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**Research Report**

## Business cycle synchronisation in the ECOWAS region

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## **BUSINESS CYCLE SYNCHRONISATION IN THE ECOWAS REGION<sup>1</sup>**

**WAMI OCCASIONAL PAPER SERIES NO. 18**

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## BUSINESS CYCLE SYNCHRONISATION IN THE ECOWAS REGION

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### **Abstract**

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*Countries of the Economic Community of West African States (ECOWAS) are heterogeneous, characterized by marked differences in production and export structures, divergent levels of inflation rates and fiscal positions. These features suggest that there is a greater tendency for the transmission of asymmetric shocks across member countries in the ECOWAS region. Understanding how well business cycles are synchronised between member countries is extremely important in designing appropriate policy responses to facilitate the launch of the single currency and reduce the cost of joining the proposed ECOWAS monetary union. This study undertakes a time-varying assessment of the degree of synchronisation of business cycles among ECOWAS member countries and analyses the role of bilateral trade, financial integration, and convergence in fiscal and monetary policy in achieving more synchronised business cycles in the region. Using the Hausman-Taylor and Error Components panel two-stage least squares (EC-2SLS) estimation techniques over the period 2001 – 2018, this study finds that well-coordinated policy responses such as the strengthening of trade linkages, convergence in fiscal policy and strong financial linkages would foster more closely synchronised business cycles across the region. Thus, measures to promote the synchronisation of business cycles and ensure the sustainable adoption of a single currency should focus not only on satisfying the macroeconomic convergence criteria, but also enhance trade and financial integration to foster broader policy coordination among countries in the region.*

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**JEL Classification:** C33, E32, O55

**Key Words:** Business Cycle Synchronisation, Trade Linkages, Financial Integration, ECOWAS.

## 1.0 INTRODUCTION

The announcement by the Authority of Heads of State and Government of the Economic Community of West African States (ECOWAS) in 2014/2015 to launch a single currency (Eco) by 2020 has revived the interests among researchers and policymakers in the region on the degree of synchronisation of business cycles. Business cycle synchronisation refers to the co-movement of countries' growth rates through time (Crowley and Schultz, 2010).<sup>2</sup> This renewed interest is driven by the common belief that the extent of synchronisation of business cycles is an important criterion for assessing individual countries' readiness to adopt a common currency. A key question of interest is whether strengthening of economic ties among Member States, through strong trade linkages, financial integration and monetary and fiscal policy convergence would play a critical role in fostering business cycle synchronisation across countries in the region. Answering this question is relevant in the light of the argument in the theory of the Optimum Currency Area (OCA), pioneered by the seminal works by Mundell (1961) and McKinnon (1963), which is one of the theories widely used to assess the costs and benefits of forming or joining a monetary

union (see for example Bayoumi and Eichengreen, 1997).<sup>3</sup>

The literature suggests that the benefits of forming a common currency area outweigh the costs if business cycles are highly synchronised across countries (Bekiros, Nguyen, Uddin and Sjo, 2015). Countries participating in a monetary union can benefit through reduced transaction costs, the elimination of exchange rate uncertainty and more transparent price, among others (Mati, Civcir, and Ozdeser, 2019). The decline in transaction costs resulting from the adoption of a common currency can enhance trade and investment flows across countries (To-Trung, 2006). It is anticipated that as business cycles are more closely synchronised, there is stronger and faster transmission of shocks across countries which will enhance policy coordination (Garcia-Herrero and Ruiz, 2008). As such, Member States can establish a common central bank which would conduct stabilization policies across countries in response to external systemic shocks (Belke, Clemens, and Gros, 2016). Because greater synchronicity leads to the propagation of symmetric shocks across countries (Altavilla, 2004), it reduces the likelihood of policy conflict among Member States, as the adoption of a common monetary policy would deliver

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<sup>2</sup> *Business cycles are more closely synchronised between countries if bilateral correlations of real GDP growth rates reach levels of 0.6 or more.*

<sup>3</sup> *A monetary union is described in terms of three basic arrangements: the adoption of a common currency, establishment of a common central bank, and the implementation of a common monetary policy across countries (Mati, Civcir, and Ozdeser, 2019).*

monetary conditions that are appropriate for all countries.

