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Macroeconomic and distributional consequences of premature deindustrialization in Chad: A CGE analysis

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Abstract

Many Sub-Saharan African countries have experienced rapid periods of deindustrialization despite substantial economic growth and high demand for manufactured goods. The existing growth literature has found that structural change and growth go hand-in-hand and that structural change towards high productive sectors is often associated with industrialization. From these two stylized facts, recent work by development economists has established that Sub-Sahara Africa has failed to industrialize. Several theories on the origin of this premature deindustrialization have also been proposed. However, most studies have only focused on a highly aggregated manufacturing sector, ignoring the existing heterogeneities within the manufacturing sector and the linkages with a highly growing—productive—service sector. Furthermore, most of the evidence on deindustrialization to date is based on cross-country econometric analysis and no previous study has investigated these issues using an input-output framework. This study uses a dynamic CGE model to test alternative (re)industrialization options for Chad.

1. Introduction

Many Sub-Saharan African countries have experienced rapid periods of deindustrialization despite substantial economic growth and high demand for manufactured goods. The existing growth literature has found that structural change and growth go hand-in-hand and that structural change towards high productive sectors is often associated with industrialization. From these two stylized facts, recent work by development economists has established that Sub-Sahara Africa has failed to industrialize. Several theories on the origin of this premature deindustrialization have also been proposed. However, most studies have only focused on a highly aggregated manufacturing sector, ignoring the existing heterogeneities within the manufacturing sector and the linkages with a highly growing—productive—service sector. Furthermore, most of the evidence on deindustrialization to date is based on cross-country econometric analysis, and no previous study has investigated these issues using an input-output framework.

Industrial policy has been key to almost every (re)industrialization process to date. Many African countries recently renewed its interest in industrial policy but faces a crossroads. In this paper, we comprehensively design an alternnative development strategy to engineer structural change and enhance industrialization of Chad. The contribution of this paper is two-fold. First, we organize national accounts and household survey data into a social accounting matrix which is a comprehensive analytical framework representing all economic transactions that took place in Chad in 2016. Second, we develop a dynamic computable general equilibrium model for Chad to highlight the transmission mechanism of industrialization.

This study focuses on Chad for several policy reasons. As a landlocked country located in the heart of Africa, Chad covers an area of 1,284,000 km² with a population of 15,332,132 inhabitants. The Human Development Index (HDI) stood at 0.404 in 2017 and governance indicators in the public sector highlight institutional and organizational weakness. Despite some recent progress, the Mo Ibrahim Index of Governance in Africa, which assesses countries' progress in governance, and the World Bank's World Governance Indicators Index rank Chad among the countries with weak national policies and institutions. The advent of the oil era in 2003 brought about structural changes and major challenges in public policy, including public financial management. Non-oil economic growth was relatively strong over the period 2003-2014. Since 2011, the completion of numerous economic infrastructure projects (refinery, cement plant, optical fiber, etc.), which should make it possible to meet the minimum conditions for growth and diversification of the national economy, have not been able to lay the foundations for industrialization. The results of this study will, therefore, inform policy on promoting growth and development through diversification and industrialization.

In this paper, we will experiment with the performance of priority sectors using a simulation model. The model used is a dynamic model in a new series of computable general equilibrium and microsimulation models. This model has special features specific to the Chadian economy. One of its peculiarities lies in the fact that it incorporates the demand functions of nested goods, where similar products are combined at the lower level to form a composite good (e.g., food, services, manufacturing products), with total household consumption of the composite goods then being determined in the upper nested part of the demand function. The production function is given by the same stepwise nesting. The lower level optimally combines the various components of value-added, which are combined at a higher level with intermediate inputs to form sectoral production. The model also offers the possibility of taking into account unemployment in the factor market because it is formulated and solved as a problem of mixed complementarity. This study uses an updated and sufficiently disaggregated Chadian Social Accounting Matrix (SAM).

2. The economy-wide model for Chad

2.1. Recursive dynamic CGE model

This study applies a recursive dynamic CGE model that includes a microsimulation and poverty module. The general specifications of the CGE model follow the basic structure of the single-country model as described by Thurlow, J. (2004) and Diao, X. et al. (2012). The CGE model has 34 production sectors and assumes constant returns to scale technology and perfect competition. The model includes three factors of production – agricultural land, capital, and composite labor. The composite labor in turn represents a nested constant elasticity of substitution (CES) aggregation of three different labor types, namely: urban formal, urban informal, and rural. Production in each of the 34 industries is represented by a Leontief function of intermediate inputs and value-added. Each sector produces outputs with fixed yield coefficients and allocates them to market sales or home consumption. With regard to marketed production, producers are assumed to optimally deliver output to the domestic and export markets, given the relative prices and the imperfect transformability between exports and domestic sales expressed by a constant elasticity of transformation (CET) function. The producer price of exported goods (called the export price) is the world price adjusted by the exchange rate, export taxes, and transaction costs.

Similar to the export side, the model adopts the Armington assumption of imperfect substitutability between imported and locally produced goods on the consumer side. The consumer price of imports (called the import price) is the world price adjusted by the exchange rate and tariffs, plus the transaction costs per unit of import. Finally, because Chad accounts for a very small share of world trade, the small-country assumption is adopted for both import and export markets. This implies that Chad faces perfectly elastic world supply and demand at fixed world import and export prices. On the demand side, the model also makes it possible to account for home consumption of its own production. This property allows for the modeling of consumption by households of some of their own production instead of selling it at a low price or purchasing similar goods at a high price. The CGE model includes one aggregate household since the income distribution analysis is performed using the microsimulation model. Final household demand follows a linear expenditure system (LES) derived from the maximization of the Stone-Geary utility function subject to a budget constraint. Optimization leads to demand functions for marketed commodities and for home-produced commodities. Demand for marketed commodities is represented by an LES function of total household consumption expenditures, a commodity's composite market price, and other commodity prices. Demand for home-produced commodities is free of transaction costs and uses producer

prices.

The CGE is a dynamic recursive model, which means that certain parameters are updated between periods based on historical trends or the results of previous periods. The duration is generally 10 years or more, with each equilibrium period representing a single year. The model now provides an exogenous picture of demographic and technological changes. Changes in population, labor supply, human capital, and total factor productivity (TFP) are derived from historical trends. Capital accumulation is determined endogenously, with investments from the previous period generating new capital stocks. Although the allocation of new capital is influenced by the sectoral shares of gross operating surplus, the final allocation depends on capital depreciation and relative gains. Sectors that generated above-average returns in the previous period will receive a larger share of new capital in the current period. The model takes account of the change in distribution by (i) splitting growth across all sectors, (ii) taking into account the employment effects of factor markets and the price effects of product markets, and (iii) applying these two effects to each household surveyed on the basis of specific factor incomes, income, and expenditure. The structure of the relationship between growth and poverty is therefore, explicitly defined ex ante on the basis of the country-specific structures and characteristics observed. This definition allows the model to capture and compare the results with respect to the distribution of economic growth across sectors.

