Disparate Structural Change and Growth Among African Countries: A Comparative Analysis of Mauritius and Senegal

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Abstract

This study investigates the driving forces behind divergent economic growth and structural transformation in Mauritius and Senegal, two historically similar sub-Saharan African nations with differing development trajectories. Employing growth accounting techniques, we assess the influence of factor inputs on the disparate growth patterns observed in these countries. Our analysis reveals that total factor productivity (TFP) stands out as the primary catalyst behind their divergent economic growth. In Mauritius, economic activity reallocation favors sectors with accelerated TFP growth, while Senegal's shift leans towards sectors with slower TFP growth. To further elucidate these dynamics, we employ a multi-sector structural change model, calibrate it to match features of data from both countries, and run a simulation experiment to understand the factors driving sectoral reallocation dynamics. Our findings from these quantitative exercises demonstrate that income effects are the strongest predictors of structural transformation in these countries, which explains why labor moves to the sector with fastest growing TFP in Mauritius. The model implies that if Senegal had experienced the sectoral TFP growth rates of Mauritius, its GDP per capita annual growth rate would have been higher by 0.45 percentage points 2.5 over the period 1990 through 2019.

Keywords: Structural change, Industrialization, Africa, Mauritius, Senegal, Economic growth.
JEL codes: E01, F01, O11, O41

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1 Introduction

Historical data show that developed countries across the world experienced a period of structural change, characterized by a falling value added share of the agricultural sector, a rising value added share of the services sector, and a hump shape in the value added share of the manufacturing sector (Herrendorf et al. 2014). This process of structural change is a key feature of long-run, sustained economic growth in neoclassical growth theory (Kuznets 1973, Herrendorf et al. 2014). The extant literature has demonstrated that both income and price effects play critical roles in structural change (Herrendorf et al. 2014, Ngai and Pissarides 2007, Kongsamut et al. 2001) and that these forces can cause sectoral reallocation of resources to persist in the long-run (Comin et al. 2021). Some developing countries, however, experience an alternative pattern of structural change in which value added moves from primary to tertiary sectors, thus affecting their development outcomes (Adhikari 2019 and Verma 2012 analyze the case of India, for example). In Africa, many countries remain poor with large agricultural sectors, while a few have successfully industrialized and grown richer. There is very little understanding of countries' heterogeneous structural change and economic growth performances.

The empirical and theoretical contribution of this paper is to better understand disparate structural change and growth in sub-Saharan African countries and the extent to which factors such as total factor productivity (TFP), capital, and labor explain the sectoral reallocation of their economies over time. The focus of the project is a comparison of the very different growth and structural change experiences of two sub-Saharan African countries, Mauritius and Senegal. Historically, Mauritius and Senegal are two similar African countries: they are both former French colonies, have been politically stable, and are not major commodity exporters. However, between 1976 and 2019, Mauritius has experienced a fast and sustained growth, while Senegal has struggled to grow (Figure 2. Figure 1 shows that only six out of a sample of 21 African countries have a positive political stability index, and of those six, only Senegal has a growth rate that is less than one percent over the period 1990-2018. Of the five countries with more than one percent growth, only Mauritius has a percentage of commodity export that is less than 80 percent of total export, which is comparable to the level of Senegal. We can therefore rule out commodity export boom as

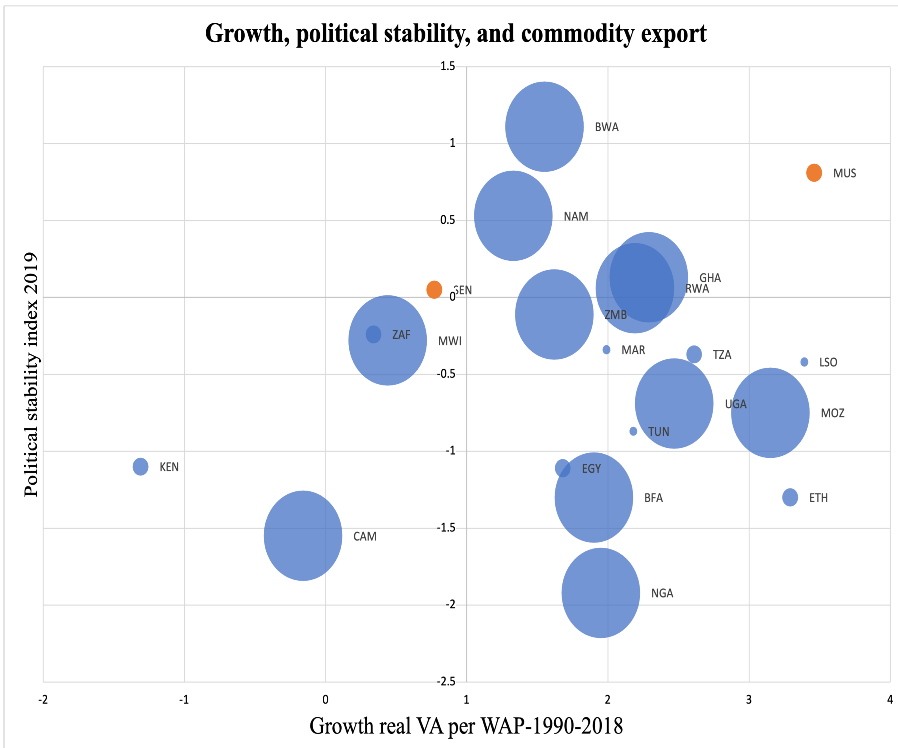

Figure 1: Growth, institutions, and commodity export

Notes: Growth rate of real value added per working-age person: average of one-year growth rates between 1990 and 2018. Political stability index in 2019. Size of the bubbles represents commodity export intensity in 2018-2019; smallest size: the percent of total merchandise exports composed of commodities is less than 50, medium size: it is bigger than 50 and less than 80; and largest size it is bigger than 80.
Data sources: Political stability index from World Bank World Governance Indicators; real value added from Economic Transformation Database; working-age population from UN national populations; percent of total merchandise exports composed of commodities, 2018-2019 from UNCTAD.

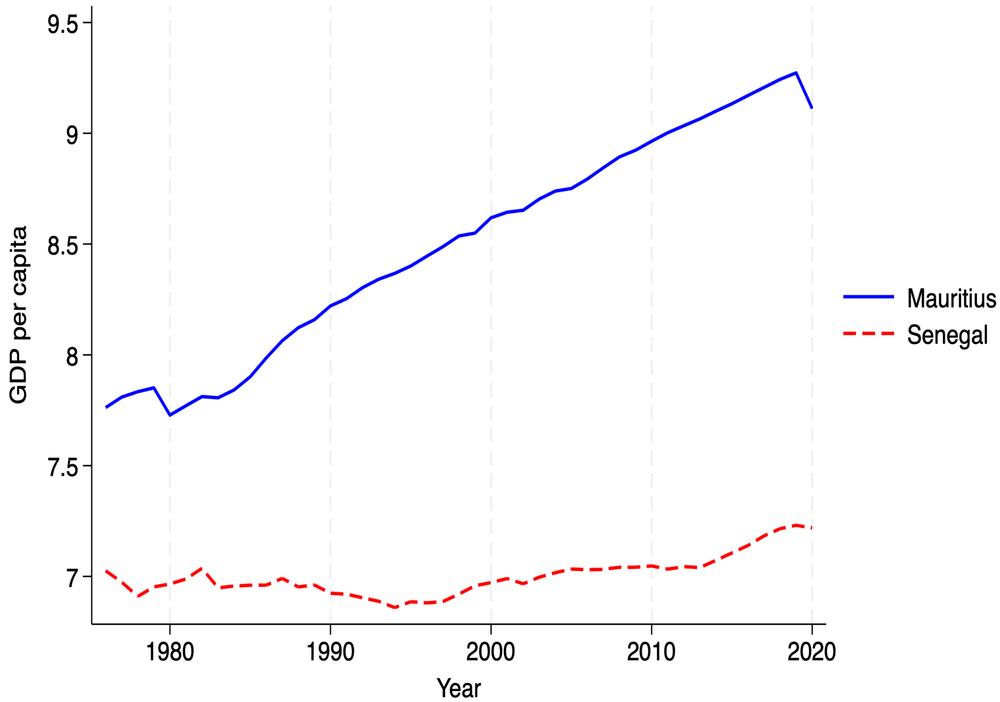

Figure 2: Real GDP per capita-log
Data source: World Bank World Development Indicators.

a potential explanation of Mauritius' fast growth, and political instability as the cause of Senegal's slow growth. Their stark growth differences must therefore have been driven by policies and reforms that have altered the sectoral reallocation of their economies.

Mauritius has followed the quintessential standard pattern of structural transformation, where both labor and economic activity moved from agriculture to the manufacturing sector, and after a brief period of industrialization, are moving to the services sector. On the other hand, Senegal has experienced little to no structural transformation demonstrated by its constant sectoral value added shares. These puzzling facts (slow vs fast growth and different structural transformation dynamics) are depicted in Figures 2, 3 and 4.

This project seeks to answer the following question: what accounts for the different growth and structural change experiences in Mauritius and Senegal? These two countries constitute an important case study that will give broader implications for the prospects of growth and development in Africa, as Mauritius is one of the fastest growing economies in sub-Saharan Africa, and Senegal

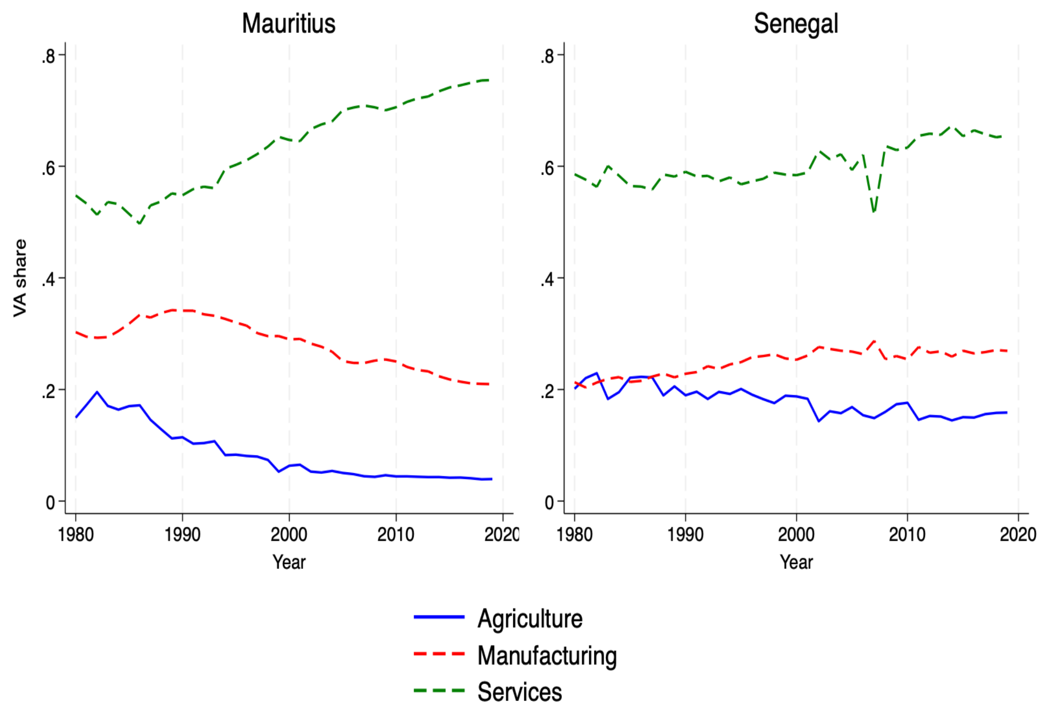

Figure 3: Sectoral real value added shares
Data constructed by author.

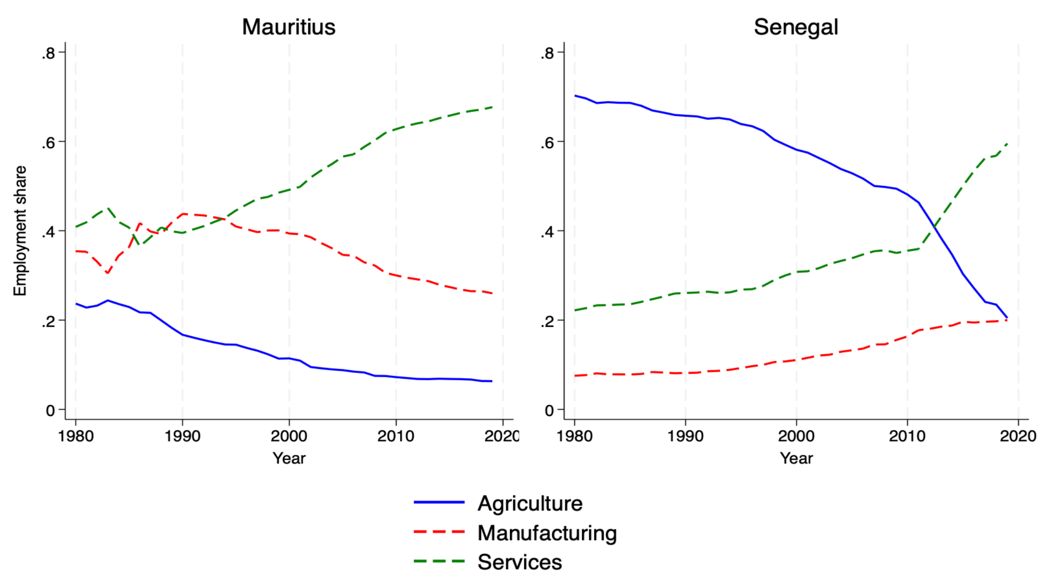

Figure 4: Sectoral employment shares
Data from the 10-Sector and the Economic Transformation Databases.

is one of the largest economies in Francophone West Africa but has experienced little growth over the past four decades.

To this end, we first collect historical national accounts data mostly from primary sources and harmonize them to construct historical sectoral data series in the same comparable national accounts system from 1980 to 2019. This data is used to first conduct an empirical accounting of Mauritius and Senegal's economies using aggregate and sectoral growth accounting exercises, and to isolate the contribution of capital, labor, and TFP. We then perform a structural accounting by calibrating and solving a three-sector neoclassical growth model of structural change with both income and price effects to match features of these two economies. We compare the model's predictions to the data to see the extent to which the model can account for facts of structural transformation across the three major sectors of economic activity: agriculture, manufacturing, and services. We then use the baseline model to run a simulation exercise to capture the important factors driving structural transformation.

