Chabi and Saygılı
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Trade openness and structural change dynamics in West African countries

Patrick Chabi[1*] and Refik Fatih Saygılı[2]

*Correspondence:
patrick.chabi@gmail.com

[1] Faculty of Economics and Administrative Sciences, Graduate School of Social Science, Ege University, 35100 Bornova, Izmir, Turkey
[2] Department of Economics, Faculty of Economics and Administrative Sciences, Ege University, 35100 Bornova, Izmir, Turkey

Abstract

In this study, we investigate the contribution of trade openness to the structural change process in ECOWAS countries. Our findings suggest that the production structural change process is significantly and positively affected by the extent of trade openness. Higher openness levels are associated with more production reshuffling between sectors. However, this impact is found to be nonlinear. After a threshold of 147.64% of trade openness, the effect reverses. Considering the labor structural change, results suggest that more openness tends to trigger the reshuffle of labor toward less productive sectors. This effect reverses after the openness reached a level of 152.42%. Moreover, exports contract, whereas imports trigger the reshuffling of domestic production factors. So, focusing on industrial-friendly import policies should be a priority for ECOWAS Countries. For labor, exports as well as imports trigger the reshuffling of labor towards less productive sectors. These findings emphasize the importance of external effects in the structural change process in ECOWAS countries. Our analysis suggests that given the basic structure of export products, as long as their increases would fail to develop manufacturing sectors, their ability to shift labor towards more productive sectors would be limited. Also, as imports promote the retail sector, which is less productive, this limits their effect to trigger a desirable labor structural change.

Keywords: Structural change, Trade openness, ECOWAS, Labor, Production

JEL Classification: F10, F41, F63, L16, O19

1 Introduction

The role of structural change is central to the development process of low-income countries. In those countries, poverty reduction stands as a first challenge and growth acceleration policies become a priority. In Africa, where there are a large number of LDCs, this reality holds. After the golden age of its economic growth from the 1960s to the end of the 1970s, Africa experienced an economic debacle in the 1980s and started recovering in the 2000s. Between 2000 and 2016, it ranked as the second fastest growing region, with an average growth rate of 4.6%. The policies implemented in these growth-accelerating frameworks include free access of the population to formal education, empowerment of women, and the adoption of trade barriers reduction policies. However, given that sectoral contributions of economic sectors to growth are probably

not equal due to the difference in sectoral productivity, it becomes necessary to focus on policies aiming to efficiently shift production resources and labor between sectors, alongside actions aiming to promote their efficient use within sectors. Succeeding to reach these goals is prone to the extent to which policymakers understand the mechanism underlying structural change in their economies.

In fact, structural change process, the reallocation of productive resources among economic sectors, should occur with labor and productive resources moving from traditional towards modern sectors. As a result, total productivity and income will rise (Lewis 1954; Kuznets 1966; Chenery 1960). Ideally, as described by Kuznets (1973) the mechanism works as follows: agriculture share in the economy declines compared to other sectors, then rises in industrial sector follows, and finally services take over manufacturing.

The driving forces of these structural changes in economies can generally be attributed to two effects in the literature: the price-effect and the income-effect. The first advocates household reallocation of consumption in response to changes in relative prices of sectoral goods (Ngai and Pissarides 2007; Acemoglu and Guerrieri 2008) while the second associates the structural change to a shift in household expenditure consecutive to a growing income (Kongsamut et al. 2001; Foellmi and Zweimüller 2008). However, there is growing interest in bringing the debate into an open economy framework (Matsuyama 2009; Uy et al. 2013; Betts et al. 2017; Teignier 2018; Swiecki 2017; Sposi 2019; Smitkova 2018; Fiorini et al. 2013). Ignoring the openness of economies could lead to a misattribution of the driving forces, given that once the openness extent is considered, an economy may experience a production shift without any changes of domestic drivers (Smitkova 2018).

These interests in accounting for trade policies have a sound theoretical base. Trade openness reforms by driving countries to specialize in some sectors (Grossman and Helpman 1990; Redding 1999; Lucas 1988; Young 1991; Bhagwati 1958; Rodrik 2009), entails they govern the subsequent reallocation of resources. Empirical works on the welfare outcome of trade reforms suggest that the total effect depends on the extent to which the particular reform reshapes the sectoral structure of the economy. For instance, many studies found that trade reform can be followed by workers transitioning from high to low-productivity sectors, notably when they go from manufacturing to services (Menezes-Filho and Muendler 2007; Kletzer 2001; Ebenstein et al. 2009). Recent contributions investigating cross-countries have underlined the importance of accounting for openness forces in understanding structural change. Smitkova?s (2018) findings evidence the relative competitiveness of sectors, and the change in the foreign market size compared to domestic capacity as the two mechanisms driving structural change in an open economy context. The study?s findings suggest that shocks to trade cost and trade imbalances are the core drivers of structural change that explain changes in manufacturing value-added in China, the United States, Germany, and the United Kingdom. In the same line, Fiorini et al. (2013) argue that domestic industrial structures respond to changes in trade openness, with trade contraction generating more adjustment across industries than opening to trade. In this process, imports tend to play a more relevant role than exports. Furthermore, there is evidence that countries

experiencing a higher growth rate are prone to more adjustments between their industries, the opposite being true for countries with high incomes.

Our contribution to this debate is to focus on low-income countries, known for their high occurrence of poverty, and a lack of relative productivity in modern sectors, by explaining to which extent and in what direction trade openness policies affect the structural change in these countries. The contribution of our work to the literature is twofold. Firstly, it helps us provide a database of indexes and the analysis of the pattern of structural change index in ECOWAS[1] countries. Hence, this can help to shed light on some controversies in African countries (see McMillan and Rodrik 2011; Carmignani and Mandeville 2014) regarding the occurrence of structural change. Secondly, it will help explore beyond the domestic causes of structural change by considering the external effects. So, we will try to show how globalization may affect the fundamental changes that govern the development process of ECOWAS countries, hence the importance of accounting for it when analyzing structural change.

Covering 14 countries in West Africa, we use a panel GMM estimation method that helps control for endogeneity. Moreover, panel GMM is suitable with the number of observations superior to the number of periods.

To study the effect of trade openness on structural change, we first compute the structural change index of production and labor force. Once these indexes are computed, their relationships with trade openness are econometrically tested. The data used in this study mainly come from the Eora multi-region input?output (MRIO) database, the World Development Indicators (WDI) database of the World Bank, the United Nations Conference on Trade and Development (UNCTAD) database, and the International Monetary Fund (IMF) database. The remainder of the paper is organized as follows. Section 2 describes the methodology, data and sources are presented in Sect. 3. Section 4 discusses the results and Sect. 5 concludes.

2 Model specification and methodology

This section describes the technique used to measure structural indexes and the modeling process.

2.1 Measurement of the structural change index

2.1.1 The norm of absolute value (NAV) techniques

Following Bacchetta and Jansen (2003); Fiorini et al. (2013), we construct a structural change index (SCI) indicating the shift of production between sectors. Hereafter, we econometrically assess whether changes in trade flows affect the sectoral composition of production in ECOWAS. The present section covers the period 1970?2015. The SCI measurement in a country, by the norm of absolute value (NAV) technique is equal to half the sum of absolute value of the differences in value-added of sectoral shares over time. Formally we have:

[1] Economic Community of West African States (ECOWAS) is constituted by 15 countries in West Africa. The state members are Benin, Burkina Faso, Cabo Verde, Cote d?Ivoire, Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo. Due to availability of data, we do not include Guinea-Bissau in our sample.

$$SCI_t = \frac{1}{2}\sum_i \left|\overline{x}_{i.t} - \overline{x}_{i,t-3}\right| \tag{1}$$

and

$$\overline{x}_{i,t} = \frac{x_{i,t+1} + x_{i,t} + x_{i,t-1}}{3} \tag{2}$$

$$\overline{x}_{i,t-3} = \frac{x_{i,t-2} + x_{i,t-3} + x_{i,t-4}}{3}, \tag{3}$$

where: SCI_t = country structural change index at time t; $\overline{x}_{i,t}$ reflects the share of a sector's (sector i value-added) value-added in total value-added at time t.

Three-year averages at the end and the beginning of a 3-year period have been used to construct the SCI in order to smoothen out year-specific effects. We use 3-year average in the present study due to data shortage and the limited number of countries.

$SCI = 0$ describes a situation with no structural change at all, over the time-period specified.

$SCI = 1$ describes a situation in which the structure of the economy completely reverses over time, where all economic activities switch for instance from industry 1 to industry 2.