These assumptions relate to the current account, the government's balanced budget, and the savings or investment account. Essentially, we assume that the real exchange rate adjusts to maintain the balance of trade (X-M), which is fixed in foreign currency. Thus, the country cannot borrow abroad but must generate export revenues to finance its imports. Although this assumption realistically limits the degree of import competition on the domestic market, it also underlines the importance of export-oriented sectors, including the oil sector. For the budget account, tax rates and consumption expenditure are determined exogenously, allowing budget savings to adjust to ensure a balance between government revenue and expenditure. In other words, changes in total nominal absorption (C + I + G) are distributed proportionally among its components. This is achieved through proportional adjustments to marginal savings and direct tax rates, with the rates of indirect taxes (T) remaining constant. Finally, we assume that total investment adjusts to changes in national savings by under the savings-driven investment closing rule. These last two closures will allow the model to capture the negative implications of the crowding-out effect resulting from the lower government revenues when the growth structure shifts towards paying sectors lower taxes.

We hypothesize that there is underemployment of labor input (possibility of unemployment). In adopting this closing rule, we assumed that real wages are rigid and that there is the mobility

of workers between different sectors of activity. Therefore, it is the level (labor supply), rather than the wage, which is considered as a factor in the aggregate employment adjustment to ensure balance in the labor market. As in any other economic model, our model has its limits. It does not take into account the interaction between sectoral growth (e.g. oil) and the degradation of the environment, which has become increasingly important in the analysis of options for growth, given the climatic conditions. Environmental degradation challenges the long-term development of the economy and must be seriously considered in a development strategy.

2.2. Data

With regard to the core data, this study employs an updated and well disaggregated 2016 SAM. Although it focuses on the manufacturing sector, the SAM also contains information on the non-manufacturing sectors thereby capturing the sectoral backward and forward interlinkages. Table 1 throught 3 show that the oil and gas sector is a major contributor to total production. However, its contribution to value-added is low, and the sector remains very capital intensive. The hydrocarbons sector contributes about 6.22% of the total value-added while its contribution to production is estimated at about 12%. This is due to the fact that its production structure remains dominated by the use of intermediate products (61.32%). The formal labor factor constitutes only 8.23%. Food-producing agriculture contributes most to the value-added of the Chadian economy, accounting for about 20% of total value-added. This sector is relatively very capital-intensive (91.78%) and informal labor-intensive (1.12%). After food-producing agriculture, come the trade and livestock, forestry and fishing sectors. As can be seen, the trade sector is also capital-intensive and informal labor-intensive, which reduces the contribution of the formal labor factor. Indeed, non-formal labor is a fairly perfect substitute for capital in an agricultural sector characterized by small farmers and self-sufficient agriculture and retailer.

[Table 1 and Table 2 around here]

Moreover, Chad's manufacturing sector has very low value-added, much lower than that of agriculture, and indeed all these sectors are intensively capital-intensive and informal labor-intensive. Contributions to value-added are of the same order of magnitude in the manufacturing sectors, generally less than 2%. However, only the meat and fish slaughtering and processing sector contributes 6.04% in the total value added. It is followed by the beverage sector (1.08%) and other agro-food products (1.45%). This reflects the fact that Chadian manufacturing industry is generally concentrated on food processing activities with low added value, which also explains the low quality of jobs.

5

The service sector is quite efficient and can contribute to the competitiveness of the Chadian economy. The significant contribution of the transport and post and telecommunications sectors to value-added (1.89% and 5.05% respectively) could indicate some success in terms of trade for a landlocked country.

In terms of trade, Chad remains dependent on imports of manufactured goods and services. Transport equipment and other industrial products account for 33.89%, while the transport sector and public administration services account for 14.62 and 14.41% respectively. In addition, this dependence on imports creates strong competition for domestic production.

Several labor-intensive sectors face strong competition from imports. Indeed, the import penetration ratio is extremely wide in several manufacturing sectors, including transport equipment and other industrial products (98.2%), chemical products (97.89%), paper, cardboard, published and printed products (73.92%), other non-metallic mineral products and construction materials (68.86%), and tobacco products (66.89%). These are generally made up of processed food products (11.5%), refined petroleum (19.2%), and chemical products (12.3%). Most of these sectors, although accounting for a minimal share of imports, are the most exposed to international competition. Among the other highly competitive service sectors, there are several sectors in which Chad can create comparative advantages, such as transport and business services.

The hydrocarbons sector accounts for about 63% of total exports. Agriculture accounts for nearly 30%, with livestock, forestry and fishing products leading the way with 15.44%. On the other hand, it is interesting to document the potential of the cotton fibre, textile, clothing and leather products sector in Chad's exports. Our results show that this sector is very export-intensive and exports more than half of its production. However, it should be noted that the other manufacturing sectors are virtually absent in exports. Taken as a whole, the structure of Chad's foreign trade shows that the agricultural sector is the hinge of the Chadian economy in terms of value-added, but at the same time, this sector is not very dependent on the outside world. This sector has export potential, although it is oriented towards the local market and less exposed to international competition.

A key point in the analysis of a country's economic structure is the identification of key sectors with important backward and forward linkages in the economy. In Table 3, we present an analysis of the key sectors of the Chadian economy on the basis of the weighted intensity of backward and forward linkages. Chad's economy has four key sectors: food crops, trade, livestock, forestry, fishing, and meat processing. These sectors have important backward and

forward spillover effects in terms of the power to spread the effect of a shock. These key sectors are scattered between agriculture and trade. The refined petroleum and hydrocarbon sectors are among the weak sectors of the economy with very few spillover effects to the rest of the economy. This is explained by the fact that these sectors are totally extroverted with little domestic value-added.

[Table 3 around here]

3. Simulations and results

This section quantitatively explores alternative growth options for Chad and their potential contribution to achieving middle-income country (MIC) status, or even emerging industrial economy status. Horizon 2030 was chosen as the target in our analyses, which corresponds to Vision 2030, the Chad that we want. This choice is also justified by the fact that in the literature, the experiences of MICs show that it is possible for a country with a per capita income at the current level of that of Chad, US$669.89, to reach the status of a middle-income country within 10 years.

In the baseline scenario, we examine whether Chad's current economic performance will be sufficient to achieve MIC status by 2030. In addition to the baseline scenario, four alternative scenarios have been developed based on the key sectors identified. Scenario 1 discusses the acceleration of growth in the agricultural sector by focusing on staple crops, export crops, and livestock. Scenario 2 simulates the effects of rapid growth in industry, particularly in agriculture-related manufacturing sub-sectors. In Scenario 3, we assess the impact of growth induced by private services (both domestic and export-oriented). In Scenario 4, we combine the effects of accelerated growth in the three sectors.

