



CAMEROON

SELECTED ISSUES

March 2022

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STATE-OWNED ENTERPRISE AND SECTORAL DISTORTIONS: GROWTH AND BUDGET IMPLICATIONS FOR CAMEROON¹

A. Introduction

1. Cameroon has launched a National Development Strategy (SDN 2030) based on an ambitious set of growth objectives. These include raising average annual growth from 4½ percent to 8 percent over the period 2020-2030, increasing the employment rate, reducing the poverty rate, and improving the governance of public institutions. A rebalancing of the economic toward the industry and service sectors is also envisaged.

2. The country's fiscal objectives aim to support the government's growth strategy while at the same time ensuring fiscal sustainability over the longer term. Reductions of inefficient spending, an increase in non-oil revenues and higher economic growth would open up fiscal space. This would allow the deficit to GDP ratio to fall, public debt to remain below 50 percent of GDP, while providing the much-needed resources to increase spending to raise human and physical capital and improve social safety nets.

3. State-Owned Enterprises (SOEs) play a large role in the Cameroon economy but pose significant risks. Cameroon's SOEs are financed in many ways, including via direct subsidies for operations, capital subsidies for investments, and government guarantees for commercial loans. High and increasing debt and poor performance of SOEs poses both significant direct fiscal and financial risks and represent a drag to economic growth. In addition, differential taxation across sectors and inefficient regulatory policies, such as administered prices, distort production and slow down economic growth, indirectly causing a loss of fiscal revenues.

4. This paper presents a general equilibrium model that explores quantitatively the growth and fiscal consequences of SOEs subsidization and distortionary sectoral policies in Cameroon. The model incorporates both static and dynamic policy-induced inefficiencies and allows to assess their direct and indirect costs for the public budget. Static inefficiencies are due to misallocations of labor capital across sectors (cross-sector distortions), or between SOEs and non-SOEs within the same sector (within-sector distortions). This paper focuses on cross-sector distortions attributed to preferential policy treatment of some sectors relative to others (e.g., through sectoral regulations), and on within-sector distortion attributed to subsidization of SOEs relative to non-SOE firms operating in the same sector. Static inefficiencies reduce the productivity of the economy and therefore investment, which over time translates into a lower dynamic capital accumulation and into additional GDP losses. Fiscal subsidization of SOEs has obvious direct costs for the government, but it also prevents an efficient allocation of production, especially when SOEs productivity is low. As such, SOEs subsidization policies decrease GDP

¹ Prepared by Amina Coulibaly (WB), Mokhtar Benlamine (IMF) and Roberto Piazza (IMF).

and ultimately have an additional indirect impact on the budget through lower tax revenues. Similarly, inefficient sectoral policies and regulations, by distorting the allocation of production factors across sectors, holds back economic growth and reduce tax revenues.

5. Policy reform scenarios that include scaling back SOEs subsidization and removing distortions across sectors deliver large potential GDP gains and sizable fiscal buffers.

Once calibrated to the Cameroon economy, the model indicates that in all the main economic sectors (primary, secondary, tertiary) the labor cost faced by SOEs is higher than in non-SOEs, whereas the return to capital is lower. These findings can be interpreted as suggesting that wages in SOEs are higher and the return on capital is lower than their corresponding market values. To the extent that these factor price differences are covered by subsidization of SOEs, direct budget costs are generated. In addition, there are indications that current policies in Cameroon may result in a distortion of the economy in favor of the primary sector over the secondary and tertiary sectors, with negative effects on aggregate productivity. Model simulations that gradually eliminate, over a 5-year horizon, about ½ of the direct SOEs subsidization and ¼ of sectoral distortions deliver a GDP increase of about 25 percent over a 15-year horizon, together with an improvement in the fiscal primary balance of about 6 percentage points of baseline GDP.² There is a strong sectoral rebalancing, with output in the tertiary and, to a lesser degree, the secondary sector expanding significantly and output in the primary sector changing little relative to the baseline.

6. The simulated scenarios indicate that well-designed policy reforms can go a long way in achieving Cameroon's growth and fiscal objectives. The policy scenarios and modeling calibration are necessarily illustrative. More detailed and reliable information on investment and labor force composition of SOEs as well as on policies that result in a preferential treatment of some economic sectors, would help sharpening the analysis and drawing more robust conclusions. Better data on SOEs would allow for instance to assess the impact on productivity of a reform of SOEs managerial practices. A systematic overview of sectoral policies would help identifying both areas where government intervention could be rolled back, and areas where better and more forceful policies are needed.

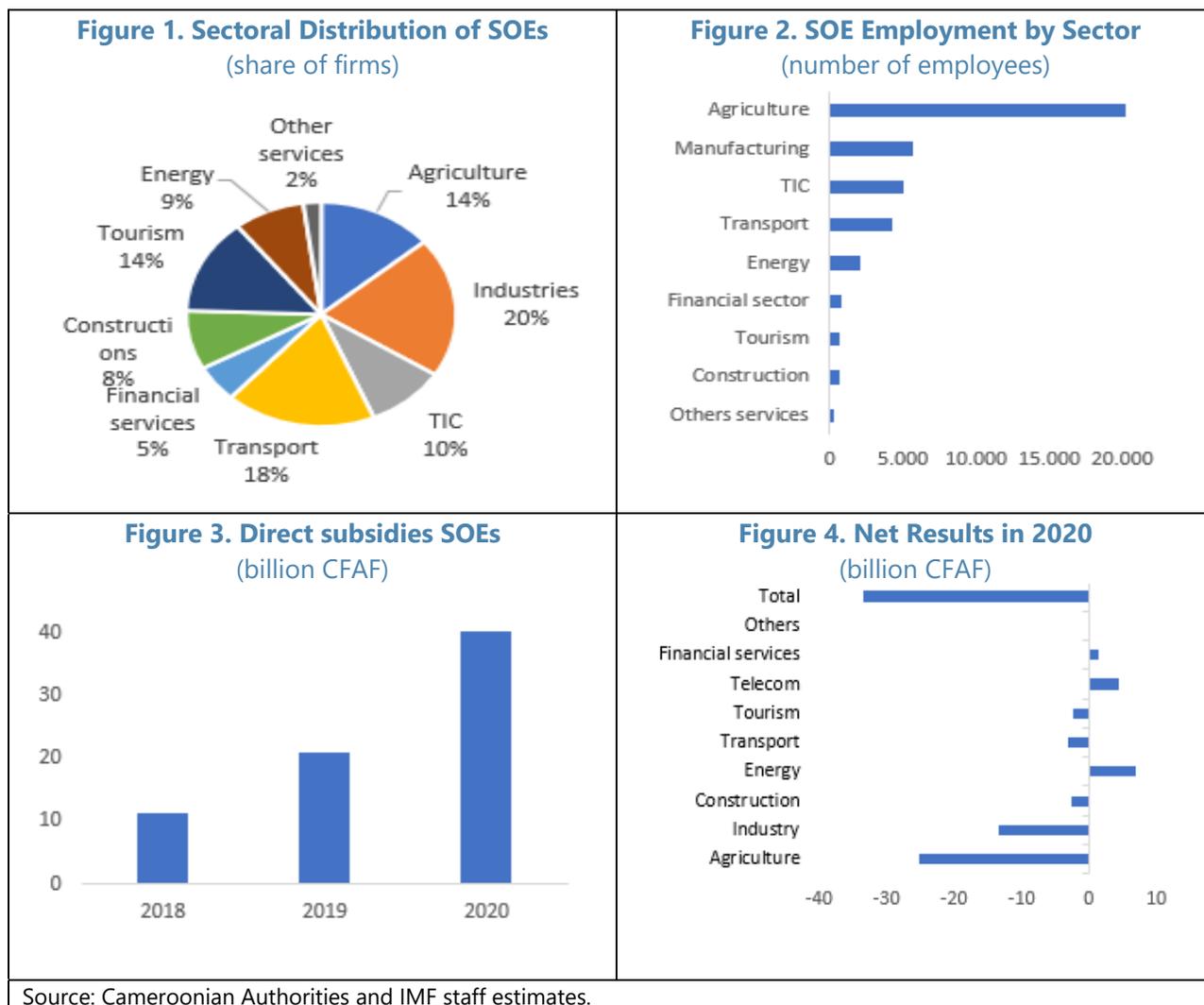
B. SOEs In Cameroon: An Overview

7. SOEs play a large role in the Cameroon economy and are present in all main sectors. Over 150 parastatal companies, including about 60 SOEs, deliver essential services such as energy, oil and gas, agriculture, finance, and transport (Figure 1). In total, Cameroon's SOEs assets amount to CFAF 4,895 billion (20 percent of GDP). In addition, SOEs employ around 40 thousand people, about half of which in the agricultural sector (Figure 2).

8. SOEs absorb a significant part of government spending and their high debt and poor performance poses significant fiscal risks. SOEs are financed by the public budget through direct subsidies for operations and capital investments, government recapitalizations, government guarantees for commercial loans, and by on-lending (whereby the government contracts loans that are subsequently transferred to the public enterprises). Direct subsidies alone (Figure 3) have increased in recent years to

² The increase in GDP leads to a significant rise in the real wage. Although this effect is not considered in the simulation, the higher market wage would very likely lead to an increase in formal employment.

CFAF 40 billion (0.2 percent of GDP), but this number does not take into account other important forms of indirect subsidization (e.g., through the accumulation of fiscal arrears). Despite the large subsidies received, the SOE portfolio has posted considerable losses throughout the last decade (Figure 4), with SOEs in which the government has a majority ownership (more than 50 percent) losing CFAF 33 billion in 2020. Several SOEs are heavily indebted and their total SOEs debt stood at 12.6 percent of GDP in 2020, with SONARA's debt alone amounting to 67 percent of total SOE's public and publicly guaranteed debt. SOEs also repeatedly build up fiscal arrears with the state, including tax arrears amounting to 1.5 percent of GDP in 2021. On the other hand, the government accumulates arrears with SOEs through non-payment of bills for SOEs services. Administered prices without the necessary public subsidies also have a negative impact on the performance of some SOEs (e.g. for CDC, SODECOTON, SEMRY and CAMPOST).



9. The poor performance of SOEs has macroeconomic implications and SOE’s monitoring has been weak. Inefficiencies in SOEs lead to an unreliable provision of key goods and services and to high input costs for firms. While the government has made progress in collecting information to monitor the performance of SOEs, the consistency and reliability of the data remains limited. Additionally, the

institutional setup for oversight and monitoring of SOEs is fragmented and includes many institutions with overlapping mandates. Two separate centralized agencies exercise the ownership function (the *SOE and Parastatal Directorate* and the *Commission for SOE Restructuring*). Ministries are in charge of technical oversight of SOEs operating in their sectors, which could create a potential source for conflicts of interest as the ministries are responsible for establishing sectoral policies that impact both SOEs and non-SOEs firms.

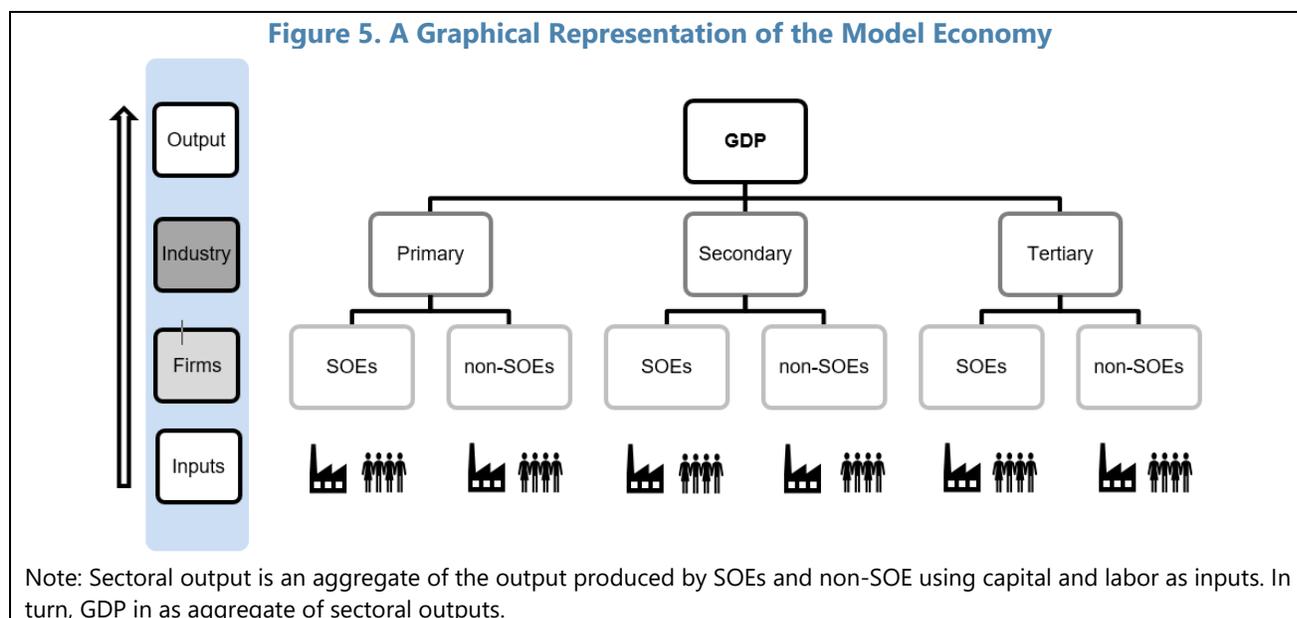
10. The government has begun substantial reforms to increase transparency and strengthen the corporate governance practices of SOEs, but results have been modest so far. In 2016 an SOE platform of all government agencies involved in SOE oversight was established. The legal framework was updated in 2017 with two laws for SOEs and EPs. A comprehensive reform strategy was also elaborated in 2018 and a new decree now regulates the remuneration of SOE management and board members, whereas a ministerial circular clarifies and strengthens the standards for the publication and submission of financial and operational information. The government launched diagnostic studies of some SOEs. However, to date, these studies have not been finalized. The CEMAC has taken steps to improve governance with the issuance of Directive 06/11 on Transparency and Governance, but the implementation of the directive has been weak.

