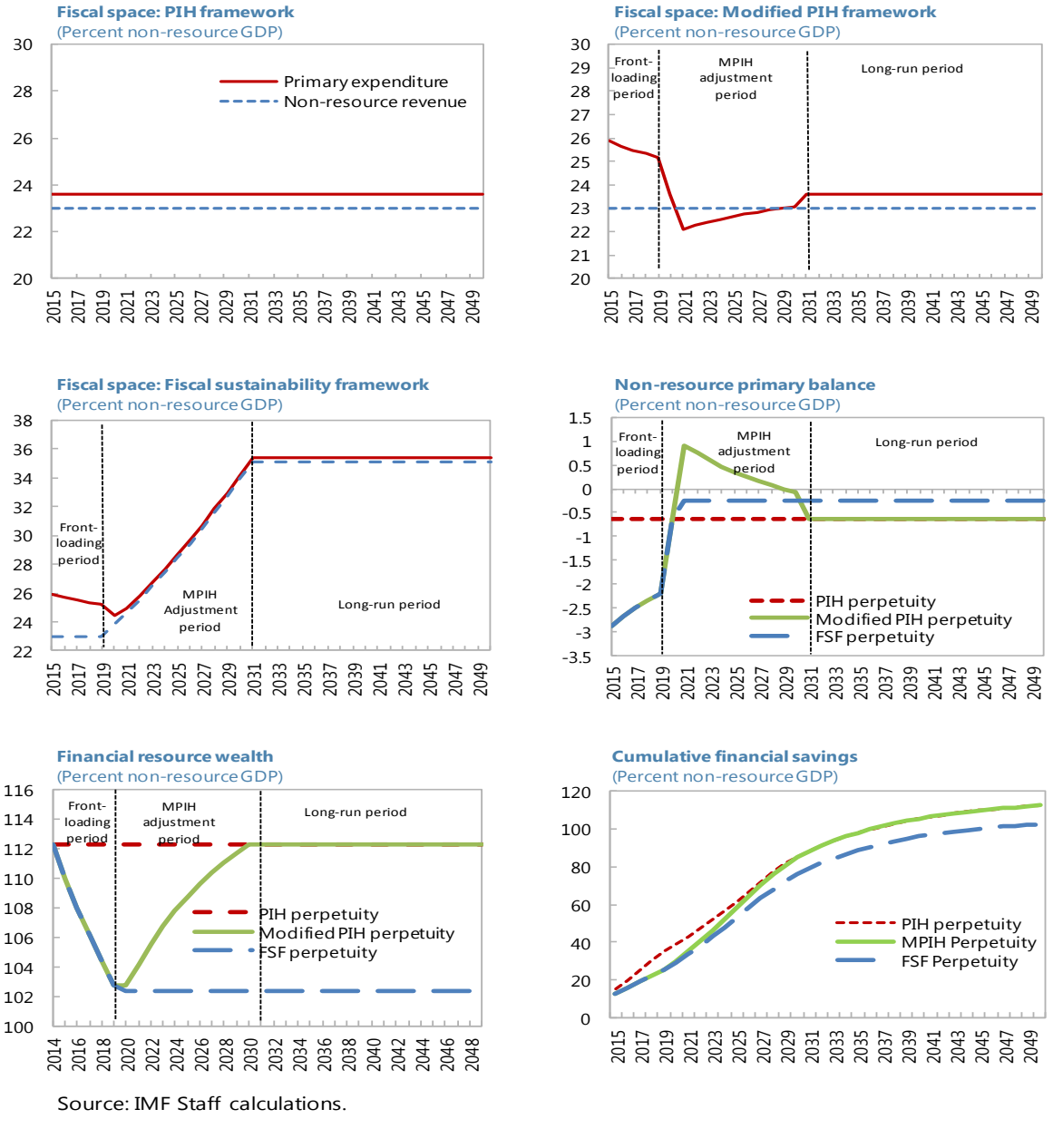
Source: IMF staff calculations.

19. When the resource horizon is long, managing the volatility of resource revenue takes precedence over issues of sustainability. A fiscal policy anchored to a structural resource balance target helps to remove the effect of commodity price volatility by applying price-based rules.[11] Under the price-based rule, budgetary revenues are projected using a smoothed ("structural") price.

[11] The fiscal anchor could be defined as the cyclically-adjusted balance—where the fiscal stance is assessed by correcting for the impact of not only commodity price shocks, but also of the output trend, asset price cycles and one-off factors. This analysis assumes only adjustments for commodity price cycles.

When actual commodity prices are higher than the structural price, realized revenues are higher than budgetary revenues and the surplus is accumulated in a stabilization buffer. Conversely, when actual prices are lower than the structural price, the deficit is covered by withdrawing funds from the stabilization buffer.

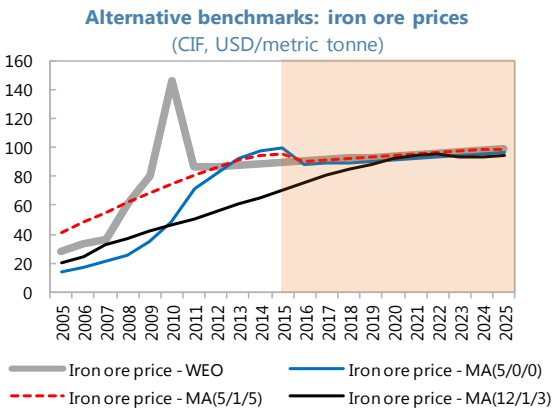
Figure 2. Mauritania: Sustainability Assessment Indicators

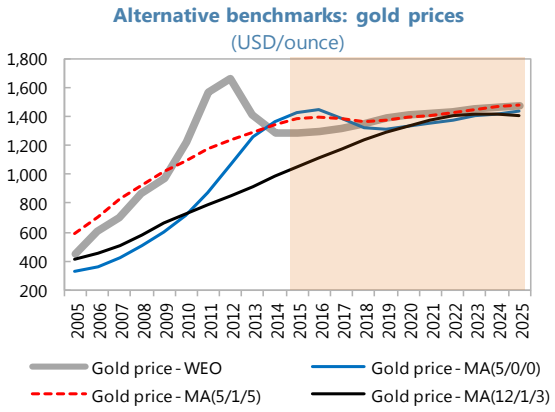


Source: IMF Staff calculations.

20. In choosing a price-rule formula, consideration must be given to the preference for smoothing spending and the need to adjust to changes in price trends. Price formulas with a short backward-looking horizon track better changes in prices, but may lead to more volatile expenditure envelopes that can fuel procyclical fiscal policy. Price formulas with longer backward-looking horizons allow smoother expenditure paths, but may systematically undershoot or overshoot actual revenues if price trends change (IMF 2012b). To simulate the effect of a structural balance anchor, three price rules were modeled for Mauritania: a five-year rolling average of historical average (5/0/0) following Ghana's budget oil price formula; a moving average of the past five years, the current year, and projected prices for the next five years (5/1/5) as in Trinidad and Tobago; and an average of the past 12 years, the current year, and three years of futures prices (12/1/3) as introduced in Mongolia in 2013 for the copper budget price.[12] These specifications were applied simultaneously to all three commodities contributing to government revenue in Mauritania in the base case scenario (iron ore, copper, and gold). Simulations indicate that, of the three rules, the 5/1/5 benchmark reduces volatility relative to actual prices while responding better to changes in prices trends (Box 2).

Box 2. Volatility Analysis: Price Smoothing



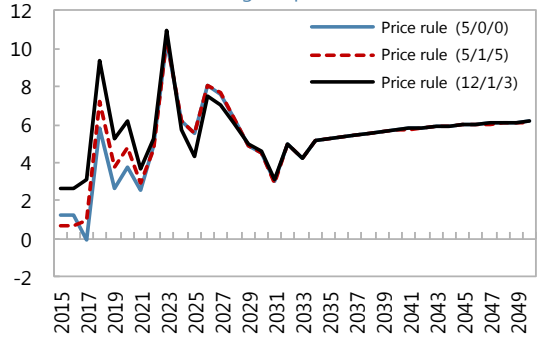


The figures above illustrate alternative benchmark iron ore and gold prices using historical and projected WEO values. For the medium term (2015-17), the moving average of the past five years (5/0/0) is the most optimistic benchmark. The moving average that incorporates the prior 12 years (12/1/3) offers a more conservative approach in the medium term, yet historically it would have been a poor benchmark because it would have undershot prices heavily over 2007-13. Given the present uncertainty as to where markets are positioned relative to the commodity cycle, a benchmark that gives equal weight to backward- and forward-looking prices, such as the moving average of 11 years (5/1/5), could provide a more balanced perspective.

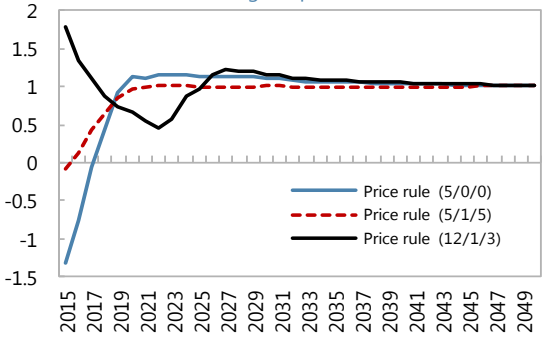
[12] These price-smoothing rules are used illustratively here and a more detailed analysis should calibrate them to the specific situation of Mauritania.

Figure 3. Mauritania: Managing Volatility Indicators

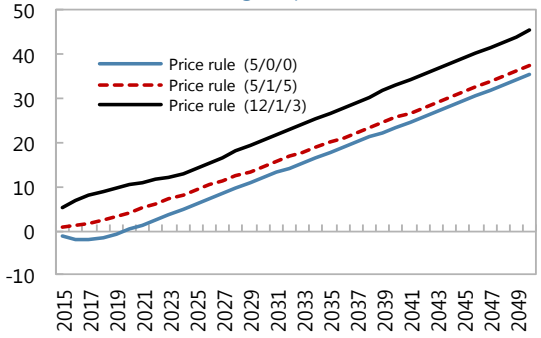
Real primary expenditure growth
(Percent change, year-on-year)
Structural balance target: 1 percent non-resource GDP



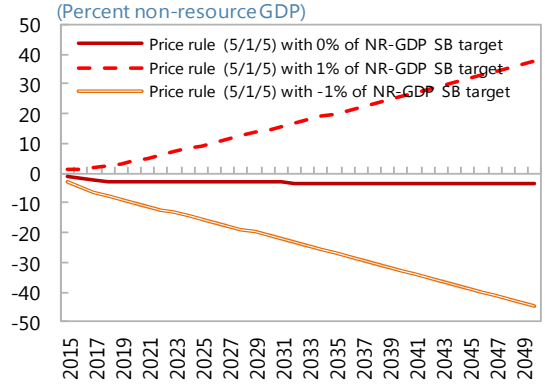
Overall primary balance
(Percent non-resource GDP)
Structural balance target: 1 percent non-resource GDP



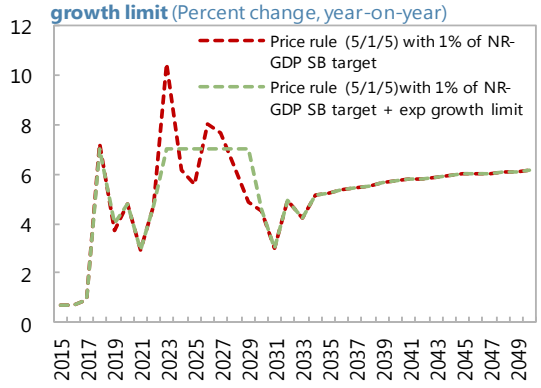
Cumulative financial savings
(Percent non-resource GDP)
Structural balance target: 1 percent non-resource GDP



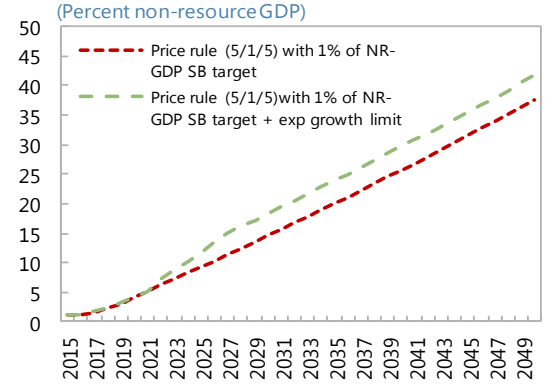
Savings under different structural balance targets
(Percent non-resource GDP)



Real primary expenditure growth with expenditure growth limit (Percent change, year-on-year)



Cumulative financial savings
(Percent non-resource GDP)



Source: IMF staff calculations.

21. The level of the fiscal anchor must be determined in the context of the country's debt position. A structural surplus should be targeted because of risk factors (such as contingent liabilities), but also as a function of Mauritania's existing absorptive capacity constraints, at least in the medium term. Simulations indicate that a structural balance rule targeting a surplus of 1 percent of non-resource GDP and with the price calculated as the moving average over 11 years (5/1/5) could smooth public expenditure growth, stabilize the overall primary balance, and allow an accumulation of financial savings to reduce government debt (Figure 3, upper and middle row panels).

22. As an illustration, an additional cap on real expenditure growth could further limit procyclicality and allow a higher accumulation of financial savings. Absorption capacity considerations may call for a cap on overall expenditure growth. Other countries (such as Mongolia) have used expenditure caps in combination with other fiscal anchors to smooth expenditure. Generating more predictable changes in spending could be particularly important for Mauritania if, for example, the Banda Gas project comes on stream and phosphate resources are developed (according to the extended scenario). Under the fiscal anchor of 1 percent structural resource surplus and a 5/1/5 price-smoothing rule, imposing an additional cap on real expenditure growth of 7 percent brings the level of financial savings up from 37 percent to 42 percent of non-resource GDP by 2049 (Figure 3, bottom row panels). Part of these financial savings could be set aside in stabilization buffers, with anything in excess saved for future generations.

E. Strengthening Institutions

23. Mauritania needs to strengthen its fiscal institutions to support transparent and efficient use of its resource wealth. A key precondition to strengthening fiscal institutions is advancing the public financial management (PFM) reforms initiated over the past years. A new Organic Budget Law (OBL), prepared in draft form in 2012, still needs formal adoption by Cabinet and Parliament. The new law will include fiscal principles, setting of fiscal objectives, a medium-term expenditure framework (MTEF), improved documentation, and a budgetary timetable with more time for legislative scrutiny (IMF 2013). The introduction of a binding MTEF encompassing the public investment program (PIP) is particularly important as a tool for monitoring fiscal policy and planning capital investment spending. More sophisticated fiscal risks analysis will also be needed to support that the government's fiscal strategy is robust to a range of risks, including commodity price and production fluctuations.

24. Equally critical is to lay the foundations for a fiscal rule to specifically address natural resource wealth considerations. Basic provisions should include fiscal objectives, the fiscal anchor, interactions with a natural resource fund, as well as escape clauses under which fiscal policy may deviate from the fiscal rule. Well-designed escape clauses are critical to preventing exceptional and unforeseeable shocks from undermining the credibility of the fiscal rule. The experience of the oil fund, whose operations have generally set an example of transparency and accountability, could serve as starting point for the design of a more comprehensive resource fund to include mineral revenue. Surplus revenues from the execution of the fiscal rule should flow into the resource fund, which would first play a budget stabilization function by providing a buffer to protect planned

capital expenditure against resource revenue volatility. Any additional surplus above this buffer would then be channeled into a savings portfolio for future generations. The resource fund should thus be a complementary policy tool that mirrors the fiscal rule, with fund flows fully integrated into the budget process.

25. To ensure that these reforms are implemented on a sustained basis, enhanced transparency and communication remain critical. A good starting point is a transparent budget formulation and execution reporting system, in which Mauritania already has a good record, including multi-year fiscal objectives which are clearly defined and published openly, with ex-post reporting to Parliament and the general public. Further, fiscal performance will preferably include all financial transactions involving the state-owned enterprises, the central government, and the general government, with identification of fiscal risks.

F. Conclusions

26. Mauritania has important natural resource wealth, and its fiscal policy is shaped by considerations resulting from its reliance on resource revenues. Prospects for price shocks in the short term and significant mining expansion in the long term could pose significant challenges to fiscal policy management. Like other commodity exporting countries, Mauritania needs to avoid procyclical fiscal policies and adopt rules that guide medium-term policy and help gain in policy predictability. Fiscal frameworks that link the sustainable level of spending to future resource revenues could be particularly relevant in the context of Mauritania. As a low income country scarce in capital, consideration could also be given to frontloading public expenditure for productive investment, within debt management constraints.