From the aggregate growth accounting exercises, we find that Mauritius and Senegal had the same growth in labor inputs and Senegal had a faster growth in capital inputs but experienced a much slower growth in value added due to its negative TFP growth. Further analyses excluding the tourism and finance industries in Mauritius reveal that the fast TFP growth in Mauritius is not driven by these two sectors. The sectoral growth accounting exercises reveal that in both Mauritius and Senegal, labor is moving to the services sector. However, in Mauritius, the services sector has the fastest growing TFP while in Senegal it has the lowest TFP growth. The positive correlation between sectoral relative TFP and labor growth in Mauritius is an unexpected result, as when goods are assumed to be gross complements in preferences, the baseline structural transformation model predicts that the labor share of a sector decreases as its relative TFP rises.

To better understand the driving forces behind structural transformation in these two countries, we use a three-sector neoclassical growth model of structural change, carefully calibrated to match initial-year national income and input-output data in Mauritius and in Senegal. We simulate the model and find that it tracks very closely the time-series data on value added shares of the agricultural, manufacturing, and service sectors in both countries. The counterfactual exercise shows that: 1. Senegal would have grown 1.5 times faster between 1990 and 2019 if it had the sectoral TFP growth of Mauritius; and 2. income effects are a stronger driver of structural transformation in both Mauritius and Senegal, and that explains why labor moves to the services sector in both countries despite it having the fastest growing TFP in Mauritius. Therefore, differential TFP growth is not as important as fast aggregate income growth. If a country like Mauritius or Senegal can sustain a fast aggregate TFP growth, regardless of which sector's TFP increases the fastest, the country's services sector will experience a boom. This finding suggests that for Senegal to experience structural transformation, it needs to enact policies and reforms to accelerate its TFP growth, so that a faster aggregate growth induces a faster change in the sectoral composition of its economy.

Related literature and contribution. This paper contributes to two main strands of literature: first it adds to the literature on structural transformation and economic growth, and second to the role of TFP in the reallocation of economic activity. Existing literature has established a link between economic growth and structural transformation (Rodrik 2016b). Some developing countries, mostly those in Asia, have had successful structural transformation which led to significant economic growth (Betts et al. 2017, Dekle and Vandenbroucke 2012). Most developing countries, however, experience an alternative pattern of structural change in which resources move from the primary to the tertiary sectors. This has been addressed by a wide range of papers (Haraguchi et al. 2016, Rodrik 2016b, G. de Vries et al. 2015).

In Africa, structural transformation has been disappointing in most countries and there is little research on the mechanisms driving it. Few research papers analyze a cross-section of African countries and focus mostly on quantifying the extent of structural transformation through some decompositions (McMillan, Rodrik, and Verduzco-Gallo 2014, McMillan, Rodrik, and Sepulveda 2017, Kaba et al. 2022, Oehmke et al. 2016). These cross-sectional studies mask differences across countries and do not delve into the mechanisms that explain the different dynamics of sectoral reallocation. The lack of research and evidence on structural transformation and growth in African countries is partly due to data limitation. We therefore add to the literature on structural transformation and economic growth by first constructing historical sectoral national accounts data for Mauritius and Senegal and documenting their growth experiences and the sectoral reallocation of their economies over each decade from 1980 to 2019. In addition to documenting the path and dynamics of structural transformation, we use a theoretical model to explain the mechanisms behind the observed patterns. This paper, to our knowledge, is the first to calibrate a model of structural transformation to data from African countries. By focusing on these two countries as a case study, this paper paints a more complete picture of their structural change and pins down the factors driving it.

The second strand of literature this paper contributes to is the relationship between sectoral TFP and reallocation of resources. There are two main drivers of structural transformation: income effects and price effects. As income grows, people consume more of the services sector output thus leading to a faster growth of that sector (Kongsamut et al. 2001). In parallel, when goods across sectors are assumed to be gross complements in preferences, the sector with faster TFP growth experiences a faster decline in its relative price, and thus a decline in its consumption share (Ngai and Pissarides 2007). Therefore, differential sectoral TFP growth is a main driver of structural transformation through price effects, as argued by Jeong 2020, Dekle and Vandenbroucke 2012, Kehoe et al. 2018. However, the extent to which price effects drive structural change relative to income effects depends on a country's economy. Sposi et al. 2021 find that in high income countries, economic activity moves to sectors with lower productivity growth. On the other hand, McMillan, Rodrik, and Verduzco-Gallo 2014 argue that growth in low-income countries is driven by reallocation of economic activity and labor from the low-productivity traditional sector to the high-productivity modern sectors. This is at the basis of the dual economy model, described by Rodrik 2016a as the fact that traditional sectors, mainly agriculture, are stagnant, while the modern sectors, manufacturing and services, are characterized by innovation and productivity growth. Verma 2012 shows that in India, the services sector has boomed at the expense of the manufacturing sector due the higher growth rate of TFP in services. Amadou and Aronda 2020 and Dieme 2018 suggest some evidence that there are great disparities in structural transformation across African sub-regions, as in some regions, resources are being allocated towards more productive sectors, while in others resources move to less productive sectors. In this paper, we find the specific linkages between sectoral TFP growth and structural transformation in Mauritius and Senegal, and further explain the apparent disparities in the relationship between TFP growth and labor reallocation using a structural model. We show that income effects, and not price effects, are the primary drivers of structural transformation in these two countries, so that to the extent that they get richer, resources move to the services sector.

The rest of the paper is organized as follows: in Section 2, we discuss our data collection and construction exercises. Then, we explain the aggregate and sectoral growth accounting exercises and discuss their results in Sections 3 and 4. Sections 5 and 6 present the model and calibration approach. We discuss the quantitative exercises and results in section 7 and some policy implications in section 8, before concluding in section 9.

2 Data

2.1 National accounts data construction

For the growth accounting exercises and structural transformation model, we use national accounts data for Mauritius and Senegal on their sectoral production and income allocation. There are two main challenges in obtaining such detailed data for African countries. The first challenge is that the system of national accounts (SNA), which is the general accounting framework used by countries to keep and report their national accounts, changed over time. Between 1980 and 2019, countries have used different SNAs: 1968 SNA, 1993 SNA, and 2008 SNA. For each new SNA, revisions were made on the classification of the sectors of economic activity, the valuation and computations of certain variables, and through the introduction of new concepts and definitions. A second challenge is that there are different sources for national accounts data for African countries, each with its time-period covered, its variables included, and its SNA. There is no single database reporting all the variables needed for this study at the sectoral level, covering the whole sample period we are interested in (from 1980 to 2019), and in the same SNA. Part of our contribution is to overcome these challenges by constructing comparable historical data.

The first main exercise of the project was therefore to collect and construct detailed, uniform, and consistent time series of national accounts data for Mauritius and Senegal, disaggregated at the industry level. To this end, we use the latest national accounts data released by the countries' statistics offices to obtain the revised series in 2008 SNA, and then use growth rates of the series in earlier systems and years from the archival data to back-cast a historical harmonized series. This same methodology is used by the Economic Transformation Database (ETD) (Kruse et al. 2022) and the 10-sector database (10SD) (Timmer et al. 2015), two databases from the Groningen Growth and Development Center that have sectoral value added and employment for a wide range of African countries, including Mauritius and Senegal, from 1970 to 2018. However, there are two main reasons why their series on sectoral value added differ from our. First, we use more recent revisions of national accounts data and thus obtain updated series. Second, we compute the series at a more disaggregated level of industry classification with 19 industries, while the ETD and the 10SD disaggregate the economies into 12 and 10 industries respectively. However, we use these databases to supplement our data and most importantly we use their estimation of sectoral active population. Furthermore, these databases are not sufficient for our study as they do not have data on compensation of employees and gross operating surplus, two data series necessary for our methodological approach. The other main source of sectoral income data is the EORA input-output tables, which have low reliability due to their high-detail yearly data obtained from extrapolations, and the quality of the data is even lower for years prior to 1990 and for developing countries.

The main challenge when constructing these time series was harmonizing the industries. The 2008 SNA is based on the International Standard Industrial Classification (ISIC) revision 4 with 19 industries, while the 1993 SNA is based on ISIC revision 3 with only 14 industries and the 1968 SNA divides the economy into only 10 industries. We maintained the 19 industries of the ISIC revision 4 as in the 2008 SNA. To obtain the same 19 industries for the 1993 and 1968 SNAs, we split some industries in these SNAs into subindustries to match the industries in the 2008 SNA. For the 1993 SNA, we did the following splits: "electricity, gas and water supply" into "electricity, gas, steam and air conditioning" and "water supply; sewerage, waste management and remediation activities"; "transportation, storage and communication" into "transportation and storage" and "information and communication"; "real estate, renting and business activities" into "real estate activities", "professional, scientific and technical activities", and "administrative and support service activities"; and finally "other community, social and personal services" into "arts, entertainment and recreation" and "other service activities".

Similarly for the 1968 SNA, we split: "electricity, gas and water" into "electricity, gas, steam

<table>
<tr><th>2008 SNA</th><th>1993 SNA</th><th>1968 SNA</th></tr>
<tr><td>Agriculture, forestry, and fishing</td><td>Agriculture, hunting, forestry, and fishing</td><td>Agriculture, hunting, forestry, and fishing</td></tr>
<tr><td>Mining and quarrying</td><td>Mining and quarrying</td><td>Mining and quarrying</td></tr>
<tr><td>Manufacturing</td><td>Manufacturing</td><td>Manufacturing</td></tr>
<tr><td>Construction</td><td>Construction</td><td>Construction</td></tr>
<tr><td>Electricity, gas, steam, and air conditioning supply</td><td rowspan="2">Electricity, gas, and water</td><td rowspan="2">Electricity, gas, and water</td></tr>
<tr><td>Water supply; sewerage, waste management, and remediation activities</td></tr>
<tr><td>Wholesale and retail trade; repair of motor vehicles and motorcycles</td><td>Wholesale and retail trade; repair of motor vehicles and motorcycles</td><td rowspan="2">Wholesale and retail trade, restaurants and hotels</td></tr>
<tr><td>Accommodation and food service activities</td><td>Hotels and restaurants</td></tr>
<tr><td>Transportation and storage</td><td rowspan="2">Transport, storage, and communication</td><td rowspan="2">Transport, storage, and communication</td></tr>
<tr><td>Information and communication</td></tr>
<tr><td>Financial and insurance activities</td><td>Financial intermediation</td><td rowspan="4">Financing, insurance, real estate, and business services</td></tr>
<tr><td>Real estate activities</td><td rowspan="3">Real estate, renting, and business activities</td></tr>
<tr><td>Professional, scientific, and technical activities</td></tr>
<tr><td>Administrative and support service activities</td></tr>
<tr><td>Public administration and defence; compulsory social security</td><td>Public administration and defence; compulsory social security</td><td rowspan="3">Producers of government services</td></tr>
<tr><td>Education</td><td>Education</td></tr>
<tr><td>Human health and social work activities</td><td>Health and social work</td></tr>
<tr><td>Arts, entertainment, and recreation</td><td rowspan="2">Other services</td><td rowspan="2">Community, social, and personal services</td></tr>
<tr><td>Other service activities</td></tr>
</table>

Table 2.1: Sector classification by system of national accounts

and air conditioning" and "water supply; sewerage, waste management and remediation activities"; "wholesale and retail trade, restaurants and hotels" into "wholesale and retail trade" and "restaurants and hotels"; "transportation, storage and communication" into "transportation and storage" and "information and communication"; "financing, insurance, real estate, and business activities" into "financial and insurance activities", "real estate activities", "professional, scientific and technical activities", and "administrative and support service activities"; and finally "other community, social and personal services" into "public administration and defence; compulsory social security", "education", "human health and social work activities", "arts, entertainment and recreation" and "other service activities". Table 2.1 details the way in which we split the 1993 and 1968 SNAs into the 19 industries of the 2008 SNA.

To achieve these splits, we compute the share of each subindustry based on the data from 2008 SNA. Then we extrapolate the shares of these subindustries for the 1993 and 1968 SNA data using the data on the industry we want to split, and use the extrapolated shares to estimate the series for the subindustries. For example, to split "electricity, gas and water supply" from the 1993 SNA into "electricity, gas, steam and air conditioning" and "water supply; sewerage, waste management and remediation activities" as in the 2008 SNA, we compute the shares of "electricity, gas, steam and air conditioning" and "water supply; sewerage, waste management and remediation activities" out of the total of those two industries from the data in 2008 SNA. We then use the "electricity, gas and water supply" series from the 1993 SNA to extrapolate the shares of "electricity, gas, steam and air conditioning" and "water supply; sewerage, waste management and remediation activities" and get the 1993 SNA estimates of these two sectors. We repeat this exercise for all the subindustries in both the 1993 and 1968 SNAs. A detailed explanation of the construction of our time series is given in the Online Appendix of this paper. Below, we give an overview of the data sources and series of the two countries.

2.1.1 Mauritius

We have five main sources for Mauritius national accounts data: the national accounts database from Statistics Mauritius; the input-output tables from Statistics Mauritius; the national accounts statistics: main aggregates and detailed tables from the United Nations; archival data from the Government Information collections of the Harvard Lamont library; and the 10-sector database. The last national accounts from Statistics Mauritius were released in December 2022 and are the latest and most accurate estimations of the country's economic activities. They were compiled following the 2008 SNA and cover the period from 2006 to 2019. The input-output tables are published every five years from 1992: 1992, 1997, 2002, 2007, 2013, 2018. The UN main aggregates and detailed tables were published in 2019 and were based on the 2008 SNA from 2013 to 2019, and on the 1993 SNA from 2008 to 2013 (with overlapping year 2013). The archival data from Harvard are the longest sectoral time series data we use and are reported based on all three SNAs: 2008 SNA from 2015 to 2019, 1993 SNA from 1998 to 2015, and 1968 SNA from 1980 to 1998. The 10-sector database gives sectoral data on value added and employment for a wide range of African, Asian, and Latin American countries from roughly 1960 to 2010. For Mauritius, we construct historical and harmonized sectoral time series for: value added, compensation of employees, gross operating surplus, and gross fixed capital formation.