C. SOEs Subsidization and Sectoral Distortions: A Dynamic General Equilibrium Model

11. The (static) production side: sectors and firms. Brandt, Tombe and Zhu (2013) present a static model where exogenously given labor services and capital stock are allocated to the production of goods across different regions labeled i . Within each region, production is undertaken by firms that are distinct by their type $j = s, n$ corresponding respectively to a state or non-state enterprise. We borrow this static formulation of Brandt, Tombe and Zhu (2013) but we adapt it so that our economy coincides with a single region, the index $i = 1, 2, 3$ represents each of the three main economic sectors (primary, secondary, tertiary), and $j = s, n$ distinguishes an SOE from a non-SOE firm. Figure 5 provides a graphical representation, which shows how output is produced at the firm level and aggregated into GDP (See Annex for more details):

- *Firm's production.* Within each sector i both SOEs non SOEs produce using a Cobb-Douglas technology with labor share indicated with a_i . As an extension to Brandt, Tombe and Zhu (2013), the labor share can differ across sectors. The TFP of a firm of type j in sector i is denoted with A_{ij} .
- *Sectoral output.* The output y_{ij} produced by SOEs and non-SOE firms is aggregated into a homogenous sectoral output Y_i using a technology with constant elasticity of substitution $1/\phi$.
- *GDP.* Sectoral output is aggregated into GDP, indicated with Y , based on a technology with constant elasticity of substitution $1/\sigma$ and in which the output of sector i is weighted by a constant ω_i .

Figure 5. A Graphical Representation of the Model Economy



12. SOEs subsidies and sectoral distortions. Firms face a set of wedges that distort both the allocation of labor and capital across SOEs and non-SOEs within the same sector, and the allocation of production across different sectors:

- *Within-sector distortions:* While non-SOE firms in sector i hire labor at a wage rate w and rent capital at an interest rate r , SOEs in the same sector face factor costs that are equal, respectively, to $\tau_i^l w$ and $\tau_i^k r$. So, for example, if $\tau_i^l > 1$ and $\tau_i^k < 1$ then SOEs in sector i face labor costs that are above the market value and rental rates that are below the market value.
- *Cross-sector distortions.* The aggregate sectoral output Y_i is sold to the market at a price P_i . However, the representative firm that aggregates sectoral outputs into GDP pays a price $\tau_i P_i$ for each unit of Y_i . So, for example, if $\tau_1 < \tau_2$ then the aggregate output of the economy (GDP) is distorted in favor of the primary sector and against the secondary sector.
- *GDP.* Given aggregate capital and labor K and L , the allocation of these inputs to SOEs and non-SOE firms in the three sectors is affected by the vector $\bar{\tau}$ that collects within- and cross-sector distortions. Aggregate output can therefore be written as function $Y = f(K, L, \bar{\tau})$.

13. Government budget. Government revenues are assumed to be derived from taxing GDP at a rate χ , so χ is the revenue-to-GDP ratio. Revenues are spent on SOEs subsidization and on the provision of a public good G . Specifically, the quantities $(\tau_i^l - 1)w$ and $(1 - \tau_i^k)r$ are assumed to be, respectively, the per-worker and per-unit-of-capital transfer by the government to SOEs operating in sector i . For example, when $\tau^l > 1$ the quantity $\tau^l - 1$ is the premium wage rate paid by the government (who ultimately owns SOEs) to SOEs workers. Similarly, if $\tau^k < 1$ then $1 - \tau^k$ is the ratio between the return on

SOEs capital received by the government and the government's financing cost r .³ If the government was to balance its budget each year, then any (positive) residual between government revenues and SOEs subsidies would be spent on the provision of the public good G . An alternative interpretation, which is followed in the description of the results of the simulations, is that G represents the government's net fiscal balance.

14. Capital accumulation and dynamic distortions. The static side of the model à la Brandt, Tombe and Zhu (2013) presented above is further enriched by embedding it into a standard dynamic general equilibrium framework. This allows to endogenize the evolution of the capital stock over time and to assess the dynamic effects of static distortionary policies.⁴ Capital accumulation is done by a representative household who, at any time t , decides how much of the current net output $(1 - \chi)Y_t$ that it appropriates to devote to consumption C_t or to investment X_t . The capital stock accumulates linearly according to $K_{t+1} = (1 - \delta)K_t + X_t$, with $\delta > 0$ being the rate of depreciation. The household supplies inelastically a unit amount of labor $L_t = 1$. The period utility enjoyed the households is assumed to be additively separable between private consumption C_t and the consumption of the public good G_t . Moreover, the utility derived from private consumption features a constant intertemporal elasticity of substitution $1/\gamma$. Future utility is discounted at a positive rate $\beta < 1$.

D. Model Calibration and Policy Scenarios

15. Calibration of technological and preference parameters. As emphasized by Brandt, Tombe and Zhu (2013), it is not always simple to find reasonable benchmarks for some parameters of the model. Parameter values are assigned as follows:

- *Technology.* The baseline calibration of Brandt, Tombe and Zhu (2013) for both the parameter ϕ and σ is around $1/2$. This makes the two output aggregation technologies relatively inelastic, so in this sense the calibration is conservative (distortions have more negative effects on GDP when elasticities are higher). For this reason, we choose a calibration $\phi = \sigma = 0.5$. The vector of sectoral weights is set equal to $\omega = (0.15, 0.80, 0.25)$ so that, given the other parameters of the model, the pre-reforms equilibrium distribution of employment across sectors matches its empirical counterpart. The vector of sectoral labor shares $a = c(0.30, 0.47, 0.65)$ is set to match sectoral ratios of labor compensation to value added from the US data (this assumes that the US economy is relatively undistorted). Capital is assumed to depreciated at a rate $\delta = 0.1$.

³ These are not the only ways to interpret the presence of labor and capital price distortions at the SOEs level. For example, non-unitary values for τ_i^l and τ_i^k may be caused by mismeasurement of production inputs, for instance if higher wages paid to SOEs worker reflect a higher quality (e.g., in terms of education) of their workforce. Still, the interpretations of the distortions in terms of subsidies seems appealing in our case given the low profitability of SOEs in Cameroon and the relatively high real salaries received by employees in the public sector compared to workers in the informal sector. Moreover, to conservatively take into account the possibility that not all of the distortions at the SOEs level are related to public subsidization, the policy reform scenarios presented in this paper consider the effects of eliminating only half of them. Note also that sectoral output distortions τ_i are assumed not to have a fiscal nature and therefore have no direct impact on the government budget.

⁴ This would allow the endogenization of the labor supply a well. This possibility is however not considered in the simulations presented in this paper

- *Preferences.* The calibration is relatively standard for macro models, with $\beta = 0.95$ and $\gamma = 2$.

16. Calibration of tax rates, SOEs

subsidization, sectoral distortions and TFP

levels. The tax rate $\chi = 0.1$ is set to match the tax revenue ratio in Cameroon. Cross- and within-sector distortions and firms' TFPs are calibrated based on empirical values of the labor and capital inputs:

Primary	Secondary	Tertiary
CDC, PAMOL, SODECOTON	CAMPOST, CICAM, IMP NAT, LABOGENIE, MAGZI, MATGENIE, SIC, SOPECAM	ADC, CAMAIR-Co, CAMTEL, CAMWATER, CNIC, CRTV, EDC, PAD, SCDP, SNI

- *Cross-sector distortions.* The vector of sectoral distortions is meant to capture preferential policy treatment of the different economic sectors. With little data available, we use the ratio of sectoral product taxes to sectoral value added as an indicative measure of preferential policy treatment of the different sector. As such, we calibrate the vector of sectoral distortions to $\tau = (1,5,2)$ reflecting, for example, the fact that the product tax ratio for the secondary sector is five times larger as the one for the primary sector. Based on this calibration, the agricultural sector among the three that receives the highest preferential treatment.
- *Within-sector distortions and TFP.* For each sector, the equilibrium conditions of the model imply that τ_i^l equals the ratio between the labor productivity of SOEs (nominal value added divided by employment) and the labor productivity of non-SOEs. The value of τ_i^k is obtained in a similar way, based on ratios of firms' nominal value added to their capital stocks. In all the three sectors, the values of the distortions, derived by matching the equilibrium equation to the data, turn out to satisfy $\tau_i^l \gg 1$ and $\tau_i^k \ll 1$, in line with the interpretations discussed previously.⁵ TFPs are computed as Solow residuals, which requires dividing each firm's value added by the price of its output. This latter variable is not available and is therefore inferred from equilibrium conditions (see Annex for details).
- *Empirical values for labor and capital.* The calculations above require finding data for the labor input and capital stocks of SOEs and non-SOEs firms. This is a daunting task, considering the lack of consistent and reliable data on SOEs in Cameroon. The values of the variables are therefore approximated in the following way. First, we base the calibration on 21 SOEs for which partial time series of employment and nominal investment over the years 2009-2019 have been made available by the authorities. Based on their main activity, SOEs are assigned to the three sectors as in Table 1.⁶ Second, employment and capital stocks are calculated for each firm, and are then aggregated across firms within the same sector. For employment, firm values for the year 2016 (or for the closest year for which data are available) are used. Capital stocks are instead calculated starting from investment data. Specifically, for each sector we divide the average nominal investment during 2009-2009 of the SOEs in that sector by the average

⁵ The derived vectors of labor and capital distortions are, respectively, $\tau^l = (1.7,3.4,11.6)$ and $\tau^k = (0.06,0.23,0.01)$.

⁶ To be conservative, SONARA is excluded from the list of SOEs used in the calibration, as its poor economic performance, even before the 2019 fire, could affect the results.

nominal gross capital formation (taken from national accounts) of the sector over the same period. We then posit that this ratio also equals the ratio between the real capital stock of SOEs and the total capital stock of the sector. The latter is calculated for the year 2019 using a permanent inventory model and time series of real capital formation at the sectoral level that go as far back as 1993.

17. Two policy reform scenarios are considered: a partial removal of SOEs subsidization and a partial removal of sectoral distortions. Denote with $\tau^* = 1$ the optimal value of distortions at both the firm and the sectoral levels, so that the condition $\tau_i^l = \tau_i^k = \tau_i = \tau^*$ delivers the efficient equilibrium for the economy. We construct two (cumulative) policy scenarios. In the first, $\frac{1}{2}$ of SOEs subsidization schemes are removed gradually over a 5-year horizon. This means that the vector of SOEs distortions in sector i , whose initially calibrated value (τ_i^l, τ_i^k) was described above, changes linearly over time and reaches a value $\frac{1}{2}(\tau_i^l, \tau_i^k) + \frac{1}{2}(\tau^*, \tau^*)$ in year 5. In the second scenario, in *addition* to the removal of half of SOEs subsidization schemes, $\frac{1}{4}$ of sectoral distortions are also removed. That is, sectoral distortions in year 5 equal $\frac{3}{4}\tau_i + \frac{1}{4}\tau^*$, where τ_i is the calibrated value of the distortion in year $t = 0$.