Hence, our index measures the extent of total reshuffling across sectors over a 3-year time period. Although the index does not offer information on the direction of structural changes, it can be useful in measuring the global behavior of the economy in response to external shocks, which is the main objective of this section.

2.2 The shift-share analysis of labor productivity in ECOWAS

In this section, we use the shift-share analysis of labor productivity which revealed the dynamics of labor reshuffling between economic sectors. The study of the effect of trade openness in countries is generally linked to global aggregate like economic growth. In this paper, we go further beyond by linking trade openness and the different components of economy-wide labor productivity (EWLP). The paradigm in sectoral labor analysis suggests that the within effect (changes within sectors) should be relevant in developed countries, whereas the between effect or the structural change component (changes between sectors) is the one that should predominate in developing countries. This is because an important productivity factor in developed economies lies in innovation enhancement that often leads the exit and entry of firms. Low-income countries having their labor mainly concentrated in low-productivity sectors such as agriculture, the shift to a more productive sector, notably the industrial sector is viewed as a critical point to raising living standards. The present section covers the period 1995?2015 due to the data availability in sectoral labor.

Based on the value-added of all principal sectors and the sectoral employment data, we proceed to a labor productivity accounting exercise by using the shift-share analysis. Due to the lack of deep sectoral data in terms of employment, our shift-share analysis just relied on the three (3) traditional broad economic sectors: agriculture, industry, and services.

In the shift-share analysis, the sectoral labor dynamic is calculated using the following formula:

$$\frac{\Delta P}{P_0} = \sum_{i=1}^{n} \frac{\overline{S}_i \Delta P_i}{P_0} + \sum_{i=1}^{n} \frac{\overline{P}_i \Delta S_i}{P_0}, \tag{4}$$

with.

$i =$ sector i $(i = 1, 2, \ldots, n)$

$0 =$ initial year.

$P =$ level of labor productivity.

$= \frac{VA}{Number\ of\ workers}$

$S =$ employment share by sector in the economy

Δchange over period $[0, T]$

$\overline{S}, \overline{P} =$ average value over the period $[0, T]$.

The first term on the right-hand side of Eq. (4) captures the contribution of within-sector productivity improvement, the "Within effect" or the "Technological progress effect". The second term captures the contribution of employment reallocation among sectors, the "Between Effect" or the "Structural Change Effect".

2.3 Analytical framework

Although the role of international trade in shaping the structure of an economy has been highlighted since the traditional trade theories of dynamic comparative advantages, the majority of theoretical, empirical, and quantitative research on structural change have been conducted in a closed economy environment, and employed frameworks built around two forces: the price-effect and the income-effect (see Ngai and Pissarides 2007; Acemoglu and Guerrieri 2008; Kongsamut et al. 2001; Foellmi and Zweimüller 2008). But following Matsuyama (2009), model-oriented research on the role of international trade in structural change has emerged (Alessandria et al. 2021). Hence, many theoretical models have been built where authors simulate and assess the role of international trade in structural change (see Uy et al. 2013; Betts et al. 2017; Teignier 2018; Swiecki 2017; Sposi 2019). In these models, international trade can shape structural transformation via two main channels. First, lower trade barriers (reduction in tariffs, or quotas) facilitate specialization, which then affects the sectoral composition of employment or value-added. Second, under a given set of trade barriers, policy changes or other shocks to the economy affect specialization patterns, which will also affect the sectoral composition of employment or value-added.

The endowment in natural resources and the extent of revenue drawn from the exploitation of natural resources can make a country specialize in some sectors, and drive the allocation of their production factor in the economy. For example, resource?rich countries may have limited incentives to diversify their economic structures, especially when high demand and prices for natural resources lead to fast economic growth, thus reinforcing their comparative advantage and specialization.

The link between demography and economic development has been largely explored (Malthus 1826; Kuznets 1960a, b; Boserup 1965; Simon 1977; Kremer 1993). Recently, many empirical research brought forward the idea that population growth induces

structural transformation. Population growth can increase manufacturing output relative to agricultural output, raising the relative price of agricultural goods (relative price effect) (Leukhina and Turnovsky 2016; Ho 2015).

It is important for countries to have efficient financial sectors. In fact, high real interest rates undermine credit expansion to the private sector, which may in turn restrict production and employment growth. For example, Bagehot (1873) argues that the success in the UK structural change is linked to the performance of its financial system. Schumpeter (1911) also shows that by directing resources to a more productive sector, the financial sector can trigger a structural change (Schumpeter 1911; Gerschenkron 1962; Hicks 1969a, b; Galbis 1977).

We control for GDP per capita levels because we expect more mature economies to be less prone to structural change. It is, for instance, a well-known stylized fact that the relative size of different sectors changes as countries develop. In particular, development is expected to go hand in hand with a shrinking of the agricultural sector and an increase in manufacturing at the early stages of development. As countries grow richer, they are likely to be characterized by a decrease in the manufacturing sector and a significant increase in the services sector. The wealthier economies are, the closer we expect their economic structure to be to the one of a mature economy in terms of the share of the main major productive sectors.

2.3.1 Empirical model

The general specification of the econometric model is guided by a review of the existing theoretical and empirical literature, which includes Martins (2018), McMillan et al. (2014), Dabla?Norris et al. (2013), Duarte and Restuccia (2010), and Herrendorf et al. (2014). The potential determinants are grouped into the following key dimensions:

structural change?=?f(initial conditions, trade, financial capital, demographic, natural resources).

The general specification can be written as

$$y_{i,t} = \alpha + X_{i,t}\beta + u_{i,t}, \tag{5}$$

where $y_{i,t}$ is the dependent variable, α is a scalar, β is a $k \times 1$ vector of slope parameters, i denotes the country, t denotes time, and $X_{i,t}$ is a $1 \times k$ vector of explanatory variables, $u_{i,t}$ is the disturbances, $u_{i,t} = \mu_{i,t} + \nu_{i,t}$, with $\mu_{i,t}$ is the unobservable country-specific effect, and $\nu_{i,t}$ is the remainder stochastic disturbance term.

The model specification used to investigate the trade openness effect on structural change index is specified as follows:

$$SCI_{i,t} = \alpha + \beta_1 SCI_{i,t-1} + \beta_2 \overline{Open}_{i,t} + \beta_3 \overline{Open}^2_{i,t} + \beta_4 \overline{Z}_{i,t} + \varepsilon_{i,t}, \tag{6}$$

where:

$\overline{Open}_{i,t}$ is the trade openness index, $\overline{Open}^2_{i,t}$ captures a possible nonlinearity. This quadratic term indicates which way the curve is bending. $\overline{Z}_{i,t}$ is the set of control variables. As control variables, we use population, natural resources rents, financial

development, and the GDP per capita. The subscripts i, t indicate, respectively, the country and the time.

By its size effect, the population of a country can induce changes in taste and new consumption habits may emerge. It is possible to use natural resource revenue to invest in new sectors or use natural resource products to innovate, to manufacture new varieties of goods in the economy. Financial development may play a groundbreaking role in the economy and shape the direction to follow by prioritizing and giving incentives towards a certain type of innovative project to fund. The GDP per capita can show a possible differential effect according to the wealth of countries.

Hence, for the production structural change index, Eq. (6) explicitly becomes:

$$\begin{aligned} Prodsci_{i,t} =& \alpha + \beta_1 Prodsci_{i,t-1} + \beta_2 \overline{Open}_{i,t} + \beta_3 \overline{Open}^2_{i,t} \\ &+ \beta_4 \overline{Pop}_{i,t} + \beta_5 \overline{Natress}_{i,t} + \beta_6 \overline{Findev}_{i,t} + \beta_7 \overline{GDPpc}_{i,t} + \varepsilon_{i,t}. \end{aligned} \tag{7}$$

For the labor structural change index, the model to be estimated is as follows:

$$\begin{aligned} Labsci_{i,t} =& \alpha + \beta_1 Labsci_{i,t-1} + \beta_2 \overline{Open}_{i,t} + \beta_3 \overline{Open}^2_{i,t} + \beta_4 \overline{Pop}_{i,t} \\ &+ \beta_5 \overline{Natress}_{i,t} + \beta_6 \overline{Findev}_{i,t} + \beta_7 \overline{GDPpc}_{i,t} + \varepsilon_{i,t}, \end{aligned} \tag{8}$$

where[2] *Prodsci* represents the structural change in terms of production, *Labsci* the structural change in terms of labor, $\overline{Open}_{i,t}$ the trade openness index, $\overline{Pop}_{i,t}$ population growth, $\overline{Natress}_{i,t}$ the natural resource rent, $\overline{Findev}_{i,t}$ the financial development indicator, and, $\overline{GDP}_{i,t}$ the GDP per capita. The subscripts i, t indicate, respectively, the country and the time.