27. The choice of the fiscal anchor will be guided by the authorities' view on the exhaustibility of the resources. The length of the resource horizon is ultimately a function of two factors: the market conditions that determine to what extent it is economically viable to develop the resource potential of the country; and the fiscal regime for extractive industries which determines the time profile and the weight of the resource revenue in the budget. Under the assumption of finite resources, the authorities should monitor a non-resource primary balance linked to a fiscal sustainability benchmark that takes into account estimates of the total resource wealth. Under the assumption of a long-term resource horizon, fiscal policy should target a structural primary resource balance to isolate the budget execution from shocks arising from commodity price fluctuations. Future discussions and analysis will be needed to pin down the technical details of a fiscal rule.

28. Fiscal frameworks for resource wealth management require strong institutions. This entails strong commitment to transparency, policy predictability and credibility, good governance structures, and an enhanced quality of institutions. The adoption of the new OBL would lay the foundations for a modern public financial management system and the implementation of a fiscal framework geared toward the specific challenges associated with managing the resource wealth to support fiscal sustainability.

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GROWTH, EMPLOYMENT, AND SOCIO-DEMOGRAPHIC CHALLENGES IN MAURITANIA[1]

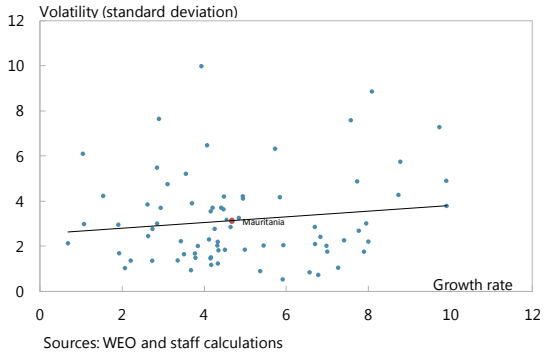
Mauritania's growth performance in recent years has been high by regional standards and is expected to strengthen over the medium term thanks to the expansion of mining capacity. That said, the economy is still reliant on a narrow natural resource base. Mauritania could benefit from the positive growth outlook and the ongoing demographic transition, with an increasing share its population at working age, to support a structural transformation of the economy, diversifying its economy to provide opportunities for more inclusive growth and reducing its vulnerability to terms-of-trade shocks. Analysis of other countries' experiences shows that as the economy diversifies, more attention should be given to human capital development and the reduction of labor market inefficiencies.

A. Introduction

1. Mauritania is a country rich in natural resources. With more than one million km^2, Mauritania is comparable in area to Egypt but its population, at only 3.5 million, is much smaller. The country is at the intersection of the Maghreb and the Sahel region (Morocco, Algeria, Senegal, and Mali) which explains the multiethnic structure of the population. Historically, Mauritania has been agro-pastoralist but as a consequence of extended, severe drought, the desert has been expanding since the mid-1960s limiting agricultural activity to the Senegal River in the south. To the west, the country has one of the richest fishing areas in the world. Mauritania also has extensive reserves of iron ore, most of which is currently extracted by the state-owned *Société Nationale des Industries Minières* (SNIM). Other metals include copper and gold.

2. Mauritania achieved a relatively good growth performance in the past 15 years, but volatility remains high. GDP grew on average by [4.9] percent during 2000–13. This period has been marked by an exceptional hike in 2006 (18.9 percent) owing to the beginning of oil production, which rose to 36,000 barrels per day. Since then, however, oil production has been decreasing, to 6,000 in 2013. Growth volatility has declined compared to 1990–99—mainly because of less reliance on the primary sector—but remains high compared to peer countries.

Growth and volatility in low and middle income countries



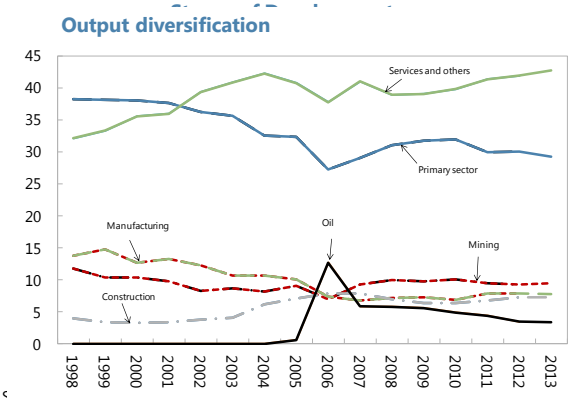
Sources: WEO and staff calculations

3. With more prudent macroeconomic management, greater political stability, and a more favorable international environment, Mauritania has recorded stronger and more stable growth. Despite the drought which marked

[1] Prepared by Tarak Jardak and Rafik Selim.

the 2011–12 agricultural seasons, GDP grew at 5.3 percent on average during 2011–13, boosted mainly by higher mining production and buoyant activity in construction and services favored by large public investments aimed at filling the infrastructure gap.

4. Medium-term prospects are promising thanks to an expansion in mining production. The momentum is likely to continue in the short to medium term as iron ore production is expected to more than double by 2019, leading to sustained growth of about 6.5 percent during 2015–19. However, a larger-than-forecasted decline in iron ore prices could lead to delays or even cancellation of some mining projects. These risks, if they materialize, could lower growth prospects. Even under the baseline scenario presented in the accompanying staff report, the authorities will continue to face the same challenges of generating more inclusive and job-creative growth. As shown by many resource-rich developing countries' experiences, growth is a necessary but insufficient condition to lower unemployment and income inequality (IMF 2013c).



Sources: ONS and staff calculations

5. Mauritania could benefit from improving human capital and labor market efficiency. According to the global competitiveness index, Mauritania continues to lag behind factor-based economies in terms of human capital—especially education—and labor market efficiency, while the infrastructure gap has been narrowing as a result of government efforts. At the same time, the presence of a young and better-educated segment of the population provides an additional opportunity to benefit from the favorable environment and speed up reforms in order to absorb the additional labor demand, reduce the unemployment rate (especially among youth) and try to bring the informal sector into the formal economy.

6. This paper takes stock of sectoral and factor dynamics in Mauritania's economic growth, discusses labor market dynamics, and explores the policy options that could support sustainable and more inclusive growth. The first section focuses on growth determinants, from a sectoral perspective and through factor analysis. Dynamics of the labor market and socio-demographic challenges will be addressed in sections 2 and 3, respectively. Lessons from other countries' experiences and policy recommendations are discussed in section 3. Section 4 concludes

B. Growth Determinants in Mauritania: Sectoral and Factor Analysis

Sectoral analysis: Some output diversification but a heavy reliance on natural resources

7. Greater trade openness and liberalization of some services have helped to diversify output, but the productive base has remained reliant on the exploitation of natural resource endowments.

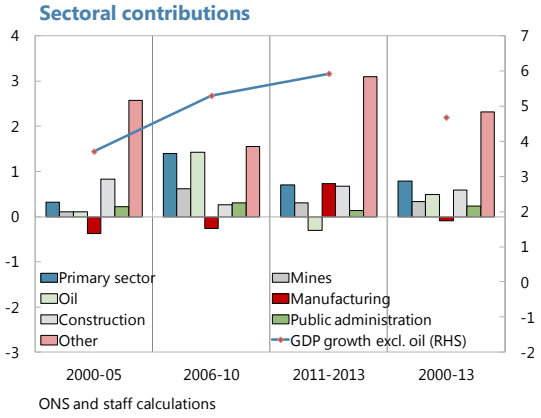
- Since the beginning of the 1990s, Mauritania has undergone a relatively rapid trade liberalization followed by a disengagement of the state from some services (Telecom, air transport). This, in addition to rapid urbanization, has increased the share of the tertiary sector, which grew by 10 percentage points during 1998–2004.

- Over the same period, the share of the primary sector, dominated by pastoral activities, declined from 38 percent in 2000 to 30 percent of GDP in (year). Difficult weather conditions, weak rural infrastructure, and low productivity owing to the extensive and dispersed nature of farms led to a weak contribution of agriculture and livestock to growth. In the second half of the 2000s and in recent years, the government has attached higher importance to the sector, offering technical and financial support to farmers and extending irrigated land, which led to yield improvement and smoothed growth volatility.

- The productive base has not changed significantly. Industrial production remains dominated by raw extractive products, and processing is shallow (in the fishing industry, for example) because of infrastructure bottlenecks (transport, electricity supply and ports), limited financial access, and a weak business environment.

8. Services and construction have been the main drivers of overall growth, but are heavily dependent on performance and revenues in the extractive sector.

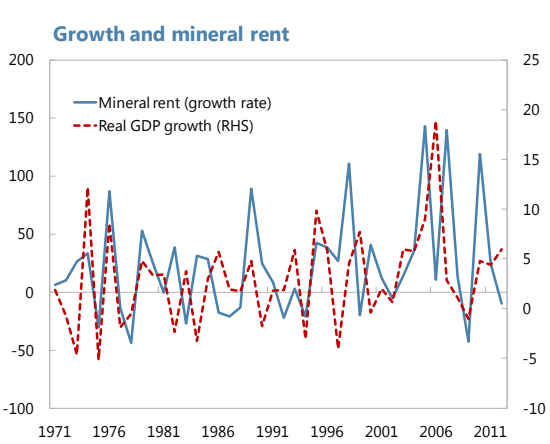
- Domestically oriented sectors such as services and construction were the main drivers of growth. In services, particularly commerce and transport, average growth was 7.5 percent and 11.9 percent, respectively, on average during 1999-2012, contributing more than half of overall growth. Construction also played an important role, growing by [11] percent on average, though its contribution was uneven across years.

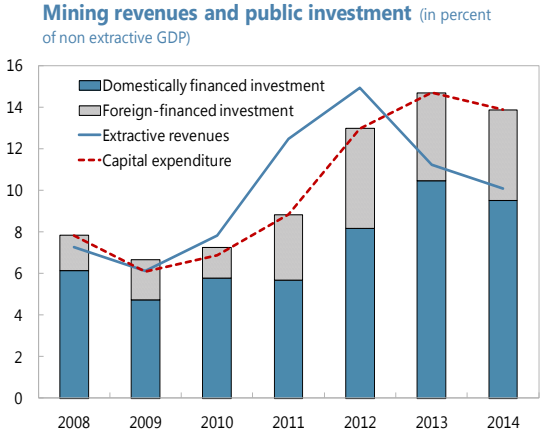


- The direct contribution of the extractive sector was low until 2007. In fact, except for the 2006 hike in oil production, production was limited to iron ore and fluctuating around 11 million tons per year. The reforms of the mining code, in addition to higher international prices, attracted large foreign investments and mining production diversified to copper and gold[2] and increased the contribution of the mining sector to 0.6 percent on average during 2007–13 compared to 0 percent during 2000–06. Moreover, because the metal prices were more than 10 times higher in 2012 than in 2000, the mining

[2]And, on a smaller scale, gypsum, uranium, quartz, and phosphate.

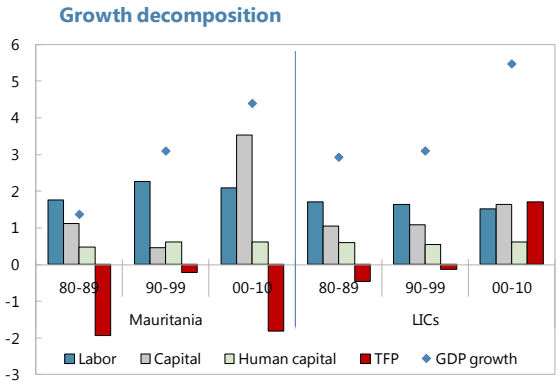
revenues increased substantially, reaching more than 25 percent of total revenues which allowed large public investment that contributed to bolstering non-extractive GDP growth.





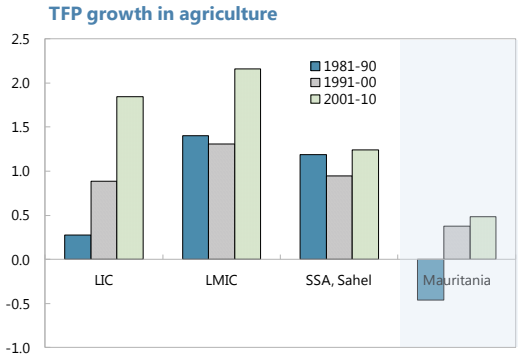
Factor analysis: The mirror of economic structure

9. GDP growth was mostly driven by the accumulation of factors of production—especially labor—while the total factor production (TFP) contribution was negative. The growth-accounting exercise results are symptomatic of an economy in which agriculture is still the biggest employer and which depends on growth in public sector and informal services with a minimal contribution from manufacturing.



Sources: Penn database and IMF staff calculations

- Labor utilization was the main driver of real GDP per capita growth, reflecting the increase of both the labor force and the participation rate, while the unemployment rate remained stable. Human capital contributed positively to growth, reflecting the gradual improvement in education measured here by the average years of schooling across the population.



Sources: USDA and IMF staff calculations

- The 2000s recorded an acceleration of capital accumulation, fostered by important investments in the extractive sector and an acceleration of public investments mostly targeted at filling the infrastructure gap.

- However, TFP contributed negatively to growth (-1.8 percent in the 2000s compared to +1.7 percent for low-income countries (LICs)). The

concentration of investments in the mining sector, the high level of informality, together with the poor quality of education and/or the inability to retain talent, could explain why the accumulation of factors did not translate into productivity gains.

Box 1. Growth Accounting Exercise: Methodology and Data

The growth accounting exercise explains output growth by decomposing it into the contributions of capital, labor, and a residual. This residual is an estimate of the changes in total factor productivity (TFP) that reflect a wide range of factors affecting input efficiency. The residual is defined as the growth in output that occurs with unchanged levels of the factor inputs.

Following the methodology of Hall and Jones (1999), the exercise is based on a standard aggregate Cobb-Douglas production function with a constant return to scale which includes physical capital, human capital, and labor as production factors and labor-augmenting technological progress is assumed:

$$Y_t = K_t^{\alpha} * (A_t H_t)^{1-\alpha} = K_t^{\alpha} * (A_t h_t L_t)^{1-\alpha}$$

where Y, K, H, h, L, and A stand for output, physical capital, effective labor input, human capital per person , employment, and total factor productivity (TFP) respectively, α refers to the capital share, and (1-α) refers to the labor share.

This can be written:

$$\frac{\dot{Y}_t}{Y_t} = \frac{\dot{A}_t}{A_t} + \propto \frac{\dot{K}_t}{K_t} + (1-\propto)\frac{\dot{H}_t}{H_t}$$

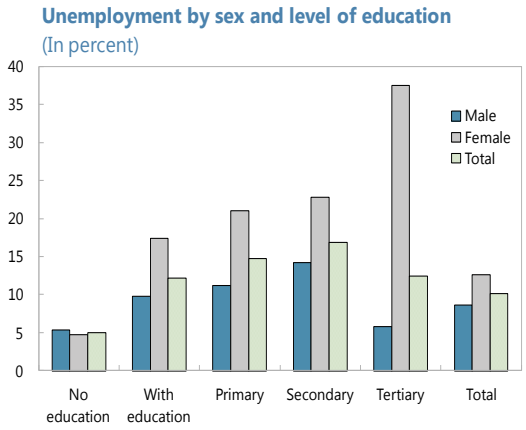
Output growth is given by TFP growth, i.e., the efficiency with which inputs of production are used, plus a weighted sum of the growth rate of physical capital and human capital.
All the data have been taken from the Penn database. The poor quality of some data, especially the employment ones, leaves some uncertainty in the results.

10. At the disaggregated level, the low agricultural productivity could partly explain the aggregate productivity gap. To better understand the picture on aggregated level, we investigated the agriculture sector. Mauritania experienced relatively low TFP growth in the agriculture sector, unlike many low-income countries including some in the Sahel region. Recent efforts to extend irrigated land, and other forms of financial support have improved the attractiveness of the sector and increased its contribution to growth during 2011–13.

C. Labor Market Dynamics, Socio-Demographic Issues, and Challenges Ahead

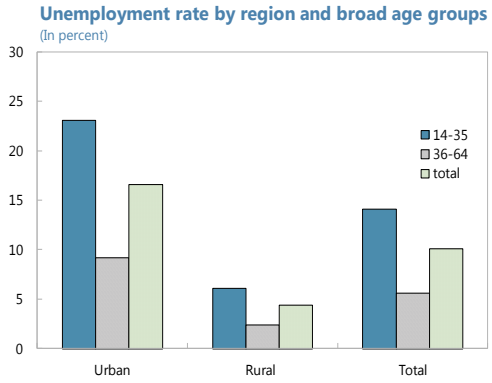
Dynamics of the labor market

11. The unemployment rate is moderate by regional standards but is uneven across internal regions, age groups, and gender. According to the 2012 national survey on employment and the informal sector (ENRE-SI), which followed International Labor Organization (ILO) methodology, the unemployment rate is 10 percent. However, using the methodology of the EPCV 2008 survey, the unemployment rate is much higher, at 31 percent in 2012, only 1 percent lower than the 2008 level. In addition, again on the basis of the new ILO methodology, the data show a high heterogeneity of unemployment across regions, age groups, and gender.