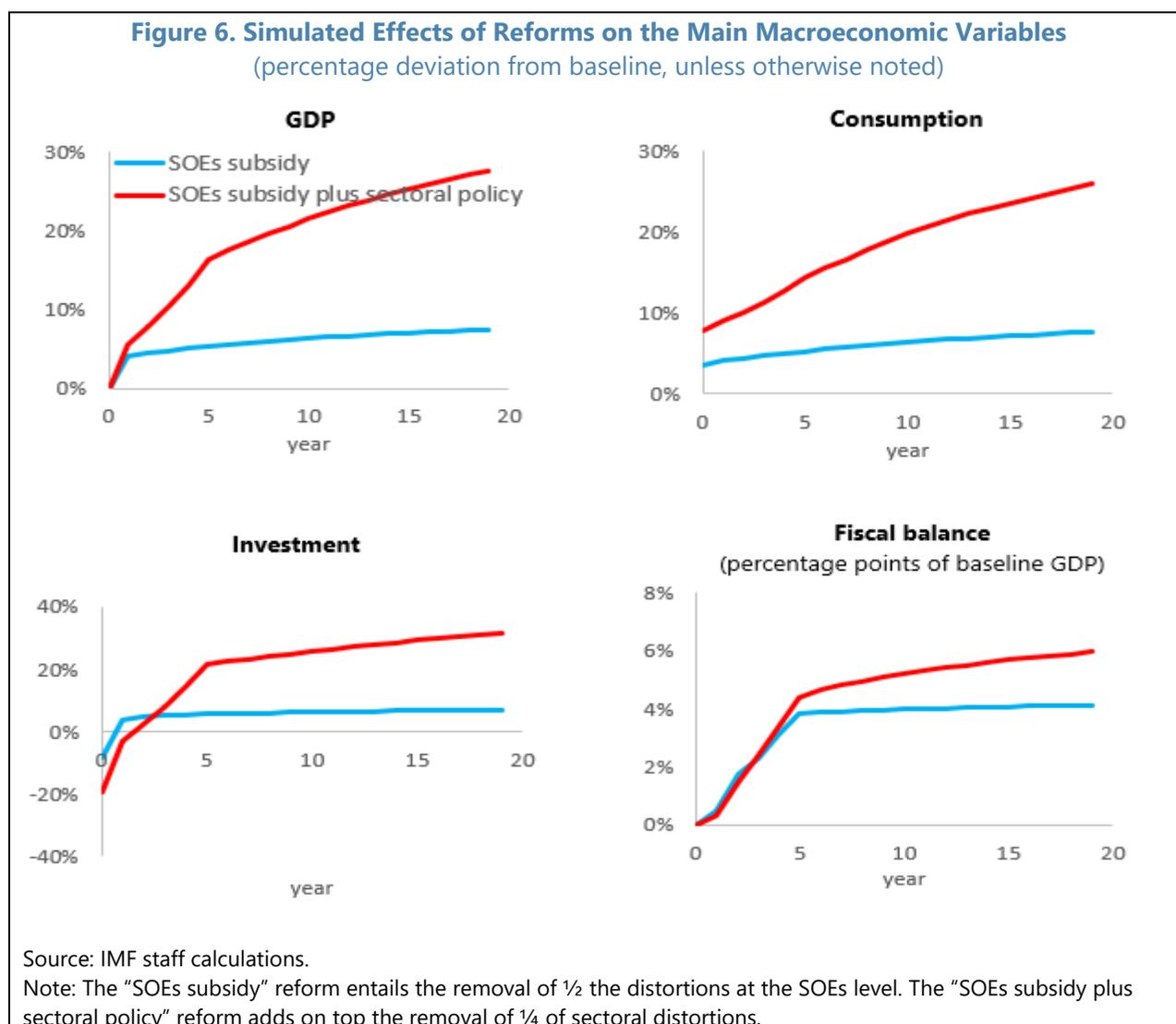
E. Results

18. Figure 6 shows the evolution of the main macroeconomic variables under the two reform scenarios. GDP increases by about 15 percent over the first five years of the simulation, during which the reforms are gradually carried out. While most of the GDP increase is attributed to the reduction of sectoral distortions, one-third of the increase is caused by the SOEs alone. GDP continues to rise even after the reforms have been implemented as investment keeps increasing throughout the simulation horizon. By year 15, that is 10 years after the completion of the reforms, GDP has grown by about 25 percent. At the time of the reform announcement in year 0, consumption jumps up and investment falls. This is a typical effect of reform announcements in macro models. Since individuals believe trust the announcement, they also expect their income to increase in the future, and thus react by reducing their savings and bringing forward part of their future higher consumption. By the second year of the reform, this temporary effect vanishes, and investment grows beyond its pre-reform level. The fiscal balance improves by about 6 percentage points, two-thirds of which can be attributed to the SOEs subsidy reform alone⁷.

19. The reforms lead to a strong rebalancing of the economy toward the tertiary and, to a lesser extent, the secondary sectors (Figure 6). Much of the relative expansion of the tertiary

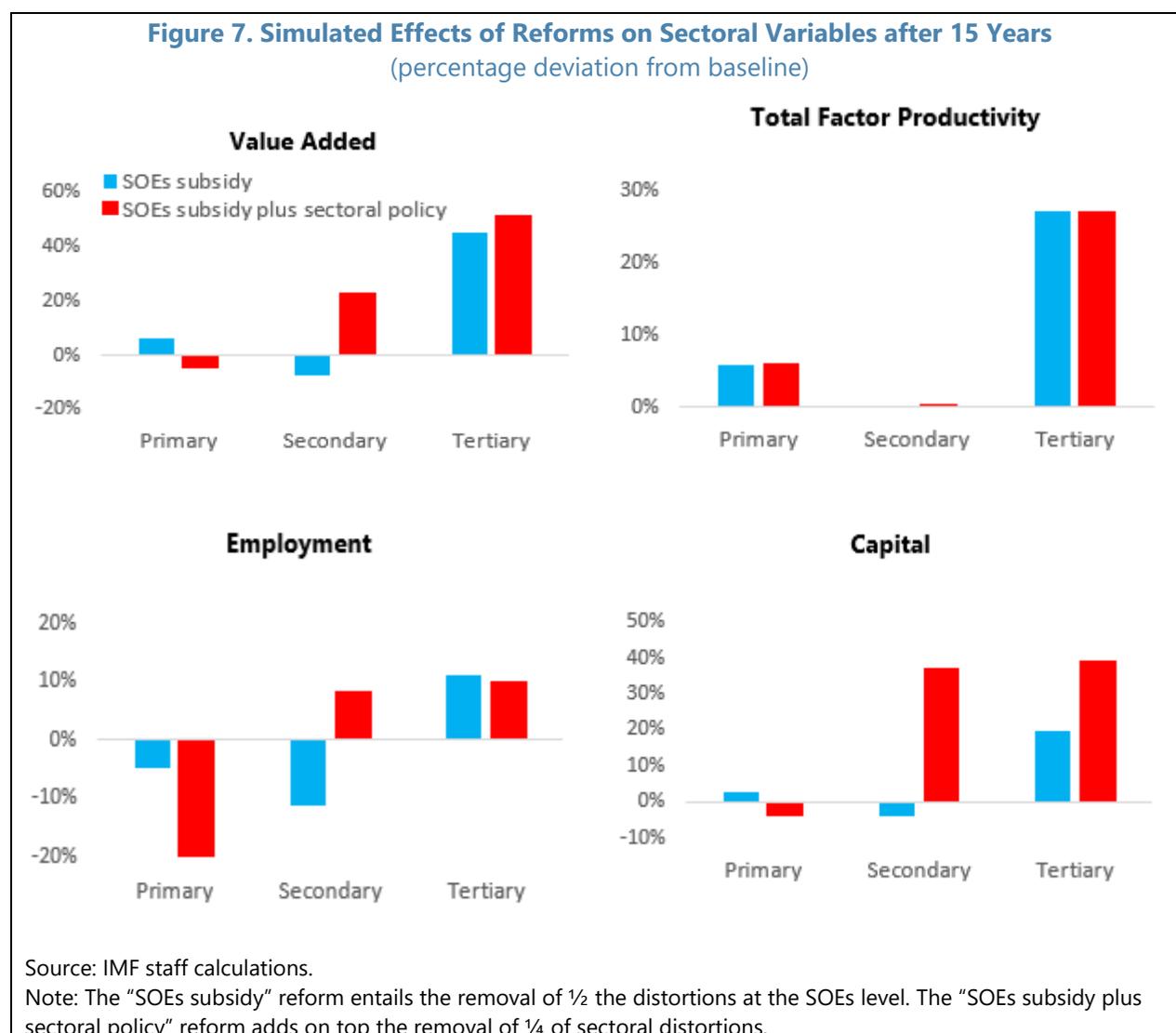
⁷ This is a conservative calculation that takes into account that a partial subsidy reforms (SOEs subsidization *rates* are assumed to be reduced by half) leads to reductions in the level of government spending on some SOEs subsidies but at the same time causes an increase in spending on remaining subsidization schemes. Take for instance the initial per-worker wage premium cost $(\tau_i^l - 1)w$ in sector i . On the one hand, the SOE subsidy reform brings down τ_i^l towards $\tau^* = 1$, which tends to reduce the level of wage premium costs. On the other, because the reforms make labor more productive, the market wage w increases, and this tends to push up government spending, considering that a wage premium *rate* $\frac{1}{2}(\tau_i^l - 1)$ is still in place after the reforms.

sector occurs following the subsidy reform, thanks to the large productivity gains that it entails. On the contrary, the expansion of the secondary sector is entirely driven by the rebalancing of sectoral demand following the reduction in sectoral distortions. After 15 years from the announcement of the reforms, value-added and capital stocks in the primary sector are largely unaffected, but employment falls by as much as 20 percent, compensated by the increase in sectoral TFP due to the SOEs subsidy reform.



20. The model calibration and the scenario simulations represent a first-pass assessment of importance by SOEs subsidy and sectoral policy reforms – but more can be done. Better and more reliable data, especially on gross capital formation for SOEs, would help improve the calibration and lay the ground for a sharper assessment of SOEs performance. This could provide, for instance, a calibration of a comprehensive SOEs reform scenario where not only subsidies are scaled down, but managerial practices are improved and SOEs productivity is increased. The analysis would also benefit from better availability of times series on gross capital formation at a more

disaggregated sectoral classification. This would allow the model to capture the specific nature of the goods produced by SOEs and the extent to which they are complementary or substitutes to the goods produced by non-SOE firms.



F. Conclusions

21. Cameroon has ambitious development and fiscal objectives. This paper highlights the potential contribution provided by reforms of SOEs subsidization and reductions of sectoral distortions. These reforms entail no additional fiscal cost and are based on reducing spending on inefficient subsidization schemes and on improving the quality of sectoral policies (both fiscal and regulatory ones).

22. Model simulations suggest that the reforms could lead to substantial GDP increases, a rebalancing of the economy towards the secondary and tertiary sectors, and a sizable increase

in the fiscal balance. The model provides evidence that SOEs wages are higher than in non-SOE firms, whereas their return to capital is lower. This generates direct costs to the budget in the form of labor and capital subsidies to SOEs and distorts the within-sector allocation of production factors. Significant cross-sector distortions also appear to exist likely driven, at least in part by policy choices that skew the composition of the economy in favor of the primary sector. Within- and cross-sector distortions reduce GDP by lowering aggregate productivity, as well as by discouraging investment and capital accumulation. Simulations show that a gradual elimination of $\frac{1}{2}$ of the estimated subsidies to SOEs and the removal of $\frac{1}{4}$ of cross-sectoral distortions would raise GDP by about 25 percent over a 15-year horizon and improve the fiscal deficit by about 6 percentage points of baseline GDP. The GDP increase would be driven by the expansion of the tertiary and secondary sectors.

23. A successful reform strategy requires priority measures to improve the governance and transparency of SOEs and, more generally, of public enterprises. Several of these measures have been put forth in previous technical reports.⁸ Collecting complete information on the financial relations between the public budget and SOEs would be a crucial step toward assessing the actual size of direct and indirect subsidization schemes to SOEs. A stronger and less fragmented institutional framework for SOEs governance and oversight would strengthen management practices and better align SOEs operations with government's financial and non-financial policy priorities. Over the medium terms, opening the capital of SOEs that have a commercial nature to the private sector would reduce fiscal risks and refocus the role of public action toward the provision of goods and services that have a clear public utility rationale.

⁸ See Helis and others (2021).

Annex I. Model Description

Table A.1 Functional forms	
Firms' production	$y_{ij} = A_{ij} l_{ij}^{a_i} k_{ij}^{1-a_i}$
Sectoral aggregator	$Y_i = \left(y_{is}^{1-\phi} + y_{in}^{1-\phi} \right)^{\frac{1}{1-\phi}}$
GDP aggregator	$Y = \left(\sum_{i=1,2,3} \omega_i Y_i^{1-\sigma} \right)^{\frac{1}{1-\sigma}}$
Period utility	$u = \frac{C^{1-\gamma}}{1-\gamma} + G$

TFP and SOEs subsidy distortions

As in Brandt, Tombe and Zhu (2013), the first order condition for the GDP aggregator firm is

$$P_i = P \frac{\omega_i}{\tau_i} \left(\frac{Y}{Y_i} \right)^\sigma = \left[\frac{\omega_i}{\tau_i} \left(\frac{PY}{P_i Y_i} \right)^\sigma \right]^{\frac{1}{1-\sigma}}$$

The first order condition of the sectoral output aggregator firm gives

$$p_{ij} = P_i \left(\frac{Y_i}{y_{ij}} \right)^\phi = P_i \left(\frac{P_i Y_i}{p_{ij} y_{ij}} \right)^{\frac{\phi}{1-\phi}}$$

The firm price level derived above is used to deflate nominal firm value added to obtain Y_{ij} . Total Factor Productivities A_{ij} are then obtained from the firms' production function in Table A.1, given capital and labor inputs. Relative distortions of SOEs input prices are calibrated using the equilibrium equations

$$\tau_i^l = \frac{p_{is} y_{is}}{p_{in} y_{in}} \cdot \frac{l_{in}}{l_{is}}; \quad \tau_i^k = \frac{p_{is} y_{is}}{p_{in} y_{in}} \cdot \frac{k_{in}}{k_{is}}$$

Aggregate production function

For given SOE distortions, equilibrium real sectoral value added can be expressed as $Y_i = A_i L_i^{a_i} K_i^{1-a_i}$ where L_i and K_i are aggregate sectoral inputs and A_i is sectoral TFP calculated as in Brandt, Tombe and Zhu (2013). Differently from Brandt, Tombe and Zhu (2013), sectoral labor shares a_i may differ across sectors, and aggregate output cannot be expressed in Cobb-Douglas form. We therefore follow an alternative approach.