The data construction for Senegal follows the same methodology as the one used for Mauritius. We have two main data sources for Senegal: the UN national accounts: Main Aggregates and Detailed Tables, and archival data from Harvard library's Government Information collections. We consider the data from the UN main aggregates and detailed tables published in 2020 as the latest revisions of Senegal's national accounts in 2008 SNA. The data from the UN tables published in 2019 and 2018 are in 1993 SNA. The archival data from Harvard's library are published in 1968 SNA and go back to 1980. We link data from these different sources to obtain detailed uniform historical time series of national accounts data for Senegal. We construct such sectoral times series for: value added, compensation of employees, gross operating surplus, and consumption of fixed capital.

With this extensive exercise of data collection and detailed constructions of sectoral national accounts series, we have a database of key time series disaggregated at 19 industries, for the two countries, making a substantive contribution to data collection and construction for African countries. In addition to providing more disaggregated sectoral value added, we have constructed reliable sectoral income data which were not readily available before. Moreover, we have sectoral gross fixed capital formation and consumption of fixed capital that will allow us to later compute sectoral capital stock series, again data that are not readily available for African countries. Finally, with all these data and the derived capital stock series, we derive TFP series at the aggregate and sectoral levels for both countries, another major contribution in understanding these African economies.

2.2 Micro data

In addition to the macro data from the countries' national accounts, we use household-level data from Mauritius to estimate hours worked and income from self-employment. The goal of the usage of micro data is to derive national estimates of sectoral and aggregate average hours worked and income from self-employment and from informal employment for the growth accounting exercises. The average hours worked, multiplied by the number of people employed, is a measure of effective labor. In the growth accounting, we use this measure for labor inputs as a robustness check. Additionally, there is generally an underestimation of labor share of income in developing countries in particular, as measures of compensation of employees from national accounts do not include the income from self-employment and informal employment. Therefore, we use estimates of national income from self-employment and informal employment derived from the micro data to adjust for the labor shares of income.

We use the Continuous Multi-Purpose Household Survey (CMPHS) from Statistics Mauritius which is a household level survey covering a range of topics including the labor force, and conducted in 1999 and then from 2001-2019. Unfortunately, this is the longest time-series micro data covering labor force activity we could find for Mauritius.

To obtain estimates of national average hours worked and informal income, we model after Young 1995 methodology. Specifically, from the micro data, for each gender and age group category, we first compute employment rates (total employment rate and self-employment rate) as the ratio of the number of people employed to the total working-age population as shown in equation 1. Then we multiply these employment rates by the total national working-age population by gender and age group obtained from the United Nations' population database to derive national estimates of total employed population by gender and age group, as shown in equation 2. To derive total hours worked for each gender and age group category, we multiply these estimates of total employed populations by the average hours worked by gender and age group from the micro data (equation 3). We take the sum across all the categories to get the total number of national hours worked and further divide this by the total employed population to get the average hours worked nationally. Similarly for income from the informal sector, we multiply the average wages for workers in the informal sector by the total informally employed population by gender and age group to obtain the national income from informal employment by gender and age group (equation 4). We take the sum over all the categories to obtain the total national monthly income from self-employment. There are two gender categories, male and female, and 11 age groups for the working-age population: 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69. We do these exercises at the sectoral level as well. A more detailed explanation of the micro data and the national estimates of hours worked and informal wages is outlined in the Online Appendix.

$$(informal)\, ER_{tga} = \frac{number\, of\, people\, (informally)\, employed_{tga}}{total\, WAP_{tga}} \tag{1}$$

$$(informal)\, NE_{tga} = (informal)\, ER_{tga} \times national\, WAP_{tga} \tag{2}$$

$$average\, HW_t = \frac{1}{number\, of\, people\, employed_t} \sum_{g,a} NE_{tga} \times average\, HW_{tga} \tag{3}$$

$$informal\, income_t = \sum_{g,a} informal\, NE_{tga} \times average\, monthly\, informal\, income_{tga} \tag{4}$$

where ER is employment rate, WAP is working-age population, NE is national employment, HW is hours worked, at time t, for each gender g age group a.

3 Aggregate Growth Accounting Exercises

The first growth accounting exercise we conduct consists of decomposing each economy's growth in value added into growth in its different components, namely growth in TFP, growth in capital inputs, and growth in labor inputs. The goal of this exercise is to estimate the contribution of each of these factors to the countries' respective growth and understand the origins of the divergences in the two countries' growth performances. This will allow us to unveil whether the large differences in GDP growth are attributable to the amounts of observable inputs employed or to the cross-country TFP differences. We first do this exercise at the aggregate level.

For each country, we assume their aggregate value added is produced using a Cobb-Douglas production function:

$$Y_t = A_t K_t^{\alpha} L_t^{1-\alpha} \tag{5}$$

for year t, where Y is the real value added, A the total factor productivity, K and L are the amounts of capital and labor inputs respectively, and α is the capital share of income. Because of the lack of data on hours worked for the two countries, labor inputs here are simply the number of people employed. We first estimate the capital shares of income, α. We then estimate the capital stock series K for the two countries using the perpetual inventory methods. Once factor shares of income and the capital stock are estimated, TFP can be inferred. The aggregate growth accounting exercises will illuminate the factors that can account for the divergence in growth of the two countries' value added.

3.1 Factor shares of income

The standard formula to compute the labor share of income, $1-\alpha$, is the ratio between unambiguous labor income and the sum of unambiguous labor income and unambiguous capital income, as follows:

$$1 - \alpha = \frac{unambiguous\ labor\ income}{unambiguous\ labor\ income + unambiguous\ capital\ income} \tag{6}$$

However, such series are not readily available for these two countries. We therefore use their data on compensation of employees and gross operating surplus to estimate their factor shares of income:

$$1 - \alpha = \frac{compensation\ of\ employees}{compensation\, of\, employees + gross\, operating\, surplus} \tag{7}$$

For both countries, compensation of employees is defined as all payments by producers of wages and salaries to their employees, in kind and in cash. These include commissions, overtime payments, bonuses, cost of living allowances, housing allowances, etc. Gross operating surplus is defined as the excess of value added over the cost of employees' compensation, consumption of fixed capital and indirect taxes reduced by subsidies. We take the average of $1 - \alpha$ over the whole sample period. This measure is not a perfect measure of labor share of income as gross operating surplus may give an overestimate of capital income. Specifically, the measure of gross operating surplus may include payments towards other factors than capital, such as interest on loans or dividends to shareholders, payments to enterprise owners, and mixed income. However, this is the best estimate of capital income that we could obtain from the two countries' national accounts.

To correct for these mismeasurements, we adjust the labor income for self-employment and informal employment wages for Mauritius and Senegal respectively. For Mauritius, compensation of employees does not include wages paid to the employer/ the self-employed. And for Senegal, it does not include wages to people informally employed. Thus, these incomes from self-employment and informal employment are included in gross operating surplus. Using the annual total income from self-employment in Mauritius derived from the CMPHS and the annual total income from informal employment from the statistics office in Senegal, we compute an adjusted labor share of income as follows:

$$1-\alpha=\frac{compensation\ of\ employees+other\ employment\ income}{compensation\ of\ employees+gross\ operating\ surplus} \tag{8}$$

where *other employment income* is self-employment income for Mauritius and informal employment income for Senegal. However, the CMPHS goes only from 2001 to 2018. Thus, we compute the baseline labor share for the whole sample period (average), 1980-2019, then compute the average for the period 2001-2018. Then we take the ratio between the long baseline labor share and the short baseline labor share, and multiply this ratio by the adjusted labor share (average) to obtain an adjusted labor share that reflects the whole sample period. These adjustments are shown in equation 9. For Senegal, we use informal income from the Senegalese statistics agency 'Agence Nationale de la Statistique et de la Démographie' (ANSD) to adjust for the labor share using the same equation as above. This informal income is from 2014 to 2019. We then follow the same steps described above to adjust for the whole sample period 1980 to 2019.

$$long\, adjusted\, labor\ share_{1980-2019}=\frac{baseline\, labor\ share_{1980-2019}}{baseline\, labor\ share_{2001-2019}}\times adjusted\, labor\ share_{2001-2019} \tag{9}$$

Table 3.1 shows the baseline and adjusted labor shares, along with the adjusted labor shares. We also see that by adjusting for self-employment and informal employment income, labor share increases by about 5.5 percentage points in Mauritius and 4 percentage points in Senegal.

	Mauritius	Senegal
Baseline	0.44	0.40
Adjusted	0.50	0.44
Difference	0.06	0.04

Table 3.1: Labor shares of income

Notes: Baseline is the unadjusted labor share of income. Adjusted is the adjusted labor share of income over the whole sample period.

3.2 Estimation of the capital stock series

To estimate capital stock series for Senegal and Mauritius, we employ the perpetual inventory methods. The first methods we use estimate both an initial level of K and an average depreciation rate. We solve the following system of equations:

$$\frac{K_1}{Y_1} = (\prod_{t=1}^{10} \frac{K_t}{Y_t})^{\frac{1}{10}} \tag{10}$$

$$\frac{1}{40}\sum_{t=1}^{40} \delta K = \frac{1}{40}\sum_{t=1}^{40} cc \tag{11}$$

$$K_{t+1} = I_t + (1-\delta)K_t \tag{12}$$

for the capital stock K_t and the average depreciation rate δ, using data on value added Y, consumption of fixed capital cc, and investment I, all in constant 1980 local currency. We use this system of 41 equations and 41 unknowns to solve for a series of K_t.

We do the same exercise by replacing equation 10 with the arithmetic mean instead of the geometric mean. Specifically, we solve:

$$\frac{K_1}{Y_1} = \frac{1}{10}\sum_{t=1}^{10} \frac{K_t}{Y_t} \tag{13}$$

$$\frac{1}{40}\sum_{t=1}^{40} \delta K = \frac{1}{40}\sum_{t=1}^{40} cc \tag{14}$$

$$K_{t+1} = I_t + (1-\delta)K_t \tag{15}$$

Moreover, we account for the possibility that the countries went through a period of capital deepening in the 1980s by replacing equation 11 with the following equation:

$$\frac{K_{T1}}{K_{T1}} - \frac{K_1}{K_1} = \frac{K_{T2}}{K_{T2}} - \frac{K_{T1}}{K_{T1}} \tag{16}$$

where $T1$ is year 1984 and $T2$ is year 1989, and solving it with equations 10 and 12 for K_t and δ.

A relatively straightforward methodology is to guess an initial level of capital, and use investment and depreciation rate data from the Penn World Table (PWT) (Feenstra et al. 2015) to derive a series of capital stock using the law of motion of capital.

$$K_{t+1} = I_t + (1 - \delta_t)K_t \tag{17}$$

It follows from this equation that once an initial K_1 is known, we can derive all the subsequent

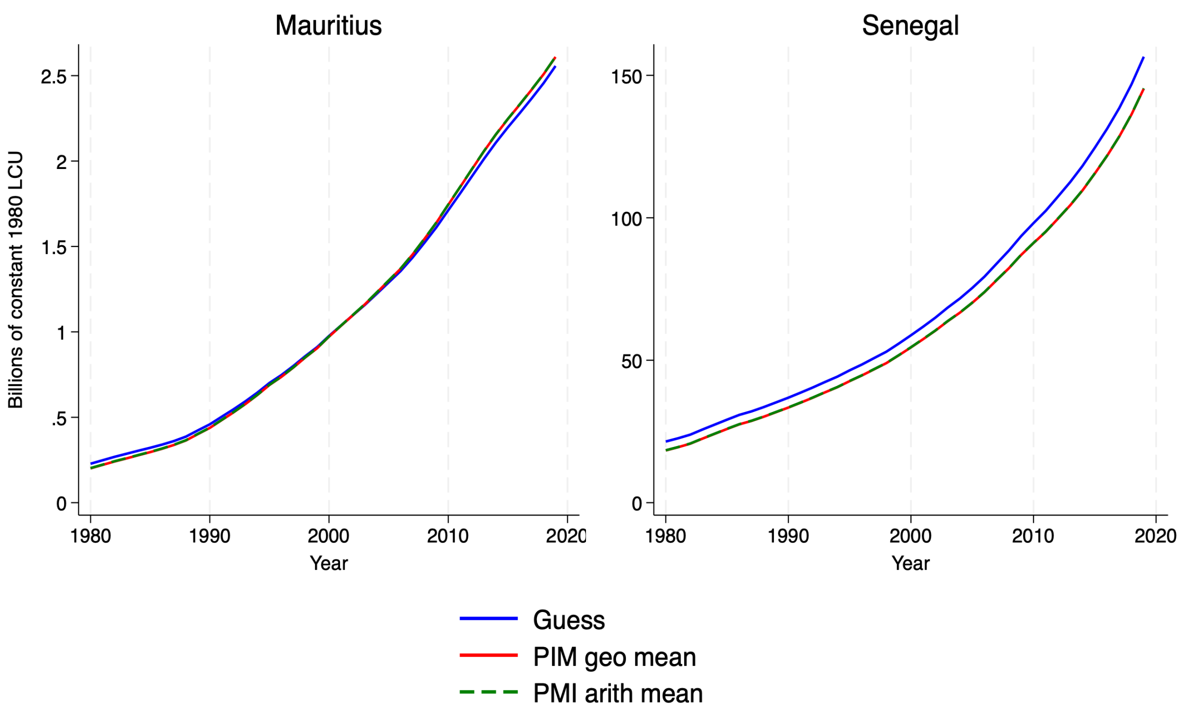

Figure 5: All estimated capital stock series

Notes: The different capital stock series are obtained from different methods. Guess is obtained from guessing an initial level of capital. PIM geo mean is obtained from the perpetual inventory method with the geometric mean. PIM arith mean is obtained from the perpetual inventory method with the arithmetic mean. And PIM cap deep is the perpetual inventory method taking into account the possibility of capital deepening. See section 3.2 for details.

K in the following time periods. The initial guess of capital matters less as we move away from the initial time period. Therefore, although our sample period is from 1980 to 2019, we use the earliest year data for investment and depreciation rate is available as our initial time period, guess a K_1 for that period, and derive a time series of capital. We have investment data from 1980 to 2019 from the national accounts, and we obtained investment from 1976 and 1965 from the World Bank's World Development Indicators for Mauritius and Senegal respectively. We first convert the World Bank investment data into 2008 SNA to make it consistent with the investment data from the national accounts. We deflate the series using the GDP deflator to have them in constant 1980 LCU. We also obtain depreciation rates for Mauritius and Senegal from 1976 and 1965, respectively, to 2017 from the PWT, and used a linear forecasting method to forecast the depreciation rates for 2018 and 2019. For the initial level of capital, we use the capital level obtained from methods 1 and 2 in 1980, and get the capital to output ratio in 1980. We get a ratio of 1.5. We then use the value added of 1965 and multiply it by 1.5 to obtain our guess of an initial capital stock in 1965. From there it is straightforward to obtain a time-series of capital stock from 1965 to 2019.