We measure all explanatory variables as the 3-year average non-overlapping for the production SCI and 5-year average non-overlapping for the labor SCI to match the measure of the structural change index. The openness to trade is defined as the ratio of total values of trade (imports and exports) to GDP.

3 Estimation techniques: the generalized method of moments (GMM) method

Equation 4 will be estimated with the GMM technique developed for dynamic panel model by Arellano and Bond (1991) and Arellano and Bover (1995) regressors contain the lag variable of explained variable and since concerns are raised by the potential endogeneity of trade openness variables productivity aggregates, GMM makes it possible to control for these endogeneity issues. Moreover, since the number of countries $N > T$, the GMM method is more suitable. The GMM techniques lay on two main estimators: The difference estimator and the system estimator.

The general form of the equation is as follows:

[2] In the formula (7) and (8) a referee suggested the use of the change in trade openness instead of the level of trade openness because if the level of trade openness is constant, explaining a persistent structural change with it would be strange. In fact, we could have used the growth rate of trade openness. However, our primary goal is to check if countries in West Africa tend to experience structural change in their production and labor structure due to their openness extent. To this end, we prioritize the size effects by using variables in levels. As we are studying a panel of countries over many years, we think that the extent of openness of each country although in level, do not necessarily remains constant over time for the same country.

Table 1 Data and sources

Variable	Definition	Source
VA	Value added	Eora-MRIO database
ProdSCI	Structure change in production	Own calculation
LabSCI	Labor structure change (between component of economy)	Own calculation
Within effect	Technological progress effect	Own Calculation
Open	Trade openness index in percentage of GDP $(M+X)/GDP$	WDI, World Bank
Pop	Population growth	WDI, World Bank
Natress	Natural Resources Rents	WDI, World Bank
Findev	Financial development indicator (credit to private sector)	WDI, World Bank
GDPpc	GDP per capita	WDI, World Bank
Tariffs	Average tariffs rate	UNCTAD
Imports	Imports as percentage of GDP	WDI, World Bank
Exports	Exports as percentage of GDP	WDI, World Bank

Source: By authors

$$y_{i,t} = \alpha y_{i,t-1} + X_{i,t}\beta + \varepsilon_{i,t}, \tag{9}$$

with $y_{i,t}$, the value of the dependent variable (a scalar), $y_{i,t-1}$ a lagged dependent variable as regressor, $X_{i,t}$ are vector of regressors and $\varepsilon_{i,t}$ the error term.

According to Arellano and Bond (1991), the estimation of Eq. (9) by the GMM method required some transformation aiming at taking a first difference of variables which leads to:

$$\Delta y_{i,t} = \alpha \Delta y_{i,t-1} + \Delta X_{i,t}\beta + \Delta \varepsilon_{i,t}, \tag{10}$$

with: Δ a first difference operator. Since correlation exists between $\Delta y_{i,t-1}$ and $\Delta \varepsilon_{i,t}$ application of MCO method to Eq. (10) would give inconsistent estimators. As a solution to this problem, Anderson and Hsiao (1982) implement an instrumental method where they use $y_{i,t-2}$ and $X_{i,t-1}$ as instruments. Arellano and Bond (1991) designed a difference-GMM technique where further lag should be used. However, another issue is still present. Given that these processes could represent a weak instrument for first difference variables if they are close to a random walk, Arellano and Bover (1995), and Blundell and Bond (1998) suggest the use of system-GMM consisting of combined estimation of Eq. (9) and (10) by using the first difference of endogenous variables as an instrument in Eq. (10). The SCI estimation is carried out by using a Stata.15.

4 Data and sources

This section shows the data we use in our estimation and their origins. All data are collected as secondary sources, but labor structural change and production structural change come from our own computation (Table 1).

4.1 Descriptive statistics

Table 2 summarizes the descriptive statistic and Table 7 (see Appendix-A1) the correlation between regressors. The correlation results suggest an absence of severe correlation between regressors. A high correlation could cause multicollinearity problems in estimation results.

Table 2 Descriptive statistics

Variable	Obs	Mean	St Dev	Minimum	Maximum
Production structural change model					
Prodsci	154	1.9436	2.2654	0.06030	14.3856
Open	145	64.6203	31.0856	9.3147	286.286
Pop	154	52.09546	2.089003	46.84761	60.55125
Natress	147	10.87743	11.32265	0.4940324	81.52435
Findev	145	14.3948	10.09655	0.197216	61.87837
GDPpc	147	465.7467	424.3172	63.20739	3475.937
Tariffs	145	15.47803	4.823865	5.293334	50.54333
Imports	145	37.46241	20.94319	4.764726	214.1191
Exports	145	27.1579	14.15847	4.550033	79.59097
Labor structural change model					
Labsci	70	0.0456139	0.1742681	-0.406868	0.827975
Within	70	0.0862765	0.3039995	-0.516041	0.703927
Open	68	65.24205	27.11214	34.46561	210.9281
Pop	70	52.05733	2.042419	47.67258	59.71
Natress	70	12.2294	13.52285	0.4961505	81.52435
Findev	69	13.81518	9.910652	0.248508	57.39664
GDPpc	70	557.3849	499.0287	70.29279	3465.429
Tariffs	68	14.76628	4.860689	5.293334	48.46333
Imports	68	38.88334	20.95267	15.51792	156.6714
Exports	68	26.3587	10.18628	9.927549	55.10948

Source: By authors

4.2 Production structural change index (SCI) evolution

The evolution of production structural change in Fig. 1 shows that movements in production adjustment between sectors have been low. Only Burkina Faso, Cape Verde, Gambia, Liberia, Mali, Sierra Leone, and Togo experienced more movements in the group.

These slight movements, put together with the fact that the production structure of these countries was basically at a traditional state?with an almost inexistent industrial structure?suggest that ECOWAS countries did not really skip from their traditional path.

4.3 Labor structural change

4.3.1 Economy-wide labor productivity evolution

Changes in the economy-wide labor productivity display a similar shape for the majority of the countries (see Fig. 2). During the period 1995?2000, the EWLP for most of the countries remains stable or experienced a fall, meaning that either labor moved toward low-productivity activities or there was a fall in labor productivity within the same sectors. Burkina Faso, Cabo Verde, Liberia, Niger, and Togo, where EWLP increased were the exception.

Between 2005 and 2010, there was a decrease in productivity for all countries. After 2010, productivity fell in all countries except in Liberia and Sierra Leone. Given the magnitude, and the fact that this trend remains global, this fall in productivity could

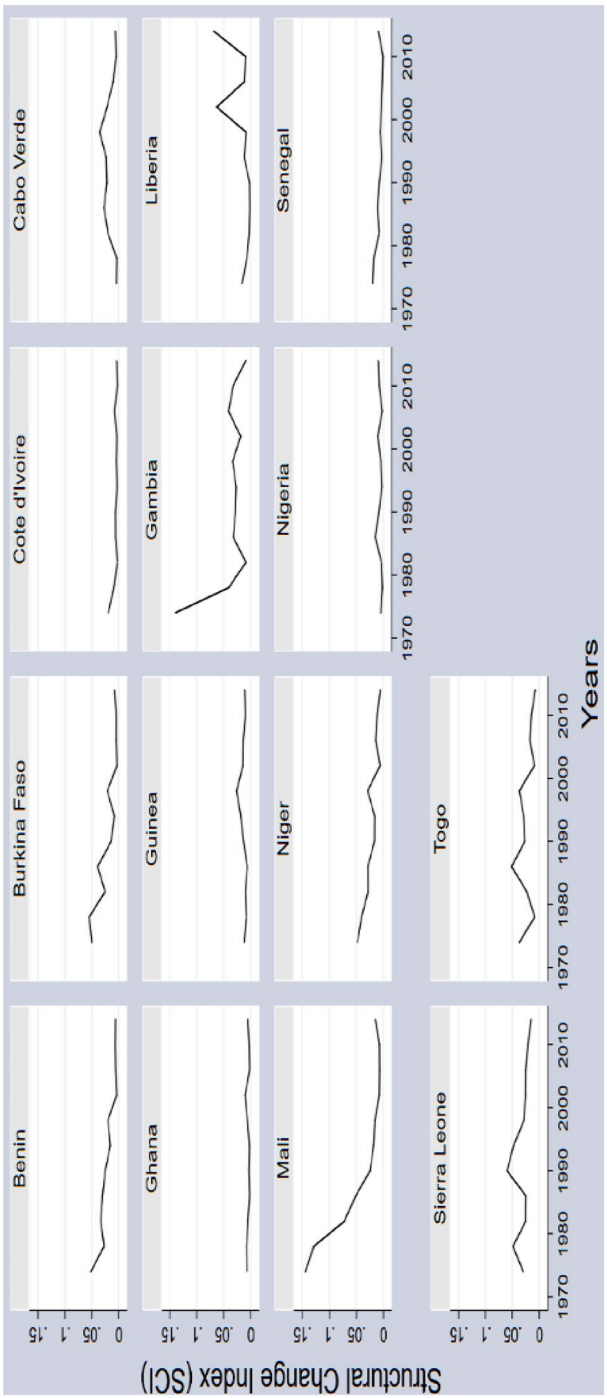

Fig. 1 Structural change index evolution in ECOWAS countries. Source: By authors based on computed SCI index