To simulate growth in the model, different options were considered: increased labor supply, expansion of agricultural land, capital accumulation and productivity growth. The increase in labor supply for various categories of labor is set exogenously. Land expansion is defined at the crop level. Productivity growth is defined exogenously and varies across sectors. Increasing the supply of labor and land, together with improving factor productivity, stimulates investment and leads to growth in capital accumulation.

We argue that productivity improvement is the result of the innovation or even adoption of technologies applied in the production process or the improvement of efficiency in the use of production inputs with a given technology. Moreover, in addition to human and physical capital as important sources of productivity growth, there are also institutional factors, including

7

market development. TFP growth has not been modelled. Instead, we exogenously changed the parameters of the TFP equations sector by sector and analyzed the structural change through reallocation of resources, capital accumulation and change in the structure of demand.

In each scenario, we examine the implications for structural change and diversification of the economy, the level of economic and industrial development achieved, and the impact on poverty levels.

To analyze structural change, we rely on sectoral changes and more specifically on the reallocation of value-added (a sector's share of total value-added at the economic level) within economic sectors over time (agriculture, industry, services). For diversification, we consider the structure of exports, more precisely the relative shares before and after the shock. Indeed, diversification is the transition to a more varied production structure, involving the introduction of new or expansion of pre-existing products, including higher quality products.

3.1. Baseline scenario

The base scenario provides a reference against which the alternative scenarios are compared. It simulates an economy that continues to grow at the pace of economic performance observed in recent years or future prospects. For this purpose, the model is calibrated to reproduce the growth prospects in 2016-2018 over the period 2019-2030, and thus generate a reference growth path. More specifically, the average annual growth rate is chosen to calibrate the baseline scenario. This outlook indicates that real GDP growth is expected to accelerate in 2019 (4.2 per cent) and 2020 (5.8 per cent) as a result of higher oil prices and the Glencore debt renegotiation. Heavily impacted by the crisis, the secondary sector should see a recovery (+2.2%) from 2019 onwards, as should the tertiary sector, which could grow by 1.2%. We have also assumed that if the economy continues to grow on current trends, similar annual growth rates will be found in the three aggregate sectors of the economy: agriculture, industry and services.

However, the following risks could jeopardize these prospects: oil price volatility, insecurity linked to Islamist groups disrupting cross-border trade, and the effects of climate change, particularly drought and locust invasion, which could affect the agricultural sector. Based on these risks, we have formulated the so-called alternative scenarios, which are divided into two groups: the pessimistic scenarios from SIM5 to SIM7, which refer to the risks identified above, and the optimistic scenarios from SIM1 to SIM4. These refer to the possibility of relying on the agricultural, industrial (non-oil) and service sectors as alternative strategies.

It should be noted that all the shocks are simulated from the year 2020 onwards in order to comply with the period chosen by the PDIDE, which is based on the horizon of 2030, i.e. over a 10-year period comprising three phases:

1. From 2020 to 2022 (Phase 1);
2. From 2023 to 2025 (Phase 2);
3. From 2026 to 2030 (Phase 3).

The results show that following the historical trends observed in recent years, Chad's economy will grow at an average annual rate of 4.55% until 2030 and its GDP per capita for fiscal year 2018 will increase from US$861 to US$1468 in 2030. The results also show that the contribution of services to GDP growth will continue to be significant, i.e. around 42.2%. Thus, as can be seen in Table 4, the economic structure has not changed over the period. Indeed, the sectoral shares have remained relatively constant and reflect the balanced growth path.

[Table 4 around here]

In examining the sources of growth in this scenario, it is found that growth is driven by increases in labor supply, agricultural land expansion, capital accumulation and total factor productivity (TFP) growth. TFP growth is defined exogenously for each sector and varies across sectors. The increase in labor supply and agricultural land combined with the improvement in TFP stimulates investment and results in an average annual growth of capital accumulation around 2.06%.

However, the following risks could jeopardize these prospects: oil price volatility, insecurity linked to Islamist groups disrupting cross-border trade, and the effects of climate change, particularly drought and locust invasion, which could affect the agricultural sector. Based on these risks, we have formulated "pessimistic" scenarios to assess their effects. We simulate the effects of possible oil price volatility. This is captured in the world by a drop in the world price of a barrel of oil. A scenario of a 20% drop (40% in 2014) and examine the implications for the 2020 -2030 economic outlook. Insecurity linked to Islamist groups disrupts cross-border trade and affects production in the affected sectors. This scenario simulates the effects of climate change, in particular drought and locust invasion that could affect productivity and output in the agricultural sector.

[Figure 1 around here]

The results we have arrived at in this scenario show that Chad needs to accelerate economic

growth if the country is to achieve middle-income country status or even emerging industrial economy status within 10-15 years. To understand the role and contribution of sectoral growth to this objective, and how economic structures can change across sectors with accelerated growth, we have developed four alternative options.

3.2. Scenario 1: Growth induced by the agricultural sector.

The baseline scenario has shown that a growth rate of 4.55% is far from being sufficient to reach, by 2030, a GDP per capita higher than US$ 2000 or even a per capita value-added (in purchasing power parity) higher than or equal to 1000. To reach these levels, we have examined the option of additional growth in the agricultural sector. Under this scenario, we simulate productivity growth and the performance of sub-sectoral growth options, using national targets for annual total factor productivity growth rates. Thus, the annual target of an accelerated agricultural growth rate of 6% has been included in the calibration, in order to comply with CAADP objectives as[1] set by NEPAD.

[Table 5 around here]

The results show that the agricultural growth rate increases to 6.26% compared to 4.32% in the baseline scenario. The GDP growth rate is 4.99%, an increase of 0.85 percentage points above its base level. The contribution of the agricultural sector increases by 37.13% while the contribution of services declines compared to the baseline scenario.

[Table 6 around here]

The structural change between agriculture, industry and services is stable and constant. The situation is quite different if we look at what is happening within each sector as shown in Tables 5, 6, and 7. These tables give us the structure and contribution of the agricultural sub-sectors. It can be seen that the contribution of food, cash and industrial agriculture, as well as livestock, forestry and fishing improved, i.e. by 1.10%, 0.23% and 0.81% respectively, compared to 0.89%, 0.05% and 0.68% in the reference scenario. Underlying this structural transformation within the agricultural sector are changes in productivity and capital accumulation. Indeed, the increase in the supply of labor and agricultural land, combined with the improvement in factor productivity, has stimulated investment and resulted in capital accumulation for the sub-sectors

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[1] Chad signed the CAADP Compact on 16 December 2013, with the objective of transforming agriculture through food and nutrition security, wealth creation and economic growth to ensure prosperity for all.

concerned. This investment is financed by the government, which contributes 26.41%, foreign financing, of which FDI accounts for around 24.70%, and private financing 48.89%.

The structure of trade summarized in the appendix gives us the sectoral shares in total exports and imports. The structure of trade in the agricultural sector shows a considerable change. There has been a marked improvement in the share of agricultural exports due to the accelerated growth of cash crops. Under this scenario the country diversifies its exports and can expect to become a net exporter of agricultural products.