For Mauritius, we do not have consumption of fixed capital data. We therefore use the depreciation rate from the PWT and employ the perpetual inventory methods to derive an initial level of capital, then use the law of motion of capital to derive the capital stock series, as shown by equations 10 and 12. Additionally, we use the guess method to estimating a capital stock series using equation 17.

For Senegal, we have data on gross fixed capital formation which is our investment data and consumption of fixed capital from their national accounts, and we also have depreciation rate from the PWT. We therefore employ all the methodologies described above to compute capital stock series for Senegal.

We can see from Figure 5 that we obtain very consistent estimates of capital stock series across different methods. Our preferred capital stock is the one derived from the perpetual inventory method with the geometric mean.

3.3 Derivation of TFP Series

Once we derive the factor shares of income and estimate the capital stock series for each country, we get the TFP residual from equation 5:

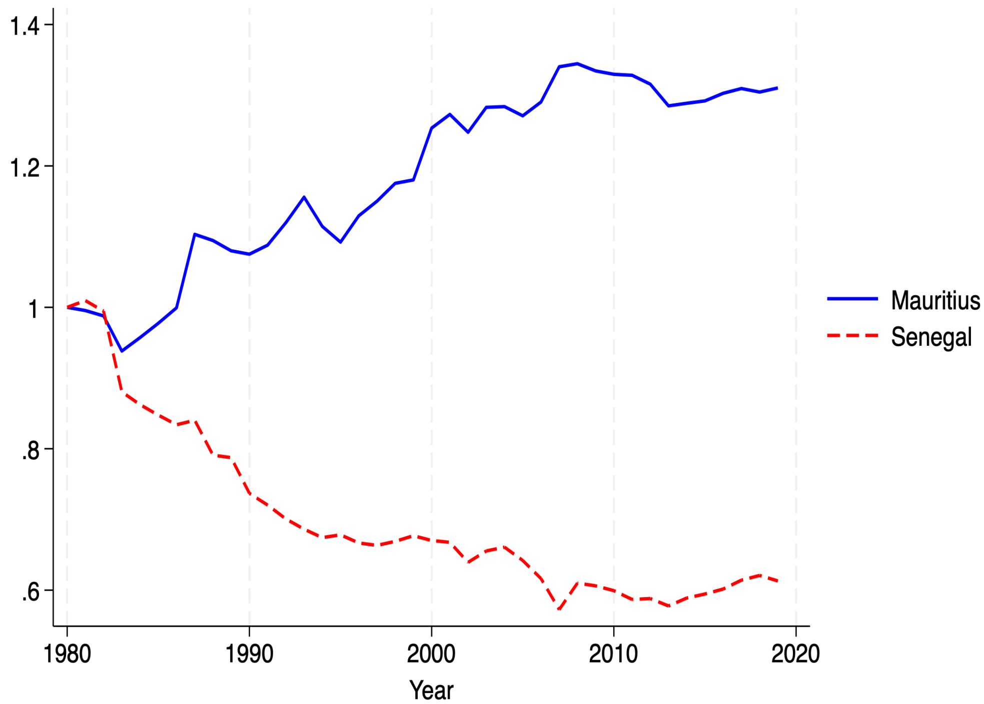

Figure 6: Total factor productivity.
Notes: TFP residual for Senegal and Mauritius, using the baseline and adjusted factor shares computed above, and deflating Y, K, and L by an aggregate deflator. TFP is normalized such that TFP in 1980 is 1.

$$A_t = \frac{Y_t}{K^{\alpha} L^{1-\alpha}} \tag{18}$$

Figure 6 shows the TFP series using the baseline and adjusted factor shares. These series are normalized so that the level of TFP in 1980 is 1. There is a drastic divergence between the two countries TFPs. Mauritius' TFP had an upward trend throughout the whole period, while Senegal's kept spiraling downwards.

3.4 Aggregate growth accounting with baseline factor shares

In this section, we discuss the results from an aggregate growth accounting, decomposing real value added growth into TFP, capital, and labor input factor growth. Using equation 5, we decompose the growth rate of real value added as follows:

$$g_Y = g_A + \alpha g_K + (1-\alpha) g_L \tag{19}$$

where, for a variable X, using the Taylor series approximation of growth rates,

$$g_X = log(X_{t+1}) - log(X_t) \tag{20}$$

We take averages of the one-year growth rates of the variables for each decade, and for the whole sample period. Tables 3.2 and 3.3 show the results for Mauritius and Senegal respectively. The biggest contributor to the growth of real value added is capital inputs, accounting for 70% and 97% of Mauritius and Senegal's growth in real value added over the whole sample period, respectively. These two countries are thus growing through capital investments rather than experiencing an innovation-led growth. They have comparable labor inputs growth with Senegal having an edge over Mauritius. However, the main factor that drives the difference between the two countries growth experiences is TFP. Indeed, in Mauritius, TFP growth is positive between 1980 and 2019, and in each decade, while in Senegal TFP growth is negative over the whole sample period and in each decade except the last one, during which TFP did not grow.

Period	Y	A	K^{α}	$L^{1-\alpha}$
1981–1990	6.72	0.72	4.32	1.68
1991–2000	6.60	1.54	4.44	0.63
2001–2010	4.34	0.59	3.25	0.50
2011–2019	2.93	-0.16	2.49	0.60
1980–2019	**5.20**	**0.69**	**3.65**	**0.86**

Table 3.2: Decomposition of VA-Mauritius

Furthermore, we decompose real value added per working-age person by first dividing all the exponents in equation 5 by $(1-\alpha)$ and dividing both sides of the equation by $Y^{\frac{\alpha}{1-\alpha}}$ to obtain the following:

Period	Y	A	K^{α}	$L^{1-\alpha}$
1981–1990	2.46	-3.05	3.57	1.94
1991–2000	2.85	-0.94	2.92	0.88
2001–2010	3.15	-1.11	3.06	1.20
2011–2019	4.97	0.25	3.09	1.62
1980–2019	**3.32**	**-1.25**	**3.16**	**1.40**

Table 3.3: Decomposition of VA-Senegal

$$Y_t = A_t^{\frac{1}{1-\alpha}} (\frac{K_t}{Y_t})^{\frac{\alpha}{1-\alpha}} L_t \tag{21}$$

We finally divide 21 by N_t, the working-age population to express value added per working-age person in terms of a TFP factor, a capital to value added ratio factor, and a labor factor as follows:

$$\frac{Y_t}{N_t} = A_t^{\frac{1}{1-\alpha}} (\frac{K_t}{Y_t})^{\frac{\alpha}{1-\alpha}} \frac{L_t}{N_t} \tag{22}$$

Similarly, we take the averages of the one-year growth rates of each component for the whole sample period and for each decade. Equation 22 is a nice representation because on a balanced growth path, the growth of $\frac{K}{Y}$ and $\frac{L}{N}$ is 0, so that the growth of $\frac{Y}{N}$ is the growth of the TFP factor. The results of this decomposition are reported in Tables 3.4 and 3.5.

Period	$\frac{Y}{N}$	$A^{\frac{1}{1-\alpha}}$	$\frac{K}{Y}^{\frac{\alpha}{1-\alpha}}$	$\frac{L}{N}$
1981–1990	4.90	1.63	1.31	1.96
1991–2000	5.03	3.46	1.73	-0.15
2001–2010	3.40	1.33	1.89	0.19
2011–2019	2.42	-0.37	1.95	0.84
1980–2019	**3.98**	**1.56**	**1.71**	**0.70**

Table 3.4: Decomposition of VA per working-age person-Mauritius

The first observation we can make is that neither of these countries is on a balanced growth path, as the capital output ratio is not constant. This decomposition allows us to estimate the contribution of the TFP factor, capital deepening, and labor factor in the growth rate of the

Period	$\frac{Y}{N}$	$A^{\frac{1}{1-\alpha}}$	$\frac{K}{Y}^{\frac{\alpha}{1-\alpha}}$	$\frac{L}{N}$
1981–1990	-0.17	-7.55	5.21	2.17
1991–2000	-0.11	-2.34	3.02	-0.79
2001–2010	0.43	-2.76	2.94	0.25
2011–2019	2.07	0.63	0.32	1.12
1980–2019	**0.52**	**-3.10**	**2.94**	**0.68**

Table 3.5: Decomposition of VA per working-age person-Senegal

countries' per capita income. For Mauritius, the TFP factor and capital deepening accounted for most of the growth, accounting for about 40% and 42% respectively. However in Senegal, there is a stark difference as TFP factor growth is negative throughout the whole period, except the last decade when it was 0. Instead, Senegal capitalized off of its capital deepening and labor input factor for most of the period. Between 1980 and 2019, Senegal's capital to output ratio grew at more than twice the rate of Mauritius', its labor factor grew as fast as Mauritius', but its negative TFP factor growth offset the positive contribution of its capital and labor factor growth.

This aggregate growth accounting suggests that in the aggregate, TFP and capital are the main drivers of growth in the two countries, and TFP is at the core of the difference between the two countries' growth experiences between 1980 and 2019. Despite having labor inputs growth rates very comparable to Mauritius' and much faster capital factor growth, Senegal lags behind due to its negative TFP growth over the sample period.

3.5 Aggregate growth accounting with adjusted factor shares

We conduct the same decompositions as above, but this time using the adjusted factor shares instead of the baseline ones. Tables 3.6 and 3.7 show the results of decomposing the growth of the real value added for Mauritius and Senegal respectively. The results are very similar to the ones obtained using the baseline factor shares. Labor inputs growth rates are higher on average in both countries, capital inputs growth lower, and TFP growth higher, compared to the results using the baseline factor shares.

Similarly, the results reported in Tables 3.8 and 3.9 are qualitatively similar to the ones obtained with the baseline factor shares.

Period	Y	A	K^{α}	$L^{1-\alpha}$
1981–1990	6.72	0.93	3.92	1.87
1991–2000	6.60	1.88	4.02	0.70
2001–2010	4.34	0.83	2.95	0.56
2011–2019	2.93	0.00	2.26	0.67
1980–2019	**5.20**	**0.93**	**3.31**	**0.96**

Table 3.6: Decomposition of VA-Mauritius

Period	Y	A	K^{α}	$L^{1-\alpha}$
1981–1990	2.46	-3.00	3.33	2.13
1991–2000	2.85	-0.84	2.72	0.96
2001–2010	3.15	-1.03	2.86	1.32
2011–2019	4.97	0.30	2.88	1.78
1980–2019	**3.32**	**-1.18**	**2.95**	**1.54**

Table 3.7: Decomposition of VA-Senegal

Period	$\frac{Y}{N}$	$A^{\frac{1}{1-\alpha}}$	$\frac{K}{Y}^{\frac{\alpha}{1-\alpha}}$	$\frac{L}{N}$
1981–1990	4.90	1.88	1.07	1.96
1991–2000	5.03	3.79	1.40	-0.15
2001–2010	3.40	1.68	1.53	0.19
2011–2019	2.42	0.00	1.58	0.84
1980–2019	**3.98**	**1.88**	**1.39**	**0.7**

Table 3.8: Decomposition of VA per working-age person-Mauritius

Period	$\frac{Y}{N}$	$A^{\frac{1}{1-\alpha}}$	$\frac{K}{Y}^{\frac{\alpha}{1-\alpha}}$	$\frac{L}{N}$
1981–1990	-0.17	-6.76	4.42	2.17
1991–2000	-0.11	-1.88	2.56	-0.79
2001–2010	0.43	-2.31	2.50	0.25
2011–2019	2.07	0.68	0.27	1.12
1980–2019	**0.52**	**-2.65**	**2.49**	**0.68**

Table 3.9: Decomposition of VA per working-age person-Senegal

Given that the tourism and finance industries are very developed in Mauritius compared to Senegal, the fast TFP and economic growth in Mauritius may be driven by these two industries. To control for that, we conduct the same aggregate growth accounting exercises excluding the tourism industries, excluding the finance sector, and finally excluding both the tourism and finance industries in Mauritius. The results for these exercises are reported in Appendices A, B, and C.

These growth accounting exercises show TFP and value added growth rates for Mauritius that are very similar to the ones reported in this section. Therefore, although these two industries in the services sector dominate the Mauritian economy, they do not fully explain the fast growth of the country.

4 Sectoral Growth Accounting Exercises

In addition to the aggregate growth accounting, we conduct a sectoral growth accounting to characterize the growth experience of the three major sectors of economic activity and to document which sectors are responsible for the aggregate growth accounting results we obtain. The sectoral growth accounting follows the same steps as the aggregate growth accounting, except that we assume that the aggregate economy comprises three main sectors of economic activity: agriculture, manufacturing, and services. The agricultural sector includes all agricultural, forestry, and fishing activities. The manufacturing sector includes mining and quarrying, manufacturing, construction, and utilities. And the services sector includes all the other activities. We assume that each sector s has a Cobb-Douglas production function:

$$Y_{st} = A_{st} K_{st}^{\alpha_s} L_{st}^{1-\alpha_s} \tag{23}$$

4.1 Sectoral factor shares of income

We compute sectoral factor shares using the same methodology described above. Specifically, for each sector s, we compute:

$$1 - \alpha_s = \frac{compensation\ of\ employees_s}{compensation\ of\ employees_s + gross\ operating\ surplus_s} \tag{24}$$

Similarly, we adjust for income from self-employment and informal employment as follows:

$$1 - \alpha_s = \frac{compensation\ of\ employees_s + other\ employment\ income_s}{compensation\ of\ employees_s + gross\ operating\ surplus_s} \tag{25}$$

For Mauritius, the sectoral self-employment income is derived from the micro data from 2001 to 2018. We do the same adjustments as the aggregate labor share of income described in section 3.1 to get an adjusted labor share for the period 1980-2019. Similarly for Senegal, the sectoral informal income is obtained from ANSD from 2014 to 2019, and we do the same adjustments to derive an adjusted labor share of income for the period 1980-2019. Tables 4.1 and 4.2 show the baseline and adjusted sectoral labor shares of income. We can see that in both countries agriculture has the highest labor share, which can be explained by the fact that agriculture is less capital-intensive in these countries. The manufacturing sector has the lowest labor share in Senegal, while in Mauritius it is the services sector.