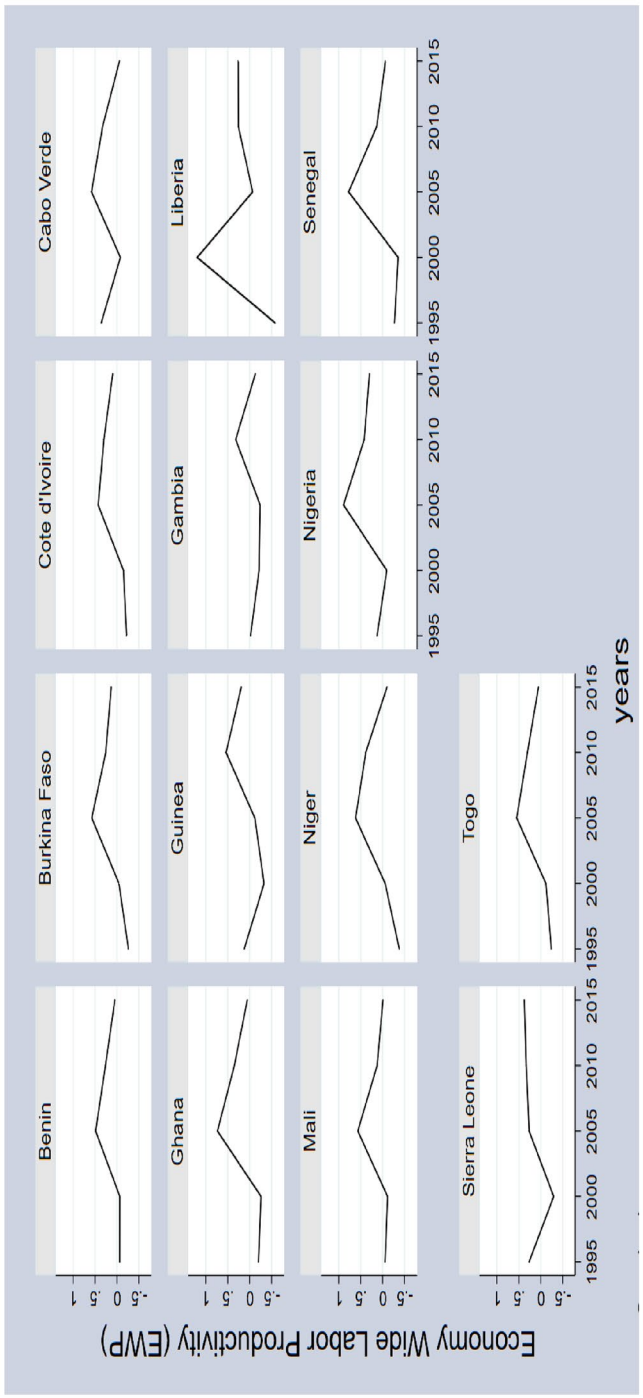

Fig. 2 The EWP evolution in ECOWAS countries. Source: By authors based on computed SCI index

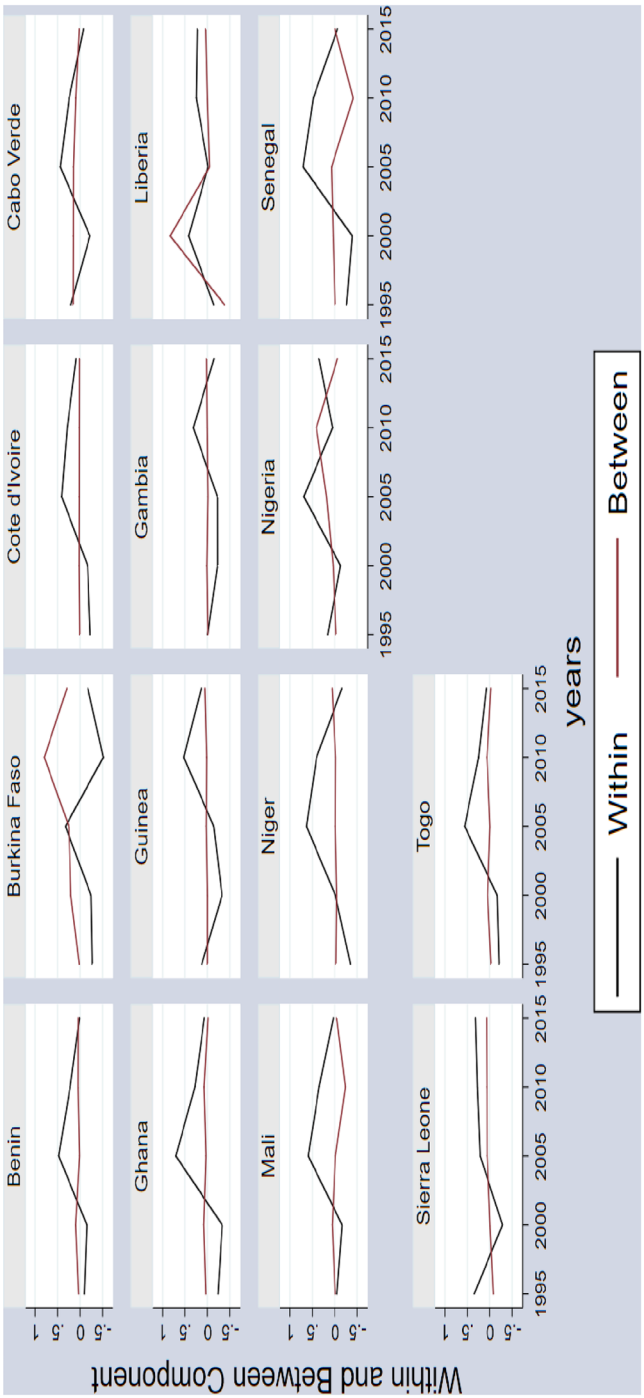

Fig. 3 Within versus between component of EWLP in ECOWAS countries. Source: By authors based on computed SCI index

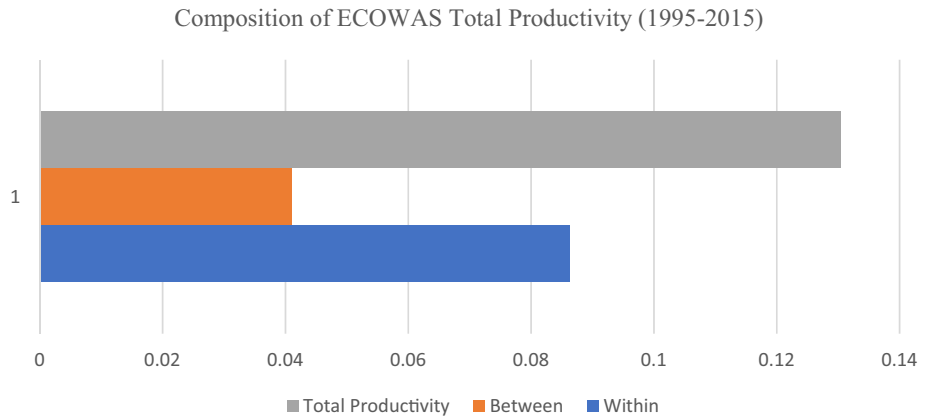

Fig. 4 Economy-wide labor productivity (EWLP), the within, and the between component in ECOWAS countries. Source: By authors based on computed productivity components

be attributed to the 2008 world financial crisis? medium term effects, and the fall of primary commodities prices, given that almost all these countries? economies heavily rely on primary commodities exports (crude oils, fuels, agricultural products).

4.3.2 The within and the between component of the EWLP in each ECOWAS countries

The evolution of the within-component of economy-wide labor productivity in ECOWAS countries shows a presence of boom and bust, unlike the between component which remains almost flat in the majority of countries. Given the evolution, two trends (two groups of countries) emerge (Fig. 3).