One of the main costs of joining a monetary union is the loss of sovereign monetary policy to deal with economic disturbances at the country level (Plasmans et al., 2006; Nzimande and Ngalawa, 2017; Mati et al., 2019). A general consensus in the literature is that the costs of joining a monetary union to Member States would be substantial when business cycles are less synchronised or the nature of shocks transmitted across countries is asymmetric (see e.g. Plasmans et al., 2006; Allegret and Essaadi, 2011). To reduce the costs of stabilization to participating countries, the traditional OCA theory stresses the need to achieve more closely synchronised business cycles across countries.

Though the traditional OCA criteria have been extensively applied in the literature in assessing the state of preparedness of member countries in forming a monetary union (e.g. Euro Area, West Africa, etc.), it implicitly assumes that the OCA criteria are exogenous (Frankel and Rose, 1998). This theory suggests that among other factors, business cycle synchronisation is a precondition for Member States to form or join a monetary union.<sup>4</sup> However, the endogeneity theory of the OCA developed by Frankel and Rose (1998) provides a clearer framework to assess how policy

harmonization would enhance business cycle co-movements among countries as the economic integration process progresses. The OCA endogeneity theory suggests that entering a monetary union would influence business cycle synchronisation through strong economic ties, such as trade linkages and fiscal integration (see Bekiros et al., 2015; Frankel and Rose, 1998). Yet, it is not clear whether such relationships could be extended to the ECOWAS region, where Member States have intensified efforts over the past two decades to promote economic integration. The policy measures include strengthening trade linkages, promoting financial integration, and adherence to macroeconomic convergence criteria to facilitate monetary and fiscal policy convergence.

The overarching objectives of such policy coordination efforts are to foster positive spillovers through strong trade and foreign direct investment flows, promote similarity of economic structures in the sub-region to enhance the alignment of business cycles and strengthen macro cooperation among countries for sustainable adoption of a single currency. However, the slow pace in which progress is being made towards this endeavor has brought to the fore interesting questions of policy relevance to the actualization of the single currency project. Are business

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<sup>4</sup> *The traditional OCA theory considers a holistic set of factors in assessing the suitability of member states to join a common currency area, including the similarity of shocks across countries, mobility of factors of production, wages and price flexibility,*

*trade and financial integration, and political integration (see e.g. Frankel and Rose, 1998; Lee and Azali, 2010).*

cycles of Member States in ECOWAS less synchronised? Does strengthening of trade and financial linkages foster business cycle co-movements between countries in ECOWAS? Does the harmonization of monetary and fiscal policies promote business cycle synchronisation among countries in the sub-region?

This paper attempts to provide answers to these questions. It determines whether strengthening of policy harmonization by promoting strong trade linkages, financial integration and convergence in fiscal and monetary policies would foster business cycle synchronisation in the ECOWAS region. By considering these issues, we contribute to the policy debate in the ECOWAS region in three significant ways. First, this paper offers a time-varying assessment of the degree of business cycle synchronisation in ECOWAS. One of the few studies on business cycle synchronisation in West Africa, Kebalo (2019), relied on a time-invariant measure of business cycles synchronisation. Second, this paper provides a comprehensive assessment of how policy coordination measures can promote business cycle synchronisation among ECOWAS countries. It considers a holistic approach to policy harmonization by considering the effects of trade intensity, financial integration, and convergence in fiscal and monetary policy on business cycle co-movements in ECOWAS. Reviewing the literature on the synchronisation of business cycles in the ECOWAS region shows a death of

research on the role of policy in promoting synchronicity. Coleman (2011) did not explore the role that policy harmonization plays in the alignment of business cycles between countries, while Kebalo (2019) only considered the effect of fiscal divergences among countries in West Africa on business cycle synchronisation. Egbuna et al. (2019) showed that ECOWAS member countries have not attained real convergence to enable them to launch a monetary union in 2020 but fell short of ascertaining the role of policy harmonization in achieving real convergence. Third, this paper assesses both the direct and indirect effects of trade linkages on business cycle synchronisation in the ECOWAS region.

In line with the OCA endogeneity theory, there is a growing consensus that increasing intra-industry trade among countries will promote convergence in economic structures and lead to more synchronised business cycles. In support of this assertion, several studies have shown strong positive impact of trade linkages on business cycle synchronisation (e.g. Frankel and Rose, 1998; Imbs, 2004; Bower and Guillemineau, 2006; Inklaar et al., 2008; Garcia-Herrero and Ruiz, 2008; Lee and Azali, 2010; Duval et al., 2014; Atenga and Martial, 2017). In the same vein, achieving close financial linkages among countries would increase business cycle synchronisation through strong trade linkages and promoting similarity in economic structures through increased



intra-industry FDI among countries (Garcia-Herrero and Ruiz, 2008).