- Unemployment is a greater concern in urban areas, averaging 16.6 percent, and with many cities recording more than 20 percent.[3] Rural unemployment is much lower, at 4.4 percent; but at the same time, poverty is very high in these regions reflecting the dominance of subsistence agro-pastoral activities and low-wage or unpaid jobs.[4] It could also be attributed to the fact that most job seekers in the rural regions choose to migrate to urban areas searching for better opportunities.

- Unemployment affects more young people: as two out of three unemployed are less than 35 years old. The unemployment rate exceeds 20 percent for the 20-29-year-old urban workforce, reaching 29 percent for the 25 29 age group. Surprisingly, better education does not guarantee easier access to a job. The unemployment rate is higher among better educated people, which could reflect skills mismatches, low quality of education, or high labor costs for small and medium-sized enterprises (SMEs). This problem is more important for women: 22.8 percent of women with a secondary education and 37.5 percent of those with



[3] Urban unemployment reached 22.6 percent in D. Nouadhibou, 49.3 percent in Tagant and 26.4 percent in Inchiri.

[4] These are mostly people working on family business.

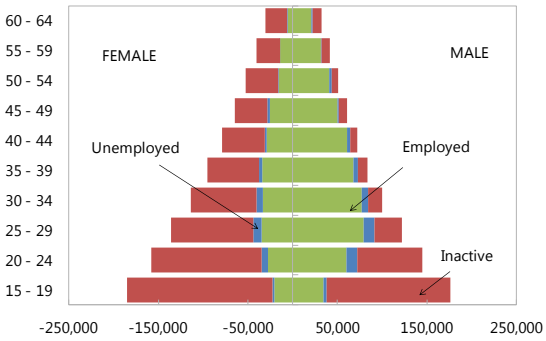
tertiary education are unemployed.

12. The relatively low unemployment rate partly reflects low participation, particularly for youth and women.

- The unemployment rate would have been higher if the participation rate were not so low, especially for youth and women. Only 4.4 out of 10 working-age people are active (looking actively for a job). The participation rate for people aged 15–24 years is only 25 percent (34 percent for men and 17 percent for women) which is low, given the relatively low level of years of schooling (five years). One possible explanation is the long time it takes to find a job for first job seekers (five years on average) which discourages them and push them to quit the active labor force. The other one is that a large number of these young people will be involved in family businesses and wait for their parents to be older to replace them.

- Government efforts to reduce the gender gap (see Box 2) contributed to an increase in the female labor force participation rate (FLFPR) which stood at 28.8 percent in 2012- comparable to MENA countries. The FLFPR is higher in rural regions, suggesting a greater need for women to work to improve their family income, but is much lower than in other countries relying mostly on agriculture (such as countries in sub-Saharan Africa). The FLFPR increases steadily from 12.5 percent for the younger cohort (15-19 years old) to 43.7 percent for the 45-49 cohort, which may suggest that the inactivity of women is due to familial responsibilities.[5]

Participation and unemployment



Sources: RGPH, ENRE-SI and staff calculations

[5] The fertility rate was declining but is still high compared to North African countries (see discussion on socio-demographic issues).

Box 2. Major Actions to Reduce the Gender Gap in Mauritania

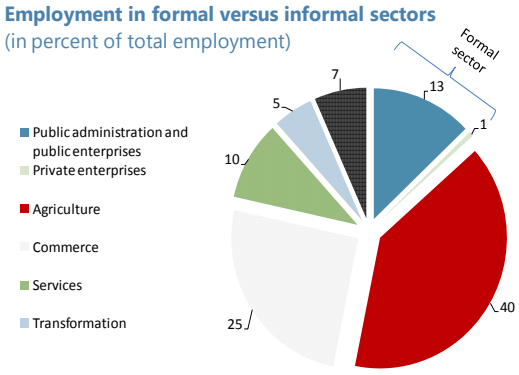
In Mauritania, the situation of women has improved markedly over the past two decades, and their role in society has been reinforced. A number of measures have been taken, particularly in the political, educational and health fields. These include:

- the creation in 1992 of a State Secretariat for Women;
- the formulation of a national strategy for the Promotion of Women in 1995 and updated in 2002;
- the adoption in 2001 of a Code of Personal Status;
- the adoption by the National Assembly in 2002 of a law making compulsory education of children, including girls from six to 14 years;
- the ratification by Mauritania of international conventions including the Convention of Elimination of all forms of Discrimination Against Women (CEDAW) and the Convention on the Rights of Children (CRC);
- the establishment in 2006, as part of the electoral law, of a 20 percent quota for women in electoral lists, which resulted in a rate of 18 percent for women elected to the National Assembly and 16 percent for women in the Senate. At the municipal councils, the proportion of elected women was more than 30 percent, well above the quota required by the Act.

13. The informal sector is very large and a large share of the workforce is highly vulnerable.

- In the absence of a developed formal private sector, the informal sector employs 86.5 percent of the total working population (more than two thirds of the working population in the nonagricultural sector). In addition to the 42.8 percent working in agriculture, informal workers are concentrated in commerce. The formal sector is dominated by public administration and public enterprises (95.7 percent) while private firms employ only 4.3 percent. While poorer and uneducated people are likely to join the informal sector, formal jobs are occupied mostly by the educated population; 28.6 percent have tertiary education and 43.1 percent have secondary education.

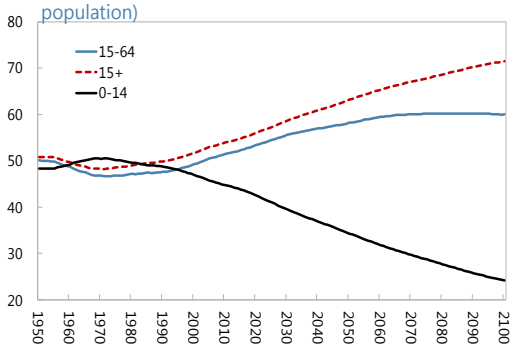
- Women entrepreneurship accounts for more than 50 percent in the informal sector. Informal units are, in general, family SMEs employing the father (or the mother) and their son. In larger firms, the hiring process relies on relatives or personal relationships; fewer than 15 percent are recruited through a placement structure or competitive procedures.



- A large share of the workforce is not protected: 38 percent are unpaid, mostly working in family businesses. Instability of jobs affects the 44 percent of workers (53 percent for women) who are involved in seasonal or temporary jobs. Therefore, the unemployment rate could vary substantially over the course of the year. More than 98 percent of workers in the informal sector have no contract, and only 4 percent of workers in the nonagricultural private sector are affiliated to the social security system. Regarding the motivations to create an informal unit, 57 percent of respondents said it was voluntary. Being independent, increasing their income, or simply familial tradition were the most common reasons invoked.

- Generally, wage setting is at the discretion of the employer (60 percent of cases). Only 9 percent of informal employees have fixed wages and most of them are paid on a day to day or task basis.

Working age population (In percent of total population)

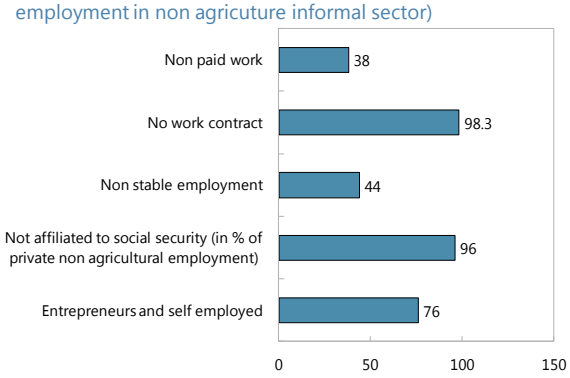


Sources: UN world population projections (revision 2012) et calculs du staff

Socio-demographic issues and challenges ahead

14. Mauritania is at the opening of a window of opportunity as working-age people comprise an increasing share of its population. The fertility rate has been decreasing since the beginning of the 1980s, although it remained high compared to North African countries. But this has been compensated by lower infant mortality—the effect of substantial improvements in health services—resulting in a stabilization of population growth and age structure during 1980-2000.[6] However, since the beginning of the 2000s, the share of the working age population has been increasing steadily, reaching 52 percent in 2013, according to the national population survey. This trend will be sustained in the next decades; the working-age population is expected to reach 60 percent in 2065 under the medium-fertility scenario,[7] or even sooner under the low-fertility scenario.

Measures of informal employment (in percent of total employment in non agricuture informal sector)

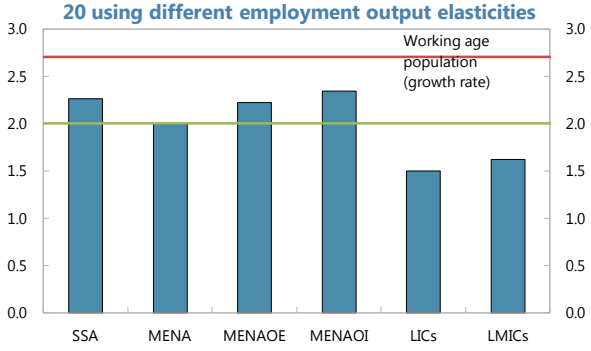


[6] The stabilization of the age structure could be also explained by emigration of the labor force to neighboring and Gulf countries.

[7] For more details, see United Nations, World Population Prospects, 2012 Revision. Data for 2013 have been adjusted to be in line with Mauritania's 2013 population census.

A higher working-age population and lower dependency ratio present a window of opportunity for productivity gains, higher income, and savings. Under some conditions that will be discussed in the next session, Mauritania could benefit from this demographic dividend. In line with other researches, Drummond and others (2014) found that a 1 percentage point change in the share of the working-age population increased real GDP per capita by 0.5 percentage point.[8] Using their estimation, Mauritania's GDP per capita could be 6 percent, 20 percent, and 40 percent higher in 2030, 2050, and 2080, respectively.

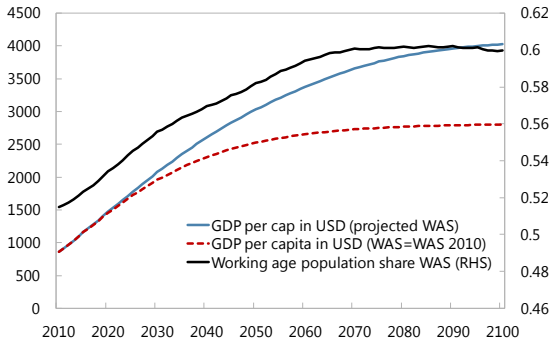
Projected employment growth in Mauritania 2014-20 using different employment output elasticities



Sources: Crivelli and others (2012), UN World population prospects (2012) revision and staff calculations

15. However, a larger working-age population means additional labor supply and higher growth is needed to absorb it. The 15-64 age group will grow by 380,000 by 2020 and by about 1,000,000 in 2030 compared to its 2013 level. Under the assumption of a constant participation rate, this means that to absorb the new entrants, the economy will need to create 25,000 jobs, on average, per year during 2014–20, 3,000 more per year than in the period 2000–13. This additional demand for jobs will reach 30,000 in 2030. Should the participation rate increase—for example, owing to an increase of female participation rate in line with historical trends—the economy will need to create 200,000 jobs during 2014–20. The expected employment growth under the baseline line scenario is 2 percent but ranges between 1.4 percent and 2.4 percent per year depending on the employment-output elasticity.[9] This will be not enough to absorb the new entrants, because the working-age population is expected to grow by 2.7 percent on average during the same period.

Potential demographic dividend in Mauritania



Sources: Drummond et al. and staff calculations

16. Rural-urban migration could raise the unemployment rate by creating a geographic imbalance in the labor market. Like many countries moving away from primary-based economies, Mauritania is undergoing urbanization. The urban population, which accounts for 42 percent of the total in 2013, will increase by 2.9 percent on average during 2010–15, compared to 1.8 percent for

[8] The results vary from 0 to 1.1 percentage points depending on the region. The demographic dividend is found to be higher for low-income countries and increasing when education improves.

[9] We used sectoral employment-output elasticities for different groups of countries which are drawn from Crivelli and others (2012).

the rural population. The population of the capital city Nouakchott grew by 4.2 percent during 2000–13, almost twice the national growth rate, and it concentrates one third of the working age population. More than 40 percent of the population of Nouadhibou—the mining and fishing city—are natives of other regions. Very high poverty in the rural areas,[10] high vulnerability owing to frequent droughts, and lack of opportunity, are likely to accelerate the process of urbanization. In early stages, urbanization is desirable in many countries, reducing poverty and increasing agricultural productivity; however at some point, the absorption of workers' flows by the urban area will be more difficult and the geographical disequilibrium in the labor market will widen.

17. The economically active population remains relatively low-skilled, and education policies results have been mixed.

- Although 68 percent of the working-age population has had access to school, almost half did not complete primary education and only 7 percent of males and 3.3 percent of women have reached tertiary education.

- The results of the different national development strategies of the education sector (*Programmes Nationaux de Développement du Secteur de l'Education*) have been mixed. Enrollment rates in primary and, to a lesser extent, in secondary schools improved since 2000. However, completion rates are still low and the transition to tertiary education remains very limited. First, this could be attributed to income constraints and the concentration of education public services in some regions. Secondly, it could suggest low expected returns from education. And finally, it could reflect a lower quality of education, that is, pupils have not acquired sufficient skills to move to the next level.[11] An ONS 2007 survey points out that a girl has only a 50 percent probability of becoming literate after six years of education. Respectively 17 and 18 percent of pupils succeed in the lower secondary level certificate and the baccalaureate. This in turn reduces the efficiency of education spending.[12]

- Gender inequalities diminished particularly for the primary level. Rural coverage has increased reducing the substantial gap between regions that prevailed in the 1990s but remains important for secondary and tertiary levels. Still, according to the EPCV 2008, significant disparities could emerge when combining all these parameters i.e. gender, income level and region. In fact, a rural girl belonging to the poorest 40 percent is three times less likely to complete primary education than an urban boy from the richest 40 percent.

[10] According to the ONS, poverty rate was 59 percent in rural areas in 2008 compared to 21 percent in urban ones.

[11] Mauritania ranked 135 out 144 countries in terms of education quality in the World Economic Forum's Global Competitiveness Report 2014–15. The PNDSE 201120 points out that among other factors, the automatic transition between primary and secondary level has lowered the overall qualifications of the students.

[12] According to the PNDSE, the efficiency rate is 70 percent for the lower secondary school and 88 percent for the upper one.

- A private education system is growing rapidly. It accounts for 11 percent of primary school students and more than 26 percent of secondary school students. This trend could reduce the burden of education on the budget, but as the private sector develops, there is a risk of further deterioration of the quality of public education because teachers could be attracted by higher wages in the private sector.

- Technical and vocational training, which is supposed to be the alternative for those who are not able to continue or choose to quit the conventional education process, remain limited and insufficient to meet the considerable demand. Only 6 percent of the new entrants in the labor force have benefited from such training. Moreover, specialties seem to be inappropriate for the labor market's needs. Qualitative surveys show that private firms are generally dissatisfied with the profiles they are hiring among this group.

D. Lessons from Other Countries' Experiences and Recommendations

In the path toward a more sustainable and inclusive growth, structural reforms targeted at the demand side, such as the diversification of the economy and the promotion of the role of the private sector (see accompanying SIP on economic transformation), are essential. At the same time, more attention is needed for the supply side. This includes the most efficient utilization of existing resources and the reduction of employment vulnerability in the short term, and the development of human capital and the gradual reduction of labor market inefficiencies in the medium to long term. Although there is no one-size-fits-all approach, other countries' experiences offer a large set of practical policies and measures, some of which are active labor market policies (ALMP). We identified three interconnected and complementary pillars that are of particular relevance for Mauritania. These are:

First pillar: Education, training, and employability

18. There is a consensus as to the impact of education on growth. The impact of education on economic growth has been acknowledged by early literature on the role of human capital and endogenous growth. Many channels have been identified notably the positive impact on labor productivity, innovation, and transmission of skills, but also, in some cases, higher income and less inequality. Hanushek and Wößmann (2007) suggest that each year of schooling boosts long-run growth by 0.58 percentage points. Lustig and Lopez-Calva (2010) argue that education has been key to reducing inequality in Brazil. Similarly, Hailu and Soares (2009) estimate that one-third of the reduction in inequality is due to the effect of education.

19. Therefore, increasing access to education has been one of the highest priorities on the development agenda in developing countries. Many, if not all, have embarked—most of the time successfully—on a vast reform agenda aimed at increasing enrollment rates, especially in primary school (education for all), while reducing gender and geographic inequalities. This effort has resulted in a large increase in the number of schools and, more generally, in education spending. With less evidence of success, conditional cash transfers were used to encourage people to send their children to school. While the *Bolsa Familia* in Brazil has been relatively successful, evidence from a similar program in Ghana (the Livelihood Empowerment Against Poverty) is more ambiguous

because there is no way of checking that the obligations have actually been met (Gbedemah and others, 2010).