When considering the first group, Benin, Cote d?Ivoire, Cabo Verde, Ghana, Guinea, The Gambia, Niger, Sierra Leone, and Togo, there is a common shape with very little changes of the between component over time. At the same time, the within component for the same group displays fluctuations.

From there, we can argue that for these countries, the economy-wide labor productivity changes are mostly explained by the within-component (i.e. the productivity effect in the same sectors). For the second group, Burkina Faso, Liberia, Mali, Nigeria, and Senegal, both the within and the between components have experienced noticeable changes over the period, though the within-component show more fluctuations.

4.3.3 Global structure of the between, the within component, and the EWLP in ECOWAS countries

Figure 4 shows the composition of economy-wide productivity on average between 1995 and 2015 in ECOWAS countries. Results reveal that in that period, the structural change component (between) of the EWLP positively contributes to global productivity as well as the within-component. The second noticeable fact is in terms of the magnitude. In fact, the within-component contributes as twice as the between, showing that during that period intra-sectoral productivity mainly led the EWLP. Hence, our study shows that structural change has on average, been growth-enhancing in ECOWAS countries between 1995 and 2015. Our conclusion diverges in this sense from those of McMillan

Table 3 System GMM result of production SCI and trade openness

Variables	Coefficient
L.Prodsci	0.45207* *(0.082)*
Open	0.14746*** *(0.011)*
$Open^2$	–0.00049*** *(0.003)*
Pop	–0.27018** *(0.045)*
Natress	0.0138399 *(0.703)*
Findev	–0.0457302* *(0.069)*
GDPpc	–0.0002394* *(0.080)*
Constant	8.391723 *(0.199)*
Countries	14
Obs	132
AR(2)	0.562
Hansen	0.408
Instrument	10
Threshold	147,64%

Source: By authors based on estimation results stata.15

***, **, and * denote significant level at 1%, 5%, and 10%

and Rodrik (2011) who concluded in a sample of 9 African countries that structural change has been growth reducing in the continent. However, it is important to clarify that the sample used in their study is different from ours. They cover 9 economic sectors, moreover, the time period is not exactly the same.

But observing the evolution country by country (see Appendix-A2) results show that in the same period, Gambia, Mali, Niger, and Senegal experienced a growth-reducing structural change on average whereas for the remaining sample even if the structural change was growth enhancing, the contribution is relatively weak on average. The stylized facts in ECOWAS did not entirely validate the shift-share analysis paradigm, which suggests that structural change should be the major contribution to growth productivity in countries that are in their early development phase. Hence, these findings suggest that ECOWAS countries should design sound policies notably in terms of employment adaptability, employment flexibility and more importantly they should have good and prospective policies in terms of training and schooling. Taking these actions would provide a qualified workforce able to match the future job market. Those actions include prioritizing short and technical training programs, which facilitate the use of labor force in practical domains. The actual reality is that most countries give priority to general education schools that do not make the labor force quickly available and functional. Hence, this can increase youth creativity, their entrepreneurial skills and interest, making them quickly ready for the job market while they are still young.

5 Estimation results

5.1 Production structural change index (SCI) and trade openness

Table 3 shows the estimation results investigating the relationship between the structural change index and trade openness in ECOWAS countries. The quadratic specification used suggests that the relationship between trade openness and the SCI is nonlinear. Results suggest that trade openness positively triggers the production SCI evolution up to an openness threshold level of 147,64%. After that threshold, the relationship turns negative.

Hence, beyond 147,64%, more openness in ECOWAS countries reduces the extent of production reshuffling between economic sectors. Opening too much leads to a slowdown, revealing a potential presence of a diminishing return process. Hence, an inverted-U shape is evidenced. These findings show that to design policies aiming at reshaping the structure of production in ECOWAS countries, not giving enough attention to external economic forces would result in inefficient results. In fact, domestic reforms cannot be the sole engine for domestic dynamics in production structure. Our results are in line with Fiorini et al. (2013) findings.

The index not showing towards which kind of industry (low or high) in terms of productivity level the total production shifts to, it is hard to know the net effect of openness in intersectoral dynamics of domestic production. But on the other hand, observing the evolution of top exporting products in Table 8 (see Appendix-A2), the order and the share did not significantly change, meaning that the impacts of these structural changes have been limiting in their capacity to radically change the comparative advantage of the countries or their international export pattern. Only two additional categories of products (HS?08 and HS?26) made their apparition. Moreover, analysis of sectoral value-added evolution shows a considerable drop in agricultural share at the end of the 1980s and the beginning of the 1990s. But this happened mostly in favor of services sectors and not manufacturing. A too high SCI implies that the concentration of the economy is in few sectors. That is not a desirable situation either, when those sectors are not the most efficient domestically and internationally as well, or are low in value-added. For instance, a concentration in mining, agriculture, or simple retail services. As this occurrence is possible, the turning point in openness may operate as a regulator. It is worth noting that trade policies of the end of the 1980s in sub-Saharan Africa were based on a deep specialization in the exports of raw materials without investing exports? resources in the development of a competitive domestic industrial sector (Kaba et al. 2022). Therefore, a trade openness based on commodities exports without a resources-investment policy can result in long-term preferences for foreign products and concentration and specialization of domestic production in a few sectors.

Considering the control variables, results indicate that increases in population contract the SCI dynamics. This is not consistent with our expectations, in which we predict that growth in population is likely to be associated with a rising and adoption of new tastes, new habits, and new consumption behavior which could eventually cause changes in production structure. Hence, these results suggest to some extent a presence of habit persistence among populations. It may be a result of some cultural and mindset persistence. Financial development and the per capita GDP contract the SCI

Table 4 Trade openness and the labor structural change

Variables	Coefficient
L.Labsci	–0.7960927*** (0.000)
Open	–0.013233** (0.041)
$Open^2$	0.0000434* (0.072)
Pop	0.0327444* (0.061)
Natress	0.0002266 (0.919)
Findev	0.0103881* (0.065)
GDPpc	–0.0001442** (0.059)
Constant	–1.044192 (0.184)
Countries	14
Obs	55
AR(2)	0.415
Hansen	0.183
Instruments	10
Threshold	152.42%

Source: By authors based on estimations results with stata.15

Note: ***,**,* denotes significant level at 1%, 5%, and 10%

dynamic. This reflects the limitation of the financial sector in funding these economies and its capability to operate their transformation. The per capita GDP result suggests that wealthier countries in the ECOWAS area in terms of per capita GDP tend to experience less structural change dynamics. The GDP result suggests that as countries get wealthier in ECOWAS, they tend to experience less structural adjustment**.** This can be explained by export composition of the wealthier nations of the group. In fact, it is known that the richest countries of the group (Nigeria, Cote d?Ivoire, Ghana) are those who are also rich in natural resources, and natural resources generally lead countries to have very concentrated production and exports. This may not help economic components to experience more shifts across sectors. Natural resource rents show no significant effect. This finding suggests that ECOWAS countries may have not been able to use their earned natural resource rents to significantly transform their economies. Natural resource management policies as implemented in most African countries are less likely to have a spillover effect. In fact, most products, either minerals (crude oil, natural gas, etc.) or agricultural (cotton, soya) are mainly exported in a raw state without a major transformation or added value. Hence, the raw materials exported for many decades seem to have low leverage in contributing to economic modernization and raising the living standards of populations. Overall, the capability of these countries in using their natural resource rents to transform their economy may be weak (Table 4).

5.2 Labor structural change index and trade openness

The estimation results on the link between trade openness and the labor structural change (between effect) component of the economy-wide labor productivity (see

Table 5 Production SCI and labor SCI

Variables	Prodsci	Labsci
L.Prodsci	0.23789*** (0.001)	
L.Labsci		0.08725** *(0.015)*
Tariffs	–0.80642** (0.029)	0.03958*** *(0.000)*
$Tariffs^2$	0.01258** (0.034)	–0.00081*** *(0.000)*
Pop	–0.12470* (0.090)	0.02092** *(0.017)*
Natress	0.01422 (0.311)	0.00983 *(0.548)*
Findev	–0.04727** (0.011)	0.00359** *(0.019)*
GDPpc	–0.00199*** (0.000)	–0.00002*** *(0.000)*
Constant	4.34310 (0.388)	0.58110 *(0.145)*
Countries	14	14
Obs	132	56
AR(2)	0.222	0.708
Hansen	0.884	0.659
Instruments	12	14
Threshold	32.07%	24.43%

Source: By authors based on estimation results with stata.15

Note: ***, **, and * denotes significant level at 1%, 5%, and 10%

Table 5), suggest that opening more to trade has led to negative structural change in ECOWAS countries. This implies that an increase in openness in ECOWAS countries reshuffles labor from high to low-productivity sectors. Furthermore, results show that the negative impact is effective up to a threshold level of 152.42%. Beyond this threshold, the effect becomes positive suggesting that highly open countries may benefit from some positive externalities like being exposed to an efficient foreign financial sector experience, to FDIs inflows, allowing countries to efficiently manage labor reallocation towards the right direction. But with an average of 64% in openness it might be hard for many countries to fully take advantage of this turning point. However, Liberia, Guinea, the Gambia and Togo are the countries likely to reach those levels.