[Table 7 around here]

However, given the initial share of the agricultural sector in GDP, the impact of this scenario on the rest of the economy is limited, albeit positive. Indeed, its contribution to achieving middle-income country status is modest. Adjusted per capita value-added remains very minimal due to the low spillover effects in the industrial sector outside the food industries. The impact on poverty reduction is analysed in Table 8. If the agricultural growth target of 6% is aimed at, the poverty reduction rate is about 37.2% at the national level, which is a clear improvement compared to the baseline scenario.

[Table 8 around here]

In summary, the agricultural sector in Chad is a driving force for the implementation of strategic development policies. Although modest, the results show that productivity growth, capital accumulation and changes in the structure of consumer demand strengthen inter-sectoral linkages during the transformation process. These results highlighted the linkages of the agricultural sector with the rest of the economy. Indeed, forward linkages increase the demand for modern inputs such as fertilizers (produced by the manufacturing sector), marketing and transportation (provided by the services sub-sectors). Backward linkages ensure the supply of agricultural raw materials for processing industries. In addition, consumption linkages (changes in the demand structure of consumers who are more likely to purchase domestic goods) have led to important growth multipliers and poverty reduction effects. Indeed, growth in agricultural productivity and production, the provision of cheap food and cheap raw materials for various industries (e.g. food processing), thus opening up opportunities for the development and diversification of production and marketing activities.

However, with regard to achieving the objective of middle-income country status or even that of an emerging industrial economy by 2030, the results show that much remains to be done. We will come back to this a little later. In the following lines we examine the alternative option

of industry-induced accelerated growth, and assess the results found so far.

3.3. Scenario 2: Industry-induced growth

To assess how industry-induced growth will contribute to Chad's overall growth and structural transformation, we have exogenously increased labor productivity in various manufacturing subsectors with higher growth in labor-intensive subsectors, particularly those related to the agricultural sector (i.e. food and wood processing, textiles, clothing and footwear). Most of these sectors are labor-intensive and are expected to generate more labor in rural and urban areas, which largely explains the structural changes in employment that have transformed some developing countries (e.g. Brazil, Malaysia, Thailand, China, India, and Viet Nam). Growth in the manufacturing sector is also expected to increase the sector's exports and reduce its imports, so that domestic demand is met by domestic production rather than imports.

By assuming much higher labor productivity in the manufacturing sector, growth is stimulated in the more labor-intensive sectors. These sectors are now in a position to compete with other sectors for labor and, as a result, attract new capital investment. Productivity-induced growth results in capital accumulation and further enhances sector growth. To finance this industry-induced growth, we have relaxed the assumption of a fixed current account balance to allow for the inflow of foreign capital to support the demand for investment in the capital goods needed for capital accumulation.

Under this industry-led growth scenario, the model predicts an average annual growth rate of 6.84% compared to 4.14% for the baseline scenario. Table 5 presents the growth in manufacturing industry (related to agri-food) which accelerates to 6.70%, other manufacturing 4.90% and other industries 5.85%. The food industry and the meat and fish slaughtering and processing industry show exceptional growth of 6.99% and 7%, while mining shows a growth of 3.48% and other agro-food industries 7.46%. Compared to the baseline scenario, growth in manufacturing is 1.83 percentage points higher in this scenario, and that of cotton fiber, textiles, clothing, and leather is 4.29 percentage points higher.

With regard to factor contributions as well as the shares of investment sources respectively, TFP takes a rather significant share (49.64%) compared to labor (11.17%), capital (34.04%) and land (5.15%) factors, which suggests that a large share is given to innovation and adoption of technologies in the production process or to the improvement of efficiency in the use of production inputs. Thus, technology-induced productivity growth is usually accompanied by rapid capital accumulation. As Anderson et al. (2008) show, capital for investment increasingly comes from other sources, such as domestic savings, foreign direct investment (FDI) and loans.

Under Scenario 2, poverty declined by about 35.9% at the national level.

FDI can play an important role in the transformation process, both directly through increased capital investment and indirectly through externalities. However, the share of FDI in GDP is often low, which shows the important role of domestic savings as the main source of investment as predicted by the model for the set of scenarios. Hence the importance of developing the financial market and providing better incentives to savers in order to channel funds more efficiently to private investors in priority sectors.

In conclusion, this scenario underscores the importance of the "industry" sector in accelerating growth and assisting the country in its quest to achieve middle-income country status. It has a higher growth multiplier than the baseline and agricultural scenarios; and its impact on poverty reduction is lower compared to the agricultural scenario. It also shows that private savings are an important source of capital for the investments needed to sustain this growth effort; hence the importance of developing a domestic financial market. Moreover, to significantly accelerate the growth rate of industry beyond the agricultural sector, the country should develop more export-oriented manufacturing industry and even rely on the quality of its export products. This manufacturing industry will need to be less dependent on agricultural inputs, as in the labor-intensive manufacturing sectors that have developed rapidly in China and Vietnam.

3.4. Scenario 3: Service-led growth

Services include both private and public services. Among private services we have those oriented towards the domestic market (trade, transport, communication and other services); and those oriented towards exports (hotels, tourism, restaurants, and finance). The trade and transport sectors, among others, are more labor-intensive than more capital-intensive sub-sectors, such as finance and communications. Therefore, we simulate an increase in labor productivity and capital accumulation to stimulate accelerated growth, mainly in the private sector. As in the previous scenario, additional capital growth is financed by increased foreign capital inflows. However, since the service sector as a whole is less capital-intensive than industry, the increase in foreign-financed investment is less than required in the previous scenario.

Table 5 provides information on the rate of growth of overall GDP as well as sectoral GDP. It is 6.84% for overall GDP against 4.55% in the baseline scenario; 5.58% in agriculture, 6.76% in industry and 7.92% in services against 4.32%, 4.87% and 4.61% in the baseline scenario respectively. It should be noted that the most important channel through which this rapid growth in services has affected the rest of the sectors of the economy is the decline in services

prices as a result of improved productivity in the sector; this has reduced production costs for the agricultural and industrial sectors, including intermediate input costs.

As for the sectoral contributions to growth, they are higher for services, i.e. 3.54% against 1.95% in the baseline scenario and the sectoral share is about 47.76% against 42.2%. Looking at the different sectors, the change in structures has remained constant if not reinforced for the sector concerned. However, this is not the case within the services sector. If we look at the structure of services and the contributions of the sub-sectors to the growth of services, it emerges that private services take a large share, i.e. 80.13% against 19.87% for public services. And among the sub-sectors, it is the trade and the building and public works products sector which saw their shares increased and posted growth rates clearly higher compared to the other sub-sectors, i.e. around 9.06% and 10.69% respectively.