	Agriculture	Manufacturing	Services
Baseline	0.50	0.46	0.42
Adjusted	0.61	0.56	0.46
Difference	0.11	0.10	0.04

Table 4.1: Sectoral labor shares of income-Mauritius

	Agriculture	Manufacturing	Services
Baseline	0.54	0.27	0.46
Adjusted	0.54	0.31	0.49
Difference	0.00	0.04	0.03

Table 4.2: Sectoral labor shares of income-Senegal

4.2 Sectoral capital stock series

For Mauritius, we have sectoral investment data but we do not have data on capital consumption. We therefore compute sectoral capital stock by using the aggregate depreciation rate and employing the perpetual inventory methods to estimate an initial capital stock for each sector. We then use the law of motion of capital to derive the sectoral time series of the capital stock. Unfortunately, for Senegal, we do not have sectoral investment data, but only sectoral capital consumption data. Because we do not know how this capital consumption data is computed and what it includes, we derive our own simulated aggregate consumption of fixed capital, by multiplying the depreciation rate and the aggregate capital stock obtained from the perpetual inventory method. We then derive the sectoral capital consumption series by multiplying the simulated aggregate capital consumption series by the sectoral shares of capital consumption from the raw data. These steps are shown in equation 26. We finally divide these sectoral consumption of fixed capital by the depreciation rate to obtain estimates of sectoral capital stock.

$$cc_{it}^{constructed} = \delta \times K_t \times \frac{cc_{it}^{data}}{cc_t^{data}} \tag{26}$$

where cc is capital consumption.

Figure 7 shows the final sectoral capital stock series for Mauritius and Senegal. As noted earlier, the agriculture sector is the least capital intensive sector in both countries with the lowest and slowest growing capital stock. The services sector has the highest and fastest growing capital stock. As the two countries experience rapid capital deepening (Figure 3.2), the differing capital intensities of their different sectors will also play a role in their labor and capital reallocation (Acemoglu and Guerrieri 2008).

4.3 Sectoral TFP series

Once sectoral factor shares and capital series are estimated, we derive the TFP residual for each sector s as follows:

$$A_{st} = \frac{Y_{st}}{K_{st}^{\alpha_s} L_{st}^{1-\alpha_s}} \tag{27}$$

Figure 8 shows the derived TFP series using the baseline factor shares. We see that in Senegal, TFP in all sectors has a downward trend, but agriculture's TFP picks up after 2010. In Mauritius, all sectors' TFP has an upward trend except agriculture, whose TFP rises initially but has a

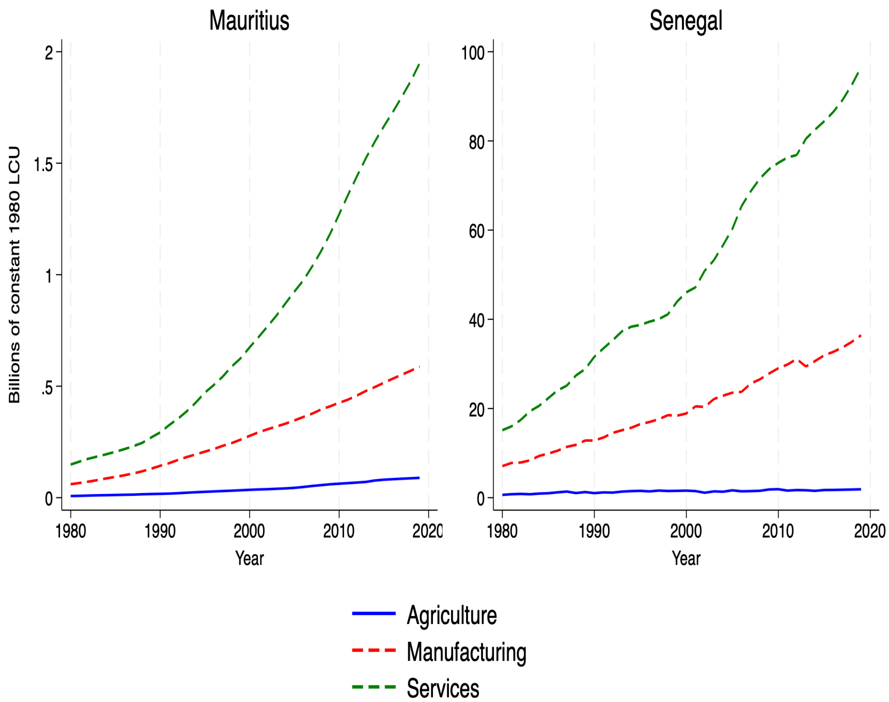

Figure 7: Sectoral capital stock series

long-run downward trend.

4.4 Sectoral growth accounting with baseline factor shares

The first sectoral accounting exercise we conduct uses the baseline sectoral factor shares. As in the aggregate growth accounting described in section 3.4, we conduct two separate decompositions. For each sector s, we decompose the growth rate of Y into the growth rates of A, K^{α}, and $L^{1-\alpha}$. Then we conduct a second decomposition exercise by equation 22. Tables 4.3, 4.5,4.4, and 4.6 show the results from the two decompositions for Mauritius and Senegal respectively.

In Mauritius, the three sectors have different patterns in the growth rates of their real value added. The average growth rates of all sectors' value added were high in the 1980s, but was highest in manufacturing and services. In the subsequent decades, services had the fastest growing value added, followed by manufacturing, while the value added of agriculture started declining following the first decade. This reveals that economic activity shifted significantly from agriculture to manufacturing and services at the beginning of the period, and then moved to mostly services.

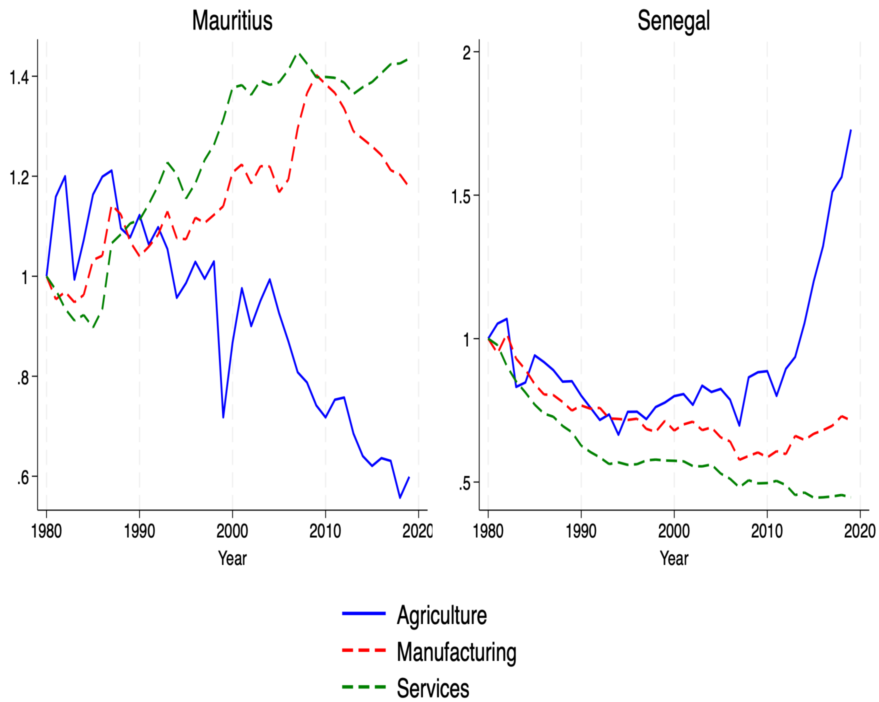

Figure 8: Sectoral TFP- Baseline factor shares

For labor inputs, services had the fastest growth in all decades. Both manufacturing and agriculture saw negative growth rates in their labor inputs in the later decades, while services kept a relatively high and positive growth. There is not a significant difference in capital inputs growth across sectors. Linking these observations on value added and labor inputs growth across sectors to the sectoral growth in TFP paints a more complete picture. At the beginning of the sample in the 1980s, agriculture had the highest TFP average growth rate. In the 1990s, when economic activity started shifting to the manufacturing and services sectors, agriculture had a negative TFP growth rate, while the growth rates of the TFP in the manufacturing and services were increasing significantly. This suggests that economic activity and labor moved from the sector with lower productivity growth (agriculture) to the ones with higher productivity growth (manufacturing and services). Over the whole sample period, agriculture had the lowest TFP growth and at the same time the lowest growth in real value added and labor.

In Senegal, the three sectors have similar value added growth rates during the whole period, suggesting a less dynamic reallocation of economic activity. Overall, value added has an upward trend in all sectors. Only agriculture has a positive TFP growth overall. TFP growth was negative in almost all decades in the manufacturing and services sectors. Capital and labor inputs growth is positive in all three sectors throughout the whole period, but labor inputs grew negatively in the last decade in agriculture. Capital inputs growth rates are highest in manufacturing and services, but the negative TFP growth rates offset the positive contribution of capital. Overall, the sector with the fastest TFP growth, agriculture, had the lowest labor inputs growth and the lowest value added growth. Therefore, economic activity and labor are moving out of agriculture, the faster TFP growth sector, to manufacturing and services, the slower TFP growth sectors.

	Period	Y	A	K^{α}	$L^{1-\alpha}$
Agriculture	1981–1990	5.60	1.16	4.30	0.14
	1991–2000	-0.19	-2.58	3.57	-1.19
	2001–2010	-0.70	-1.89	2.91	-1.71
	2011–2019	-0.12	-2.01	1.95	-0.06
	1981–2019	**1.18**	**-1.31**	**3.21**	**-0.72**
Manufacturing	1981–1990	7.72	0.39	4.60	2.73
	1991–2000	5.21	1.49	3.55	0.17
	2001–2010	2.91	1.36	2.29	-0.74
	2011–2019	0.01	-1.79	1.92	-0.11
	1981–2019	**4.07**	**0.42**	**3.12**	**0.53**
Services	1981–1990	6.43	1.07	3.90	1.46
	1991–2000	8.47	2.13	4.81	1.53
	2001–2010	5.31	0.15	3.65	1.51
	2011–2019	3.95	0.29	2.73	0.93
	1981–2019	**6.09**	**0.93**	**3.80**	**1.37**

Table 4.3: Decomposition of VA-Mauritius

We conduct the same decompositions using the adjusted factors shares and the results are robust. We include the tables of results in Appendix D. Additionally, we do the same exercises in Mauritius excluding tourism, finance, and both, and the results are included in Appendices E, F, and G. Again, our results are robust to these sensitivity tests.

The growth accounting exercises have demonstrated that TFP growth is the principal driver of the divergence in the two countries' growth in economic activity, as well as the reallocation of resources across the sectors. From the results, it is clear that in Mauritius, fast TFP growth drove its fast growth in output per working-age person especially in the first two decades of the sample period,

	Period	Y	A	K^{α}	$L^{1-\alpha}$
Agriculture	1981–1990	2.23	-2.22	2.20	2.25
	1991–2000	2.46	-0.02	1.97	0.51
	2001–2010	2.47	1.03	0.86	0.58
	2011–2019	4.39	7.42	-0.05	-2.98
	1981–2019	**2.85**	**1.40**	**1.28**	**0.17**
Manufacturing	1981–1990	3.19	-2.65	4.34	1.50
	1991–2000	3.01	-1.21	2.82	1.40
	2001–2010	3.52	-1.48	3.15	1.85
	2011–2019	5.73	2.21	1.84	1.68
	1981–2019	**3.81**	**-0.86**	**3.07**	**1.61**
Services	1981–1990	2.26	-4.67	3.98	2.94
	1991–2000	2.92	-0.88	2.04	1.76
	2001–2010	3.21	-1.45	2.64	2.02
	2011–2019	4.82	-1.17	1.51	4.48
	1981–2019	**3.26**	**-2.07**	**2.57**	**2.76**

Table 4.4: Decomposition of VA-Senegal

	Period	$\frac{Y}{N}$	$A^{\frac{1}{1-\alpha}}$	$\frac{K}{Y}^{\frac{\alpha}{1-\alpha}}$	$\frac{L}{N}$
Agriculture	1981–1990	3.78	2.33	2.98	-1.53
	1991–2000	-1.76	-5.20	7.40	-3.96
	2001–2010	-1.63	-3.82	6.58	-4.39
	2011–2019	-0.63	-4.06	4.06	-0.63
	1981–2019	**-0.05**	**-2.65**	**5.29**	**-2.68**
Manufacturing	1981–1990	5.90	0.85	0.99	4.07
	1991–2000	3.65	3.22	1.64	-1.21
	2001–2010	1.98	2.94	1.57	-2.54
	2011–2019	-0.49	-3.86	4.12	-0.75
	1981–2019	**2.84**	**0.90**	**2.03**	**-0.09**
Services	1981–1990	4.61	2.51	0.47	1.62
	1991–2000	6.90	5.03	-0.16	2.03
	2001–2010	4.38	0.36	1.39	2.63
	2011–2019	3.44	0.68	1.09	1.68
	1981–2019	**4.87**	**2.18**	**0.69**	**2.00**

Table 4.5: Decomposition of VA per working-age person-Mauritius

and that both economic activity and labor moved to sectors with higher TFP growth. However in Senegal, the negative TFP growth throughout the period offset the contribution of labor and capital inputs, such that the country barely grew especially in the first three decades. At the same

	Period	$\frac{Y}{N}$	$A^{\frac{1}{1-\alpha}}$	$\frac{K}{Y}^{\frac{\alpha}{1-\alpha}}$	$\frac{L}{N}$
Agriculture	1981–1990	-0.40	-4.07	2.17	1.51
	1991–2000	-0.50	-0.03	1.56	-2.02
	2001–2010	-0.24	1.90	-0.50	-1.64
	2011–2019	1.49	13.63	-3.76	-8.38
	1981–2019	**0.05**	**2.58**	**-0.04**	**-2.49**
Manufacturing	1981–1990	0.56	-9.86	7.45	2.96
	1991–2000	0.05	-4.52	2.33	2.24
	2001–2010	0.80	-5.50	2.14	4.16
	2011–2019	2.83	8.20	-8.72	3.35
	1981–2019	**1.02**	**-3.20**	**1.04**	**3.17**
Services	1981–1990	-0.37	-10.16	6.01	3.78
	1991–2000	-0.04	-1.92	1.00	0.88
	2001–2010	0.50	-3.16	1.98	1.68
	2011–2019	1.92	-2.56	-2.38	6.86
	1981–2019	**0.46**	**-4.50**	**1.75**	**3.21**

Table 4.6: Decomposition of VA per working-age person-Senegal

time, there was little to no reallocation of economic activity, and labor was being reallocated to sectors with lower TFP growth rate. These results explain why in Senegal, sectoral labor shares are shifting while value added shares have remained relatively constant throughout the whole period. These findings from the sectoral growth accounting exercises are puzzling if we consider only price effects. The canonical structural transformation model developed in Herrendorf et al. 2014 predicts that in a closed economy, over time and as countries grow, resources move from the sectors with faster growing TFP to the slower TFP growing sectors. In other words, the correlation between sectoral differences in labor and sectoral differences in TFP should be negative. This is established by the fact that as a sector's TFP increases relative to the other sectors' TFP, its relative price decreases. Assuming sectors are complements such that their elasticity of substitution is less than one, the spending share of the sector with faster TFP growth decreases, and consequently, so does its labor share. This is the opposite of what we observe in Mauritius, which nonetheless has had a successful structural transformation. The reallocation resulting from differential TFP growth rates and price effects however does not necessarily hold in the presence of income effects, different capital intensities, and trade. In the next exercise, w use a multi-sector structural model with both price and income effects, as well as different sectoral capital intensities, to better understand the dynamics observed in Mauritius and Senegal.