The mechanism underlying this movement may be the adverse effects of the availability and easy accessibility of imported products, forcing countries to abandon certain types of their most productive domestic production plants as competing internationally in these industries becomes difficult. For example, most of the sub-Saharan African countries were more industrialized in the 1980s than in the following years. Manufacturing products like cotton transformation or processed food plants that previously existed in these countries progressively disappeared from the economic area due to, among others, mismanagement issues and a loss of world competitiveness by the 1990s. Currently, most of the wealthy successful entrepreneurs in ECOWAS and Africa have specialized in a "basic" retail sector. Hence, importers are almost all specialized in the sale of products like iron, used cars, food, processed food, ready to wear clothes, office and electronic items.

During the study's time period, labor has mainly shifted from agriculture to services in ECOWAS countries (see Fig. 7). But the fact that there is an important presence of retail activities in the service sector can explain this shift of labor towards less productive sectors. Also, as shown in Fig. 6 (see Appendix A2), the rise in sectoral labor productivity that started at the beginning of the 2000s is mostly due to factors different from trade openness like financial development, and the rise of labor efficiency occurring with sectors (the within effect). With the double-edge sword of trade highlighted in the literature, after the threshold, countries would learn through their high exposure to the external environment, by better coordinating with complementary policies. Exposure to a competitive environment to some extent can help lift some distortions and countries would efficiently start reallocating factors.

The results of production structural change and labor structural change seem to exhibit some contradictions. However, as our production structural change index does not explicitly indicate if production resources move toward a low or high-productivity sector, it is difficult to conclude that the two results contradict each other at this stage. Firstly, if we assume that production resources move toward less productive sector (as labor does) then the two processes reinforce each other. But in the case where production resources move to high-productivity sector in opposition to labor, the explanation may be that trade openness favors the reshuffling of resources towards more productive sectors through a mechanism involving some factors that are substitute for labor. To illustrate this possibility, Ciccone and Papaioannou (2008) show that some sectors may relatively upgrade in resources while not favoring labor to reallocate towards them. They underline the flexibility of labor market and ease of entry and exit into industry as being two important driving forces explaining the extent to which structural change in the direction of modern activities takes place. They argue that intersectoral reallocation within manufacturing industries is slowed down by entry barriers. When employment conditions are rigid, firms are likely to respond to new opportunities by upgrading plant and equipment (capital deepening) rather than by hiring new workers. As a result, this slows down the transition of workers to modern economic activities.

Regarding the control variables, financial development and natural resources have positive effects, but are only significant for financial development. Population and per capita GDP have a negative and significant effect. Findings for population show that a sound policy aiming at empowering human resources through better training, and a good command of economic forecasting in terms of population evolution is necessary. This can contribute to sustaining economic activities and good previsions can help setting an efficient organization of the workforce. For GDP, if most rich countries tend to experience negative structural change, this suggests that the within component could be the main channel governing economic development in this area. The non-significance of natural resources reveals a need for countries to reassess their natural resource policy in order to exploit resources with the goal of transforming them into their own country at least to some extent. The financial sector and policymakers should work together to ensure more efficiency of labor allocation in the economy, this, together with a better transformation of natural resources, may result in a more diversified economy.

Table 6 Differentiated effects of imports and exports on production SCI and labor SCI

Variables	Prodsci	Prodsci	Labsci	Labsci
L.Prodsci	0.4069412*** *(0.013)*	0.7567337*** *(0.000)*		
L.Labsci			−0.5688235*** *(0.003)*	0.1124913*** *(0.004)*
Export	−0.2408176*** *(0.003)*		−0.0653925** *(0.023)*	
$Export^2$	0.0030006*** *(0.002)*		0.0008754** *(0.030)*	
Imports		0.3175665*** *(0.001)*		−0.0084216*** *(0.000)*
$Imports^2$		−0.0013275*** (0.002)		0.0000472*** *(0.000)*
Pop	0.1085049 (0.260)	−0.2791986** (0.046)	0.0469917** *(0.040)*	0.0050758*** *(0.000)*
Natress	0.0120159 (0.485)	0.025893 (0.284)	0.0006547 *(0.853)*	−0.000241 (0.721)
Findev	−0.0451217** (0.031)	−0.0792532** *(0.031)*	0.0101061** *(0.037)*	0.0049148** *(0.047)*
GDPpc	−0.000733* (0.095)	−0.0000441* *(0.091)*	−0.0001729** *(0.038)*	−0.0000758** (0.013)
Constant	−1.273526 (0.772)	5.937493 *(0.307)*	−1.355713 *(0.111)*	5.9374 *(0.307)*
Countries	14	14	14	14
Obs	132	132	55	55
AR(2)	0.132	0.711	0.414	0.359
Hansen	0.284	0.583	0.339	0.744
Instruments	12	10	10	13
Threshold	40.12%	119.65%	37.35%	89.21%

Source: By authors based on estimation results stata.15

Note: ***, **, and * denotes significant level at 1%, 5%, and 10%

5.3 Robustness check and differentiated effects of imports and exports

To ensure the robustness of our results we run the model with an alternative openness variable notably by using average tariff rates. Results (Table 5) suggest that rising tariffs (which is equivalent to more closing the economy) result in slowing down the process of structural change.

This confirms the previous results suggesting that more openness leads to more production reshuffling between sectors. However, beyond the threshold of 32.07%, this effect will become positive. This might be explained by the fact that after this peak, an economy may find itself at the point where it is too closed to the rest of the world so that it will lack diversity in its production structure. Consequently, a rapid reshuffling in some sectors would start to happen. The result of control variables also holds in terms of the sign and significance level.

Robustness check using tariff rates as robustness confirms the previous results for labor structural change index. In fact, rising tariffs cause labor to be reallocated towards the most productive sectors until a threshold of 24.43% is reached. Hence, these results confirm that international trade structure leads structural change in a direction that does not help ECOWAS countries to experience the right pattern of economic development in line with development theories which is labor reshuffling

from agriculture to industry and finally services. In fact, even agriculture which is considered as African countries' natural and favorable sector has still not reached a maturity stage.

5.4 Differentiated effects of imports and exports

Using exports and imports to see the differentiated effects, results (Table 6) show that they have different effects on the production SCI. Exports shrinks whereas imports trigger the reshuffling of domestic production factors. The threshold level is 40.12% for exports and 119.65% for imports. As shown in Table 8, export structures did not significantly change over time and remained concentrated in basic products. That can possibly explain why exports slow down the SCI evolution. As all modern products are imported, imports seem to have a more significant effect on the dynamic of production factors. Also, the size of the impact is stronger with imports compared to exports.

Overall, trade openness evolution contributes to changes in the composition of domestic production structure in ECOWAS and moreover, this effect is not endless as a threshold is found.

We additionally use exports as well as imports to assess their differentiated effects. Imports and Exports trigger the reshuffling of labor toward less productive sectors. The threshold level is 37.35% for exports and 89.21% for imports.

Hence, these results confirm that the international trade structure leads structural change in a direction that does not help ECOWAS countries to experience the right pattern of economic development that is in line with development theories predicting a labor reshuffling from agriculture to industry and finally services. In fact, even agriculture which is considered as a natural and favorable sector of African countries, has still not reached a maturity stage. Exports are concentrated in agriculture and mining, which are the least productive (see Table 8 Appendix-A2). Imports mostly include final products that are likely to spread in service sector. Hence, increasing imports could imply increasing labor in services. But in LDCs, a significant part of labor in services is likely to have low productivity compared to industry and even some parts of the agricultural sector for at least two reasons. Firstly, services are not as sophisticated as it is in developed countries like the USA, or EU countries. Secondly, services include a large part of retails, and trade in final miscellaneous products, that do not require a highly skilled, well-trained labor force, or decent quality of human capital, hence the probable lack of productivity. The presence of most of these countries at the bottom of the global value chain of products they buy could be preventing them to set some industrial plants.