Standard profit maximization conditions for a representative sectoral firm that produces according to $Y_i = A_i L_i^{a_i} K_i^{1-a_i}$ and pays market prices for capital and labor give

$$(1) \quad \frac{L_i}{K_i} = \frac{a_i}{1-a_i} \rho$$

where $\rho = \frac{r}{w}$ is the relative cost of capital. Equating r to the marginal product of capital and using condition (1), allows us to write the price of sectoral output as

$$(2) \quad P_i = \frac{r}{A_i (1-a_i)^{1-a_i} a_i^{a_i} \rho^{-a_i}}$$

The usual first order condition for the GDP aggregator firm can be written to yield

$$(3) \quad \left(\frac{\tau_i P_i}{\omega_i P} \right)^{-\frac{1}{\sigma}} Y = Y_i = A_i \left(\frac{L_i}{K_i} \right)^{a_i} K_i = \left(\frac{a_i}{1-a_i} \kappa \right)^{a_i} K_i$$

The left and right sides of (3) yield and expression for K_i . Setting $\sum_i K_i = K$ gives the equation

$$(4) \quad (r\rho)^{-\frac{1}{\sigma}} \sum_i \beta_i \rho^{\frac{1-\sigma}{\sigma} a_i} = K$$

with

$$\beta_i = \left(\frac{\omega_i}{\tau_i} \right)^{\frac{1}{\sigma}} A_i^{\frac{1-\sigma}{\sigma}} \left(\frac{a_i}{1-a_i} \right)^{\frac{1-\sigma}{\sigma} a_i} (1-a_i)^{\frac{1}{\sigma}}$$

Equation (3) can alternatively be written as

$$(5) \quad \left(\frac{\tau_i P_i}{\omega_i P} \right)^{-\frac{1}{\sigma}} Y = \left(\frac{a_i}{1-a_i} \rho \right)^{a_i-1} L_i$$

Setting $\sum_i L_i = L$ gives

$$(6) \quad (r\kappa)^{-\frac{1}{\sigma}} \sum_i \beta_i \frac{a_i}{1-a_i} \rho^{\frac{1-\sigma}{\sigma} a_i+1} = L$$

Dividing (4) by (6) and rearranging yields

$$(7) \quad \sum_i \beta_i \frac{\frac{L}{K} - \frac{a_i}{1-a_i} \rho}{\rho^{\frac{\sigma-1}{\sigma} a_i}} = 0$$

For given values of K and L , equation (7) can be solved to obtain the equilibrium value of the relative price of capital ρ . Equations (4) and (6) then allows us to write K_i and L_i in terms of ratios κ_i and λ_i ,

$$\kappa_i \equiv \frac{K_i}{K} = \beta_i \rho^{\frac{1-\sigma}{\sigma} a_i} \quad \lambda_i \equiv \frac{L_i}{L} = \beta_i \frac{a_i}{1-a_i} \rho^{\frac{1-\sigma}{\sigma} a_i+1}$$

In conclusion, for given K and L and a vector $\bar{\tau}$ of SOEs and sectoral distortions, we can derive sectoral TFP A_i and equilibrium inputs K_i and L_i . This gives us sectoral output Y_i , which in turn gets aggregated into Y according to the following aggregate production function

$$Y = f(K, L, \bar{\tau}) = \left[\sum_i \omega_i (A_i L_i^{a_i} K_i^{1-a_i})^{1-\sigma} \right]^{\frac{1}{1-\sigma}} = \left\{ \sum_i \omega_i \left[A_i \left(\frac{a_i}{1-a_i} \rho \right)^{a_i} \kappa_i \right]^{1-\sigma} \right\}^{\frac{1}{1-\sigma}} K$$

Capital accumulation and the household problem

This is solved through standard value function iteration given a modified aggregate production function $(1-\chi)f(K, L, \tau)$ to account for the fraction of output that is not appropriated by the household.

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FINTECH AND FINANCIAL INCLUSION IN CAMEROON¹

A. Introduction

1. The paper studies the relationship between Fintech and financial inclusion in Cameroon. Cross-country evidence has established that financial inclusion, as one dimension of financial development, plays a role in reducing poverty, improving access to finance for small firms, and smoothing consumption of households. Given that Fintech has grown very fast in Cameroon in recent years, it is becoming important to understand the extent to which Fintech contributes to greater financial inclusion, and what dimensions could be improved. Recent evidence suggests that Fintech can sometimes foster financial inclusion by complementing or substituting more traditional forms of finance; however, the evidence also suggests that it remains crucial to tackle various barriers to finance to reap benefits of digital finance.

2. The paper is organized as follows. Section B reviews selectively the literature on financial inclusion, Fintech and financial development. Section C establishes stylized facts on digital money and financial access in Cameroon. Section D explores the empirical relationship between digital money and intermediation by micro-finance institutions. Section E studies empirically the relationship between financial development and economic growth in Cameroon. Policy implications for Cameroon are discussed in Section F.

B. Financial Inclusion, Fintech and Financial Development: Lessons from the Literature

3. Financial inclusion plays an important role in economic development. The broad process of financial development has been shown to promote economic growth as well as to enhance productivity growth and capital accumulation both at the macroeconomic and the microeconomic level (Beck et al. (2020)). It has also been shown to reduce income inequality and poverty. Financial inclusion can be thought of as an aspect of financial development and is therefore potentially associated with many of the benefits that are derived from this process.

4. Financial inclusion, provided an adequate environment is in place, can in turn be beneficial at the macroeconomic and microeconomic levels. Barajas et al. (2020a) find that greater financial inclusion is associated with lower income inequality; they argue that there is a case for promoting women's financial inclusion, as inequality falls even more when policies are inclusive of women. Provided quality of regulation and supervision is high, financial inclusion and stability can be pursued simultaneously. Barajas et al. (2020b) argue that structural as well as policy-related factors, such as frictions related to information asymmetries and moral hazard, and encouraging bank competition or channeling government payments through bank accounts play an important role in the level of financial inclusion; they note that financial inclusion is particularly important regarding households' access and use of financial services to manage risks and smooth

¹Prepared by Mokhtar Benlamine (IMF) and Thierry Tresselt (IMF).

consumption, and the easing of financing constraints of micro, small, and medium-sized enterprises (MSMEs). Fouejie et al. (2020) show that financial inclusion for MSMEs is favored by economic and institutional stability, competition, public sector size and government effectiveness, credit information infrastructure (e.g., credit registries), the business environment (e.g., legal frameworks for contract enforcement), and financial supervisory and regulatory capacity. Mengistu and Perez-Saiz (2018) find that bank competition helps financial inclusion. IMF (2018a) shows that access to finance is low in Cameroon and depends on socio-economic conditions, including low education levels, and that the micro-finance sector plays an important role as a source of financial services.

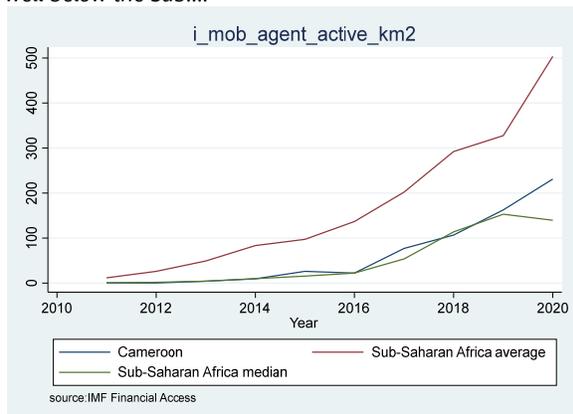
5. Fintech and digital finance can, under the right environment, help improve financial inclusion. Khera et al. (2021b) find that access to infrastructure, financial and digital literacy, and quality of institutions are key drivers of digital financial inclusion, and that digital financial inclusion can help foster economic growth. Sahay et al. (2020) show that across countries digital finance tend to increase financial inclusion, complementing or substituting traditional finance; however, accelerating growth of digital financial services could also present financial stability risks if their regulation and supervision does not keep pace. IMF (2018b) studies the successful development of mobile money in Kenya and its role in fostering financial inclusion; it notes that traditional bank deepening has also played a role but new innovations in mobile technology have allowed greater access financial services and have diversified providers of financial services and has helped smooth consumption, reduce poverty and stimulate growth. By contrast, Gershenson et al. (2021) do not find evidence of an association between Fintech development and greater financial inclusion in Latin America, and that barriers to entry in the financial sector, along with a constraining regulatory environment, may have hindered a faster adoption of Fintech. Sy et al. (2020) observes that Fintech has been a major force shaping the financial industry in Sub-Saharan Africa and that it may carry significant gains for financial inclusion and deepening by improving the level of efficiency of the financial sector. To foster Fintech, policymakers need to fill the large existing infrastructure gap in the region, starting with electricity and internet services, and regulations need to keep up with Fintech innovations.

C. Financial Access and Digital Money in Cameroon: Stylized Facts

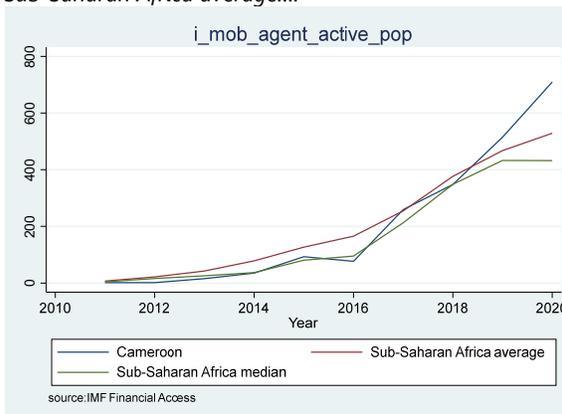
6. Access to mobile money has improved tremendously in Cameroon in recent years, enabled by growing use of mobile phone and internet, but could improve further (Figure 1). The number of active mobile agent outlets per km² has increased from 4 on average in 2014 to 230 in 2020. This level of access to mobile outlets is at about the median for Sub-Saharan countries, but it remains well below the average across Sub-Saharan countries which is at 503 active mobile agent outlets per km². The number of active mobile agent outlets per capita has also grown very rapidly, from 35 agents in 2014 to 709 in 2020, and is above the Sub-Saharan Africa average of 528 in 2020. The use of mobile money infrastructure (percent of population with a subscription to mobile cellular phones) and the use of internet infrastructure (percent of population using internet) have improved significantly in recent years and are at the Sub-Saharan Africa average, but remain well below the world average.

Figure 1. Access to Digital Money

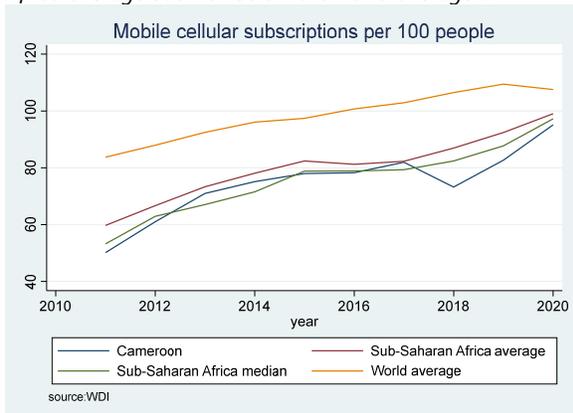
Access per km2 has improved significantly but remains well below the Sub...



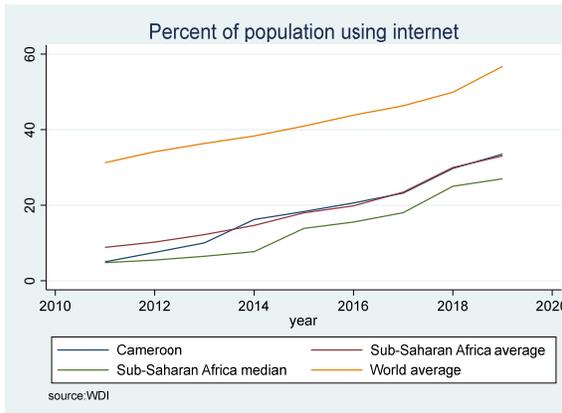
While access to mobile agents per capita has been at the Sub-Saharan Africa average....



Use of mobile phone infrastructure is at Sub-Saharan Africa average but well below the world average ...