5 Model of Structural Transformation and Growth

We employ a structural transformation model to map the dynamics of sectoral reallocation of the two economies and pin down the factors that drive them. This three-sector growth model is adopted from Herrendorf et al. 2014, with one main deviation: we use different sectoral factor shares of income calibrated from the data. In this model, there are two forces driving structural transformation: income effects and prices effects.

5.1 Household

The economy is comprised of a representative household with lifetime utility:

$$U = \sum_{t=0}^{\infty} \beta^t log(C_t) \tag{28}$$

where β is the discount factor of future consumption. The household allocates its income to investment and consumption across the three sectors: agriculture, a, manufacturing, m, and services, s. C_t is the composite consumption and is given by:

$$C_t = [\omega_a^{\frac{1}{\epsilon}}(c_{at} - \bar{c_a})^{\frac{\epsilon-1}{\epsilon}} + \omega_m^{\frac{1}{\epsilon}}(c_{mt})^{\frac{\epsilon-1}{\epsilon}} + \omega_s^{\frac{1}{\epsilon}}(c_{st} + \bar{c_s})^{\frac{\epsilon-1}{\epsilon}}]^{\frac{\epsilon}{\epsilon-1}} \tag{29}$$

where ω_i is sector i's preference weight, ϵ governs the elasticity of substitution across the sectors, $\bar{c_a}$ and $\bar{c_s}$ are the non-homothetic terms and represent the household's subsistence requirement in agricultural goods and its endowment in services, respectively. The income and price effects driving structural transformation are introduced through these non-homothetic terms and the elasticity of substitution, respectively. With the non-homothetic terms, the income elasticity of the services sector is greater than one, so that as income grows over time, people consume more of its goods relative to the agricultural and manufacturing sectors, whose income elasticities are less than and equal to one, respectively. If ϵ is less than one, goods are gross complements in preferences. This implies that as a sector's relative price decreases, its consumption share declines. Goods are gross substitutes if ϵ is bigger than one and this means that as a sector's relative price decreases, its consumption share increases. The household owns capital that it rents to the firms and supplies its labor inelastically.

5.2 Production

The consumption goods are produced from capital k and labor n following production functions:

$$y_{it} = \phi_{it} k_{it}^{\alpha_i} (\gamma_i^t n_{it})^{1-\alpha_i} \tag{30}$$

for $i \in \{a, m, s\}$. ϕ_{it} is a sector specific productivity parameter that affects the level but not the growth rate of TFP on a balanced growth path and γ_i^t is the exogenous labor-augmenting technology progress. Define:

$$A_{it} \equiv \phi_{it} \gamma_i^{t(1-\alpha_i)} \tag{31}$$

as the total factor productivity for sectors $i \in \{a, m, s\}$. The production functions can therefore be rewritten as:

$$y_{it} = A_{it} k_{it}^{\alpha_i} n_{it}^{1-\alpha_i} \tag{32}$$

Total investment is derived from the three sectors' value added and the total volume of investment is distributed across the three sectors based on their rates of return relative to the price and depreciation rate as follows:

$$inv_{it} = \eta_i[\frac{r_{it}}{\delta + p_{invt}}]^{\zeta_i} \tag{33}$$

$$inv_t = \sum_i inv_{it} \tag{34}$$

$$i_{it} = shinv_i \times inv_t \tag{35}$$

where inv_{it} is investment in each sector i (destination), η_i is a scale parameter, ζ_i is the price elasticity of demand for the investment product for each sector i, δ is the depreciation rate of capital, p_{inv} is the price of the investment good, i_{it} is the investment from each sector (origin), and $shinv_i$ is the share of total investment derived from sector i.

The sectoral capital follows the standard low of motion of capital:

$$k_{it+1} = inv_{it} + (1 - \delta)k_{it} \tag{36}$$

Aggregate labor grows at a constant rate as follows:

$$N_{t+1} = N_t \times (1 + g_N) \tag{37}$$

where N_t is the total labor supply and g_N is the labor growth rate. At the aggregate level, markets clear such that:

$$N_t = n_{at} + n_{mt} + n_{st} \tag{38}$$

$$y_{it} = c_{it} + i_{it} \tag{39}$$

The agricultural good is the numeraire so that its price is normalized to be 1.

5.3 Competitive equilibrium

5.3.1 Household's optimality conditions

In each period, the household solves the following sequential problem:

$$\max_{i_{it},c_{it}} log(C_t) \tag{40}$$

subject to

$$C_t = [\omega_a^{\frac{1}{\epsilon}}(c_{at} + \bar{c_a})^{\frac{\epsilon-1}{\epsilon}} + \omega_m^{\frac{1}{\epsilon}}(c_{mt})^{\frac{\epsilon-1}{\epsilon}} + \omega_s^{\frac{1}{\epsilon}}(c_{st} + \bar{c_s})^{\frac{\epsilon-1}{\epsilon}}]^{\frac{\epsilon}{\epsilon-1}} \tag{41}$$

$$\sum_i p_{it}c_{it} + \sum_i p_{it}i_{it} = \sum_i r_{it}k_{it} + w_t N_t \tag{42}$$

The static optimality conditions from the household's problem are as follows:

$$\frac{1}{C_t}C_t^{\frac{1}{\epsilon}}\omega_a^{\frac{1}{\epsilon}}(c_{at} + \bar{c_a})^{\frac{-1}{\epsilon}} = \lambda_t p_{at} \tag{43}$$

$$\frac{1}{C_t}C_t^{\frac{1}{\epsilon}}\omega_m^{\frac{1}{\epsilon}}(c_{mt})^{\frac{-1}{\epsilon}} = \lambda_t p_{mt} \tag{44}$$

$$\frac{1}{C_t}C_t^{\frac{1}{\epsilon}}\omega_s^{\frac{1}{\epsilon}}(c_{st} + \bar{c_s})^{\frac{1}{\epsilon}} = \lambda_t p_{st} \tag{45}$$

Taking the ratios between 43, 44, and 45 gives:

$$\frac{p_{at}(c_{at} + \bar{c_a})}{p_{mt}c_{mt}} = \frac{\omega_a}{\omega_m}(\frac{p_{at}}{p_{mt}})^{1-\epsilon} \tag{46}$$

$$\frac{p_{at}(c_{at} + \bar{c_a})}{p_{st}(c_{st} + \bar{c_s})} = \frac{\omega_a}{\omega_s}(\frac{p_{at}}{p_{st}})^{1-\epsilon} \tag{47}$$

$$\frac{p_{mt}c_{mt}}{p_{st}(c_{st} + \bar{c_s})} = \frac{\omega_m}{\omega_s}(\frac{p_{mt}}{p_{st}})^{1-\epsilon} \tag{48}$$

We can see from equations 46 to 48 that if ϵ is less than 1, the consumption share of one good relative to another, $p_{it}c_{it}$, increases as its price increases. These consumption shares are closely related to value added shares. This shows how the elasticity of substitution across sectors, governed by ϵ, is one factor driving sectoral reallocation through price effects.

5.3.2 Firm's optimality conditions

For each sector $i \in \{a, m, s\}$, the representative firm solves the following profit maximization problem:

$$\max_{k_{it},n_{it}} p_{it}A_{it}k_{it}^{\alpha_i}n_{it}^{1-\alpha_i} - k_{it}r_t - n_{it}w_t \tag{49}$$

The optimality conditions from this problem are:

$$r_t = \alpha_i p_{it}A_{it}(\frac{n_{it}}{k_{it}})^{1-\alpha_i} \tag{50}$$

$$w_t = (1-\alpha_i)p_{it}A_{it}(\frac{k_{it}}{n_{it}})^{\alpha_i} \tag{51}$$

For two different sectors i and j, taking the ratio between the rental rate yields:

$$\frac{\alpha_i p_{it}A_{it}(\frac{n_{it}}{k_{it}})^{1-\alpha_i}}{\alpha_j p_{jt}A_{jt}(\frac{n_{jt}}{k_{jt}})^{1-\alpha_j}} = 1 \tag{52}$$

Simplifying the above equation gives this expression for relative prices:

$$\frac{p_{it}}{p_{jt}} = \frac{\alpha_j}{\alpha_i}\frac{A_{jt}}{A_{it}}(\frac{k_{it}}{n_{it}})^{1-\alpha_i}(\frac{n_{jt}}{k_{jt}})^{1-\alpha_j} \tag{53}$$

Equation 53 shows the inverse relationship between prices and productivity, such that for sector i, as its TFP A_{it} increases relative to sector j's, it relative price decreases.

Furthermore, taking the ratio between 50 and 51 gives us the capital to labor ratio for each sector $i \in \{a, m, s\}$:

$$\frac{k_{it}}{n_{it}} = \frac{\alpha_i}{1-\alpha_i}\frac{w_t}{r_t} \tag{54}$$

5.3.3 Competitive equilibrium definition

A competitive equilibrium is factor prices $\{w_t, r_{it}\}$, goods prices $\{p_{it}, p_{invt}\}$, and allocations $\{c_{it}, n_{it}, k_{it}, i_{it}\}$ for $i \in \{a, m, s\}$ such that given a series of sectoral productivity growth:

- given prices, $\{c_{it}, n_{it}, k_{it}\}$ solve the household's utility maximization problem (equations 46, 47, 48)
- given prices, $\{n_{it}, k_{it}, i_{it}\}$ solve the firms' profit optimization problems (equations 50, 51, 53, 54)
- markets clear.

6 Calibration

To calibrate the model, we use sectoral data on consumption, prices, investment, labor and capital income, and value added. We obtain data on sectoral consumption and investment from the countries' supply and use tables from the Africa Supply and Use Tables (ASUT) (Mensah and G. J. de Vries 2024) that cover the period from 1990 to 2019. The set of parameters we need to calibrate are the following: the sectoral non-homothetic parameters; share parameters of the consumption composite; scaling and share parameters of the investment functions; sectoral factor shares of income. We calibrate the model to match base year (1990) data in Mauritius and Senegal. All variables in the data are normalized such that base year total value added equals 100. Base year prices are set equal to 1.

To calibrate the non-homothetic terms ($\bar{c_a}$ and $\bar{c_s}$), we adopt Herrendorf et al. 2013's method and use sectoral consumption and price data from 1990 to 2019 and iterated feasible generalized nonlinear least square estimation. The results we obtained are shown in Table 6.1.

	Mauritius	Senegal
$\bar{c_a}$	-0.997	-0.057
$\bar{c_s}$	1.25	14.75

Table 6.1: Non-homothetic parameters

For the sectoral consumption weights ω_i, we target to match base-year sectoral consumption data. We use the optimality conditions from the household's problem given by equations 46 and 47, the constraint that the sum of the weights equals 1, and data on nominal sectoral consumption in the base year to solve for ω_a, ω_m, and ω_s. Table 6.2 shows the results.

	Mauritius	Senegal
ω_a	0.047	0.11
ω_m	0.34	0.33
ω_s	0.61	0.56

Table 6.2: Consumption weights

For the investment functions, η_i is estimated using equation 33 in the base year and $shinv_i$ is estimated from base-year investment data. The following values are obtained:

	Mauritius	Senegal
η_a	0.047	0.11
η_m	0.34	0.33
η_s	0.61	0.56
$shinv_a$	0.008	0.125
$shinv_m$	0.821	0.462
$shinv_s$	0.171	0.413

Table 6.3: Investment coefficients

For the sectoral capital shares, we divide the gross operating surplus by its sum with the compensation of employees in the base year. The results are reported in Table 6.4.

	Mauritius	Senegal
α_a	0.48	0.50
α_m	0.50	0.79
α_s	0.56	0.55

Table 6.4: Capital shares

For the rest of the parameters, we follow standard literature and set $\delta = 0.05$ (Kehoe et al. 2018), $\epsilon = .89$ (Herrendorf et al. 2013), and $\zeta = .1$.

7 Quantitative Results

We solve a general equilibrium of the model above using sectoral TFP growth from the growth accounting exercises as exogenous shocks. We first compare the value added shares from the benchmark model with the data to evaluate the goodness of fit of the model, and then do a counterfactual exercise to answer the question: what would the two countries' growth trajectory be like if they had alternate productivity?

7.1 Benchmark model

The sectoral value added shares obtained from the model are plotted in Figures 9 and 10 along with the data. In Mauritius, the model matches very closely the sectoral value added shares. In Senegal, the model does a good job at matching the trends of the agriculture and services value added shares. However, it predicts a hump shape in the manufacturing value added share while in the data there is a slight increase. This fit suggests that, to the extent the model's structure reflects the countries' actual structural transformation processes, the frictionless environment can be used to simulate alternative scenarios and assess how their trajectories might have differed.