Fiscal divergences among countries in a union would lead to lower synchronisation of business cycles among countries (Davas, Rose, and Szapary, 2005). This is expected given that Member States with divergent fiscal positions are more likely to propagate asymmetric fiscal shocks, which affect business cycles differently across countries. The evidence strongly supports this perspective, showing a positive effect of fiscal policy synchronisation on business cycle co-movements (Atenga and Martial, 2017; Bunyan et al., 2019; Duval et al., 2014; Inklaar et al., 2008; Nzimande and Ngalawa, 2017). Similarly, the literature suggests that countries with similar monetary policy stance tend to propagate symmetric monetary shocks which induce business cycle co-movements. There exists empirical evidence showing that achieving monetary policy similarity enhances business cycle synchronisation (e.g. Inklaar et al., 2008; Nzimande and Ngalawa, 2017).

The paper covers a panel of eight countries in the ECOWAS region over the period 2001-2018, comprising Member States of the WAMZ (The Gambia, Ghana, Guinea, Liberia, Nigeria and Sierra Leone), Cape Verde, an Observer Member and Cote d'Ivoire, the largest economy in the West African Economic and Monetary Union (WAEMU) Zone. Because countries in the WAEMU Zone are more homogeneous in terms of institutional characteristics and policy convergence, compared to WAMZ

countries, our country sample includes only the largest economy in the WAEMU area. Along the lines of policies pursued to strengthen economic ties in the ECOWAS region over the last two decades, we considered this study period to determine whether strengthening efforts to enhance policy convergence would lead to more closely synchronised business cycles among Member States.

The paper employs the Hausman-Taylor (HT) estimation technique, and the panel two-stage least squares (2SLS) to assess the robustness of the results to the adoption of an alternative estimation technique. The panel 2SLS more compressively deals with the problem of endogeneity bias compared to the HT estimator, by taking into consideration the correlation between the explanatory variables and the disturbances (including the unobserved country effects). The results show that strengthening of trade linkages between countries would lead to more closely synchronised business cycles indirectly, through its complementary effects on financial integration and improving fiscal positions. We find strong evidence indicating that promoting financial linkages and fiscal policy convergence between member countries would lead to higher synchronisation of business cycles.

Following the introduction, the rest of the paper is structured as follows. Section two reviews the literature on drivers of business cycle synchronisation, while section three describes the methods and the type of data used. Section four conducts

empirical analysis and discusses the levels of synchronisation of business cycles

among countries. Section five concludes with some policy implications.

## 2.0 LITERATURE REVIEW

The synchronisation of business cycles is considered as one of the most important criteria in assessing the state of preparedness of countries in establishing a common currency area (Babetskii, 2005; Bekiros et al., 2015; Belke et al., 2016). This view is rooted in the underpinnings of the traditional theory of the Optimum Currency Area (OCA), pioneered by Mundell (1961) and Mckinnon (1963). Accordingly, a number of scholars have argued that the benefits of forming a common currency area would outweigh the relative costs of loss of autonomy in monetary policy implementation decisions if business cycles are highly synchronised across countries (see Bekiros et al., 2015). This suggests that the cost of implementing a common monetary policy is lower when countries are exposed to symmetric shocks (Babetskii, 2005).

Two theories exist on the OCA that underscore the relevance of similarities in business cycles in the establishment of a common currency area. The traditional theory of the OCA identifies different criteria that researchers and policymakers assess to determine the suitability of member countries in joining a common currency, such as similarity of shocks across countries, mobility of factors of production, wages and price flexibility, trade and financial integration, and

political integration (Frankel and Rose, 1998; Lee and Azali, 2010).<sup>5</sup> This literature suggests that achieving a high level of output synchronicity would foster the propagation of symmetric shocks across countries. It therefore points to the importance for participating countries to achieve an appropriate level of convergence regarding the established criteria before joining a common monetary union. This would reduce the stabilization cost to these countries and reduce the likelihood of policy conflicts.