The factor contributions to services sector growth are summarized in Table 6. They are of the order of 5.95% for labor, 28.09% for capital, 4.70% for land and 61.27% for TFP. The share of TFP in services reflects the importance of knowledge and technology for further developing the economy and making it more competitive and resilient. In its development plan, Chad is aiming for a set of science and technology parks as well as significant investments to be made to better accumulate human capital. To achieve this, capital for investments to support such a productivity effort must come from the Government (25.97%), external financing including FDI (22.27%) and private savings (51.76%). As noted above. It would be important to develop a financial market in the country in order to mobilize private resources and channel them towards sectors considered as priorities.

With regard to the incidence of poverty, under this scenario 3, table 8 shows that poverty has declined by 31.3% against 39.1% in the baseline scenario and much less than in the two previous scenarios.

In summary, Scenario 3 showed how accelerated growth in the services sector could contribute to the goal of achieving middile-income status. The services sector has growth potential that could contribute to the diversification of production and even exports. The model has shown that the strong growth linkages between domestically oriented productive services and the rest of the economy is the main reason why growth in the service sector generates higher revenues than growth in the industrial sector. Private services, especially trade and transport, are important sources of employment, especially unskilled employment; and are a source of important inputs for other sectors of the economy. Indeed, lower prices for services reduce production costs for the agricultural and industrial sectors, including intermediate input costs. Moreover, strong growth in the sector has a greater impact on poverty reduction than in the

agricultural and industrial sectors.

3.5. Scenario 4: Accelerated growth in the three scenarios combined

The results of scenarios 1 to 3 show that rapid growth in one sector alone will not lead to significant poverty reduction. Therefore, combined growth across sectors will be necessary to reach middle-income status by 2030 or even emerging industrial economy status. Thus, in Scenario 4, we have combined the labor, land, capital and productivity growth assumptions we applied in the previous three scenarios to assess the joint impact of accelerated growth at the sectoral level and for the economy as a whole.

Thus, this addition constitutes a significant positive shock for the Chadian economy, as it will imply a strong expansion in the sector that dominates exports. The results of this scenario show that the rate of GDP growth in each sector is accelerated thanks to the effects of intensified intersectoral linkages. Indeed, the GDP growth rate is 8.64% per year; agriculture grows at 8.03%, industry at 9.80%, and services at 9.15%.

In terms of sectoral composition, the positive structural change has been in favour of the industrial and service sector. A detailed analysis by sub-sector shows that all sub-sectors of agriculture (except cash and industrial agriculture), mining, and some public services have lost influence to manufacturing and private services.

Factor contributions to growth show that the shares of labor, capital and land factors have decreased while the TFP contribution amounts to 66.46% (scenario 4) against 45.96% in the baseline scenario. Thus, the acceleration of growth should be supported by productivity growth. The acceleration of growth is also supported by capital accumulation, as shown by the share of investment in GDP.

Moreover, technology-led productivity growth is usually accompanied by rapid capital accumulation. As noted above, capital for investment increasingly comes from sources such as domestic savings, foreign direct investment (FDI) and loans. With regard to sources of investment, the breakdown is as follows: Government (26.27% (Scenario 4), foreign capital including FDI (23.97% (Scenario 4) and private savings (49.76% (Scenario 4). It emerges from these considerations that private savings are expected to play an important role in financing investment capital as predicted by the model. Thus, the development of financial markets is necessary. Below the growth rate of 8.64% per year (Scenario 4), poverty has declined at the national level by 24.5% (Table 8).

4. Conclusion

This analysis shows that the acceleration in growth in one sector alone has not led to a significant increase in per capita income and thus has not led to the planned achievement of the objectives. On the other hand, combined growth (or rather a multisectoral approach) between the sectors will be necessary to achieve middle-income country status or, under certain conditions, even emerging industrial economy status in the period 2019-2030. In order to maintain such a level of growth, factor contributions show that factor productivity is relatively high, while the share of labour, land and capital has decreased over time. It follows from this the importance of innovation and the application of technology in the production process and even of a more efficient use of the means of production. Moreover, the productivity growth induced by the technology stimulates investment and leads to rapid capital accumulation. The acceleration in growth will therefore have to be supported not only by productivity growth, but also by capital accumulation.

The capital to finance this level of investment comes from these three sources: government, foreign capital including foreign direct investment and private savings. These considerations indicate that private savings will play an important role in financing investment capital, as the model predicts. These results show how important it is for Chad to develop a financial market.

The objectives of the development plan and those of an industrial and diversified economy could be achieved and it would be possible to accelerate growth rates by more than 9% per year. However, everything will depend on the determination and action of the Congolese government and even on its political choices.

5. References

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6. Tables and figures

Table 1. Structure of domestic value-added in total production and exports

	Production	Value added	Export	Imports	Export intensity	Import penetration ratio
Food crops	14.37	19.99	9.26	0.99	10.32	1.27
Cash rops	0.90	1.20	4.36	0.00	77.81	0.00
Livestock, forestry, fishing products	10.68	14.65	15.44	0.27	23.14	0.46
Hydrocarbons	11.92	6.22	62.80	0.00	84.36	0.00
Other extractive industries	0.75	0.93	0.00	0.83	0.01	16.85
Meat and fish processing	9.46	6.04	0.02	1.53	0.03	2.93
Oil	0.89	0.08	0.01	1.85	0.12	27.94
Products of cereal processing	1.04	0.38	0.00	0.46	0.00	8.84
Beverages products	1.71	1.08	0.00	1.15	0.00	10.87
Tobacco products	0.14	0.09	0.03	1.52	3.47	66.89
Other agri-food products	2.06	1.45	0.00	7.57	0.01	40.97
Manufacture of textiles and leather	0.96	0.22	3.44	2.43	57.35	31.79
Wood and furniture	0.55	0.40	0.00	0.21	0.01	6.63
Paper and printed products	0.07	0.06	0.01	1.06	1.77	73.92
Refined petroleum	2.98	0.88	0.28	7.40	1.49	31.53
Manufacture of chemicals and chemical products	0.01	0.02	0.00	7.25	3.81	97.89
Other non-metallic mineral products and construction materials	0.08	0.03	0.00	1.16	0.00	68.86
Manufacture of transport equipment and other manufacturing	0.11	0.03	0.00	33.89	0.00	98.20
Electricity, gas and water	0.61	0.17	0.00	0.08	0.00	1.92
Construction: building houses factories offices and roads	2.40	1.77	0.00	0.00	0.00	0.00
Wholesale and retail trade	13.06	17.74	0.00	0.00	0.00	0.00
Repair	1.82	2.09	1.50	0.05	13.23	0.53
Hotel and restaurants	0.78	0.44	1.14	0.17	23.39	3.88
Transports	3.03	1.89	0.56	14.62	2.96	46.79
Information and communication	4.13	5.05	1.14	0.66	4.41	2.80
Other Financial Intermediation	1.07	1.19	0.00	0.44	0.00	6.81
Real estate activities	1.73	2.38	0.01	0.00	0.11	0.00
Other Business Services	2.51	2.29	0.00	14.41	0.00	52.06
Other government services	4.57	4.03	0.00	0.00	0.00	0.00
Education	1.73	2.28	0.00	0.00	0.00	0.00
Human health and social work	2.09	2.80	0.00	0.00	0.00	0.00
Veterinary services	0.15	0.19	0.00	0.00	0.00	0.00
Private households with employed persons	1.63	1.93	0.00	0.00	0.00	0.00