7.2 Counterfactual exercise

We use the model to do a counterfactual exercise to see how Senegal's economy would have behaved between 1990 and 2019 had it experienced different productivity growth. We simulate Senegal's structural transformation and growth trajectory had it had the same sectoral TFP growth as Mauritius. We therefore assume Senegal's three sectors to have the TFP growth of Mauritius' sectors, between 1990 and 2019. Figure X depicts the sectoral value added shares of Senegal from this counterfactual. We can see that with faster sectoral TFP growth and the services sector having the fastest growth TFP, resources move out of the agriculture and manufacturing sectors

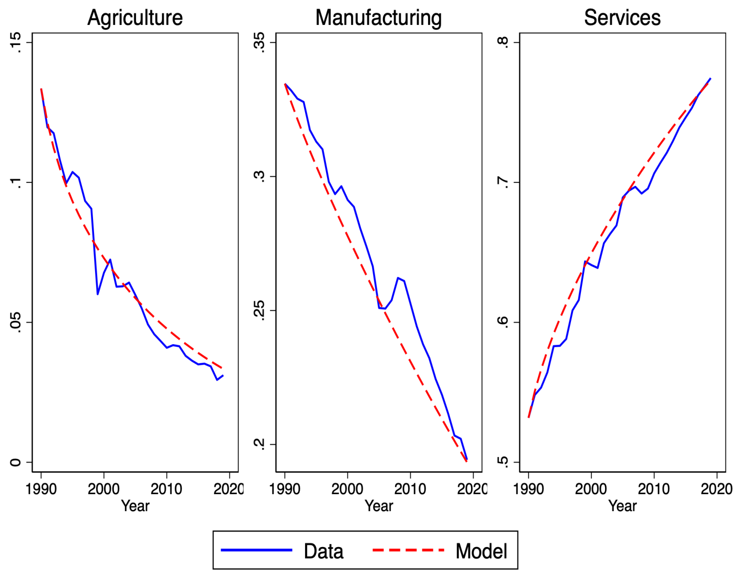

Figure 9: Value added shares-data vs baseline model-Mauritius

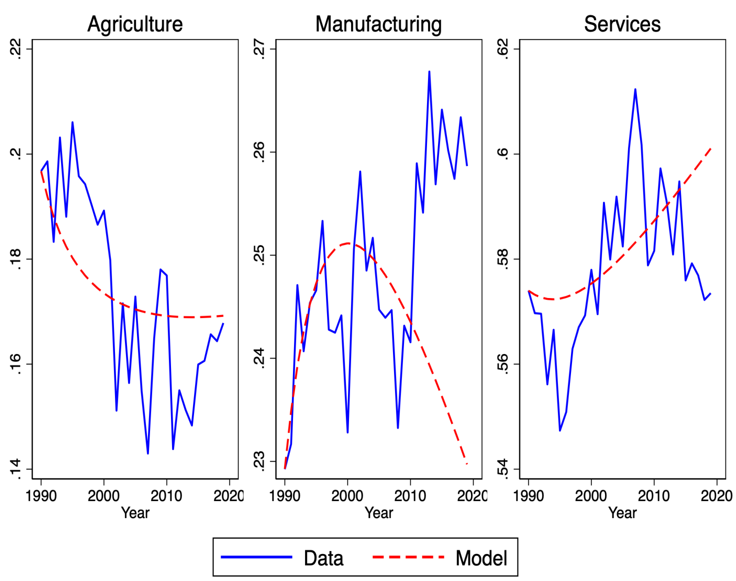

Figure 10: Value added shares-data vs baseline model-Senegal

to the services sector. Therefore, even in Senegal, conditional on faster TFP growth, the services sector experiences a faster rise in its share of the economy despite having the highest TFP growth rate. This indicates that income effects are the strongest drivers of structural transformation in these countries, as opposed to substitution effects. Consequently, Senegal's total value added annual growth rate would have increased by 0.45 percentage points if it had the sectoral TFP

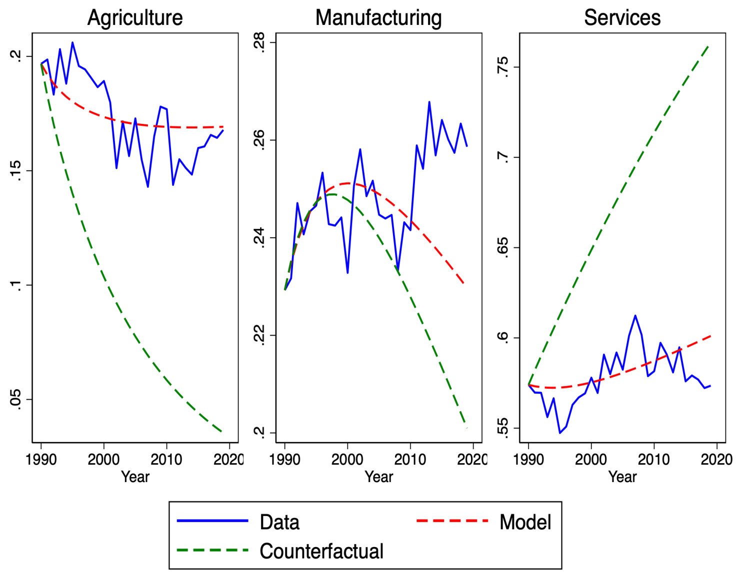

Figure 11: Value added shares-data vs baseline vs counterfactual 1-Senegal

Notes: Counterfactual 1: SEN has the same sectoral TFP growth as MUS.

of Mauritius, equivalent to a 48% increase. This is consistent with the results from the growth accounting exercises where we demonstrated that TFP accounted for about 40

Overall, the model's predictions are in line with results from the empirical accounting. In the benchmark model, resources are being reallocated to the services sector in Mauritius although the services sector has the fastest growing TFP. Additionally, in the counterfactual exercise with Senegal having the sectoral TFP growth of Mauritius, the services sector's share of the economy increased relatively faster. Therefore, although goods are assumed to be gross complements in preferences, the model predicts a reallocation of resources towards the sector with faster decline in relative prices when countries grow fast. This hints that income effects dominate price effects in the resource reallocation across sectors.

8 Reforms and Policy Discussion

From the baseline model and the counterfactual experiments, we have provided evidence that the differential sectoral TFP growth rates do not matter as much as the aggregate growth of the country. Through this lens, for Senegal to experience some structural transformation, it needs to foster positive TFP growth in all sectors, without necessarily prioritizing one sector, such as the manufacturing one, over the others.

TFP levels and growth rates off long-run paths are understood to reflect country-specific policies, practices, and institutions. Some distinguishable policies Mauritius has implemented date back to the 1970s, during the Washington Consensus following the debt crisis in many developing countries (Mistry 1992). Mauritius' structural reforms were centered around one main strategy: private sector expansion to promote export diversification. In the 1970s, Mauritius established export processing zones (EPZs) to give firms producing for export markets preferential treatment, such as duty free access for imported inputs and tax incentives (Subramanian and Roy 2001, Woldekidan 1992). The goal of the EPZs was to promote export of manufacturing goods such as sugar and textiles. They led to high production and exports of these goods. These policies are reflected in the data given that in the 1980s, Mauritius was already fairly industrialized with a manufacturing sector accounting for almost 40 percent of total value added against only 20 percent in Senegal. Moreover, they have contributed to the fast increase of aggregate productivity as the EPZs were characterized by fast productivity growth (Subramanian and Roy 2001).

On the other hand, Senegal's effort to position itself as an exporter in the international market failed, as the country had an import substitution policy. In the 1970s, it enacted an import-substitution policy that was based on high tariff rates and export subsidies (Goldsbrough et al. 1996, Cissé et al. 2016). These measures limited access to intermediate inputs and therefore had perverse effects through lost competitiveness due to low productivity, thus having a negative impact on export performance (Annabi et al. 2005, Cissé et al. 2016).

It is clear that these reforms must have played a role in the current economic landscapes of the two countries, specifically their TFP levels and growth rates. Mauritius' fast TFP growth must have been driven, at least partially, by its focus on facilitating domestic firms to have access to inputs and export markets. A major obstacle to Senegal experiencing fast TFP growth has been the difficult access to imported inputs. Therefore, policies to boost Senegal's TFP growth can be centered around facilitating access to intermediate inputs, especially for exporting firms. Since 2010, its agricultural sector's TFP has been rising rapidly and this is partially attributable to its GOANA (Great Agricultural Offensive for Food and Abundance) plan. The GOANA plan, launched in 2008, aimed to foster food production in the country through greater access to agricultural inputs and equipment (ACET 2013). This demonstrates that with strong policies to enhance sectoral production through access to intermediate inputs, Senegal can boost the productivity of a sector. Thus, Senegal can push for these policies to accelerate the TFP growth in services and manufacturing and maintain the recent boom in TFP growth in agriculture.

9 Conclusion

Long standing economic evidence across countries suggests that structural transformation and growth go hand in hand, and contemporary trends show different patterns of structural transformation in developing countries. In this paper, we study the disparate structural change and growth experiences in Mauritius and Senegal, two sub-Saharan African countries that are otherwise similar. We first conduct aggregate and sectoral growth accounting exercises and find that TFP is the main driver of the faster growth in Mauritius. At the sector level, economic activity is reallocated to faster growing TFP sectors in Mauritius while in Senegal it is being reallocated to slower growing TFP sectors. In light of these results, we develop and calibrate a multi-sector structural transformation model. We solve for a general equilibrium of the model for Mauritius and Senegal taking sectoral TFP growth rates as exogenous shocks and assuming different sectoral factor shares calibrated from the data. Overall, the model matches the data on sectoral value added shares well.

We further conduct a counterfactual exercise to explore the alternate sectoral composition and growth trajectory of these countries had they had different productivity. We find that Senegal would have grown 1.5 times faster between 1990 and 2019 if it had the sectoral TFP growth of Mauritius. The counterfactual exercises also demonstrate that in these economies, labor is always being reallocated to the services sector, even when the latter has the fastest TFP growth and despite goods being gross complements. This indicates that the rise of the services sector follows from income growth, such that income effects are the main drivers of structural transformation in these countries. In light of these findings, countries like Senegal need to focus on reforms that boost their aggregate TFP growth to promote structural transformation.

This project has a few limitations, all of which relate to the structural model we use. In our model, we abstract from government and trade, all of which are important components of the two economies. A natural extension of this model is therefore to assume open economies with a government. This is particularly important in accounting for the role of trade in structural transformation and growth. Moreover, while this paper underscores the centrality of TFP in explaining divergent growth, the specific determinants of TFP in these countries remain unexplored. Our discussion in section 8 highlights the non-negligible role the structural reforms of the 1970s around trade openness and industrialization played in the successful industrialization and fast growth in Mauritius compared to Senegal. This emphasizes the importance of including trade and an intermediate input structure in the model. Future research can shed light on the impact of such reforms in these countries on fostering fast positive TFP growth using such a model. Lastly, in Senegal, the data show discrepancies between the trends of value added and employment shares. This model can't account for that (Buera and Kaboski 2009). Future research can explore ways to account for these using models incorporating home production, sector-specific factor distortions, or differences across sectors in the accumulation of human capital.

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Appendices

A Aggregate growth accounting without tourism sector

Period	Y	A	K^{α}	$L^{1-\alpha}$
1981-1990	6.67	0.75	4.25	1.68
1991-2000	6.53	1.68	4.28	0.57
2001-2010	4.15	0.76	3.00	0.39
2011-2019	2.89	-0.17	2.47	0.59
1980-2019	**5.11**	**0.78**	**3.53**	**0.81**

Table A.1: Decomposition of VA-Mauritius

Period	$\frac{Y}{N}$	$A^{\frac{1}{1-\alpha}}$	$\frac{K}{Y}^{\frac{\alpha}{1-\alpha}}$	$\frac{L}{N}$
1981-1990	4.86	1.66	1.28	1.92
1991-2000	4.96	3.74	1.54	-0.31
2001-2010	3.21	1.69	1.59	-0.08
2011-2019	2.38	-0.37	1.96	0.80
1980-2019	**3.89**	**1.73**	**1.58**	**0.58**

Table A.2: Decomposition of VA per working-age person-Mauritius

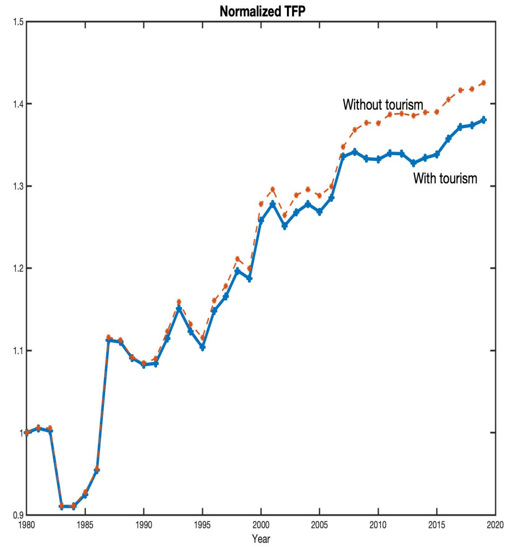

Figure 12: Aggregate TFP-whole economy vs economy without tourism-Mauritius

B Aggregate growth accounting without finance sector

Period	Y	A	K^{α}	$L^{1-\alpha}$
1981-1990	6.55	0.59	4.18	1.78
1991-2000	6.16	1.22	4.31	0.64
2001-2010	4.07	0.45	3.16	0.47
2011-2019	2.83	-0.19	2.41	0.61
1980-2019	**4.96**	**0.53**	**3.54**	**0.88**

Table B.1: Decomposition of VA-Mauritius

Period	$\frac{Y}{N}$	$A^{\frac{1}{1-\alpha}}$	$\frac{K}{Y}^{\frac{\alpha}{1-\alpha}}$	$\frac{L}{N}$
1981-1990	4.73	1.27	1.42	2.04
1991-2000	4.60	2.63	2.14	-0.18
2001-2010	3.14	0.96	2.10	0.08
2011-2019	2.32	-0.42	1.92	0.82
1980-2019	**3.73**	**1.15**	**1.89**	**0.69**