20. However, there is increasing—though still tentative—evidence that in addition to quantity, education quality matters, especially in developing countries. Substantial differences in education outcomes between countries have been highlighted. These differences were at first attributed to diminishing marginal returns to schooling. Recent research, however, argues that they could be explained by differences in the quality of education, that is, in the amount of cognitive skills acquired after some years of schooling. Recent case studies in developing countries (Ghana, Kenya, Morocco, Pakistan, South Africa, Tanzania) suggest that the returns on quality may be even larger in developing countries than in developed countries.

21. Improving the quantity and quality of education does not necessarily imply additional resources. Using a hybrid approach (parametric and nonparametric), Grigoli (2014) finds evidence of large potential gains in enrollment rates in secondary education from improving efficiency, especially in lower-income economies such as those in Africa. Where needed, a reallocation from other public expenditures could be envisaged. More generally, reallocating education expenditure to reduce student-to-teacher ratios (where these are high, for example, in rural regions) and improving the quality of institutions could help improve the efficiency of education spending.

22. At the same time, better adapting the labor supply to the demand and supporting job seekers in finding jobs is likely to improve education and training outcomes.

- Education programs are to be tailored to better fit the employers' needs and improve the employability of the educated labor force. Skills mismatch could substantially reduce education outcomes as they lead either to higher unemployment rate or underutilization of educated people. In the first case, this may encourage students - especially poor- to leave school earlier, reducing their ability to improve their condition. In the second, this will push the educated workforce to informality or to low-skills jobs, ultimately reducing their productivity. This is typical in many North African countries which experienced high unemployment rate among youth and educated workforce while at the same time, many surveys point that enterprises complain about the inadequacy of skills of job seekers. In such context, reforming the education programs may be necessary (content, pedagogy) to better fit current private sector needs and future development prospects.

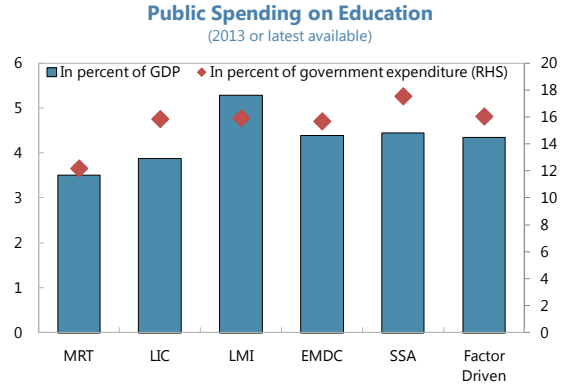
- Technical and vocational training could provide appropriate skills and better access to the job market for early school leavers. Many technical vocational education and training (TVET) systems fail because they focus on the needs of the formal economy. West African countries such as Benin, Togo, Senegal, and Mali are restructuring TVET systems to incorporate traditional apprenticeships, including certification mechanisms, while South Africa and Ethiopia are opening their TVET systems to meet the informal economy's needs. Experiments in Morocco, Benin, and Cameroon underscore the need to associate social partners (employers and employees) in TVET systems for the identification of jobs and for the development of appropriate training strategies and methods.

Recommendations: *Education is one of the priorities of the current government. As a matter of fact, the President announced 2015 to be the year of education. What follows are a few suggestions that could structure policy discussions:*

- Pursuing efforts to increase enrollment and attainment rates in primary school, with special attention to the poor and girls: in this context, conditional cash transfers could be used, together with efficient monitoring systems and adult literacy programs that are already in place could also help increase awareness of the importance of education.

- Improving the quality of education at basic levels and investing in infrastructure for the secondary level (especially in the rural areas) could help increase enrollment rates beyond primary school. Participating in international assessments tests (PISA, etc.) could be useful for dynamic analysis.

- Moving toward supply-driven education and TVET programs; this consists in programs with more empirical content[13](see PNDSE) and a focus on promising fields with high future labor demand. The latter objective may imply to entail partnerships with stakeholders (mainly employers) in designing the programs. TVET system should focus more on the informal sector, including agriculture-related training in rural areas. Current workers could also benefit from shorter time training. Finally, public spending on TVET should be reinforced (it is currently 0.02 percent of GDP).



Sources: National authorities and World Bank's World Development Indicators.

- Reinforcing the role of *Agence Nationale de Promotion de l'Emploi des Jeunes* in smoothing the transition to work by supporting job seekers over a broader geographical area, and by greater coordination with the private sector. Currently, placement rates are satisfactory (61.5 percent) but vary substantially by gender (only 31 percent for women compared to 64 percent for men) and across regions (65 percent in urban regions compared to 28 percent in rural).

- Regarding financing, there is room to better target public expenditures (subsidies and other social transfers), introducing gradually conditional cash transfers where public services are available, better targeting of education spending by setting geographical priorities, linking education to other development strategies with external financing, and involving the private sector in financing the reform of the TVET system.

[13] For example, by promoting dual vocational education and training that combines workplace experience and training with school-based (vocational) education, usually within a particular occupation or sector of work.

Second pillar: Female participation and gender equality

23. Increasing female participation could help achieve higher and more inclusive growth. Higher female participation would be an important component of the demographic dividend. Higher female participation rates are estimated to have accounted for about a third of East Asia's high per capita growth rates in the period between 1965 and 1990 (Bloom and Williamson, 1998). More recent studies find significant macroeconomic gains from increasing FLFPR. Aguirre and others (2012) estimate that raising FLFPR to country-specific male level would increase GDP by 12 percent and 34 percent in the United Arab Emirates and in Egypt, respectively. International experience also indicates that getting women into jobs is associated with poverty reduction. It has found for example that in countries with low levels of female employment, families often under-invest in girls' education with important externalities on children's nutrition and education outcomes. Lastly, increasing FLFP may also increase competitiveness, and thus growth, by reducing labor costs. Using a general equilibrium model for South Mediterranean countries Tsani and others (2012) suggest that removing barriers to female participation could lead to lower real wages, higher competitiveness, and higher growth. Their simulation results show that, in Tunisia for example, a 2.5 percentage point increase of the FLFPR during 2015–30 will reduce real wages by 4.25—percentage points and increase GDP growth by 1.75 percentage point.

24. Female participation is hindered by social, legal, and economic obstacles. Unequal access to education, high fertility rates, conservative social norms, notably related to the traditional intra-household division of labor which implies that women do most household work, restrictive legislation and even a hostile environment in some countries, curtail women's opportunities to engage in formal employment in many parts of the world. Within the MENA region, the lack of opportunities or long queuing in the public sector, the difficulty of finding private employment, and the sizable gender wage gap in both sectors lead many women to decide not to enter the workforce. The resulting low FLPF has serious consequences for the economy as a whole, because potential productivity gains and economic growth are sacrificed when a large part of the labor force is discouraged from working.

25. Even when FLFPR is high, the potential of women is often underutilized or underpaid. In some developing countries, the female participation rate is high; however, most of the time, they are confined to low-productivity jobs in agriculture, housework, or public services that have no career development prospects and are regarded as a natural extension of their traditional role in society (education, health). High poverty is often associated with high FLFP, as working is a necessity. Lastly, women are generally paid less than men, which makes them attractive for enterprises looking for unskilled, cheap labor.

26. Public policy could help overcome the social norms (see IMF SDN/13/10). Fiscal policy plays an important role in encouraging women's participation. Bangladesh prepared a gender-responsive budget in 2005. More specifically, fiscal measures to better reconcile work and family life

include (i) making child care available and affordable e.g. by providing child care subsidies for working mothers, (ii) publicly financed parental leave schemes which guarantee that women can return to their jobs,[14] (iii) flexible work arrangements or part-time jobs, and (iv) increasing expenditure in rural infrastructure, for example, by making clean water more accessible and improving transportation systems, can reduce the time women spend on domestic tasks and facilitate their access to markets. Linking child and family benefits to female labor force participation could be envisaged. Other policies aimed at promoting women's entrepreneurship include improving access to resources, especially for rural women, such as education, land, and credit.

Recommendations: As stated in previous sections, many measures have been undertaken by the government to help fill the gender gap. To complement them, we suggest the following actions:

- Ensuring equal opportunities in education at all levels and in all regions (first pillar).
- Gender mainstreaming in budget and public policy formulation: the ongoing Public Investment Management Support Project 2014–16 with the African Development Bank will give more detailed and technical recommendations on how to include gender considerations in public investment programs and in the planning, and monitoring and evaluation of public policies. This applies for all development policies, sectoral strategies, etc.
- Adopting active labor market policies to reduce unemployment, notably but not only among highly educated women, including measures to promote both employment and entrepreneurship. The gender-neutral policies described in the first pillar remain valid, but some specific actions could be considered, such as a system of preferences—like in affirmative action policy—for public hiring programs, and vocational training.
- Helping women reconcile work and family so as to facilitate labor market participation, such as providing affordable public child care and preschool; currently, fewer than 10 percent of children have access to such services in Mauritania. In addition, maternity leave, flexible work arrangements and part-time jobs should be encouraged; the labor code[15] increased maternity leave to 14 weeks, eight of these for the period after the delivery, with some flexibility within the pregnancy and nursing period. Further extension of maternity leave could be envisaged, with care to not create disincentives to hiring women by increasing the costs associated with their employment. Among rural women, the fertility rate is still high, calling for redoubled efforts with information and advocacy campaigns. Investment in health and infrastructure (water, electricity, transport) and easier access to land and financing will help bring women into the economy.

[14] This is the case in Brazil, where maternity benefits policies include 120 days of paid leave at 100 percent of their salary, which is paid by the employer but reimbursed by Brazil's Social Security Institute. An additional 60 days allowance that can be provided by employers is tax-deductible.

[15] Act No. N° 2004-015 to establish a Labour Code (*Loi N° 2004-015 du 6 juillet 2004 portant Code du travail*), dated July 6, 2004.

Third pillar: Market segmentation: the vulnerability of informal workers and attractiveness of the public sector

27. Informality has important shortcomings, but there is a growing awareness of the importance of the informal sector in job creation in developing countries. The drawbacks of informality of firms and employment on macro and micro level have been identified in the literature, ranging from low productivity, low tax revenues, workers' vulnerability, etc. Reducing informality is often prescribed as a remedy for developing countries to improve growth, reduce poverty, and ensure fiscal stability, among other benefits. However, more recently, analysts tend to recognize that the transition is very challenging because the role of the informal sector is particularly important in job creation. A more pragmatic approach consists in dealing with informality as a fact while at the same time trying to bring the informal sector into the mainstream (ILO, 2014).

28. In the immediate near term, actors in the informal economy must be recognized by labor laws, and minimum protection mechanisms should be put in place. Most informal workers, both self-employed and wage earners, are typically deprived of predictable work, workers' benefits, social protection, and representation. Irregularity of work is also a source of instability. There is a significant, though not complete, overlap between working informally and being poor. The numbers of working poor are declining in countries where informality is retreating, and vice versa. Basic workers' rights should apply to all workers. In practice however, labor laws cover only workers with a clear relationship between employer and employee, calling for an extension of labor laws or issuance of specific regulation[16] for informal workers. Enforcing the law may be challenging because of limited capacities of the state (labor inspectors). Promoting the role of unions and NGOs is essential to complement the efforts of the state. To reduce the vulnerability of informal workers, some governments have designed basic social protection packages (essentially health.)[17] Also, unemployment benefits and public works have often been used in Latin America and Eastern Europe to mitigate the impact of income shocks on informal workers.

29. In the short to medium term, a comprehensive approach that allows and encourages SMEs to gradually enter the formal economy must be formulated. The choice between formality and informality results, in general, from a cost-benefit calculation. Evidence from international experience shows that informality is often associated with high costs associated with operating in the formal sector, including labor market rigidities, high taxes, and complex administrative procedures, coupled with scant benefits from formality—or lack of information about these benefits. Informality could also be associated with lack of credibility of public institutions. Enhancing governance and the transparency of the public sector will increase confidence and reduce the reluctance of firms and workers to move to formality.

[16] This is the case for domestic and casual workers.

[17] In addition to "classical" tax-funded health systems, several countries in Africa, such as Ghana, have launched national health insurance programs with a view to providing universal access to comprehensive benefit packages.

30. In many countries, large informal sectors coexist with a large and very attractive public sector. A bloated public sector, which provides greater job security and higher wages than private sector employment at comparatively similar productivity and skills levels, tends to distort labor market outcomes. Leigh and Flores (2012) find that in the Southern African Customs Union, the hiring process and wage policy in the public sector have typically inflated wage expectations and placed a premium on graduates in liberal arts and social sciences over skills in demand in the private sector, influencing education choices and contributing to a skills mismatch in the labor market and higher youth unemployment because of the limited absorption capacity of the public sector. This also hampers the development of a formal private sector because the majority of the educated workforce will be much more willing to work in the public sector, lowering entrepreneurship.

Recommendations: *Although many efforts have been undertaken in the first two pillars, much more needs to be done in the third, in particular:*

- Setting minimum social protection packages for informal workers.
- Adapting the labor code by extending its coverage to informal workers while taking into account their great diversity (employees, self-employed workers, contributing family workers, etc.) and the peculiarities of the activities they undertake (agriculture, domestic work, craft industry, street vendors, etc.). At the same time, to ensure the application of the law, there is merit to reviewing the relative weight of coercive actions against policies that favor incentives and supporting measures, and to reinforcing the role of trade unions and associations.
- Promoting a greater awareness of the benefits and protection that come with formalization: according to ENRE-SI, only 18 percent of informal entrepreneurs know the CNSS but only 14 percent are against being affiliated; the others have either neutral or favorable views. There may be also room to gradually increase the maximum monthly earnings for contribution purposes, which is 70,000 ouguiya at present.
- Reducing regulatory and non-regulatory barriers to formalization (such as excessively high minimum wages), while protecting workers' rights. Although they are supposed to ensure minimum earnings for the worker, high minimum wages can be an incentive to informality (for example, hiring with no employment contract) and add to the worker's vulnerability.
- Reducing the gap between public and private sector wages by applying a productivity-oriented public wage policy while gradually aligning wages with the private sector levels; this will allow increasing productivity in the public sector and will control the wage bill.

E. Conclusion

31. In recent years, Mauritania's growth performance has been mostly driven, directly and indirectly, by the extractive sector. But the overall growth masks a two-speed economy with low productivity gains. The labor force is largely underutilized as reflected in the high youth unemployment rate and the low female participation rate. Moreover, a large share of the workforce is highly vulnerable because informality dominates in the economy.

32. Over the medium term, Mauritania is expected to be one of the best performers in the region, thanks to a substantial improvement in its mining production; however, pressures on the labor market are likely to increase at the same time, as a result of a higher share of the population at working age and the rural-urban migration.

33. To better benefit from the demographic dividend, Mauritania needs more focus on human capital development, in particular by improving education, quantitatively and qualitatively. In addition, Mauritania needs also more focus on inclusion, in particular by promoting a more active role for women in the economy and increasing protection of informal workers. A more comprehensive approach is however needed to reduce informality gradually over the medium term.

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STRUCTURAL REFORMS AND ECONOMIC DIVERSIFICATION FOR MORE INCLUSIVE GROWTH IN MAURITANIA[1]

Mauritania envisages boosting economic growth and its inclusiveness through structural reforms and economic diversification. While Mauritania has made great advances in the areas of macroeconomic performance, advances in structural reforms have lagged behind. This paper examines, based on other countries' experiences, the type of structural reforms and economic diversification that could boost and sustain growth for Mauritania. It finds that yielding higher growth rates would require increases in total factor productivity through banking sector reforms geared at financial stability, investment in human capital, improving the business climate, strengthening the efficiency of public investment, improving governance and institutions, and developing a well-targeted export promotion strategy.

A. Introduction

1. Mauritania has achieved several milestones in terms of macroeconomic performance and advances in the structural reform area. Not only the economy has benefited from high growth performance supported by responsible macro policies and high commodity prices; but also from structural reforms that started in the 1990s identifying the need to create a supportive business environment for private sector development.

- In the 1990s, reforms such as trade liberalization, exchange rate reforms, state owned enterprise (SOE) reform, and privatization were identified as priorities.

- In the mid-2000s, the focus of reforms priorities shifted to the financial sector, capacity building and governance. A broad reform of the financial sector reform was envisaged to deepen financial intermediation and improve the functioning of the banking system. Key measures included the gradual correction of the high degree of credit concentration, improvements in supervision, a clean-up of commercial banks' balance sheets, and modernization of the payments system.

- In the late 2000s, reform emphasis was geared towards improving fiscal governance, monitoring and control of budget execution and civil service reform. The latest ECF program (2010-13), while calling for accelerated structural reforms to spur growth and foster private sector development, focused on fiscal reforms to promote fiscal consolidation, on a multi-pronged banking sector reform to support financial stability, on reducing cost of doing business and improving competitiveness.