Table 2: Production factors

	Intermediate inputs	Formal labor	Informal labor	Formal capital	Informal capital	Production taxes	Total
Food crops	7.10	0.00	1.12	0.00	91.78	0.00	100
Cash rops	10.37	0.00	5.25	0.00	84.38	0.00	100
Livestock, forestry, fishing products	8.39	0.00	3.58	0.00	87.97	0.05	100
Hydrocarbons	61.32	8.23	0.00	24.60	0.00	5.86	100
Other extractive industries	17.46	0.60	43.06	4.71	33.07	1.11	100
Meat and fish processing	57.05	1.79	2.86	2.22	35.52	0.56	100
Oil	94.24	0.24	0.38	0.30	4.76	0.08	100
Products of cereal processing	75.04	1.04	1.66	1.29	20.64	0.33	100
Beverages products	57.23	1.79	2.85	2.21	35.37	0.56	100
Tobacco products	57.33	1.78	2.84	2.20	35.28	0.56	100
Other agri-food products	52.80	1.97	3.14	2.44	39.03	0.62	100
Manufacture of textiles and leather	81.14	11.71	0.35	0.21	2.16	4.43	100
Wood and furniture	50.40	3.46	9.14	0.02	35.81	1.17	100
Paper and printed products	41.06	4.11	10.87	11.68	30.90	1.39	100
Refined petroleum	79.42	12.83	0.00	6.82	0.00	0.94	100
Manufacture of chemicals and chemical products	1.09	6.89	18.23	19.61	51.85	2.33	100
Other non-metallic mineral products and construction materials	78.33	1.51	3.99	4.30	11.36	0.51	100
Manufacture of transport equipment and other manufacturing	79.93	1.40	3.70	3.98	10.52	0.47	100
Electricity, gas and water	84.63	2.71	0.00	15.13	1.38	-3.85	100
Construction: building houses factories offices and roads	49.95	7.64	4.55	20.75	15.62	1.48	100
Wholesale and retail trade	9.25	2.51	3.43	7.66	76.81	0.34	100
Repair	23.13	2.12	2.91	6.49	65.06	0.29	100
Hotel and restaurants	62.12	3.27	0.78	7.61	25.70	0.53	100
Transports	56.99	8.64	0.40	9.92	21.76	2.28	100
Information and communication	17.56	9.71	0.86	51.65	16.32	3.89	100
Other Financial Intermediation	25.09	22.03	0.00	50.49	0.00	2.38	100
Real estate activities	8.07	15.80	0.13	17.56	55.67	2.76	100
Other Business Services	38.46	10.58	0.09	11.76	37.27	1.85	100
Other government services	40.54	49.64	0.00	8.61	0.00	1.21	100
Education	11.95	88.05	0.00	0.00	0.00	0.00	100
Human health and social work	9.73	19.89	0.00	27.72	35.62	7.03	100
Veterinary services	14.07	18.93	0.00	26.39	33.91	6.69	100
Private households with employed persons	20.85	28.94	1.26	0.00	48.44	0.51	100

Table 3: Key sectors

Num	Sector	Backward linkages	Forward linkages	Backward linkages (weighted)	Forward linkages (weighted)
1	Food crops	1.174	2.644	1.415	3.121
2	Cash rops	1.144	0.303	1.305	0.095
3	Livestock, forestry, fishing products	1.184	1.988	1.396	2.319
4	Hydrocarbons	0.675	0.739	0.565	0.905
5	Other extractive industries	1.102	0.273	1.136	0.122
6	Meat and fish processing	1.285	2.150	1.426	2.494
7	Oil	1.312	0.329	1.396	0.216
8	Products of cereal processing	1.063	0.412	0.979	0.260
9	Beverages products	1.148	0.511	1.212	0.447
10	Tobacco products	1.212	0.153	1.246	0.037
11	Other agri-food products	1.160	0.585	1.233	0.515
12	Manufacture of textiles and leather	1.029	0.257	0.917	0.140
13	Wood and furniture	1.253	0.273	1.296	0.078
14	Paper and printed products	0.950	0.133	0.942	0.016
15	Refined petroleum	0.851	0.766	0.663	0.620
16	Manufacture of chemicals and chemical products	1.104	0.103	1.202	0.004
17	Other non-metallic mineral products and construction materials	0.807	0.129	0.691	0.009
18	Manufacture of transport equipment and other manufacturing	1.240	0.108	1.276	0.012
19	Electricity, gas and water	0.881	0.321	0.664	0.129
20	Construction: building houses factories offices and roads	0.975	0.205	0.921	0.094
21	Wholesale and retail trade	1.137	2.364	1.328	2.619
22	Repair	1.092	0.529	1.201	0.372
23	Hotel and restaurants	1.174	0.293	1.168	0.139
24	Transports	0.939	0.577	0.909	0.581
25	Information and communication	0.939	0.996	0.933	1.035
26	Other Financial Intermediation	0.898	0.386	0.841	0.233
27	Real estate activities	1.096	0.563	1.202	0.462
28	Other Business Services	0.993	0.441	1.013	0.370
29	Other government services	1.020	0.203	0.991	0.176
30	Education	1.143	0.323	1.162	0.204
31	Human health and social work	1.015	0.434	1.066	0.346
32	Veterinary services	0.999	0.219	1.027	0.031
33	Private households with employed persons	1.123	0.492	1.208	0.400

Table 4: Baseline Scenarios and Options for Accelerated Growth

	Baseline	Growth scenarios induced by:			
		Agriculture	Indsutry	Services	Combined
1. Growth rate, 2019-2030 (%)					
GDP	**4.14**	**4.99**	**5.32**	**6.84**	**8.64**
Primary	3.67	5.36	4.84	5.58	7.39
Agriculture	4.32	6.26	5.48	5.93	8.03
Extraction	0.4	-1.14	0.79	3.62	3.27
Secondary	4.44	5.13	6.70	6.76	9.80
Manufacturing	4.4	5.13	6.70	6.74	9.79
Other manufacturing	3.4	3.06	4.90	6.75	9.28
Other industries	6.5	5.28	5.85	12.50	13.73
Tertiary	4.43	4.56	5.05	7.92	9.15
Private service	4.4	4.53	5.18	8.48	9.90
Public services	4.5	4.64	4.66	5.98	6.44
2. Sectoral shares in 2030					
GDP	**100**	**100**	**100**	**100**	**100**
Primaire	38.4	40.25	36.52	33.43	33.53
Agriculture	32.2	37.13	32.73	28.98	30.04
Extraction	6.2	3.12	3.79	4.44	3.49
Secondary	9.8	9.89	11.37	9.64	11.05
Manufacturing	9.7	9.86	11.34	9.58	10.99
Other manufacturing	1.5	1.19	1.42	1.47	1.59
Other industries	0.0	0.03	0.03	0.06	0.05
Tertiary	42.2	40.04	40.81	47.41	44.49
Private service	31.8	30.06	31.18	37.99	36.37
Public services	10.4	9.98	9.63	9.42	8.12