6 Conclusion

In the context of globalization and the implementation of growth-enhancing policies, there is a risk for low-income countries to eventually specialize in low-productivity sectors. This is exacerbated by the fact that low-income countries operate in basic goods and basic sectors. This fact motivated us to conduct an investigation on the contribution of trade openness to structural change in this paper. We shed light on the pattern of

structural change in ECOWAS countries and attempt to explain to which extent and in what direction opening policies affect the structural change in these countries. Results revealed that the structural change magnitude has been low in production as well as in labor. The econometric results suggest that the evolution of the production structural change is significantly and positively triggered by the extent of trade openness. Increasing openness as predicted by theories is found to trigger the share of production reshuffling between economic sectors. This can reflect a simple reallocation between sectors, or the exit of many old sectoral activities and the creation of new activities. However, the impact is nonlinear. After a threshold of 147.64% of trade openness, the effect reverses and turns to negative. This has two implications. The first is that trade openness effects should not be ignored in the factors that trigger the production structural change in ECOWAS countries. Secondly, given that most of these countries operate to some extent in basic products, there is a risk to continue losing their efficiency in some sectors and finally get trapped only in basic products, resulting in a form of deindustrialization similar to what they experienced in the 1980s. On the other hand, considering the labor structural change, results suggest that increasing trade openness in ECOWAS tends to trigger the reshuffling of labor towards less productive sectors. This effect reverses after the openness reaches a level of 152.42%. Moreover, exports contract whereas imports enhance the reshuffling of domestic production. So, focusing on industry friendly import policies should be a priority for ECOWAS countries. For labor, exports as well as imports trigger the reshuffling of labor towards less productive sectors. Our analysis suggests that given the basic structure of export products, as long as their increases would fail to develop a manufacturing sector, their effect in shifting labor towards more productive sectors would be limited. Also, as imports promote retail sectors, which are less productive, this would limit their effect to trigger a right labor structural change. During the study's time period, labor has mainly shifted from agriculture to services in ECOWAS countries. But the fact that there is an important presence of retail activities in the service sector can explain this shift of labor towards less productive sectors. With the ongoing servicification process in the world and the increase of technology in service sectors, we argue that countries should adapt their human capital training to the actual trend, characterized by a significant presence of Information and Communication Technology (ICT) in services. Also, the promotion of policies aiming to attract industrial plants in the framework of the Global Value Chain system is imperative. These industrial plants should be related to the main goods produced in the countries (cotton, cocoa, oil, food transformation). In fact, given the level of openness after which labor shifts toward a positive direction and the average openness in ECOWAS countries the benefits to labor structural change may actually be limited.

In summary, econometric investigation shows that trade openness triggers structural change in production and labor. In terms of production, the net effect of globalization will lie in the orientation given to imports and exports. The issue is that given the weakness of their economy notably in the industrial sector, there is a risk to be trapped with all resources concentrated in basic sectors. This would create the well-known vicious circle where countries export raw materials and reimport the same goods in manufactured form. At this pace, it may be hard to industrialize ECOWAS with traditional paradigms. Hence, there is a need to link the services sector to industrial policies. Integration in the

global value chain is an ideal way in our view. This can be achieved by setting up regional hubs. It entails an intra-regional coordinated policy to upgrade in global value chain, where plants in ECOWAS countries can be set according to the comparative advantage of each country. This coordination will avoid inefficient competition between countries, but instead, the outcome will be a regional manufacturing sector agenda.

Finally, as we were able to account for only three sectoral labor force, further research can focus on more disaggregated sectoral labor data. Moreover, the effect of openness on the sub-industrial sector components (manufacture, mining) is another way to explore. These would sharpen the results and policy recommendations.

Appendix

A1. See Table 7

Table 7 Correlation table

Variables	Prodsci	Open	Pop	Natress	Findev	GDPpc	Imports	Exports
Production structural change model								
Prodsci	1.0000							
Open	–0.1742	1.0000						
Pop	–0.2569	0.4659	1.0000					
Natress	–0.1495	–0.0990	0.0103	1.0000				
Findev	–0.2612	0.4727	0.2081	–0.2402	1.0000			
GDPpc	–0.2171	0.4421	0.5602	–0.2451	0.4680	1.0000		
Imports	–0.0707	0.8683	0.5924	–0.3398	0.4961	0.4310	1.0000	
Exports	–0.2356	0.8227	0.5314	0.2095	0.2906	0.3097	0.4324	1.0000
Variables	**Labsci**	**Open**	**Pop**	**Natress**	**Findev**	**GDPpc**	**Imports**	**Exports**
Labor structural change model								
Labsci	1.0000							
Open	–0.2750	1.0000						
Pop	–0.0679	0.3375	1.0000					
Natress	0.1201	–0.2313	–0.0070	1.0000				
Findev	–0.0817	0.4632	0.5538	–0.2555	1.0000			
GDPpc	–0.1057	0.4494	0.208	–0.3021	0.4910	1.0000		
Imports	–0.2097	0.8855	0.5440	–0.4683	0.4733	0.4530	1.0000	
Exports	–0.2634	0.7988	0.5357	0.1564	0.2882	0.2878	0.4277	1.0000

Source: By authors based on WDI database

A2. See Figs. 5, 6 and 7

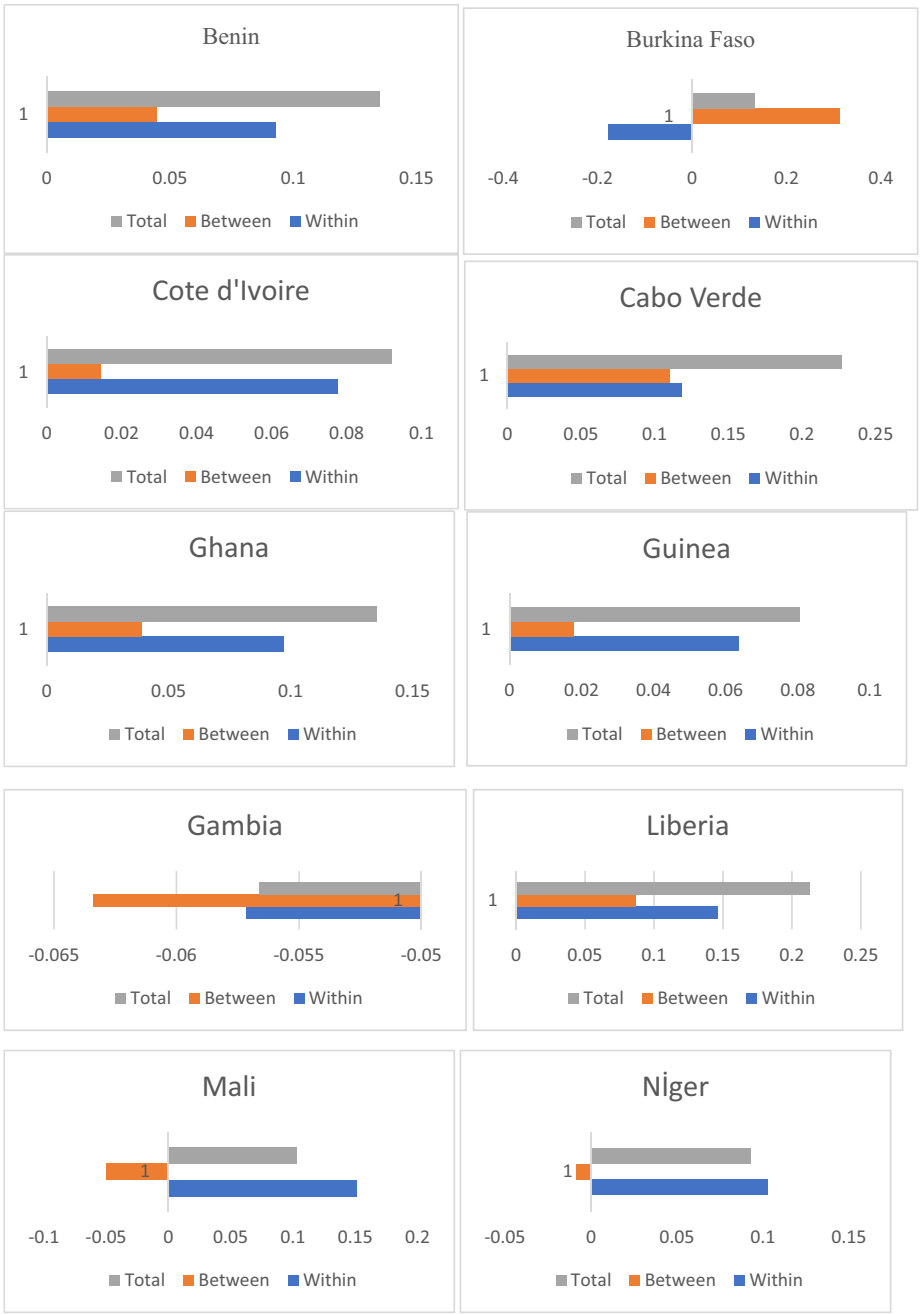

Fig. 5 Economy-wide labor productivity and components (period 1995-2015) Source: By authors based on computed productivity components.