[1] Prepared by Aminata Touré.

Episodes of achievements and advances were also followed by episodes of relaxation of reforms amidst substantial political instability and external shocks; both having a negative impact on compounding reforms. Going forward, efforts to consolidate macroeconomic stability are to be accompanied by a comprehensive structural reform agenda to support economic diversification and job creation, ultimately aiming at poverty reduction and improving living conditions.

2. This paper explores the structural reforms needed to accelerate and sustain Mauritania's economic growth and enhance its inclusiveness. Section A presents the consensus in the literature on the roles of structural reforms implementation in boosting higher growth economic and that of diversification in sustaining higher long run economic growth. Section B gauges the impact of selected reforms on productivity growth, based on the results of cross-country empirical analysis. Section C assesses the potential benefits of economic diversification for Mauritania in the long term-run, also based on similar countries' experiences. Section D concludes by proposing an agenda of high-priority structural reforms for Mauritania.

B. Structural Reforms and Diversification for Enhancing Growth and Inclusiveness

3. Structural reforms help remove obstacles to a more efficient allocation of resources and a higher growth. There is broad consensus that structural reforms—together with improvements in institutional quality—create the conditions needed for better resource allocation, greater productivity, and faster income convergence. Both theory and recent empirical work argue that structural transformation—the dynamic reallocation of resources from less to more productive sectors—is a key ingredient of economic development. In addition, as noted in IMF (2014), structural reforms have led to diversification in exports and domestic production that, in turn, has been conducive to faster economic growth and lower output volatility in low-income countries (LICs).

4. Sustaining growth. There is broad consensus that the following structural reforms are important components of an overall strategy for raising incomes and sustaining economic growth:

- Reducing rigidities in product and factor markets;
- Liberalizing FDI;
- Developing financial systems; and
- Enhancing international trade.

The literature has also found evidence that sustaining growth is positively correlated with macroeconomic stability, the degree of equality of the income distribution, democratic institutions, and economic openness (higher propensities to export manufactures, greater openness to FDI, and avoidance of exchange rate overvaluation).

5. Quality of institutions. In addition to structural reforms, sound economic institutions that promote competition, entrepreneurship and innovation have been found to increase productivity growth at the cross-country, industry, and firm levels. At the same time, political economy literature

has found that in weaker institutional settings, special interests and associated rent-seeking may block reforms that are beneficial for society at large. Also, the overall quality of countries' institutions affects the willingness to reform as well as the timing and boldness of reforms. Most importantly, countries' experiences in successfully implementing productivity-enhancing reforms and structural transformation show that success is largely influenced by the authority of the executive power (Ahmadov, 2012).

6. Distance to frontier and productivity. Neo-Schumpeterian growth theory suggests that the economic development process is influenced by country's income gap, with advanced economies that defines the global technological frontier (GTF). The main growth driver for economies further away from the GTF is the adoption of existing technologies. The closer countries approach the GTF, the higher the relative importance of innovation, rather than imitation, for sustaining productivity and output growth. Policies aimed at sustaining productivity growth and fostering convergence depend on countries' stage of development; that is, they are , i.e. country-specific to their own context and to the distance from the GTF.

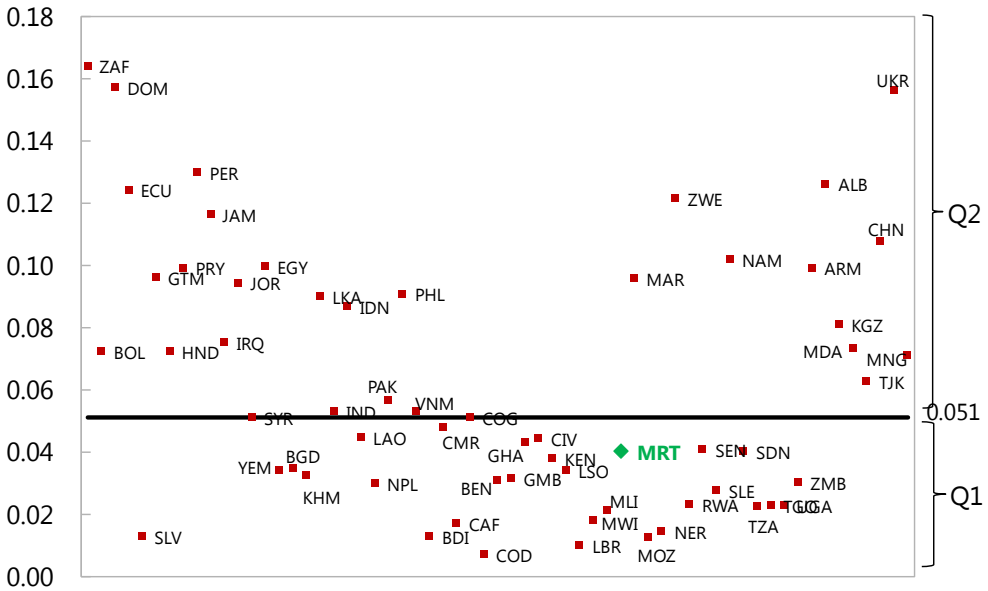
7. Economic diversification. Recent work has found growing evidence of the macroeconomic benefits of diversification in supporting higher economic growth and lower output volatility. Diversification is especially important in the early stages of the development process. Cross-country analysis and case studies shows that diversification in production, exports, and trading partners typically plays an important role in encouraging growth. Diversification is also closely related to structural transformation, particularly in countries in the early stages of economic development.

C. Structural Reforms to Boost Productivity

8. The analysis borrows the results of the empirical analysis of Dabla-Norris and others (2013) to gauge the role of structural reforms and institutional factors in driving productivity growth for Mauritania. The paper uses the conceptual framework of the distance frontier, a sample of 100 countries (advanced, emerging, and developing) with 40 years of data (1970–2010), to estimate the impact of a wide range of structural reforms and institutional factors on countries' growth productivity (see Annex I for model specifications and list of reforms).

9. The note then uses the empirical results of Q1 countries to gauge Mauritania's potential productivity payoffs from undertaking considered structural reforms. The model divides countries into four income quartiles (Q1 to Q4) according to their distance frontier approximated by each country's productivity gap with the United States. Mauritania falls in the first income quartile (Q1) and does share characteristics with other countries in this group: per capita GDP, structural bottlenecks, and institutional character (Figure 1).

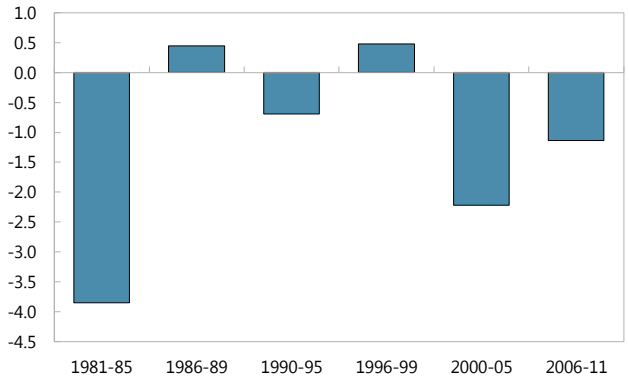
Figure 1. Selected Countries Relative GDP
(With respect to United States)



Source: Dabla-Norris and ohers, 2013.

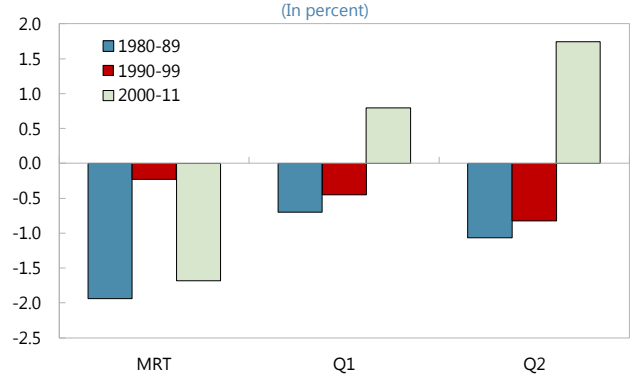
10. Mauritania's recent growth acceleration has not been fueled by productivity gains. Learning from other comparator countries' experiences, where growth dynamics have been fueled by productivity gains, could inform on which reforms are likely to boost Mauritania's productivity.

Figure 2. Mauritania TFP Growth, 1981-2011
(In percent)



Source: IMF, Dabla-Norris and others, 2013.

Figure 3. Mauritania and Selected Comparators: TFP Growth, 1980-2011
(In percent)



Source: IMF, Dabla-Norris and others, 2013.

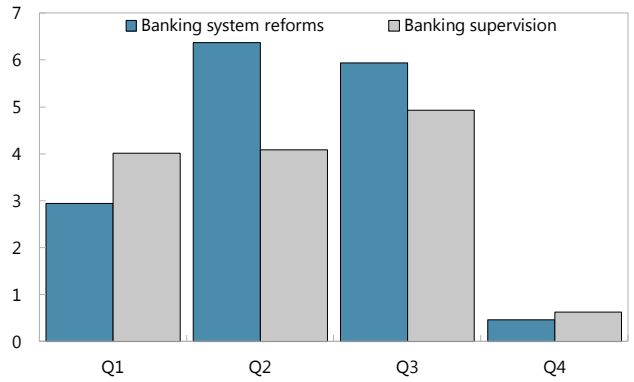
Which policies for enhancing total factor productivity?

Domestic financial reforms

The importance of financial sector reforms for increasing productivity, namely banking system reforms and capital market development, varies by countries' income group.

11. Banking sector reforms. The results show that overall banking sector reforms increase productivity for countries in the first and second quartiles, but more so for the latter (see Annex I, Table I). For countries in the first quartile, the most productivity-enhancing banking sector reforms are those that strengthen banking supervision. Given the magnitude and the highly statistically significant coefficient for these countries, which mostly have bank-based financial systems, these results suggest that prudential policies to prevent excessive risk-taking can support greater investment and efficiency in productive sectors. Reducing financial repression through restrictions on the price (interest rate controls) and quantity of credit can also help spur the movement of resources to their more productive uses for Q2 countries.

Figure 4. Banking Sector Reforms
(Potential productivity payoffs from 1 std of improvement in reform index)



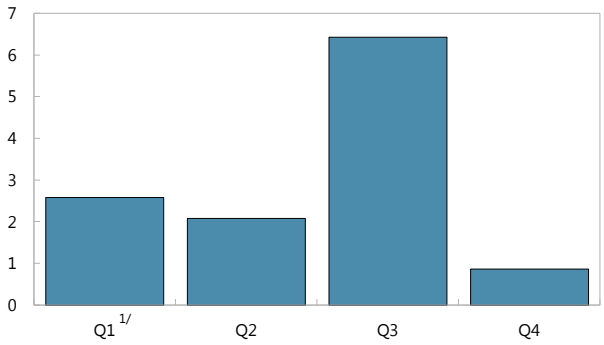
Source: Dabla-Norris and others, 2013.

Implications for Mauritania: Mauritania has made great strides in the areas of banking supervision, particularly in: (i) strengthening banks' capital and establishing provisions for nonperforming loans (NPLs); (ii) pursuing efforts to improve the quality of bank portfolios to reduce the share of nonperforming loans (NPLs); and (iii) enhancing the central bank's supervisory capacity for more effective supervision. Going forward, more progress on the implementation of prudential, solvency, liquidity, and risk concentration measures will likely yield high productivity gains.[2] Continued strengthening of the supervisory role and tools of the CBM for both offsite and onsite inspections will also improve the quality of supervision; while implementing a banking resolution framework will safeguard financial stability and the banking sector's role in economic development.

[2] The 2014 FSAP update identified that the crisis prevention framework should be bolstered with the introduction of macroprudential surveillance, and the liquidity risk could be better managed with more qualitative requirements in the liquidity framework and focused onsite supervision.

12. Capital market development. Policies encouraging the development of equity, bond, and securities markets can be particularly effective for increasing total factor productivity (TFP): they can lower the cost of capital and facilitate the financing of new capital and innovation. In contrast with the banking sector reforms, capital market development is not significant in boosting productivity for the Q1 countries, but is highly significant for countries in the upper quartiles. The fact that the coefficient is not statistically significant while it is highly so for the other income groups, seems to suggest that capital market development requires certain preconditions to support economic development. These are likely to be related to a well-developed banking sector, deep and liquid interbank markets for money and foreign exchange, and a certain level of private sector development.

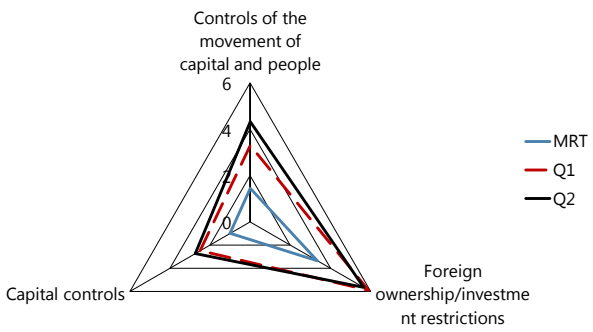
Figure 5. Capital Market Developments
(Potential productivity payoffs from 1 standard of deviation of improvement in reform index)



Source: Dabla-Norris and others, 2013.
1/ Statistically not significant.

Implications for Mauritania: There is a need to diversify the sources of financing in Mauritania to support medium- to long-term economic growth opportunities, because the banking sector only finances short-term trade activities or consumer credit, and the *Caisse de Depots et de Développement* (CDD) finances some of the longer-term and riskier credits. Despite this need for diversified financing sources, Mauritania has a number of prerequisites to meet for stock market development. These include further deepening of the financial sector and strengthening of the monetary policy framework with a liquidity management framework. Furthermore, investor's confidence should be strengthened with better governance and overall improvements in the business environment, which the authorities are aiming at. These improvements would help increase the potential pool of investable funds.

Figure 6. Investors' Freedom
(Rating scale from 0 to 10, higher rating indicate less restrictions)



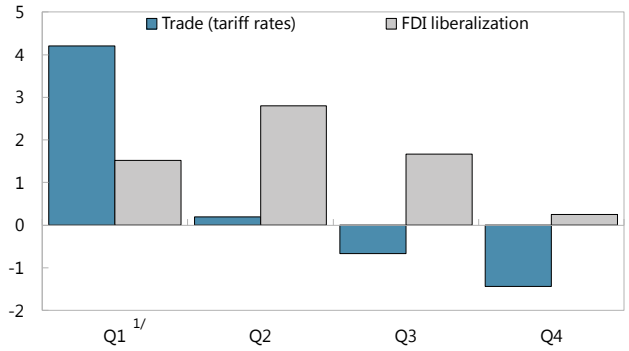
Source: Fraser dataset on "Economic Freedom of the World."

Real sector reforms

13. Trade and FDI liberalization. Barriers to international trade and foreign investment are detrimental to productivity growth.

Reducing trade barriers. The economic literature has consistently found that more open economies have experienced higher growth (Wacziard and Welch, 2008). The empirical results suggest that reducing trade barriers is highly beneficial in raising TFP for Q1 countries (Figure 7). Tariff and nontariff barriers prevent efficient allocation of resources and technology transfer. The removal of nontariff barriers that limit regional integration can prompt agricultural productivity growth (Tombe, 2012).

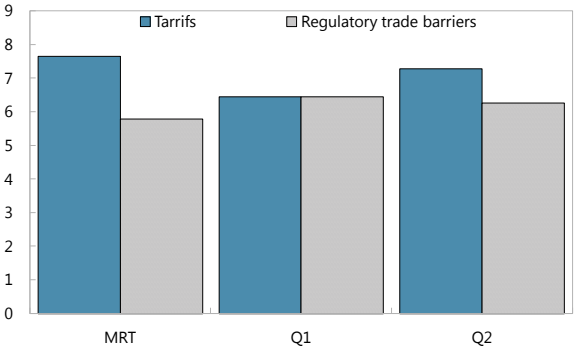
Figure 7. Trade and FDI Liberalization
(Potential productivity payoffs from 1 std of improvement in reform index)



Source: Dabla-Norris and others, 2013.
1/ FDI liberalization not statistically significant for Q1s.

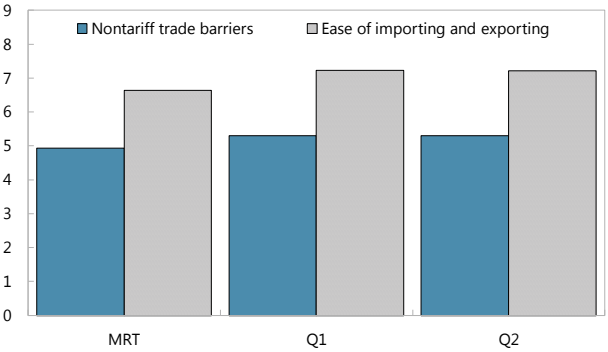
Implications for Mauritania: As the authorities take steps to increase the value-added chain in agriculture and farming sectors to develop an exporting industry, they should be taking steps to reduce nontariff and other regulatory trade barriers (Figures 8a–8b). When compared to Q1 and Q2 countries, Mauritania compares favorably for tariffs barriers but not so well on nontariff barriers and ease of imports and exports (costs and time). Reducing these barriers through an improved business environment, could help open up new markets, facilitate export diversification, and improve the sectoral efficiency of the exporting industries. These would benefit from market access and deeper trade integration, cheaper imported inputs, and more robust competition.