Table 5: Aggregate and sectoral GDP growth rates

	Baseline	Growth scenarios induced by:			
		Agriculture	Indsutry	Services	Combined
GDP	**4.55**	**4.99**	**5.32**	**6.84**	**8.64**
Primary	**4.32**	**5.36**	**4.84**	**5.58**	**7.39**
Agriculture	**4.94**	**6.26**	**5.48**	**5.93**	**8.03**
Food crops	4.89	5.89	5.08	5.93	7.51
Cash rops	4.67	13.57	5.70	2.97	10.10
Livestock, forestry, fishing products	5.03	5.85	5.97	6.13	8.52
Extraction	**0.42**	**-1.14**	**0.79**	**3.62**	**3.27**
Hydrocarbons	-0.15	-2.11	0.23	3.29	2.68
Other extractive industries	3.51	3.55	3.87	5.58	6.49
Secondary	**4.87**	**5.13**	**6.70**	**6.76**	**9.80**
Manufacturing	**4.87**	**5.13**	**6.70**	**6.74**	**9.79**
Processed food	5.10	5.46	6.99	6.73	9.87
Meat and fish processing	5.15	5.57	7.00	6.62	9.71
Oil	5.17	5.90	5.53	6.64	8.35
Products of cereal processing	4.85	4.99	6.40	6.86	9.42
Beverages products	5.21	5.51	6.67	7.10	9.69
Tobacco products	5.38	5.75	6.68	8.23	11.18
Other agri-food products	4.89	5.03	7.46	6.79	10.75
Other manufacturing	**3.43**	**3.06**	**4.90**	**6.75**	**9.28**
Manufacture of textiles and leather	1.19	1.48	5.47	3.67	11.62
Wood and furniture	5.79	5.85	6.93	9.34	11.39
Paper and printed products	4.16	3.63	5.99	8.19	11.10
Refined petroleum	2.56	1.76	3.48	5.64	6.80
Manufacture of chemicals and chemical products	5.21	4.98	6.70	13.03	16.64
Other non-metallic mineral products and construction m	4.51	4.13	5.22	9.00	10.71
Other industries	**5.83**	**5.28**	**5.85**	**12.50**	**13.73**
Tertiary	**4.61**	**4.56**	**5.05**	**7.92**	**9.15**
Private services	**4.62**	**4.53**	**5.18**	**8.48**	**9.90**
Electricity, gas and water	3.55	3.25	4.05	6.25	7.11
Construction: building houses factories offices and road	6.38	6.42	6.71	10.69	11.93
Wholesale and retail trade	5.07	5.13	5.86	9.06	10.96
Repair	4.51	4.30	4.87	8.31	9.06
Hotel and restaurants	4.67	4.53	5.49	7.04	8.63
Transports	2.72	1.98	3.01	6.75	7.32
Information and communication	4.49	4.45	4.70	8.09	9.14
Other Financial Intermediation	3.32	2.96	3.67	6.72	7.64
Real estate activities	4.77	4.87	5.07	7.76	8.72
Other Business Services	1.55	0.05	1.83	5.95	5.83
Public services	**4.57**	**4.64**	**4.66**	**5.98**	**6.44**
Other government services	5.00	5.00	5.00	5.00	5.00
Education	4.25	4.35	4.33	5.33	5.78
Human health and social work	4.40	4.46	4.51	6.59	7.16
Veterinary services	4.81	5.19	5.28	6.43	7.75
Private households with employed persons	4.23	4.40	4.47	7.54	8.47

Table 6: Contribution of sectors and sub-sectors as a percentage of GDP

Secteur	Baseline	Growth scenarios induced by:			
		Agriculture	Indsutry	Services	Combined
GDP	**4.55**	**4.99**	**5.32**	**6.85**	**8.66**
Primary	**1.64**	**2.09**	**1.81**	**2.00**	**2.65**
Agriculture	**1.62**	**2.14**	**1.77**	**1.81**	**2.49**
Food crops	0.89	1.10	0.90	1.01	1.27
Cash rops	0.05	0.23	0.06	0.02	0.12
Livestock, forestry, fishing products	0.68	0.81	0.81	0.78	1.11
Extraction	**0.02**	**-0.05**	**0.04**	**0.19**	**0.16**
Hydrocarbons	-0.01	-0.08	0.01	0.15	0.11
Other extractive industries	0.03	0.03	0.03	0.04	0.05
Secondary	**0.48**	**0.50**	**0.70**	**0.66**	**1.02**
Manufacturing	**0.48**	**0.50**	**0.70**	**0.65**	**1.01**
Processed food	0.43	0.46	0.63	0.55	0.87
Meat and fish processing	0.29	0.31	0.42	0.36	0.56
Oil	0.00	0.00	0.00	0.00	0.01
Products of cereal processing	0.02	0.02	0.02	0.02	0.03
Beverages products	0.05	0.06	0.07	0.07	0.10
Tobacco products	0.00	0.00	0.01	0.01	0.01
Other agri-food products	0.06	0.07	0.11	0.09	0.16
Other manufacturing	**0.05**	**0.04**	**0.07**	**0.10**	**0.14**
Manufacture of textiles and leather	0.00	0.00	0.01	0.01	0.03
Wood and furniture	0.02	0.02	0.03	0.04	0.05
Paper and printed products	0.00	0.00	0.00	0.00	0.01
Refined petroleum	0.02	0.01	0.03	0.04	0.05
Manufacture of chemicals and chemical products	0.00	0.00	0.00	0.00	0.00
Other non-metallic mineral products and construction m	0.00	0.00	0.00	0.00	0.00
Other industries	**0.00**	**0.00**	**0.00**	**0.01**	**0.01**
Tertiary	**1.95**	**1.89**	**2.11**	**3.54**	**3.98**
Private services	**1.48**	**1.41**	**1.64**	**2.93**	**3.37**
Electricity, gas and water	0.01	0.00	0.01	0.01	0.01
Construction: building houses factories offices and road	0.12	0.12	0.12	0.22	0.24
Wholesale and retail trade	0.84	0.83	0.97	1.63	1.99
Repair	0.08	0.08	0.09	0.17	0.17
Hotel and restaurants	0.02	0.02	0.02	0.03	0.03
Transports	0.04	0.03	0.05	0.12	0.12
Information and communication	0.20	0.20	0.21	0.39	0.43
Other Financial Intermediation	0.04	0.03	0.04	0.08	0.08
Real estate activities	0.11	0.11	0.11	0.18	0.19
Other Business Services	0.03	0.00	0.03	0.12	0.10
Public services	**0.48**	**0.48**	**0.47**	**0.60**	**0.61**
Other government services	0.19	0.19	0.18	0.17	0.16
Education	0.09	0.09	0.09	0.10	0.11
Human health and social work	0.12	0.12	0.12	0.18	0.18
Veterinary services	0.01	0.01	0.01	0.01	0.01
Private households with employed persons	0.07	0.07	0.07	0.14	0.15