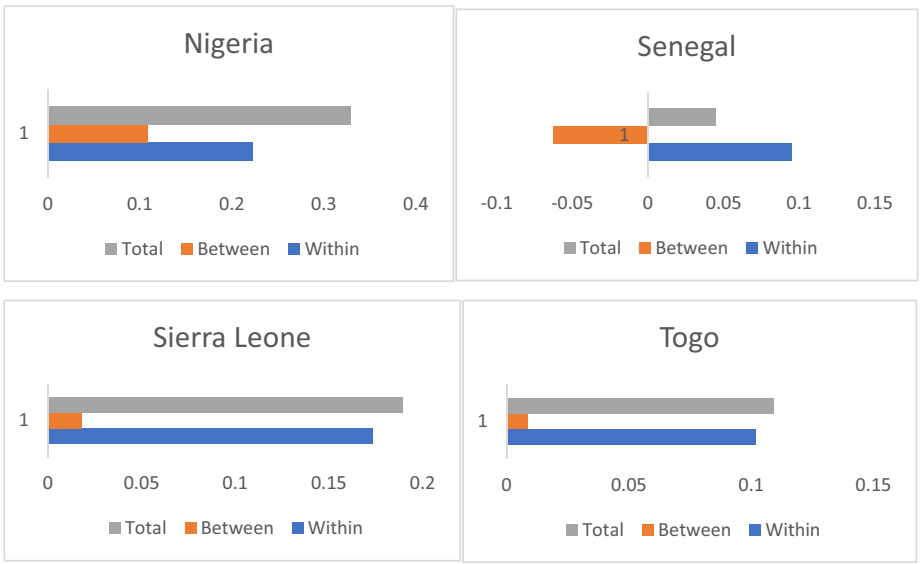

Fig. 5 continued

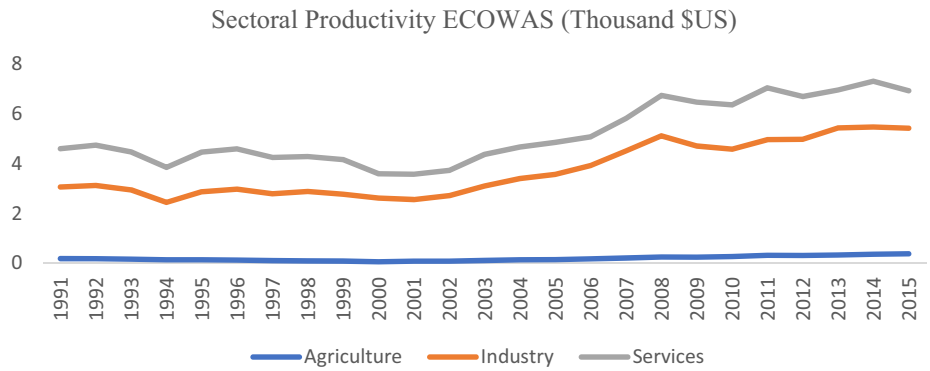

Fig. 6 Sectoral labor productivity. Source: By authors based on WDI database

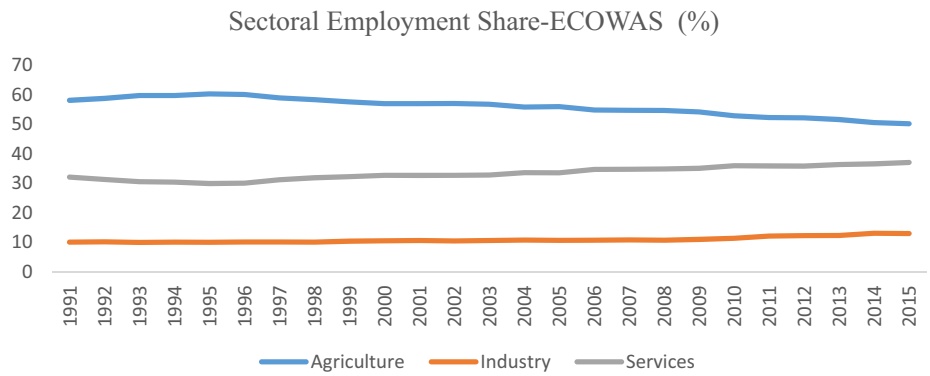

Fig. 7 Sectoral employment share in ECOWAS countries. Source: By authors based on WDI database

A3. Formula for the threshold (γ) calculation:

Let us consider the following equation:

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_1^2 + \beta_3 x_2 + \varepsilon,$$

where y represents the structural change variable and x_1 the trade openness variable and x_2 a control variable.

The above equation allows for testing the various form of trade openness and structural change relationship:

$\beta_1 < 0$ and $\beta_2 > 0$ reveals a U-shape relationship.

$\beta_1 > 0$ and $\beta_2 < 0$ reveals an inverse U-shaped relationship.

$\beta_1 > 0$ and $\beta_2 > 0$ reveals a monotonically increasing linear relationship.

$\beta_1 < 0$ and $\beta_2 < 0$ reveals a monotonically decreasing linear relationship.

Taking the derivative with respect to x_1 yields:

$$\frac{\delta y}{\delta x_1} = \beta_1 + 2\beta_2 x_1.$$

The optimal point is found by setting the derivative equal to 0:

$$\frac{\delta y}{\delta x_1} = 0 \Leftrightarrow x_1 = -\frac{\beta_1}{2\beta_2}.$$

Then this point $\left(-\frac{\beta_1}{2\beta_2}\right)$ represents the turning point in the relationship between trade and structural change variables.

A4. See Table 8

Table 8 Top 15 product category exported by ECOWAS (2012–2017)

	Top 15 products exported											
	2012		**2013**		**2014**		**2015**		**2016**		**2017**	
Total top five products share	**HS**	**90.05**	**HS**	**85.59**	**HS**	**87.40**	**HS**	**84.46**	**HS**	**83.56**	**HS**	**87.11**
Top five products	'27	70.70	'27	68.63	'27	76.29	'27	65.33	'27	51.44	'27	53.16
	'71	7.12	'71	7.14	'18	4.46	'18	8.46	'71	15.85	'71	15.85
	'40	6.18	'18	5.31	'71	2.93	'71	4.45	'18	10.08	'18	8.99
	'18	5.06	'40	2.63	'89	2.21	'89	4.44	'08	3.64	'26	3.17
	'89	1.00	'89	1.89	'36	1.51	'08	1.79	'26	2.55	'08	2.92
	'52	0.96	'08	1.17	'52	1.16	'26	1.61	'52	1.78	'52	1.46
	'08	0.81	'52	1.13	'26	1.14	'52	1.38	'39	1.05	'15	1.41
	'04	0.67	'26	1.11	'08	1.06	'12	1.01	'44	1.03	'40	1.29
	'41	0.64	'12	1.01	'84	0.82	'40	0.88	'40	0.98	'89	1.04
	'26	0.50	'41	0.76	'63	0.65	'88	0.80	'15	0.84	'39	0.96
	'23	0.44	'44	0.69	'12	0.63	'25	0.71	'03	0.82	'25	0.70
	'12	0.39	'03	0.55	'40	0.60	'03	0.70	'12	0.73	'03	0.67
	'03	0.37	'84	0.54	'41	0.49	'15	0.56	'25	0.71	'12	0.60
	'44	0.36	'25	0.49	'25	0.47	'84	0.56	'28	0.62	'44	0.48
	'25	0.34	'33	0.47	'03	0.44	'39	0.53	'84	0.53	'10	0.46

Source: By authors based on UNCTAD database

HS = Harmonized System Code. International numerical method of classifying traded products; HS04=Dairy produce; birds' eggs; edible products of animal origin. HS08=Edible fruit and nuts. HS12=Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit. HS18=Cocoa and cocoa preparations. HS26=Ores, slag and ash. HS27 = Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral. HS32=Tanning or dyeing extracts; tannins and their derivatives. HS39=Plastics and articles thereof. HS40=Rubber and articles thereof. HS41=Raw hides and skins and leather. HS44=Wood and articles of wood; wood charcoal. HS63=Other made-up textile articles; sets; worn clothing and worn textile articles. HS71=Natural or cultured pearls, precious or semi-precious stones, precious metals. HS89=Ships, boats and floating structures

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Declarations

Competing interests
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