Figure 8a. Trade Barriers
(Rating scale from 0 to 10, higher rating indicate less restrictions)



Source: Fraser dataset on "Economic Freedom of the World."

Figure 8b. Regulatory Trade Barriers
(Rating scale from 0 to 10, higher rating indicate less restrictions)



Source: Fraser dataset on "Economic Freedom of the World."

Liberalizing FDI. The results suggest that liberalization of FDI is not significant at boosting productivity growth for Q1 countries, whereas for Q2 countries and Q3s it can foster economy-wide productivity gains (Figure 6).

Implication for Mauritania: The authorities envisage attracting FDI through public-private partnerships (PPPs) to finance their large infrastructure projects in gas and power, and the Nouadhibou free trade zone. Although attracting FDI, which are long-term resources, would help meet their financing needs, the authorities acknowledge that they face tough competition due to weaknesses in the institutional environment and infrastructure. Continued macroeconomic and political stability and improved business climate will foster a better climate to attract FDI.

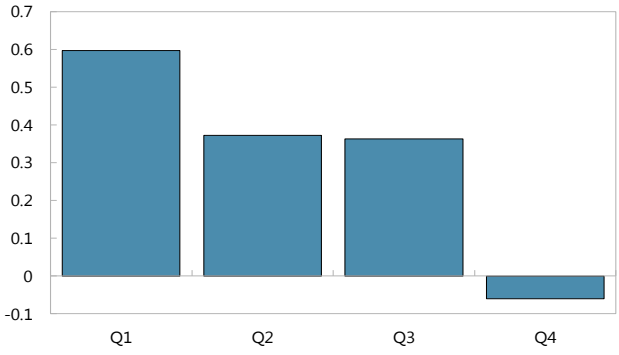
14. Agricultural reforms. Contrary to previous findings, the present empirical analysis suggests that agricultural reforms are not significant for Q1 countries, but are highly conducive to higher productivity growth for Q2 countries. Nevertheless, efforts to boost sector productivity through appropriate land reforms and improvements in physical infrastructure could yield economy-wide productivity gains including facilitating structural transformation in economies with still-high shares of agricultural employment.

Implication for Mauritania: During 2010–14, the government has scaled up public investment in agriculture, irrigation potential, improving roads and water infrastructure networks in agricultural areas. Arable land has increased by about 80 percent and irrigated land area rose from 9,000 to 16,000 hectares. This has helped achieve higher crop yields. The authorities have also started attracting FDI to develop large scale agricultural projects. Going forward, government intervention could be scaled back to allow for more private initiative.

Institutional reforms

15. Legal and property rights. Empirical results suggest that Q1 countries, even more than countries in higher quartiles, can bring in the most benefits in productivity gain by strengthening the quality of their institutional frameworks that protect property rights, including intellectual property, and facilitate private contracting (Figure 9).

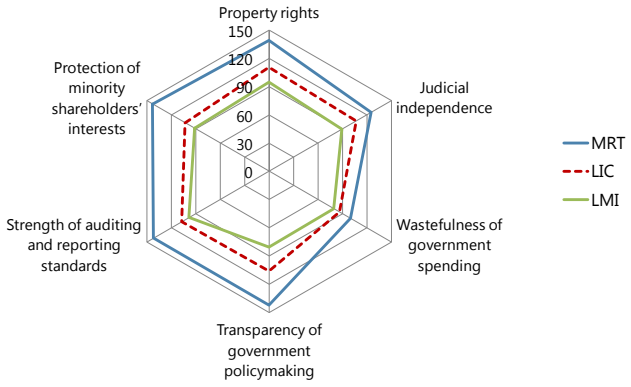
Figure 9. Legal and Property Rights
(Potential productivity payoffs from 1 std of improvement in reform index)



Source: Dabla-Norris and others, 2013.

Implications for Mauritania: Measures aimed at strengthening all aspects of governance could be highly beneficial in improving productivity, because Mauritania scores low in many governance indicators such as property rights, protection of minority shareholders, strength of auditing and reporting, and government transparency (Figure 10). In particular, Mauritania should ensure that all the preconditions for market-based economic activity are in place. In particular, property rights and the ability to enforce contracts are two critical elements of a country's institutional and legal framework that help create solid foundations for market based economic activity. They could help promote private investment including through FDI and entrepreneurship, and could help foster financial sector development.

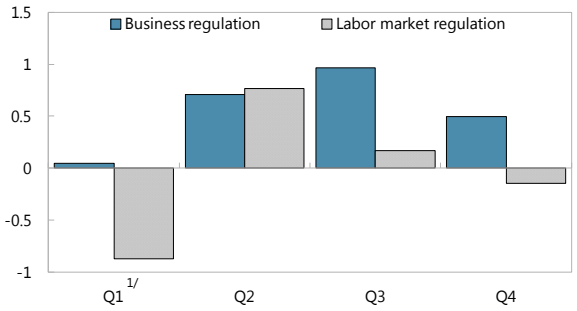
Figure 10. Institutions
(Rank)



Source: World Economic Forum, Global Competitiveness Index.

16. Business and labor market regulations. Heavy regulatory burdens can discourage international participation and severely limit a country's ability to benefit from knowledge transfers, economies of scale, and production-reallocation efficiencies. The empirical analysis suggests that although for Q1 countries reforms aimed at improving business regulations do not significantly raise the aggregate productivity growth, they are significant for Q2 countries' productivity gains (Figure 11). For labor regulations, the analysis suggests that removing excessive labor market rigidities is not positively associated with higher aggregate productivity for Q1 countries, though it is for Q2 countries. Nonetheless, policy reforms to reduce informality can also be important avenues for enhancing productivity.

Figure 11. Business and Labor Market Regulations
(Potential productivity payoffs from 1 std of improvement in reform index)

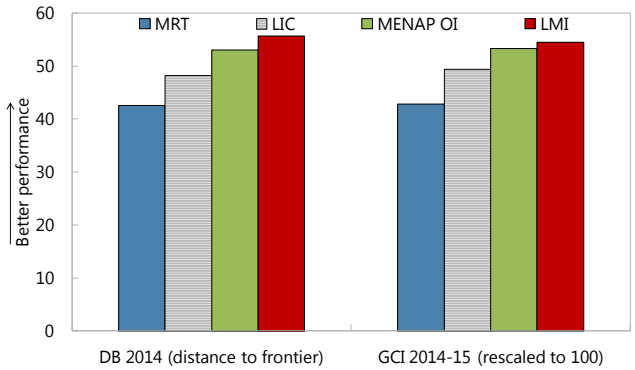


Source: Dabla-Norris et al. (2013).
1/ Business regulation not statistically significant for Q1s.

Implications for Mauritania: Mauritania scores low in most of the World Bank's Doing Business indicators (Figures 12–13). To address Mauritania's low rankings, the authorities are taking steps such as the launch of the one-stop shop to reduce the number of procedures and the cost for creating a business; the elimination of the minimum required capital to open a business; and improvements in access to finance with a modernization of the *centrale des risques* at the CBM (including all financial transactions above UM 3,000). Other measures such as the revamping of the code of commerce and the revision of the procurement code are regulatory steps in the right direction. Measures aimed at reducing administrative burdens, simplifying regulations,

strengthening competition, improving the dialogue with the private sector, and cutting red-tape will further help to boost productivity growth.[3]

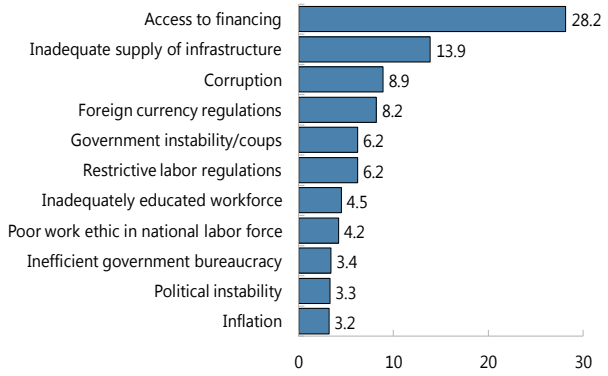
Figure 12. Business Environment in International Perspective



Sources: World Economic Forum, Global Competitiveness Index; and World Bank, Doing Business.

Figure 13. The Most Problematic Factors for Doing Business

(In percent of responses, lower is better)



Source: World Economic Forum, Global Competitiveness Index.

Boosting productive capacity

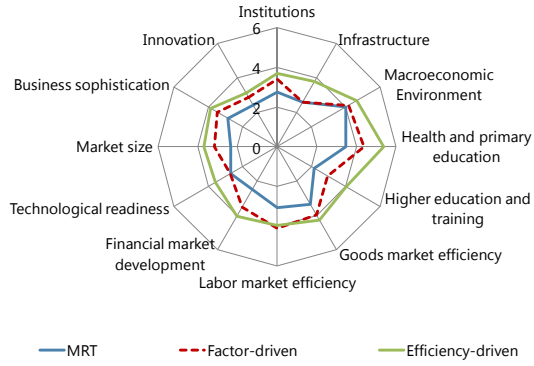
The following aspects, though not explicitly accounted for in the analysis, are also important for boosting productivity growth.

17. ***Human capital development.*** Education is a fundamental determinant of economic growth and long-term living standards. Accumulation of human capital can foster the development of skill-intensive industries and new technologies, and also boost a country's productivity performance by facilitating technological diffusion between firms. Though not explicitly accounted for in this empirical exercise because of data limitations, evidence from Aghion and Howitt (2009) suggests that primary and secondary education matters more for a country's ability to imitate the frontier technology (which is the case for lower-income and lower-middle-income countries), while tertiary education has a larger impact on a country's possibility of innovating (advanced economies). Lower-income countries will need to improve the quality and coverage of education to facilitate the shift of labor into higher-productivity industries and services. As countries move up value chains, technology transfers tend to be more skill-intensive, requiring sufficient research and development in the recipient country to adapt new technologies to local conditions.

[3] For labor market reforms, see "Growth, Employment, and Socio-Demographic Challenges in Mauritania"

Implications for Mauritania. Mauritania is a factor-driven economy (Figure 14). As Mauritania embarks on structural transformation to diversify its economic structure and export base, its economy will need to move its technology frontier toward higher efficiency. Among other things, this transformation will require additional educational skills, as the authorities acknowledge. They have started tackling the low retention rates in primary and secondary education, and are increasing the provision of specialized training in mining, public works, fishing, agriculture, and farming to enhance skills.[4]

Figure 14. Stages of Development
(Score)



Source: World Economic Forum, Global Competitiveness Index.

18. ***Improving the quantity and quality of infrastructure***. Investment in infrastructure has a positive long-term impact on a country's income level. As noted in Dabla-Norris and others (2013), empirical evidence shows that insufficient physical infrastructure is a major drag on productivity growth for emerging market economies (EMs) and even more so for LICs. Inadequate infrastructure is a key determinant of low productivity growth in the agriculture and manufacturing sectors, when compared with more advanced economies. In addition, improved quality of public investment is equally important because inefficiencies in public investment management and weak governance often distort the impact of public spending on capital accumulation. This is particularly pertinent for many resource-rich developing countries, where public investment rates have increased during the recent resource boom but investment quality suffers from relatively weak capacity in comparison with other countries.

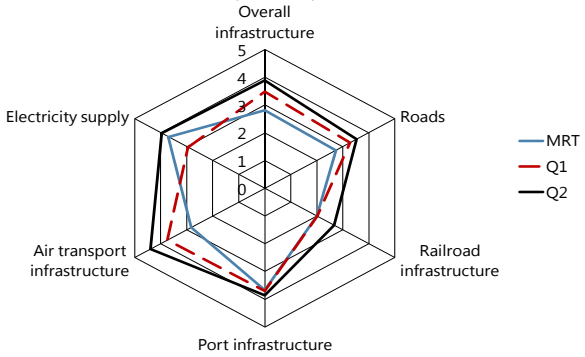
Implications for Mauritania: Mauritania compares favorably with peers in quality of electricity supply, but improvements in the quality of air transportation, roads, railroads and port infrastructures will be needed to boost productivity (Figure 15a). Similarly, on public investment efficiency, though Mauritania scores well compared to peers in the quality of appraisal, selection, and evaluation of projects, the index of public investment management practices suggests that the quality of implementation and management of projects within government investment portfolios could be improved (Figure 15b).

Mauritania has in recent years scaled up its public investment not only to enhance basic infrastructure networks such as roads, water, port, airport, and electricity, but also to decisively support key sectors such as agriculture. Continuous progress on this front, together with better implementation and management, would help improve connectivity to markets, both domestic and

[4] For education reforms, see "Growth, Employment, and Socio-Demographic Challenges in Mauritania"

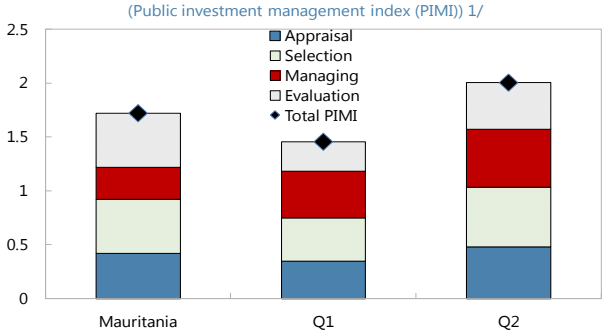
foreign, boost prospects for labor-intensive manufacturing and agriculture and thus generate positive economy-wide productivity and growth effects. In addition, addressing the infrastructure gap will also help transform the country into a more efficiency-driven economy. Given the magnitude of the infrastructure gap and the limited public resources, however, a viable strategy to develop infrastructure would require attracting private investment. Reforming the regulatory environment for infrastructure and promoting PPPs would help catalyze private investment.

Figure 15a. Infrastructure Quality Index
(Score, 1-7)



Source: Fraser dataset on "Economic Freedom of the World."

Figure 15b. Public Investment Efficiency
(Public investment management index (PIMI)) 1/



Source: Dabla-Norris and others, 2011.
1/ Higher PIMI values indicate better investment planning and implementation; 4 is the highest value.

Fiscal policy efficiency. Although not explicitly included in the empirical analysis of Dabla-Norris and others (2013), fiscal reforms could help ensure that provision of public services in education, training, and infrastructure are more efficient and better targeted, thereby fostering productivity growth. In general, the composition and quality of taxation and public spending can have significant productivity, growth, and labor market impacts (IMF, 2013; IMF, 2012).

Implications for Mauritania: Tax collection efforts in Mauritania have improved remarkably in the past years. Policymakers should seek the right balance, in mobilizing revenues with alternative revenue raising measures and tax incentives (a common practice to attract FDI and promote research and development), because tax policies (for example, corporate taxes) can affect productivity by creating disincentives for firms to engage in innovative activities. By the same token, cutting back spending in nonproductive areas such as distortionary and poorly targeted energy subsidies, and improving the efficiency of public spending in priority areas, including strengthening public financial management, could yield important productivity gains.

D. Diversification to Sustain Long-Run Growth

Export diversification

19. This section borrows the empirical results of IMF (2014) on the "Diversification and Transformation in LICs," which investigates the effect of diversification on growth for a sample of 84 countries, including Mauritania. The empirical analysis focuses on understanding whether the

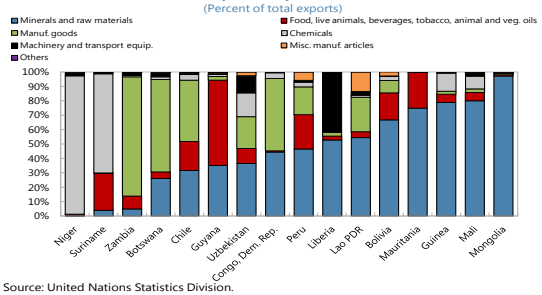
development of diversified export structure and broad-based comparative advantages are beneficial to growth.

20. The results show that export diversification has a decisive impact on growth for LICs once nonlinearities are introduced in the specification of the model.[5] A one standard deviation increase in LICs' export diversification raises their growth rate by about 0.8 percentage points in the long term, suggesting that export diversification is crucial for growth in LICs. The growth determinants identified by the model are initial GDP, government quality, investment, population growth, and government expenditure. The results provide support for both the neoclassical growth model as well as new growth theories that emphasize productive government expenditures and the quality of institutions.