Table B.2: Decomposition of VA per working-age person-Mauritius

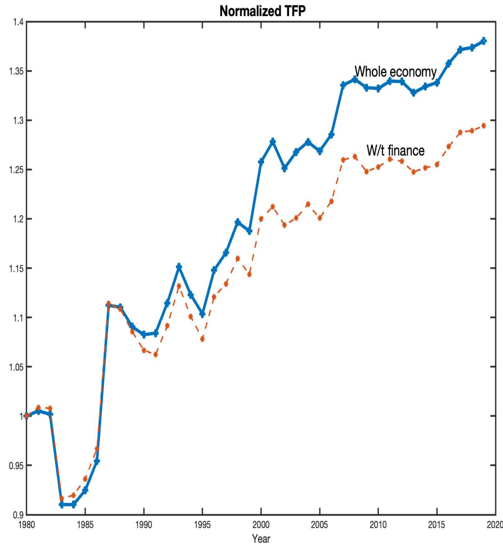

Figure 13: Aggregate TFP-whole economy vs economy without finance-Mauritius

C Aggregate growth accounting without tourism and finance sectors

Period	Y	A	K^{α}	$L^{1-\alpha}$
1981-1990	6.49	0.60	4.09	1.79
1991-2000	6.07	1.35	4.14	0.58
2001-2010	3.84	0.59	2.90	0.35
2011-2019	2.77	-0.20	2.38	0.60
1980-2019	**4.84**	**0.61**	**3.40**	**0.84**

Table C.1: Decomposition of VA-Mauritius

Period	$\frac{Y}{N}$	$A^{\frac{1}{1-\alpha}}$	$\frac{K}{Y}^{\frac{\alpha}{1-\alpha}}$	$\frac{L}{N}$
1981-1990	4.67	1.29	1.38	2.00
1991-2000	4.50	2.87	1.96	-0.33
2001-2010	2.90	1.26	1.84	-0.20
2011-2019	2.27	-0.43	1.93	0.78
1980-2019	**3.62**	**1.29**	**1.77**	**0.56**

Table C.2: Decomposition of VA per working-age person-Mauritius

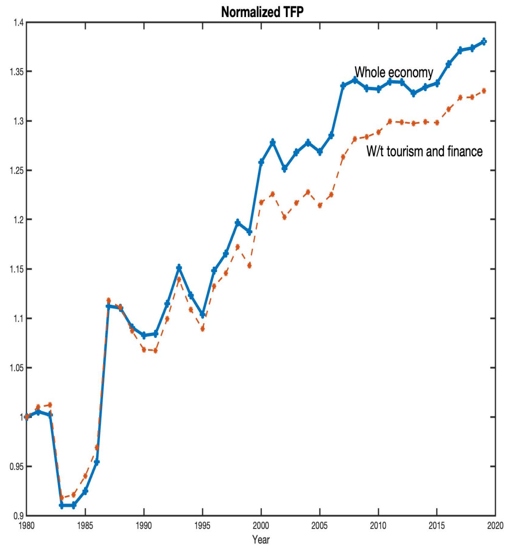

Figure 14: Aggregate TFP-whole economy vs economy without tourism and finance-Mauritius

D Sectoral growth accounting with adjusted factor shares

.

	Period	Y	A	K^{α}	$L^{1-\alpha}$
Agriculture	1981-1990	5.6	2.12	3.30	0.18
	1991-2000	-0.19	-1.46	2.74	-1.47
	2001-2010	-0.70	-0.81	2.23	-2.12
	2011-2019	-0.12	-1.54	1.49	-0.08
	1981-2019	**1.18**	**-0.39**	**2.46**	**-0.89**
Manufacturing	1981-1990	7.72	0.64	3.80	3.28
	1991-2000	5.21	2.07	2.94	0.20
	2001-2010	2.91	1.91	1.89	-0.89
	2011-2019	0.01	-1.44	1.59	-0.14
	1981-2019	**4.07**	**0.85**	**2.58**	**0.63**
Services	1981-1990	6.43	1.20	3.63	1.60
	1991-2000	8.47	2.32	4.47	1.67
	2001-2010	5.31	0.27	3.39	1.65
	2011-2019	3.95	0.39	2.54	1.01
	1981-2019	**6.09**	**1.06**	**3.53**	**1.50**

Table D.1: Decomposition of VA-Mauritius

	Period	Y	A	K^{α}	$L^{1-\alpha}$
Agriculture	1981-1990	2.23	-2.22	2.19	2.25
	1991-2000	2.46	-0.02	1.97	0.51
	2001-2010	2.47	1.03	0.86	0.58
	2011-2019	4.39	7.42	-0.05	-2.99
	1981-2019	**2.85**	**1.40**	**1.28**	**0.17**
Manufacturing	1981-1990	3.19	-2.64	4.09	1.74
	1991-2000	3.01	-1.27	2.66	1.61
	2001-2010	3.52	-1.59	2.97	2.14
	2011-2019	5.73	2.05	1.74	1.94
	1981-2019	**3.81**	**-0.94**	**2.89**	**1.86**
Services	1981-1990	2.26	-4.63	3.67	3.21
	1991-2000	2.92	-0.88	1.88	1.92
	2001-2010	3.21	-1.43	2.44	2.20
	2011-2019	4.82	-1.47	1.39	4.89
	1981-2019	**3.26**	**-2.12**	**2.37**	**3.01**

Table D.2: Decomposition of VA-Senegal

	Period	$\frac{Y}{N}$	$A^{\frac{1}{1-\alpha}}$	$\frac{K}{Y}^{\frac{\alpha}{1-\alpha}}$	$\frac{L}{N}$
Agriculture	1981-1990	3.78	3.46	1.85	-1.53
	1991-2000	-1.76	-2.39	4.59	-3.96
	2001-2010	-1.63	-1.32	4.08	-4.39
	2011-2019	-0.63	-2.51	2.52	-0.63
	1981-2019	**-0.04**	**-0.64**	**3.28**	**-2.68**
Manufacturing	1981-1990	5.90	1.15	0.68	4.07
	1991-2000	3.65	3.73	1.13	-1.21
	2001-2010	1.98	3.43	1.08	-2.54
	2011-2019	0.49	-2.58	2.84	-0.75
	1981-2019	**2.84**	**1.53**	**1.40**	**-0.09**
Services	1981-1990	4.61	2.59	0.40	1.62
	1991-2000	6.90	5.00	-0.14	2.03
	2001-2010	4.38	0.57	1.18	2.63
	2011-2019	3.44	0.84	0.92	1.68
	1981-2019	**4.87**	**2.29**	**0.58**	**2.00**

Table D.3: Decomposition of VA per working-age person-Mauritius

	Period	$\frac{Y}{N}$	$A^{\frac{1}{1-\alpha}}$	$\frac{K}{Y}^{\frac{\alpha}{1-\alpha}}$	$\frac{L}{N}$
Agriculture	1981-1990	-0.40	-4.07	2.16	1.51
	1991-2000	-0.50	-0.03	1.56	-2.02
	2001-2010	-0.24	1.89	-0.50	-1.64
	2011-2019	1.49	13.63	-3.76	-8.38
	1981-2019	**0.05**	**2.58**	**-0.04**	**-2.49**
Manufacturing	1981-1990	0.56	-8.48	6.08	2.96
	1991-2000	0.05	-4.09	1.90	2.24
	2001-2010	0.80	-5.11	1.75	4.16
	2011-2019	2.83	6.60	-7.12	3.35
	1981-2019	**1.02**	**-3.01**	**0.85**	**3.17**
Services	1981-1990	-0.37	-9.24	5.08	3.78
	1991-2000	-0.04	-1.76	0.85	0.88
	2001-2010	0.50	-2.86	1.67	1.68
	2011-2019	1.92	-2.93	-2.02	6.86
	1981-2019	**0.46**	**-4.23**	**1.48**	**3.21**

Table D.4: Decomposition of VA per working-age person-Senegal

E Sectoral growth accounting without tourism sector

	Period	Y	A	K^{α}	$L^{1-\alpha}$
Agriculture	1981–1990	5.60	1.16	4.30	0.14
	1991–2000	-0.19	-2.58	3.57	-1.19
	2001–2010	-0.70	-1.89	2.91	-1.71
	2011–2019	-0.12	-2.01	1.95	-0.06
	1981–2019	**1.18**	**-1.31**	**3.21**	**-0.72**
Manufacturing	1981–1990	7.72	0.39	4.60	2.73
	1991–2000	5.21	1.49	3.55	0.17
	2001–2010	2.91	1.36	2.29	-0.74
	2011–2019	0.01	-1.79	1.92	-0.11
	1981–2019	**4.07**	**0.42**	**3.12**	**0.53**
Services	1981–1990	6.31	1.11	3.76	1.44
	1991–2000	8.50	2.46	4.58	1.46
	2001–2010	5.11	0.39	3.30	1.43
	2011–2019	4.00	0.33	2.72	0.95
	1981–2019	**6.03**	**1.09**	**3.61**	**1.33**

Table E.1: Decomposition of VA-Mauritius

	Period	$\frac{Y}{N}$	$A^{\frac{1}{1-\alpha}}$	$\frac{K}{Y}^{\frac{\alpha}{1-\alpha}}$	$\frac{L}{N}$
Agriculture	1981–1990	3.78	2.33	2.98	-1.53
	1991–2000	-1.76	-5.20	7.40	-3.96
	2001–2010	-1.63	-3.82	6.58	-4.39
	2011–2019	-0.63	-4.06	4.06	-0.63
	1981–2019	**-0.05**	**-2.65**	**5.29**	**-2.68**
Manufacturing	1981–1990	5.90	0.85	0.99	4.07
	1991–2000	3.65	3.22	1.64	-1.21
	2001–2010	1.98	2.94	1.57	-2.54
	2011–2019	-0.49	-3.86	4.12	-0.75
	1981–2019	**2.84**	**0.90**	**2.03**	**-0.09**
Services	1981–1990	4.49	2.57	0.41	1.51
	1991–2000	6.94	5.69	-0.57	1.82
	2001–2010	4.17	0.90	0.92	2.36
	2011–2019	3.50	0.76	1.04	1.70
	1981–2019	**4.81**	**2.52**	**0.43**	**1.85**

Table E.2: Decomposition of VA per working-age person-Mauritius

F Sectoral growth accounting without finance sector

	Period	Y	A	K^{α}	$L^{1-\alpha}$
Agriculture	1981–1990	5.60	1.16	4.30	0.14
	1991–2000	-0.19	-2.58	3.57	-1.19
	2001–2010	-0.70	-1.89	2.91	-1.71
	2011–2019	-0.12	-2.01	1.95	-0.06
	1981–2019	**1.18**	**-1.31**	**3.21**	**-0.72**
Manufacturing	1981–1990	7.72	0.39	4.60	2.73
	1991–2000	5.21	1.49	3.55	0.17
	2001–2010	2.91	1.36	2.29	-0.74
	2011–2019	0.01	-1.79	1.92	-0.11
	1981–2019	**4.07**	**0.42**	**3.12**	**0.53**
Services	1981–1990	6.06	0.76	3.66	1.64
	1991–2000	7.94	1.71	4.59	1.64
	2001–2010	5.07	0.01	3.50	1.56
	2011–2019	4.01	0.41	2.60	0.99
	1981–2019	**5.82**	**0.73**	**3.61**	**1.47**

Table F.1: Decomposition of VA-Mauritius

	Period	$\frac{Y}{N}$	$A^{\frac{1}{1-\alpha}}$	$\frac{K}{Y}^{\frac{\alpha}{1-\alpha}}$	$\frac{L}{N}$
Agriculture	1981–1990	3.78	2.33	2.98	-1.53
	1991–2000	-1.76	-5.20	7.40	-3.96
	2001–2010	-1.63	-3.82	6.58	-4.39
	2011–2019	-0.63	-4.06	4.06	-0.63
	1981–2019	**-0.05**	**-2.65**	**5.29**	**-2.68**
Manufacturing	1981–1990	5.90	0.85	0.99	4.07
	1991–2000	3.65	3.22	1.64	-1.21
	2001–2010	1.98	2.94	1.57	-2.54
	2011–2019	-0.49	-3.86	4.12	-0.75
	1981–2019	**2.84**	**0.90**	**2.03**	**-0.09**
Services	1981–1990	4.24	1.69	0.75	1.81
	1991–2000	6.37	3.79	0.53	2.06
	2001–2010	4.14	0.02	1.59	2.52
	2011–2019	3.50	0.92	0.90	1.68
	1981–2019	**4.59**	**1.62**	**0.94**	**2.03**

Table F.2: Decomposition of VA per working-age person-Mauritius

G Sectoral growth accounting without tourism and finance sectors

	Period	Y	A	K^{α}	$L^{1-\alpha}$
Agriculture	1981–1990	5.60	1.16	4.30	0.14
	1991–2000	-0.19	-2.58	3.57	-1.19
	2001–2010	-0.70	-1.89	2.91	-1.71
	2011–2019	-0.12	-2.01	1.95	-0.06
	1981–2019	**1.18**	**-1.31**	**3.21**	**-0.72**
Manufacturing	1981–1990	7.72	0.39	4.60	2.73
	1991–2000	5.21	1.49	3.55	0.17
	2001–2010	2.91	1.36	2.29	-0.74
	2011–2019	0.01	-1.79	1.92	-0.11
	1981–2019	**4.07**	**0.42**	**3.12**	**0.53**
Services	1981–1990	5.90	0.78	3.48	1.64
	1991–2000	7.93	2.02	4.33	1.58
	2001–2010	4.80	0.20	3.13	1.47
	2011–2019	4.08	0.48	2.57	1.03
	1981–2019	**5.72**	**0.88**	**3.40**	**1.44**

Table G.1: Decomposition of VA-Mauritius

	Period	$\frac{Y}{N}$	$A^{\frac{1}{1-\alpha}}$	$\frac{K}{Y}^{\frac{\alpha}{1-\alpha}}$	$\frac{L}{N}$
Agriculture	1981–1990	3.78	2.33	2.98	-1.53
	1991–2000	-1.76	-5.20	7.40	-3.96
	2001–2010	-1.63	-3.82	6.58	-4.39
	2011–2019	-0.63	-4.06	4.06	-0.63
	1981–2019	**-0.05**	**-2.65**	**5.29**	**-2.68**
Manufacturing	1981–1990	5.90	0.85	0.99	4.07
	1991–2000	3.65	3.22	1.64	-1.21
	2001–2010	1.98	2.94	1.57	-2.54
	2011–2019	-0.49	-3.86	4.12	-0.75
	1981–2019	**2.84**	**0.90**	**2.03**	**-0.09**
Services	1981–1990	4.08	1.69	0.69	1.71
	1991–2000	6.37	4.36	0.17	1.84
	2001–2010	3.87	0.44	1.20	2.24
	2011–2019	3.57	1.04	0.83	1.70
	1981–2019	**4.50**	**1.90**	**0.72**	**1.88**

Table G.2: Decomposition of VA per working-age person-Mauritius