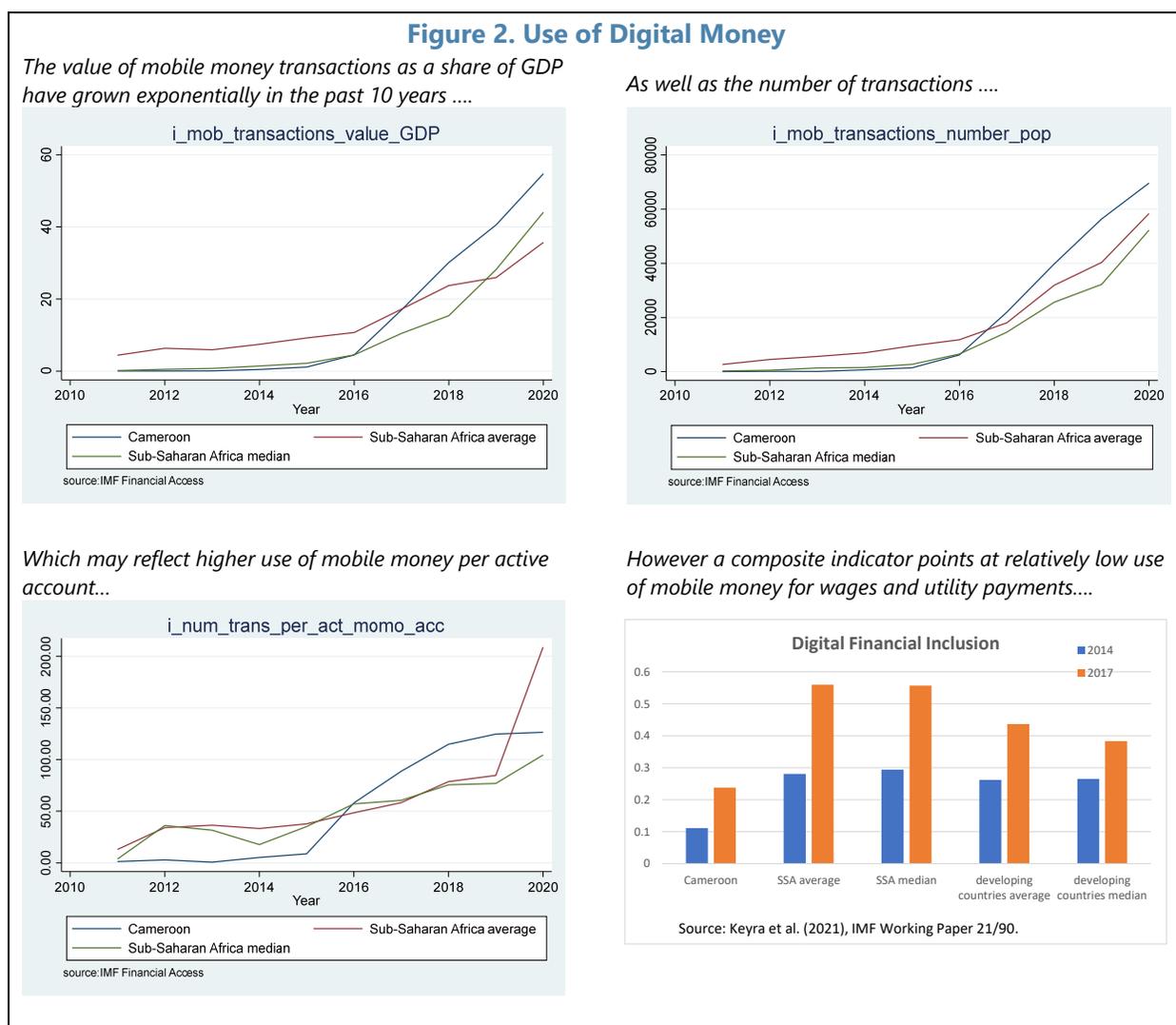
And so does use of internet infrastructure ...



7. Mobile money transactions have grown very fast in recent years, surpassing the Sub-Saharan Africa average, but a composite indicator suggests that use of digital money may remain comparatively low in some areas (Figure 2). The use of mobile money for various transactions has grown exponentially in Cameroon in recent years and is above the average for Sub-Saharan African countries. The total value of annual transactions has grown from below ½ percentage points in 2014 to reach about 55 percent of GDP

Digital Financial Inclusion Index		
Access	Data Source	Weight
Access to digital infrastructure		
Mobile subscription per 100 people	ITU	0.125
% of population who have access to internet	ITU	
Number of registered mobile money agents per 100,000 adults		
	GSMA; IMF FAS; staff est.	0.25
Usage		
		0.125
% of adults who have a mobile account	WB Findex	
% of adults who use internet to pay	WB Findex	
% of adults who use mobile phone to receive salary or wages	WB Findex	
% of adults who use mobile phone to make utility payments	WB Findex	

in 2020. This likely reflects the sharp increase in the number of transactions per year for 1,000 adults, from about 700 in 2014 to about 70,000 in 2020; in particular, the number of transactions per active account has grown from about 5 per year in 2014 to about 126 on average in 2020. However, a composite indicator of FinTech financial inclusion developed by Khera et al. (2021) shows a relatively low level of Digital Financial Inclusion in Cameroon, despite its relatively good level of infrastructure and use of transactions. This indicator that also includes indicators of the use of mobile phone for utility payments and wages suggests a low level of use in these two areas.



8. Access to traditional commercial banking infrastructure is comparatively low, while access to micro-finance institutions is better than the Sub-Saharan Africa average (Table 1).

Commercial banks have relatively few branches and ATMs, which limits SMEs and individuals' access to traditional banking services. The number of branches per 100,000 adults (respectively per 1,000 km²) have increased in recent years, but at 2.15 on average (respectively 0.68 on average), this remains about ½ of the Sub-Saharan Africa median of 4.02 (respectively 1.28) at the end of 2019. Indicators of access to micro-finance institutions fare relatively better, as the number of micro-

finance institutions branches are at or above the Sub-Saharan Africa average both per 100,000 adults or per 1,000 km². However, while both the average and the median indicators of micro-finance access have improved for Sub-Saharan African countries, they have remained stable in Cameroon since 2014.²

Indicators of financial access: banks and micro-finance institutions							
Commercial banks				Micro-finance institutions			
Commercial bank branches per 100,000 adults				All microfinance institution branches per 100,000 adults			
	Cameroon	Average SSA	Median SSA		Cameroon	Average SSA	Median SSA
2014	1.98	4.89	3.93	2014	6.67	4.35	2.17
2019	2.15	4.86	4.02	2019	6.95	5.30	3.01
Commercial bank branches per 1,000 km ²				All microfinance institution branches per 1,000 km ²			
	Cameroon	Average SSA	Median SSA		Cameroon	Average SSA	Median SSA
2014	0.54	4.26	0.97	2014	1.81	1.60	0.77
2019	0.68	2.30	1.28	2019	2.19	2.31	1.28
ATMs per 100,000 adults							
	Cameroon	Average SSA	Median SSA				
2014	3.58	10.02	5.57				
2019	4.61	13.05	6.08				
ATMs per 1,000 km ²							
	Cameroon	Average SSA	Median SSA				
2014	0.97	3.47	1.59				
2019	1.45	4.63	2.23				

Source: IMF Financial Access Data

D. Fintech and Micro-Finance Development in Sub-Saharan Africa

9. An empirical analysis is undertaken to assess the relationship between mobile money and micro-finance institutions (Box 1). Dynamic panel regressions with annual data are undertaken for a sample of 23 Sub-Saharan countries for the period 2011-2020. The dependent variable is the ratio of the volume of loans issued by micro-finance institutions to GDP.³ Explanatory variables include real GDP growth as a proxy for economic activity and two variables measuring the extent of mobile money activity: (i) the ratio of the value of mobile money transactions to GDP: and: (ii) the ratio of the number of mobile money transactions per capita. The regressions include a lagged dependent variable to capture persistence of intermediation by micro-finance institutions and a set of country fixed effects to capture observed and unobserved persistent difference of micro-finance development across countries in our sample.

10. Mobile banking activity is negatively associated with micro-finance institutions' lending activities, suggesting that digital money may substitute for other forms of finance (Table 2). While the association may not be causal, the finding suggests that mobile banking

² This could be explained by the fact that two micro-finance institutions became banks during this period.

³ Another variable considered was the ratio of deposits to micro-finance institutions to GDP. However, there was a lack of sufficient data to perform a regression analysis.

activity may be a substitute for some lending by micro-finance institutions rather than stimulate such lending. This finding is consistent with recent evidence in Sub-Saharan Africa.⁴ Within countries, more mobile money activity is associated with lower credit by micro-finance institutions, after controlling for economic activity (real GDP growth), for past levels of credit-to-GDP by micro-finance institutions, and for time invariant countries specific characteristics (such country fixed effects would capture permanent differences across countries in the level of mobile banking activity and of credit by micro-finance institutions) (columns 1 and 3). The association holds with each of the two indicators of mobile money activity. The association is statistically significant: a 1 standard deviation increase in mobile banking activity (for the relevant indicator in column (1) and (3) is associated with lower credit by micro-finance institutions of 0.6 percentage of GDP (column (1) and 0.8 percentage p of GDP (column (3) respectively.⁵ The negative association remains but becomes statistically insignificant when country fixed effects are omitted (columns (3) and (4), suggesting that the findings reflect correlations *within country* and not correlations *between countries*.

Box 1. Empirical Model: Mobile Money and Micro-Finance

We estimate an econometric model linking lending by micro-finance institutions to the degree of mobile money activity. The empirical model is as follows:

$$Credit_GDP_{i,t} = \alpha \cdot Credit_GDP_{i,t-1} + \beta \cdot growth_{i,t} + \delta \cdot Mobile_Money_{i,t} + F_i + \varepsilon_{i,t} \quad (1)$$

Where $Credit_GDP_{i,t}$ is the ratio of lending by micro-finance institutions to GDP, $growth_{i,t}$ is real GDP growth, $Mobile_Money_{i,t}$ is the ratio of the value of mobile money transactions to GDP or the ratio of the number of mobile money transactions per capita, F_i is a set of country fixed-effects and $\varepsilon_{i,t}$ is an error term.

The sample covers the period 2011-2020 and includes 23 Sub-Saharan countries (see table). Robustness analysis includes dropping the data for 2020 and estimating a Cameroon specific slope coefficient.

Economy	Freq.	Percent	Cum.
1 Angola	5	3.25	3.25
2 Benin	6	3.9	7.14
3 Botswana	6	3.9	11.04
4 Burkina Faso	7	4.55	15.58
5 Cameroon	5	3.25	18.83
6 Côte d'Ivoire	7	4.55	23.38
7 Gambia, The	1	0.65	24.03
8 Ghana	5	3.25	27.27
9 Guinea	8	5.19	32.47
10 Guinea-Bissau	6	3.9	36.36
11 Kenya	10	6.49	42.86
12 Liberia	3	1.95	44.81
13 Malawi	3	1.95	46.75
14 Mali	7	4.55	51.3
15 Niger	7	4.55	55.84
16 Nigeria	9	5.84	61.69
17 Rwanda	10	6.49	68.18
18 Senegal	7	4.55	72.73
19 South Africa	5	3.25	75.97
20 Togo	7	4.55	80.52
21 Uganda	10	6.49	87.01
22 Zambia	10	6.49	93.51
23 Zimbabwe	10	6.49	100

⁴ See: [Mobile financial services can increase impacts of microfinance organizations—but the story is more complicated than we think \(brookings.edu\)](#); and: [Mobile Money and the Economy: A Review of the Evidence | The World Bank Research Observer | Oxford Academic \(oup.com\)](#)

⁵ These statistical correlations appear economically significant given that in our sample the average ratio of credit by micro-finance institution to GDP is 1.54 percent.

Table 2. Cameroon: Regression Results: Mobile Money and Micro-Finance

Dependent variable: loans by micro-finance institutions / GDP	(1)	(2)	(3)	(4)
Lagged dependent variable	1.372*** (0.102)	1.468*** (0.0540)	1.372*** (0.102)	1.467*** (0.0540)
Real GDP growth	0.593 (0.776)	-1.002 (1.160)	0.0687 (0.656)	-1.203 (1.095)
Mobile banking transaction value / GDP	-0.00316*** (0.00107)	-0.000343 (0.00152)		
Number of mobile banking transaction / capita			-2.28e-06*** (6.83e-07)	-8.88e-07 (9.28e-07)
constant	3.198 (2.872)	-0.376*** (0.0724)	3.212 (2.866)	-0.351*** (0.0689)
Country FE	YES	NO	YES	NO
Observations	154	154	154	154
R2	0.995	0.978	0.995	0.978

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

E. Financial Development and Economic Growth in Cameroon

11. This section investigates the relationship between economic growth and credit to the private sector in Cameroon. A time series econometric analysis is developed to explore the existence of a long-run relationship between economic growth and financial development using cointegration technics. The variables considered are real GDP per capita, the ratio of gross investment to GDP, trade openness proxied by the ratio of export and import of goods and services to GDP, and credit to the private sector. The data are on a quarterly frequency and cover the period 2013-2020. Variables meet statistical requirements for a cointegration analysis (Box 2).

12. Financial development has a long-run positive association with economic growth in Cameroon which may operate through productivity growth (Table 3). We find, consistent with economic theory, a positive and statistically significant long-run positive relationship between GDP per capita and credit to the private sector, with an elasticity of 0.36, which indicates that a 1 percent increase in the ratio of credit to the private sector to GDP results in a 0.36 percent increase in GDP per capita in the long-run. The coefficient confidence interval for this elasticity varies between a minimum of 0.05 and a maximum of 0.68, confirming the statistical significance of this relationship. This finding is obtained in a cointegration relationship that also includes the ratio of investment to GDP, implying that the estimated long-run relationship between private credit and GDP operates through other channels than investment, such as productivity growth. Consistent with economic theory, we also obtain a positive and statistically significant long-run positive relation between GDP per capita and investment, with an elasticity of 0.11. To the extent that investment partly relies on credit from the financial sector, financial development also impacts economic growth through the investment channel. These findings are consistent with the existing cross-country literature (Beck et al. (2000)

Box 2. Time Series Statistical Tests

Unit root tests are conducted using both Augmented Dickey Fuller (ADF) and Phillips Perron (PP) and conclude that all the variables are non-stationary and integrated of order 1 (table x-1). The Johansen's (1988) multivariate cointegration model conclude the existence of at least one long-run relationship between the variables. Several tests are conducted to confirm the robustness of the results, including (i) the CUSUM and CUSUM of squares series tests (Brown, Durbin, and Evans, 1975) to check the stability of the regression parameters; (ii) Breusch-Godfrey serial correlation test. Additionally, both the ADF and PP unit root tests confirm that the regression residual is stationary.