Table 6: Relative shares of sectors and sub-sectors as a percentage of GDP

Sector	Baseline	Growth scenarios induced by:			
		Agriculture	Indsutry	Services	Combined
Total GDP	100	100	100	100	100
Primary	**37.6**	**40.3**	**36.5**	**33.4**	**33.5**
Agriculture	33.6	37.1	32.7	29.0	30.0
Food crops	18.6	19.9	17.5	16.2	15.8
Cash rops	1.1	2.8	1.1	0.7	1.3
Livestock, forestry, fishing products	13.9	14.5	14.2	12.1	13.0
Extraction	4.0	3.1	3.8	4.4	3.5
Hydrocarbons	3.2	2.4	3.1	3.7	2.8
Other extractive industries	0.7	0.7	0.7	0.7	0.7
Secondary	**10.1**	**9.9**	**11.4**	**9.6**	**11.0**
Manufacturing	10.1	9.9	11.3	9.6	11.0
Processed food	8.7	8.7	9.9	8.1	9.4
Meat and fish processing	5.8	5.8	6.6	5.3	6.1
Oil	0.1	0.1	0.1	0.1	0.1
Products of cereal processing	0.4	0.3	0.4	0.3	0.4
Beverages products	1.1	1.0	1.1	1.0	1.1
Tobacco products	0.1	0.1	0.1	0.1	0.1
Other agri-food products	1.4	1.3	1.7	1.3	1.6
Other manufacturing	1.3	1.2	1.4	1.5	1.6
Manufacture of textiles and leather	0.1	0.1	0.2	0.1	0.3
Wood and furniture	0.4	0.4	0.4	0.5	0.5
Paper and printed products	0.1	0.0	0.1	0.1	0.1
Refined petroleum	0.6	0.6	0.7	0.7	0.7
Manufacture of chemicals and chemical products	0.0	0.0	0.0	0.0	0.0
Other non-metallic mineral products and construction n	0.0	0.0	0.0	0.0	0.0
Other industries	0.0	0.0	0.0	0.1	0.1
Tertiary	**42.3**	**40.0**	**40.8**	**47.4**	**44.5**
Private services	31.9	30.1	31.2	38.0	36.4
Electricity, gas and water	0.1	0.1	0.1	0.1	0.1
Construction: building houses factories offices and road	**2.0**	**1.9**	**1.9**	**2.5**	**2.3**
Wholesale and retail trade	16.9	16.2	16.9	20.4	20.5
Repair	1.9	1.7	1.8	2.2	2.0
Hotel and restaurants	0.4	0.4	0.4	0.4	0.4
Transports	1.4	1.2	1.3	1.7	1.5
Information and communication	4.5	4.3	4.2	5.2	4.8
Other Financial Intermediation	1.0	0.9	0.9	1.1	1.0
Real estate activities	2.2	2.2	2.1	2.4	2.2
Other Business Services	1.5	1.2	1.4	1.9	1.5
Public services	10.4	10.0	9.6	9.4	8.1
Other government services	3.9	3.7	3.6	3.0	2.5
Education	2.0	1.9	1.8	1.7	1.5
Human health and social work	2.7	2.6	2.5	2.6	2.3
Veterinary services	0.2	0.2	0.2	0.2	0.2
Private households with employed persons	1.7	1.6	1.6	1.9	1.7

Table 7: Incidence of Poverty (%)

|	Baseline	Agriculture	Industry	Service	Combined
2018	47.5	47.5	47.5	47.5	47.5
2019	46.9	46.9	46.9	46.9	46.9
2020	46.5	46.3	46.1	46.0	45.1
2021	45.6	45.1	44.8	44.5	43.8
2022	44.7	44.4	44.0	43.7	42.2
2023	44.1	43.8	43.4	42.6	40.3
2024	43.8	43.1	42.5	41.0	38.1
2025	43.3	42.1	41.3	39.7	35.9
2026	42.3	41.0	40.3	38.0	33.9
2027	41.4	40.2	39.4	36.3	31.6
2028	40.8	39.1	38.1	34.8	28.8
2029	39.9	38.0	37.4	33.1	27.0
2030	39.1	37.2	35.9	31.3	24.5

Figure 1: Basic and pessimistic scenarios (GDP growth)

23
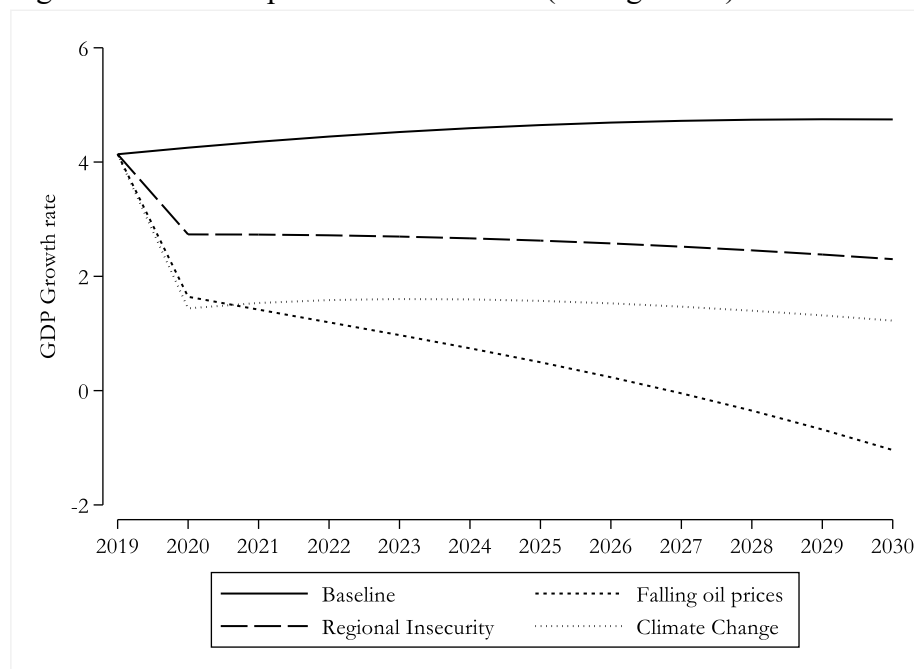
Figure 2: Basic and pessimistic scenarios (Poverty reduction)