21. Export diversification in LICs could yield 0.4 to 0.8 percentage points in growth rates. The model also predicts that for LICs export diversification by expanding to new products lead to similar results for the LICs and could yield 0.4 to 0.8 percentage points in growth rates. Thus, LICs can stimulate growth by diversifying their exports at the extensive and intensive margins.

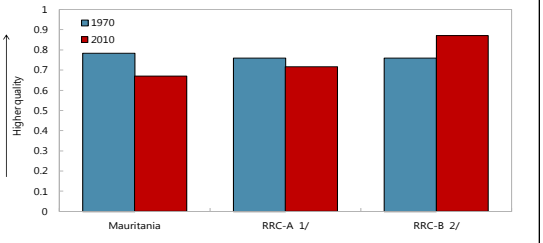
Implications for Mauritania: Even compared to other mining resource-rich countries, Mauritania's export base is narrowly focused on exports of raw mining and fishing products (Figure 16). In addition, export diversification quality has declined since the 70's similarly to most LICs within the resource-rich group (Figure 17). Mauritania's long-term growth can benefit from export diversification of products, along the payoffs consistent with the average LIC. A more diversified export base will help reduce vulnerabilities to external shocks and growth volatility, and would promote more sustained growth. This will help create jobs and ease the path to more inclusive growth. In addition, diversification, if coupled with reforms geared at greater trade openness and competitiveness, will open Mauritania's access to new markets.

Figure 16. Mauritania and Selected Resource-Rich Comparators: Export Composition
(Percent of total exports)



Source: United Nations Statistics Division.

Figure 17. Mauritania and Selected Resource-Rich Comparators: Export Quality
(Index, higher is better)



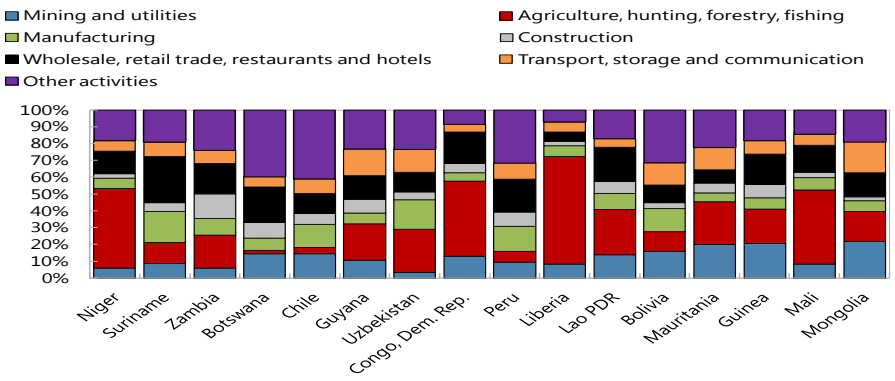
Source: IMF (2014), Export Diversification and Quality Dataset.
1/ Includes the following resource-rich countries: Bolivia, Botswana, Congo, Guinea, Guyana, Lao P.D.R., Liberia, Mali, Niger, Uzbekistan, and Zambia
2/ Includes the following resource-rich cou

[5] If the existence of nonlinearities (that countries become less diversified after they achieve certain income level) is not introduced, the model predicts that export diversification does not have an effect on growth volatility in the global sample.

Output diversification

22. LICs can derive large benefits from diversifying their production structure, even more so than from export diversification. When looking at whether output diversification can boost growth, the empirical analysis found that when nonlinearities are introduced, one standard deviation in output diversification raises the average annual growth rate by about 1.4 percentage points. In addition, output diversification can help reduce output volatility and allow for more sustained growth in the long term.

Figure 18. Mauritania and Selected Resource-Rich Comparators: Sectoral Composition of Real GDP

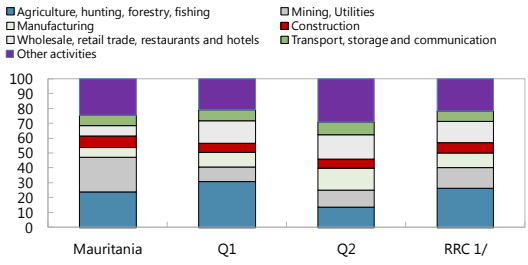


Source: United Nations Statistics Division.

Implications for Mauritania: Despite certain caveats, diversifying the production base and the export base could boost Mauritania's average annual growth rate by 1.4 and 0.8 percentage point, respectively, a payoff similar to that for other LICs. In addition to greater trade openness, export diversification will help reduce growth volatility emanating from exogenous shocks. Mauritania's production base is more diversified than those of other mining resource–rich countries (Figure 18), which could bring additional gains to growth potential.

However, the production base lacks output diversification in terms of value added of real sectors, which also matters for growth (IMF 2014). The value added of the major economic sectors such as agriculture, farming, fishing, manufacturing, and services are low when compared with other resource-rich and Q1 countries (Figure 19). Diversification in output and exports are interlinked and can be considered as the outcome of structural transformation—the dynamic of allowing reallocation of resources toward more productive sectors. In addition, both output and export diversification help reduce output volatility, which helps sustain growth in the long term and creates more opportunities for job creation that promotes

Figure 19. Mauritania and Selected Comparators: Value Added by Economic Activity
(Percentage share distribution)



Source: United Nations Value Added Database.
1/ includes average of resource rich countries.

growth inclusiveness. The authorities recognize that the hopes of boosting and sustaining growth rest on their ability to transform and diversify the productive base away from sectors exposed to exogenous shocks, and to develop both human capital and physical infrastructure so as to accommodate planned changes in industrial structure. The authorities are therefore developing exporting industries in red meat, poultry, dairy products and fishing together with the development of supporting infrastructure; and setting up PPPs.

E. Conclusion and Recommendations

23. Meeting the challenge of boosting productivity, sustaining long-term growth and improving inclusiveness will depend crucially on the ability of the authorities to successfully implement an ambitious structural reform agenda in a manner that is mindful of their priorities and competitive advantage, while also strengthening institutional capacity. While acknowledging the difficulty of the tasks ahead, reforms to support economic productivity growth and diversification in Mauritania should be pursued, with the following items given priority:

- Continue strengthening the macroeconomic policy framework;
- Pursuing banking sector reforms to support financial stability using the roadmap of the recently concluded FSAP;
- Invest in improving human capital development;
- Continue improving the business climate to facilitate private sector development;
- Strengthen the efficiency of public infrastructure investment, to ensure that quality infrastructure is put in place;
- Improving governance and strengthening institutions to support policy predictability; and
- Developing a solid export promotion strategy that encompasses all aspects of international trade (barriers to trade, competitive advantage, etc.).

24. Above all, countries' experiences in successfully implementing productivity-enhancing reforms and structural transformation show that success is largely influenced by the authority of the executive power and broad ownership of reforms. Mauritanian policy makers will have to ensure that these elements of success are given due consideration.

Annex. The Model

Empirical framework assessing the role of structural and institutional factors in driving productivity growth.

a. Model estimated using standard panel productivity growth equation.

$$\Delta y_{i,t} = \alpha + \beta y_{i,US,t-1} + \gamma X_{i,t-1} + \mu_t + v_i + \epsilon_{i,t'}$$

$\Delta y_{i,t}$: annual productivity growth rate.

$y_{i,US,t-1}$: one-year lag of productivity gap with the United States; this captures convergence effects.

$X_{i,t-1}$: one-year lag of each reform indicator or institutional variable,

μ_t , v_i: the year dummies and the country dummies. The country fixed effects control for any time-invariant country characteristics (such as geographical location, historical legacies, and legal origins) that could affect both productivity growth and adoption of reforms.

b. Reforms and institutional factors ($X_{i,t-1}$):

   i. Financial sector reforms:

      a. Banking system reforms: interest rate controls, credit controls, privatization, and banking supervision

      b. Capital market development

   ii. Trade and FDI liberalization

   iii. Institutional reforms: legal system and property rights, sound money, freedom to trade internationally

   iv. Product market and regulatory reforms: agriculture, business regulation, and labor market regulations

   v. Human and physical capital:

      a. Human capital: years of secondary and tertiary education

      b. Physical capital: electricity and roads

The scope of reforms is limited to the IMF de jure reforms and liberalization in the real and financial sectors (domestic financial systems, trade, liberalization of agriculture, and FDI).

TFP Regression Results

	Q1	Q2	Q3	Q4	Full sample
Financial sector reforms					
Banking system reforms [1/]	2.939	6.365	5.933	0.459	3.272
	[1.736]*	[1.545]***	[1.872]***	[0.639]	[0.656]***
Interest rate controls	1.240	1.592	1.429	0.363	1.033
	[0.964]	[0.737]**	[0.847]*	[0.304]	[0.307]***
Credit controls	0.850	2.906	1.004	0.488	1.182
	[0.986]	[0.819]***	[0.815]	[0.341]	[0.343]***
Privatization	1.047	2.475	3.059	-0.144	1.402
	[1.011]	[0.863]***	[0.879]***	[0.372]	[0.363]***
Banking supervision	4.011	4.079	4.926	0.628	2.206
	[1.963]**	[1.251]***	[1.549]***	[0.443]	[0.473]***
Capital market development	2.581	2.077	6.43	0.86	2.359
	[1.843]	[1.224]*	[1.002]***	[0.431]**	[0.447]***
Trade and FDI liberalization					
Freedom to trade internationally	0.351	0.702	0.355	0.098	0.287
	[0.167]**	[0.158]***	[0.127]***	[0.084]	[0.061]***
Trade (tariff rates)	4.196	0.190	-0.670	-1.434	0.497
	[1.490]***	[1.029]	[1.099]	[0.774]*	[0.542]
FDI liberalization	1.513	2.799	1.668	0.249	1.472
	[1.302]	[0.762]***	[0.762]**	[0.351]	[0.338]***
Institutional reforms					
Legal system and property rights	0.597	0.372	0.363	-0.061	0.149
	[0.220]***	[0.178]**	[0.194]*	[0.101]	[0.082]*
Sound money	0.405	0.477	0.097	-0.010	0.185
	[0.125]***	[0.112]***	[0.109]	[0.066]	[0.051]***
Product market and regulatory reforms					
Agriculture	0.320	3.959	-0.074	1.115	1.982
	[1.065]	[0.880]***	[0.938]	[0.834]	[0.458]***
Business regulation	0.044	0.704	0.965	0.493	0.491
	[0.364]	[0.277]**	[0.214]***	[0.128]***	[0.115]***
Labor market regulation	-0.872	0.762	0.165	-0.149	-0.244
	[0.482]*	[0.458]*	[0.250]	[0.107]	[0.113]**

Source: Dabla-Norris and others, 2013.

[1/] Includes interest controls; credit controls such as directed credit, reserves requirements; privatization; and supervision reforms.

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PUBLIC INVESTMENT, NATURAL RESOURCE AND DEBT SUSTAINABILITY[1]

Mauritania—a low-income country endowed with significant mining resources—has embarked upon an ambitious public investment program to address infrastructure gaps and support growth in the non-extractive sectors of the economy, with the objective to achieve faster job creation and poverty reduction. This study applies the Debt, Investment, Growth and Natural Resources (DIGNAR) model to analyze the benefits of the higher public investment as well as the impact of the associated financing requirements on the country's debt and fiscal policy path. The model simulations suggest that the authorities should be prudent regarding their investment plans, in particular in the event of further declines in iron ore prices, and should be ambitious in improving their investment management capacity. In particular, their currently planned public investment path will be costly in terms of foregone private consumption in the medium run—including under current commodity price projections.

A. Introduction

1. The mining industry is the main driver of Mauritanian exports. Extractive industries comprised on average about 83 percent of the country's total exports in 2009–13. Iron ore is the largest component of Mauritania's commodity export basket, alone accounting for over half of overall exports. The iron ore mining industry has substantial expansion plans, with the public mining company SNIM[2] aiming to triple its mining output in the next 10 years, with additional expansion of mining production expected from the private sector. The projected increase in iron exports will be a major driver of the projected strong output growth over the next decade.

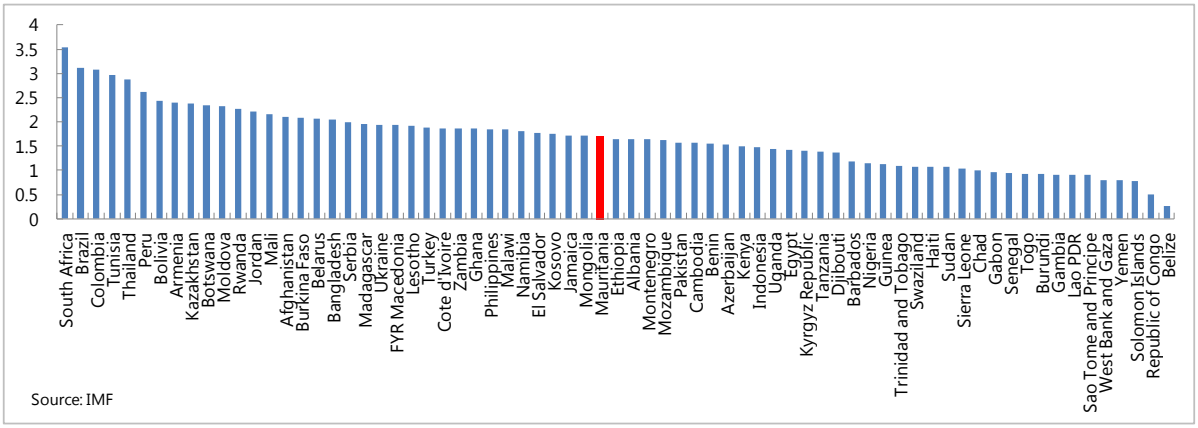
2. The authorities have taken advantage of the recent period of high iron prices and access to concessional borrowing to ramp up investment plans. Mauritania needs to address urgent investment needs to become a middle-income country. Both job creation through economic diversification and improvement of the living standards of the population require better infrastructure, including transport and electricity generation and distribution. Further irrigation in the south of the country can increase agricultural output and increase employment. The authorities have recently increased public investments to address these needs more rapidly, taking advantage of higher fiscal revenues from extractive industries due to higher commodity prices during 2012–14 and available, mostly concessional, borrowing.

[1] Prepared by Grace B. Li and Frantisek Ricka.

[2] SNIM is a majority state-owned iron mining company (with foreign minority shareholders). Its dividend payments to the state represent a major budget income category. SNIM is currently the only major iron producer in Mauritania, while private companies have plans to start production in the coming years.

3. Investment in Mauritania, however, is subject to the usual capacity constraints prevalent in lower-income countries. An IMF study (Dabla-Norris et al. (2011)) calculated a Public Investment Management Index (PIMI) for a number of emerging markets and lower-income countries. PIMI is a composite index of the efficiency of the public investment management process that draws upon country diagnostics on public investment management systems conducted by the World Bank, existing budget survey databases and assessments carried out by donors, and expert surveys (Figure 1). The index evaluates four stages of public investment: appraisal, selection, managing and evaluation. Mauritania is positioned roughly in the middle of the PIMI sample of countries (and behind, for instance, Tunisia but ahead of Egypt). While the country can achieve positive results through public investments, capacity to invest efficiently is an issue to consider when making investment decisions, and its improvement can lead to significant benefits.

Figure 1. Public Investment Management Index (PIMI)



B. Model Description

4. The DIGNAR model provides a framework in which to analyze the benefits of higher investments versus their costs in terms of the impact on a country's debt level.[3] The model is designed to analyze the nexus between natural resources revenues management, public investment, and public debt in the context of investment capacity constraints. The analytical framework is based on Araujo et al. (2013), Buffie et al. (2012), Berg et al. (2013) and Melina et al. (2014) and includes a natural resource sector, limited investment efficiency and absorptive capacity as well as a detailed fiscal specification reflecting the choices by the authorities in financing investments through external debt, taxes and drawings from the sovereign wealth fund (currently Mauritania's oil fund, which was set up at the start of the short-lived oil boom in 2006 and amounted to almost US$100 million, equivalent to 2 percent of GDP in 2014). Taking resource revenues and public investment policy as

[3] The description of the DIGNAR model is based on the DIGNAR Selected Issues Paper in the Republic of Congo 2014 Article IV staff report.

given, the framework can simulate the macroeconomic outcomes of investing resource revenue, accounting for the investment-growth linkage and the feedback effect on non-resource revenue. In allowing the evaluation of the level of future private consumption after public investment has borne its fruit, against the cost of foregone current private consumption resulting from financing that investment through taxes, the model can also provide insights regarding the intergenerational impact of the public investment program.