Date: 01/11/22 Time: 11:34
 Sample: 2005Q1 2020Q4
 Included observations: 30
 Series: L_R_GDP_P_CAPITA L_CREDIT_PRI_SECTOR L_INVETSMEN2 L_...
 Exogenous series: D(L_OIL_PRICES)
 Warning: Rank Test critical values derived assuming no exogenous series
 Lags interval: 1 to 1

Selected (0.05 level*) Number of Cointegrating Relations by Model

Data Trend:	None		Linear		Quadratic
	No Intercept	Intercept	No Intercept	Intercept	Intercept
Test Type	No Trend	No Trend	No Trend	Trend	Trend
Trace	2	2	2	1	1
Max-Eig	2	2	1	1	1

*Critical values based on MacKinnon-Haug-Michelis (1999)

Table 1. Unit Root tests

Variable	Transformation	ADF			PP			Result
		Intercept	Intercept and Trend	None	Intercept	Intercept and Trend	None	
Real GDP per Capita (R_GDP_P_CAPITA)	Log	0.874	0.728	0.998	0.016	0.000	0.984	I(1)
	dlog	0.000	0.000	0.000	0.000	0.000	0.000	
Claims on the private sector (CREDIT_PRI_SECTOR)	Log	0.004	0.906	1.000	0.000	0.770	0.000	I(1)
	dlog	0.000	0.000	0.000	0.000	0.000	0.000	
Openess (OPENESS)	Log	0.761	0.005	0.409	0.046	0.005	0.491	I(1)
	dlog	0.000	0.000	0.000	0.000	0.000	0.000	
Investment (INVESTMENT2)	Log	0.916	0.049	0.999	0.101	0.000	0.984	I(1)
	dlog	0.000	0.000	0.000	0.000	0.000	0.000	
Residual	Log	0.000	0.000	0.000	0.000	0.000	0.000	I(0)

Table 3. Cameroon: Cointegration Relationship

Dependent Variable: L_R_GDP_P_CAPITA
 Method: Least Squares
 Date: 01/11/22 Time: 11:33
 Sample (adjusted): 2013Q1 2020Q4
 Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.284413	0.837832	11.08147	0.0000
L_CREDIT_PRI_SECTOR	0.363571	0.113014	3.217052	0.0034
L_OPENESS	-0.087312	0.056669	-1.540728	0.1350
L_INVETSMEN2	0.112609	0.042878	2.626259	0.0140
@TREND	-0.004072	0.002150	-1.893530	0.0691
R-squared	0.695864	Mean dependent var	11.96938	
Adjusted R-squared	0.650807	S.D. dependent var	0.049565	
S.E. of regression	0.029290	Akaike info criterion	-4.080573	
Sum squared resid	0.023163	Schwarz criterion	-3.851551	
Log likelihood	70.28916	Hannan-Quinn criter.	-4.004659	
F-statistic	15.44401	Durbin-Watson stat	2.640516	
Prob(F-statistic)	0.000001			

Note: L_X refers to the Log transformation of Variable X.

$$= \alpha \cdot \text{Credit_GDP}_{i,t-1} + \beta \cdot \text{growth}_{i,t} + \delta \cdot \text{Mobile_Money}_{i,t} + F_i + \varepsilon_{i,t}$$

F. Policy Implications for Cameroon

13. Despite the rapid development of mobile money, access to financial services in Cameroon remain low, and reforms to improve financial inclusion for individuals and firms should be accelerated. Experience from other countries suggests that a sound banking system is a prerequisite for further progress in financial inclusion, which in turn helps further financial deepening and stimulates economic growth. Mobile banking has progressed rapidly in recent years and supports financial inclusion, in particular money transfers and payments, but could further support intermediation activities of microfinance institutions.

14. The new National Strategy for Inclusive Finance 2021-2025 creates an opportunity for a wave of reforms. The strategy could include specific policy actions to improve financial literacy and land registries; create credit bureaus and strengthen existing institutions that facilitate information gathering and sharing among banks and microfinance institutions. It could also cover reforms to further strengthen mobile banking, including through phone network infrastructure, and to reinforce complementarities with the banking system including regarding microconsumer loans. New taxes included in the 2022 budget law, such as the income tax on non-profit micro-finance institutions and the tax on mobile transactions, should be reviewed and phased out given their inconsistency with financial inclusion and financial development objectives.

15. Reforms of the banking will also contribute to the financial inclusion objective. These include: (i) Restructuring of the two failed banks; (ii) implementation of the 2019 law allowing a clean-up of past NPLs from bank balance sheets should continue along with the hiring and training of judges and clerks and making specialized commercial courts operational; (iii) tax policies, including VAT on interest revenues, and the taxation of provisions at the time of write-off of bank legacy NPLs, could be reviewed in the context of the upcoming tax diagnostic (above) to facilitate financial intermediation activities of banks and microfinance institutions; (iv) SRC resources and its organizational structure need to be further strengthened consistent with its mandates.

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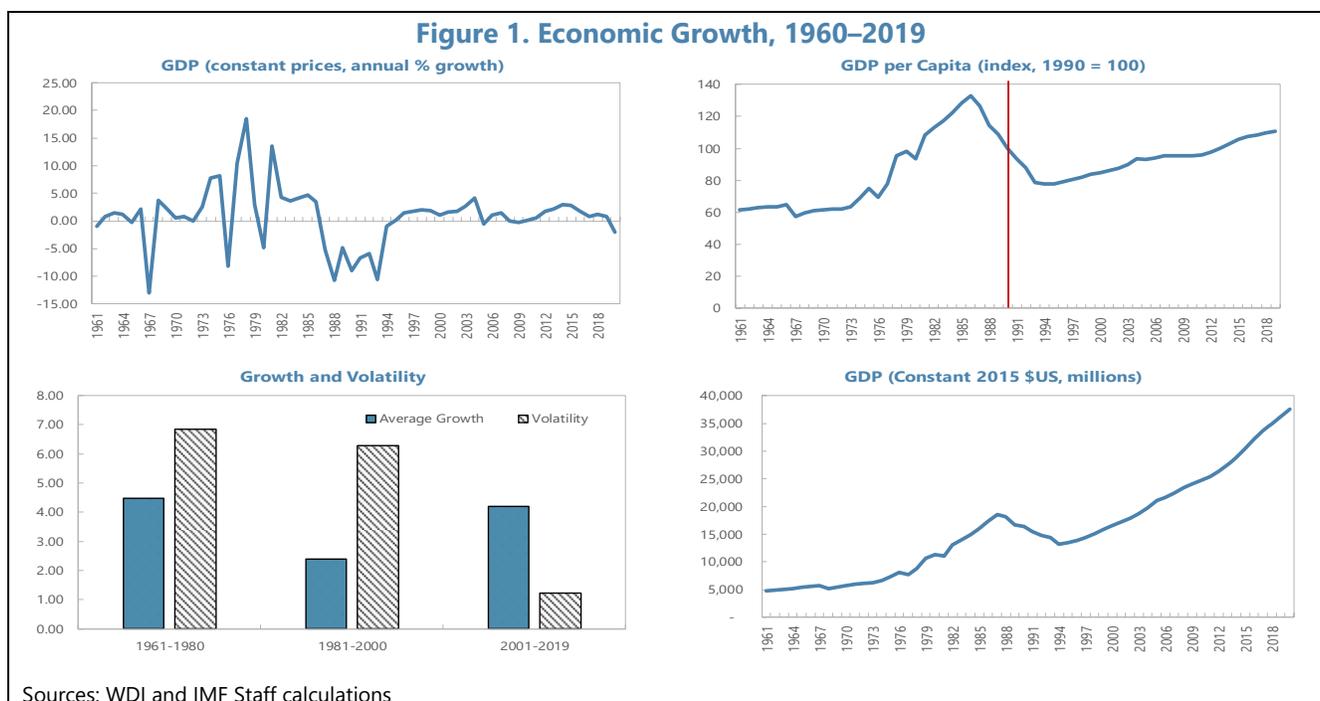
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POTENTIAL GROWTH IN CAMEROON¹

A. Introduction

1. Cameroon is a lower-middle-income country with a population of 25 million. Since gaining independence in 1960, annual growth has been limited to 3.6 percent on average with GDP per capita growing just 0.8 percent on average. As the largest economy in the CEMAC - accounting for over 60 percent of reserves, over 40 percent of the region's GDP, and around 55 percent of the total population - the country contributes significantly to the region's economic development. Cameroon is bordered by Nigeria to the northwest, Chad to the northeast, the Central African Republic to the east, the Republic of the Congo to the southeast, Equatorial Guinea and Gabon to the south, and the Atlantic Ocean to the southwest.

2. Since 1960, economic activity in Cameroon has been characterized by periods of robust growth, severe recession, and volatility (Figure 1). From 1960 to 1980, Cameroon enjoyed strong economic growth despite periods of volatility, expanding almost 6 percent annually on average. Beginning in the mid-1980s, Cameroon suffered a deep recession, contracting almost 30 percent from 1986 to 1993 due, in part, to commodity price shocks impacting principal exports including oil, cocoa, and coffee. Following a devaluation of CFA Franc in 1993, the economy recovered and sustained moderate growth while volatility diminished significantly. Since 2010, the economy has grown roughly 4 percent annually on average. Despite overall growth, GDP per capita remains relatively stagnant and has yet to return to pre-crisis levels.

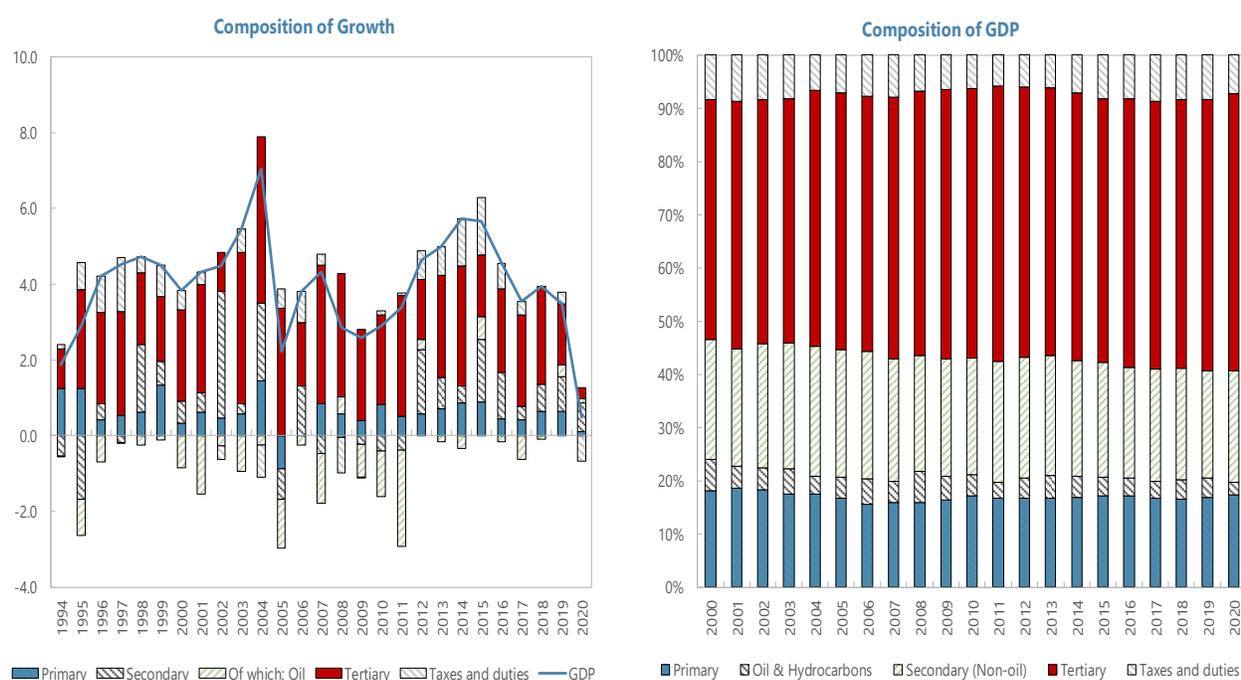


¹ Prepared by Mokhtar Benlamine, Magdi Ahmed (AFR) and Amina Coulibaly (World Bank).

3. Over the last two decades, Cameroon's economic structure has gradually shifted from being primary and secondary sector-intensive to become largely tertiary based (Figure 2).