5. The DIGNAR model provides a stylized representation of a small open economy with iron production and public investment needs like the Mauritanian economy. The particular features of the model are:

- *The government finances its consumption and investment expenditure with taxes, debt and savings accumulated in the sovereign wealth fund (SWF).* The path of external concessional debt is given by the projection of repayment of the existing stock of concessional debt and new concessional debt disbursements consistent with those in the debt sustainability analysis (DSA) based on the needs of the public investment program. The government thus only decides the level of non-concessional (commercial) external debt. Commercial foreign debt is subject to a risk premium that depends on the stock of external debt. Fiscal revenues are collected from the extractive and non-extractive sectors. The government chooses the consumption tax (VAT) rate, starting from the initial level of 14 percent in place at the end of 2014. In every period, the government can choose to close the fiscal gap with an increase in taxes and/or debt, as well as by drawing down savings in the SWF. While Mauritania's SWF is currently the country's oil fund, the model application assumes that, should the government collect substantial revenues from the extractive sector of the economy, it would wish to save some of the receipts and could do so in a more general extractive SWF.

- *The physical capital formation process[4] is subject to absorptive capacity and government efficiency constraints.*[5] In particular, effective government investment is a fraction of government expenditure on investment. In the Mauritanian model calibration, investment efficiency (the ratio of effective investment to investment expenditure) is currently assumed at 0.5 in the non-natural resource sector, a value suggested for other lower-income countries, and rising over the next decade to 0.6, a level applied in the cases of some transition economies (e.g. Kazakhstan).[6] This increase assumes that Mauritania will implement substantial improvements to its public investment management process over the coming ten years across the four areas used to calculate the PIMI index and, especially, in project management and appraisal, where it is

[4] The model only considers one single type of productive public capital formation. It does not allow exploring sectoral composition of investment (and possibly different investment efficiency in various sectors) or issues related to human capital accumulation.

[5] Human capital investment could be another source of investment relevant for economic diversification. See accompanying paper on structural reform and economic diversification by A. Toure.

[6] This implies that efficient investment accounts for 50 percent of total investment expenditure.

lagging behind its peers. Furthermore, to capture the idea of rising investment costs due to absorptive capacity constraints, investment efficiency is assumed to fall when the expenditure level exceeds a certain threshold.[7]

- *Two types of households*. Rule-of-thumb consumers are liquidity constrained and consume all of their disposable income in each period. Optimizing households are subject to borrowing constraints and have only limited access to financial markets to acquire international bonds with portfolio adjustment costs, which restrict the degree of capital account openness. The private sector pays a premium on foreign debt over the interest rate that the government pays on its own external debt.

- *Three production sectors*. In the non-extractive economy traded and non-traded goods are produced according to a Cobb-Douglas production function with three inputs: labor, private capital and public capital. The difference between these two sectors resides in the modeling of technological progress—assumed to be exogenous in the non-traded sector whereas in the traded sector it is subject to learning-by-doing externalities and depends positively on previous-period output. The intuition is that once traded-sector production starts falling, knowledge and skills can be lost. Growth in both sectors of the non-extractive economy is endogenously determined as a function of behavior of firms and households, which in turn respond to government policies and outcomes in the third sector. The latter, the extractive sector, produces iron ore and output is assumed to be exogenous, with both price and quantities taken as given. Given iron ore's dominant role in Mauritania's extractive sector and the projected rise in iron ore production, iron ore mining is taken to represent Mauritania's entire extractive sector.

C. Investment and Revenue Scenarios

6. The DIGNAR analysis of Mauritanian public investments is based on a 2x2 matrix of scenarios, considering a baseline and an aggressive investment path under baseline and downside iron ore price projections.

- *Baseline investment path* is consistent with the projections in the staff report, which assumes a high level of public investments over the next three years. Public investment as a percent of GDP remains anchored at the 2018 level (around 10 percent of GDP) afterward. This path is driven by the authorities' investment plans in conjunction with a projection for the extractive sector output and extractive fiscal revenues as well as new external debt disbursements embedded in the DSA.

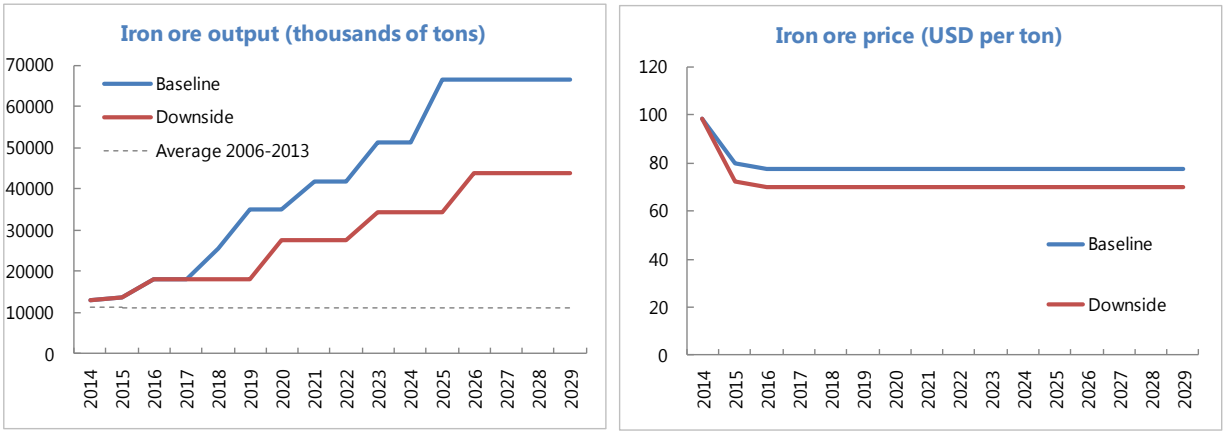
[7] Absorptive capacity constraints start binding when public investment rises above 75 percent from its initial value. The calibration of the model implies that the average investment efficiency approximately halves when public investment spikes to around 200 percent from its initial value.

- *Aggressive investment path* assumes that the authorities continue investing at the baseline peak level currently projected for 2015, at almost 15 percent of GDP, through 2018 before starting the decline projected in the baseline to reach a level of about 10 percent of GDP by 2021.

- *Baseline iron ore price projection* is based on an iron ore price of USD72 per ton, which is close to the prevailing price in the world commodity markets in late 2014. This projection also assumes that all currently planned mining projects come to execution and start production within one year of the scheduled date. This will more than triple the iron ore production of Mauritania over the next decade and production will be anchored at over 65 million tons per year by 2030.

- *Downside iron ore price projection* assumes a further 10 percent decline in prices to about USD 65 per ton. This is close to futures market prices in 2015-16 as of end-2014. It is assumed that the lower price would lead to canceling of at least one substantial mining project and delays in the implementing others. The overall iron ore mining capacity will still increase substantially over the coming years to 44 million tons by 2026.

Figure 2. Mauritania: Iron Ore Projections, 2014–29



Source: IMF staff estimates.

D. Results

7. The simulations show that the ambitious public investment plans would increase output but also lead to a decrease in private consumption under current commodity prices.

- *The results for the baseline investment path under the baseline iron ore price projections suggest that the authorities' current investment plans are sustainable but hurt private consumption.* Given the high poverty levels in Mauritania, foregone consumption will be costly. The model would finance the beginning of the investment plan with a combination of additional debt, and drawings on the resources currently in the oil fund, later replacing the latter source with an

increase in consumption taxes once the oil fund runs out of resources. This policy change will decrease private consumption by about one percent below its steady state value in the medium run. The lower consumption will in turn reduce non-extractive output to its steady-state value after an initial rise. Only once the investments have begun fully bearing fruit in 2019 will consumption start increasing, returning to the steady state value by 2028, with non-extractive output rising almost one percent above its steady state. In the meantime, total public external debt rises substantially in the coming two years, peaking at slightly over 70 percent of GDP, but then stabilizes and begins steadily declining by 2019.

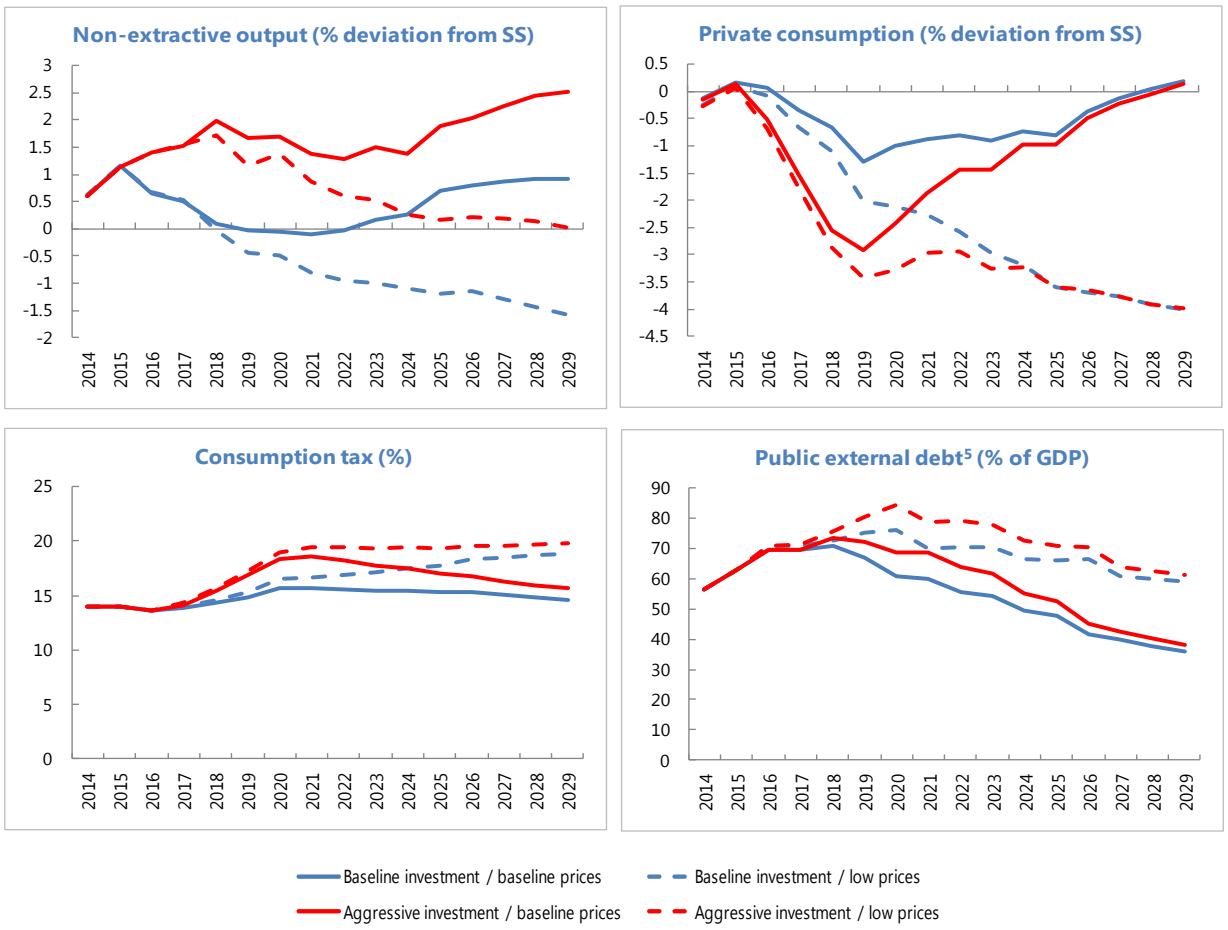
- *If iron prices fall further and mining expansion projects are delayed, the current investment plan will become very costly in terms of foregone private consumption and will reduce nonextractive output.* As extractive revenues of the government fall—due to the lower price and output in iron mining relative to the baseline scenario—the authorities will have to increase taxes and public external debt further. This will result in a sharp fall in private consumption and a substantial decrease in non-extractive output in the medium run. At the same time, public external debt will increase further and then decrease more slowly than in the baseline price scenario. Overall, these results suggest that the authorities' baseline investment plans would be very costly to maintain in terms of foregone private consumption should commodity prices decrease further[8]

- *A more aggressive investment path would result in higher output at a substantially higher foregone consumption cost in the medium run.* A longer period of scaled-up investments would succeed in increasing non-extractive output more than 2.5 percent above the steady state, almost three times the difference achieved in the baseline investment scenario. Yet, this would come at the cost of substantially higher consumption taxes required to finance the investment path, which would, in turn, depress private consumption by up to 3 percent below its steady state value. Consumption would eventually recover, but the overall consumption loss in the medium and long run would be very large and likely exceed the benefits of the successful efforts to increase non-extractive output.

- *A further iron ore price decline would be particularly damaging to private consumption levels if the authorities pursue a more aggressive investment path.* The negative impact on consumption would effectively combine the declines seen in the previous two scenarios, resulting in a steep drop in the next five years followed by further stagnation and even decrease in the long run. Non-extractive output would still initially increase above its steady-state level as a result of the higher investments but then fall back as a result of the fall in private consumption. The level of external public debt would rise above 80 percent of GDP by 2020 and only slowly decrease after that. Overall, the costs in terms of consumption as well as the debt dynamics of maintaining an aggressive public investment plan in the face of lower iron prices would be very large.

[8] These series exclude the debt owed by Mauritania to the Kuwaiti Investment Authority (KIA) from which the country is seeking debt relief.

Figure 3. Mauritania: Model Simulations, 2014-29



Source: IMF Staff estimates

E. Conclusions and Policy Implications

8. The DIGNAR application points to the potential costs in terms of foregone private consumption of a scaled-up public investment plan in Mauritania, calling for flexibility in implementation should extractive revenues fall short of expectations. While higher levels of public investments will benefit the country in terms of non-extractive output and eventually private consumption, in the medium run their cost will be substantial. In particular, their financing will require higher debt and tax levels, the latter of which will depress private consumption even under the baseline investment plans and price projections. The model suggests that a higher-than-currently-envisaged investment path would have even larger costs. Even in the baseline investment path, the authorities will need to remain flexible in implementation in the face of volatile global commodity prices. Should prices decrease further and mining expansion projects be delayed or scaled back, too much of the planned investments would have to be financed through higher debt or taxes, potentially hurting private consumption even in the long run.

9. Further improvements in investment capacity would increase the benefits of public investments in Mauritania and ultimately reduce their costs. The model application already assumes an improvement over the next decade in the country's public investment efficiency. A faster or more substantial improvement would increase the positive impact of the planned investment path on the economy, or alternatively achieve the same results as in the model baseline at lower foregone consumption costs. The components of the PIMI index with particularly low values relative to peers—those capturing project management and appraisal—suggest starting points for efforts to further improve public investment efficiency in Mauritania.

Annex. Key Model Equations

The economy features three sectors: natural resource production, nontraded goods production and traded goods production. Since the natural resource sector employs a small and stable fraction of labor force and a large part of investment is financed by foreign investment, we assume that natural resource production follows an exogenous process described by

$$\frac{\tilde{y}_{O,t}}{\tilde{y}_O} = \left(\frac{\tilde{y}_{O,t-1}}{\tilde{y}_O}\right)^{\rho_{yo}} exp\left(\varepsilon_t^{yo}\right),$$

where $\rho_{yo} \in (0,1)$ is an auto-regressive coefficient and $\varepsilon_t^{yo} \sim iid\ N(0, \sigma_{yo}^2)$ is the natural resource production shock. Due to the small open economy assumption the international natural resource price is taken as given and evolves according to

$$\frac{\tilde{p}_{O,t}}{\tilde{p}_O} = \left(\frac{\tilde{p}_{O,t-1}}{\tilde{p}_O}\right)^{\rho_{po}} exp\left(\varepsilon_t^{po}\right),$$

where $\rho_{po} \in (0,1)$ is an auto-regressive coefficient and $\varepsilon_t^{po} \sim iid\ N(0, \sigma_{po}^2)$ is the resource price shock.

The government collects natural resource revenues from its production

$$t_t^O = \tau^O s_t\, \tilde{p}_{O,t} \tilde{y}_{O,t},$$

where τ^O is royalty tax rate that can be made time-varying, if necessary. s_t is the relative price of traded goods to the consumption basket. Assuming that the law of one price holds for traded goods implies that s_t also corresponds to the real exchange rate.

Firms in both nontraded and traded sectors produce according to a Cobb-Douglas production function using labor, private capital and public capital

$$y_{i,t} = z_i (k_{i,t-1})^{1-\alpha_i} {L_{i,t}}^{\alpha_i} {k_{G,t-1}}^{\alpha_G},$$

where z_i is a total factor productivity scale parameter, k_i is the sectoral-specific private capital, L_i is the sectoral-specific labor, k_G is the public capital, α_i is the labor share of sectoral income and α_G is the output elasticity with respect to public capital, $i \in \{N, T\}$ represents nontraded or traded sector.

We explicitly model inefficiency in the public sector. Effective investment is given by

$$\tilde{g}_t^I = \epsilon(g_t^I) g_t^I,$$

where g_t^I is government public investment expenditure, and $\epsilon \in (0,1]$ governs the efficiency of public investment. The law of motion of public capital is given by

$$k_{G,t} = \left(1 - \delta_{G,t}\right) k_{G,t-1+}\, \tilde{g}_t^I,$$

$\delta_{G,t}$ captures the time-varying depreciation rate due to lack of maintenance on existing public capital.

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