Cameroon is well-endowed with natural resources with abundant agricultural, mineral and hydrocarbon assets. While the economy remains dependent on primary commodities, the emergence of manufacturing in the 1990s, mainly centered on processing agricultural and petroleum products, contributed to growth and helped diversify economic activity. Over the last 20 years, service sector activity has grown from 45% of GDP to just over 51%, owing to growth in commerce, health and education, and transportation services.

Figure 2. Structure of National Accounts, 1994–2019



Sources: Country Authorities and IMF staff calculations

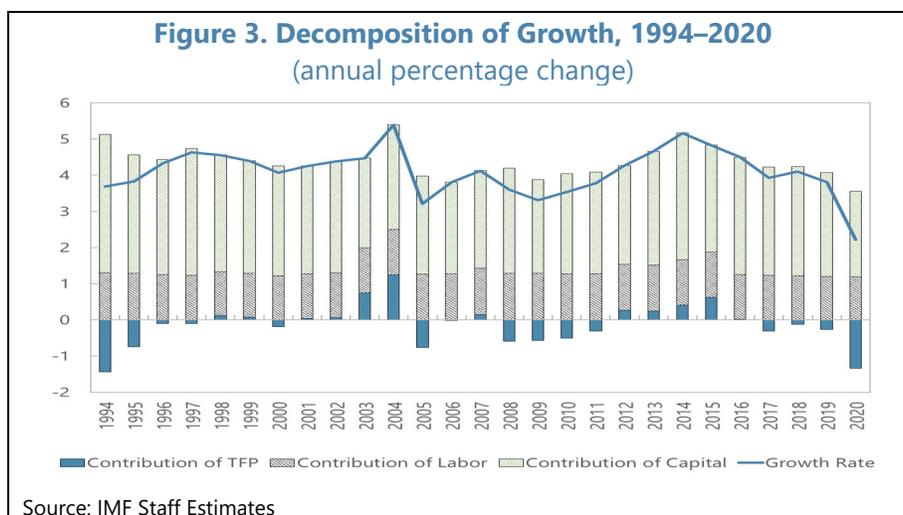
4. The Authorities' development strategy for 2020-2030 (SND30) aims to make Cameroon an emerging market country over 25-30 years. Adopted in January 2020, the SND30 intends to achieve a structural transformation of the economy by making fundamental changes in economic and social structures to promote endogenous, inclusive development, while preserving the potential for future generations. The strategy aims to i) put in place conditions favorable to strong and durable economic growth and implement structural changes essential for the industrialization of the country; ii) improve living conditions and access to basic social services by ensuring a significant reduction in poverty and underemployment; iii) strengthen climate resilience and mitigate the effects of climate change; and iv) improve governance. Quantitative targets include raising the annual growth rate to 8.1 percent on average over 2020-2030, reducing the trade balance deficit to 3 percent of GDP by 2030, decreasing the poverty rate to less than 25 percent by 2030; decreasing underemployment to less than 50 percent by 2030; and raising the Human Capital Index from 0.39 (in 2018) to 0.55 and the Human Development Index to 0.70 in 2030.

5. This paper assesses potential growth and discusses policies and reforms to address structural constraints and expand Cameroon’s economic frontier. First, we examine potential growth using different techniques. We then discuss policies and areas of reforms that may help boost Cameroon’s potential output and help achieve the country’s ambitious development objectives.

B. Potential Growth in Cameroon

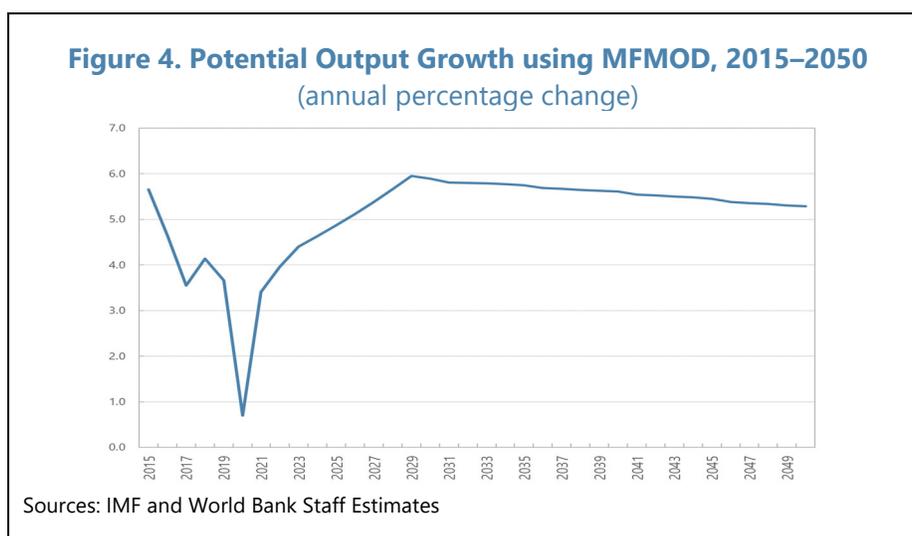
6. Potential output is a crucial concept in economic policy and research. Potential output is defined as the maximum amount of goods and services an economy can produce at full capacity without creating additional inflationary pressures and its measurement encompasses multiple limits and constraints. Policymakers often refer to potential output to tailor policy measures towards achieving development objectives. Several methodologies are used in the literature to measure this unobserved variable from statistical filters separating short- and long-term variations to more sophisticated methods including structural models. This section proposes two methods to estimate potential growth in Cameroon over the 1993-2020 period, namely statistical filters, and a production function.

- Statistical filters are commonly used in the literature for their simplicity to identify the non-cyclical component of a variable over a certain period. We apply different filters to the output growth for Cameroon over the 1993-2018 period including the Hodrick Prescott (HP) linear filter (1997), the Christiano and Fitzgerald (2003) and Baxter and King (1999) band-pass filters. We exclude 2020 and 2019 to control for the impact of the COVID-19 pandemic and the impact of the fire of the national oil refinery, respectively. The filters suggest a potential output growth varying between 3.9 to 4.4 percent over the period 1993-2018, with an average of 4.8 percent over the last decade and a maximum of 5.5 percent in 2014 and 2015.
- Following the seminal work of Solow (1957), a production function based on the combination of three inputs: labor, physical capital, and total factor productivity (TFP) is used for this exercise. Assuming constant returns to scale, potential growth is computed by applying a Cobb-Douglas growth accounting formula. The trends of physical capital and labor are computed using the HP filter to estimate the trend of GDP growth and the TFP component is computed as a residual. This model indicates a potential output growth varying between 3.2 percent and 5.4 percent over the period 1993-2019, with an average of 4.5 percent over the last decade. The COVID-19 pandemic reduces potential output growth to 2.2 percent in 2020. TFP growth averaged 0.02 percent over the last decade and contributed negatively to GDP growth over the last 25 years. Physical capital grew by 5.5 percent on average from 1994 to 2020 and contributed to potential growth by 3 percentage points (Figure 3).



7. The authorities need to accelerate TFP and increase investment and to achieve their development objectives.

- Based on the current pace of reforms, the World Bank’s Macroeconomic and Fiscal Model (MFMOD) is applied to Cameroon to assess the evolution of potential growth over the medium-to-long term. MFMOD is a structural econometric model applied to 181 developing and developed countries with similar formulation to Klein or Cowles Commission-type (Fair 1992) models. The model’s results for Cameroon indicate that potential output growth varied between 3.5 and 5.7 percent from 2015 to 2019, with an average of 4.3 percent. In 2020, the model indicates that the pandemic severely impacted Cameroon’s potential, decreasing to 0.7 percent. Over the medium and long term, a simulation based on extending the TFP growth rate, consistent with current policies, suggests that growth is expected to increase gradually to 5.1 percent in 2026 and to 6 percent in 2029. Starting from 2030, growth is expected to gradually decelerate to 5.6 percent by 2040 (Figure 4).



- Based on the previous simulation, we use a Cobb-Douglas production function to develop additional static simulations to better understand the challenge of further increasing potential growth. We focus on increasing the contribution of TFP and physical capital given that increasing the contribution of human capital takes longer to materialize. Based on the model, an increase of TFP growth by 2 percent per year and a slight acceleration of physical capital from 5.5 to 6 percent per year (to maintain debt sustainability) would lead to a 2.5 percentage point (to 8.2 percent) increase in real GDP growth over the medium-to-long term.
- These results highlight the need and importance of accelerated and continuous structural reforms to achieve the authorities' development objectives.

C. Policies & Reforms to Boost Potential Growth

8. Accelerated, continuous and well-sequenced structural reforms are needed to achieve the Authorities' ambitious development strategy. Economic literature has identified TFP growth as a critical driver of sustained growth and prosperity through improvement in innovation, resource allocation, and productivity of each of the production factors. Jones (2016) highlights that differences in TFP account for about two-thirds of the variation in per capita income across the world. Growth in Cameroon is constrained by its low productivity and inefficiencies. The slower the TFP growth, the more Cameroon must rely on investment to accelerate real growth. Boosting Cameroon's TFP provides an opportunity to grow more efficiently and sustainably over the long term. A wide range of factors affect productivity (Abdychev 2015), including i) macroeconomic conditions (inflation, government debt and public employment); ii) openness and technology creation and transfer; iii) quality of labor inputs and efficient allocation; iv) female labor force participation; v) sectoral composition, structural change, and economic diversification; vi) monetary and financial development; and vii) institutions and regulatory factors.

D. Reforms to Increase Public Investment Efficiency

9. Increasing public investment efficiency could yield significant macroeconomic gains. The 2020 Public Investment Management Assessment found that Cameroon's relative efficiency gap, with respect to the efficiency frontier (determined in relation to the best-performing countries), is 60 percent, compared to 40 percent for SSA countries. The debt-investment growth model (DIG) can be used to measure gains from public investment reforms and favorable financing strategies in Cameroon.² The model highlighted positive macroeconomic outcomes associated with improvements to public investment efficiency. When public investment is scaled-up by 2 percentage points of GDP with favorable financing options, private consumption, investment, and GDP increase by 26 percent, 16 percent, and 4.8 percent respectively by 2034. This reinforces the need to prioritize high-yield investment on roads and power generation infrastructure while ensuring the initial timeline and costs of projects are respected.

² IMF Country Report No. 19/247

10. The 2020 PIMA assessment proposes a sequential roadmap for the implementation of short-, medium-, and long-term reforms. These reforms include i) reducing the time and cost of public investments and strengthening their controls, by reviewing and streamlining texts, processes and actors at each stage of the projects; ii) signing performance contracts and specifying project selection criteria; iii) better-defined land expropriation procedures and landowner compensation strategies that facilitate speedy implementation of infrastructure projects; and iv) improving governance and budgetary discipline through the gradual elimination of cumbersome procedures and unscheduled investments and expenditure, limiting the eviction effect on budgeted projects.

E. Reforms to Address Risks Associated with SOEs and Ensure Competitiveness

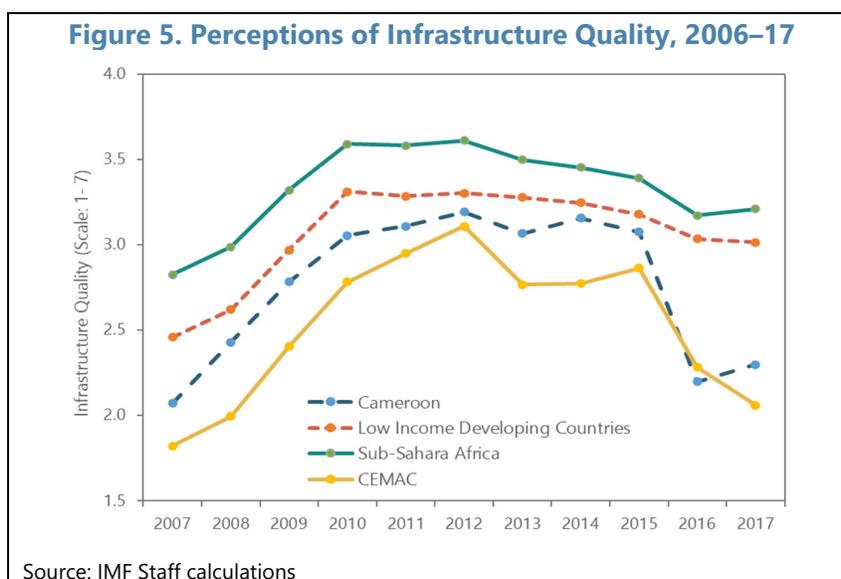
11. More competitive markets would promote productivity gains. Among Latin American countries that introduced market-oriented reforms in the 1990s, Loayza et al (2005) found that the contribution of structural and stabilization policies boosted growth by around 3 percent. In Cameroon, various factors limit competition including market concentration, crowding out of the private sector by large state-owned commercial firms, and government regulations. Model simulations suggest that reassessing subsidies to SOEs and regulatory reforms that promote equitable business practices across sectors can help achieve growth and fiscal objectives. Simulations of policy reforms scenarios show that a gradual elimination of half of the estimated subsidies to SOEs and the removal of one-fifth of cross-sectoral distortions would raise GDP by about 25 percent over a 15-year horizon and reduce the fiscal deficit by about 6 percentage points of baseline GDP. In this scenario, the increase in growth would be driven by expansion of the tertiary and secondary sectors.

12. Reforms to promote market competitiveness and productivity gains could include: i) reducing formal firms' entry cost by simplifying administrative procedures, facilitating access to financing, promoting fair market competition and strengthening anti-corruption measures; ii) improving governance and transparency of SOEs by enhancing their monitoring, improving disclosure of their contingent liabilities, and adopting performance contracts; and iii) adopting a stronger and less fragmented institutional framework for SOE governance and oversight. The reform agenda could also include liberalizing the capital of SOEs that have a commercial nature to foster competitiveness and refocus the role of public enterprises towards the provision of goods and services with a clear public utility rationale.

F. Reforms to Reduce the Infrastructure Gap and Increase the Efficiency of Logistic Services to Promote Regional Trade

13. The quality and accessibility of economic infrastructure remain limited in Cameroon. The perception of Cameroon's infrastructure quality lags behind the average for countries in Sub-Saharan Africa (Figure 5). The quality of roads along regional corridors in Cameroon is poor and suffers from poor maintenance and weak enforcement of axle weight regulations, contributing to high formal and informal transport costs. Large segments of the nine road corridors connecting Cameroon with Nigeria are comprised of dirt and gravel and are impossible to pass during the rainy

season and difficult in the dry season. Checkpoints and roadblocks are common and occur every 20 kilometers on average, leading to long transit times and further increasing transportation costs. The existence of a trucking cartel operating in CEMAC adds to structural inefficiencies due to its freight allocation scheme. A few large freight forwarders at Douala collaborate with a few large trucking companies to fix prices with excessive markups along regional corridors and allocate available transit cargo among truckers. These formal and informal regulatory constraints limit regional competition and have sizeable impact on the final price due to high transport prices.



14. Reforms aiming at improving the quality of infrastructure and tackling the logistic services key bottlenecks are essential to promote regional trade and competition. These reforms could include i) scaling up efficient road investment and maintenance by ensuring sufficient financing for new projects and the rehabilitation of existing roads; ii) removing or reducing road check points to reduce informal payments; iii) strengthening the management of Port operations and establishing a data-based performance monitoring system; and iv) deregulating and liberalizing the trucking industry to improve quality of service and reduce transport prices. Measures to facilitate access to adequate financing for transporters to renew their fleet are also needed to unleash the sector’s potential.

G. Reforms to Increase Financial Development and Inclusion

15. Financial development and inclusion are associated with economic development. Financial development plays a critical role in financing the economy through investment and consumption and is considered in the literature as one of the engines of economic growth (McKinnon, 1973; Shaw, 1973; King and Levine, 1993a, 1993b; Calderón and Liu, 2003; and Bist, 2018). Empirical studies suggest that credit to the private sector is positively associated with long term GDP per capita growth in Cameroon. Testing the cointegration between credit to the private sector and GDP per capita growth in Cameroon highlights the existence of a statistically significant, positive long-run relationship. A one percent increase in the ratio of credit to the private sector to

GDP results in a 0.36 percent increase in GDP per capita in the long run, with a coefficient confidence interval varying between 0.05 and 0.68.

16. Reforms aiming to accelerate financial and banking soundness and access are essential. International experience suggests that a sound banking system is a prerequisite for further progress in financial inclusion, which in turn helps further financial deepening and stimulates economic growth. Reforms could include i) strengthening the soundness of the banking and financial sectors; ii) improving financial awareness and financial literacy; and iii) facilitating access to financing and mobile money through a review of the key bottlenecks.

H. Reforms to Enhance Gender Equality

17. An increasing body of literature highlights the positive role of gender equality in enhancing inclusive growth. Gender equality has been associated with higher income and faster growth (IMF 2015; Hakura et al 2015; Duflo 2012; and Kochhar et al 2017), more equal income distribution (Hakura et al 2015; Gonzalez et al 2015; Ashan et al 2017), economic diversification (IMF 2016), and better access to finance (Aslan et al 2017). Using the estimates of the determinants of growth in a panel of 115 advanced, emerging market, and developing economies (IMF, 2015), a decomposition exercise highlights the impact of gender inequality on differences in average real GDP per capita growth rates in Cameroon compared to SSA and benchmark emerging market Asian (ASEAN 5) and Latin American (LAC 5) countries. The simulations indicate that GDP per capita growth in Cameroon could increase by 0.25 percentage points if its Gender Inequality Index score³ is brought down to the SSA average and by more than 1 percentage point if it is brought to the average of the 5-main emerging Asian countries (Indonesia, Malaysia, Thailand, Philippines and Vietnam) or the 5 leading Latin American economies (Brazil, Chile, Colombia, Mexico and Peru).

18. Reforms could focus on narrowing participation gaps. These reforms could include i) strengthening ongoing efforts to adopt gender budgeting; ii) pursuing efforts to translate approved international treaties that promote gender equality into domestic laws and issuing implementation decrees to operationalize existing laws; iii) modifying laws and policies aimed at facilitating female entrepreneurship; iv) intensifying consultations with banks and technical and financial partners to facilitate women's access to financial services and credit; iv) eliminating remaining legal barriers to women's access to property and enhancing women's education; and v) continuing to support increased women's political participation.

I. Reforms to Enhance Economic Complexity

19. Economic complexity is positively linked with economic growth. Countries tend to converge to the level of income dictated by the complexity of their production capabilities (Hidalgo and Hausmann, 2009). This implies that the structure of a country's product portfolio influences future production capabilities and by proxy, prospects for economic growth. The Economic

³ A higher score denotes a higher degree of gender inequality

Complexity Index (ECI) offers an indirect measure of economic complexity by examining the diversity and ubiquity of a countries' exports basket (Figure 6).

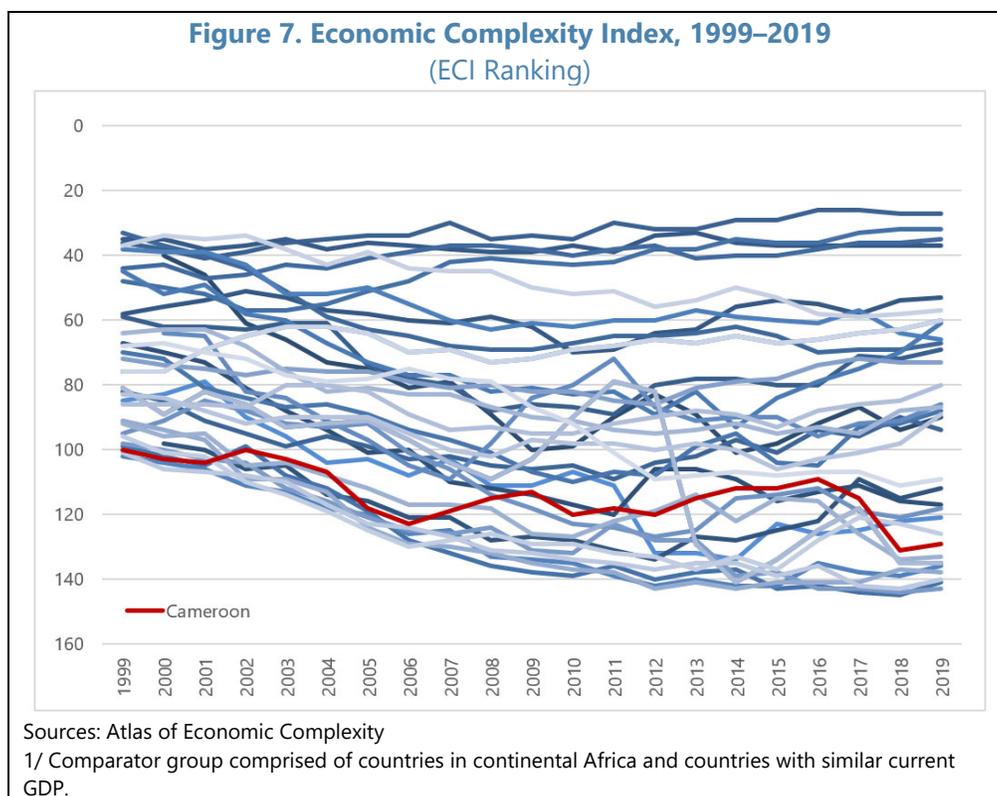
20. Cameroon has a diversified economy, but industrial production remains weak. In Cameroon, the primary, secondary, and tertiary sectors comprise of 19, 25, and 56 percent of economic activity, respectively, making it one of the most diversified economies in the CEMAC region. Although the transition to a service-intensive economy has gradually reduced dependence on primary commodities and strengthened its resilience against external price shocks, weaknesses in industrial capabilities limit the potential to move towards more sophisticated product production. While manufacturing has grown over the last two decades, it remains centered on rudimentary processing of agricultural and mineral products and is hampered by poor infrastructure quality and an unfavorable business environment.

21. Policies to develop public infrastructure and foster private investment are needed to promote dynamism and create opportunities for more sophisticated product production. Due to its dependence on primary commodities, particularly on crude oil and increasingly on liquified natural gas, Cameroon scores poorly on the ECI relative to other countries in Africa and among comparatively sized economies (Figure 7). While a large range of agricultural exports helps diversify sources of income source and offers some protection against volatile energy prices, efforts to improve the complexity of products produced are needed to extend the economic frontier and catalyze sustained growth.

Figure 6. Export Product Portfolio, 2019



Source: Atlas of Economic Complexity



J. Reforms for Innovation

22. Innovation can play an essential role in sustaining and boosting potential growth.

Solow (1956) pointed to the importance of innovation for economic growth by arguing the existence of a positive long-term relationship. Based on three main concepts, the Schumpeterian growth model argues that long term growth is due to innovation, that innovation is driven by entrepreneurial investments, and that innovation replaces old technologies, highlighting the importance of competition through innovation and education. Aghion (2006) draws four key lessons on the relationship between growth and innovation for the EU: i) innovation is a main engine of growth for countries with high per capita GDP; ii) innovation-led-growth requires complementary policies to ensure coherence between structural reforms and policies to, among other things, mitigate negative sectorial implications and help reallocate workers; and iii) that *“structural reforms need careful agenda-setting and prioritization, based on a comparative cost-benefit analysis where the value of each reform would be measured by the ratio of its contribution to the overall growth potential”*.

23. Policies aiming at promoting innovation could yield sizeable gains to growth potential for Cameroon. Daksa et al. (2018) analyzes the drivers of enterprise innovation in Ethiopia, using a multivariate Probit model, and found that engagement in R & D, on-the-job training, and website ownership significantly influence enterprise innovation. These findings stress the importance of policies aimed at strengthening education and broadening professional formal training of skills, knowledge, and techniques, to boost enterprise innovation. Based on the global innovation index

(GII)⁴, Cameroon performs better than the SSA average in three of the seven GII pillars: *Human capital & research*, *Business sophistication* and *Knowledge & technology* outputs. Cameroon, however, performs worse than the SSA average in four pillars: *Institutions*, *Infrastructure*, *Market sophistication* and *Creative outputs* (Table 1).

Strengths	Weaknesses
Graduates in science & engineering, %	Rule of law
Gross capital formation, % GDP	Global R&D companies, top 3, mn US\$
Microfinance gross loans, % GDP	QS university ranking, average score top 3
Firms offering formal training, %	Information & communication technologies (ICTs)
University/industry research collaboration	ICT use
ICT services imports, % total trade	Market sophistication
Scientific & technical articles/bn PPP\$ GDP	Ease of protecting minority investors
Growth rate of PPP\$ GDP/worker, %	Trade, competition, and market scale
ICT services exports, % total trade	Applied tariff rate, weighted avg., %
Cultural & creative services exports, % total trade	Intellectual property payments, % total trade
	Creative outputs
	Intangible assets
	Global brand value, top 5,000, % GDP
	Creative goods exports, % total trade
	Wikipedia edits/mn pop. 15–69

Source: Global Innovation Index (2020)

K. Conclusion

24. This paper estimates Cameroon’s potential growth and discusses policies and reforms to address structural constraints and expand Cameroon’s economic frontier. Accelerated, continuous and well-sequenced structural reforms can help achieve the objectives of the SND30 and put Cameroon on the path of higher, sustainable, and more inclusive long term growth. One important finding is that Cameroon’s growth is constrained by its low productivity and inefficiencies. If such constraints are not addressed, then policymakers risk relying mostly on higher investment to accelerate real growth. However, such a strategy would be in turn be constrained by the need for the country to achieve a moderate or low risk of debt distress. Boosting Cameroon’s TFP provides an opportunity to grow the economy more efficiently and sustainably over the long term. The paper discusses several policy options that would yield growth dividends, such as (i) increasing public investment efficiency in line with the recommendations of the 2020 PIMA; (ii) promoting market competitiveness and productivity gains; (iii) improving the quality of infrastructure and tackling the logistic services key bottlenecks to promote regional trade and competition; (iv) improving the quality of infrastructure and tackling the logistic services key bottlenecks are essential to promote regional trade and competition; (v) accelerating financial and banking soundness and access; (vi) narrowing participation gaps between women and men; (vii) developing public infrastructure and

⁴ The Global Innovation Index (GII) ranks world economies according to their innovation capabilities. Consisting of roughly 80 indicators, grouped into innovation inputs and outputs, the GII aims to capture the multi-dimensional facets of innovation.

fostering private investment to create opportunities for more sophisticated product production; and
(viii) promoting innovation.

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