One limitation associated with the traditional literature on OCA, is the inherent assumption that the criteria, particularly trade integration and business cycle co-movements are exogenous. Attempts to address this deficiency in the literature spurred the development of the OCA endogeneity theory pioneered by Frankel and Rose (1998). The endogeneity theory stresses that the criteria on OCA should not be treated as exogenous, as they are influenced by the adoption of common economic policies across member countries as the economic integration process progresses. It argues that while countries may not satisfy the OCA criteria, they could do so after entering into a common currency union, through strong economic ties such as promoting trade linkages and fostering fiscal integration,

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<sup>5</sup> Frankel and Rose (1998) underline four factors mostly used in the literature to assess the suitability of member countries-trade openness, similarity of shocks and cycles,

degree of labour mobility and system of risk-sharing, particularly through fiscal transfers.

which increases business cycle synchronisation between countries. The formation of a currency union would promote convergence in economic structures among member countries, which reduces the likelihood of the transmission of exogenous asymmetric shocks (Grigoras and Stanciu, 2016).

## **2.1 Trade Linkages and business cycle synchronisation**

The endogeneity theory (Frankel and Rose, 1998) spurred research interest in establishing the drivers of business cycle co-movements between countries. The literature suggests that the effect of trade intensity on the synchronisation of business cycles between countries depends on the nature of trade and the type of shocks propagated across countries (Garcia-Herrero and Ruiz, 2008). It asserts that greater trade intensity would have positive impact on business cycle correlations if driven by intra-industry trade, which encourages the development of similar economic structures across countries and promotes the synchronisation of business cycles. Frankel and Rose (1998) suggest that strong trade ties between member countries through the elimination of trade barriers would increase intra-industry trade, induce the propagation of demand shocks across countries and enhance the synchronisation of business cycles.

Apart from the direct effect of trade linkages, the OCA endogeneity literature

also considers the indirect channels through which trade linkages influence business cycle co-movements, particularly through the similarity of production structures or financial links (Garcia-Herrero and Ruiz, 2008; Imbs, 2004). Similarly, they submitted that strong trade ties between countries would promote financial linkages by encouraging FDI in export-oriented sectors (Garcia-Herrero and Ruiz, 2008). In contrast, however, fostering closer trade ties through inter-industry trade could encourage specialization and the development of different economic structures across countries, which would lead to a divergence in productive structures between countries thus facilitating the transmission of asymmetric shocks between member countries and reducing business cycle synchronisation.

Considering the endogenous OCA theory, Frankel, and Rose (1998) found a positive impact of trade intensity on business cycle co-movements using an instrumental variable estimation technique. The study uses gravity variables such as bilateral distance between countries and dummy variables for the existence of a common border and common language between countries as instruments for the endogenous trade intensity variable. One problem with this approach is the difficulty in capturing the indirect effects of trade. Recognition of this limitation have spurred scholars to adopt other estimation techniques to capture the indirect effects of trade. There is an overwhelming evidence

in support of the hypothesis that bilateral trade intensity leads to more synchronised business cycles between countries (see e.g. Atenga and Martial, 2017; Nzimande and Ngalawa, 2017; Duval et al., 2014; Dees and Zorell, 2011; Lee and Azali, 2010; Garcia-Herrero and Ruiz, 2008; Inklaar et al., 2008; Bower and Guillemineau, 2006; Imbs, 2004). However, Abiad et al. (2013) did not find any statistically significant positive effect of trade on the co-movements in business cycles.

## **2.2 Financial Linkages and business cycle synchronisation**

The question of whether closer financial linkages influence business cycle synchronisation has also received considerable attention in the endogenous OCA literature. However, there are two sets of theories with opposing views regarding the relationship between financial linkages and business cycle synchronisation. On one hand, it is argued that greater financial integration would lead to more synchronised business cycles when shocks to the domestic banking sector are propagated globally through reduction in lending across countries, which tends to synchronise output growth between countries. (Duval et al., 2014; Kalemli-Ozcan et al., 2013).

Financial integration influences the synchronisation of economic activities between countries indirectly through trade links or its impact on economic structures in these countries (Garcia-Herrero and

Ruiz, 2008). The literature suggests that closer financial integration promotes the allocation of capital across countries, facilitating trade and increasing the synchronisation of output growth. Similarly, increased financial integration would enhance similarity in economic structures when it promotes intra-industry FDI between countries. This occurs through the concentration of FDI inflows in host countries on those sectors where the source country has a comparative advantage, thereby replicating productive structures at home. It is also opined that financial integration will promote the development and integration of credit and capital markets, which enhances the transmission of monetary policy across member countries (Bhatia et al, 2011). A few studies have shown that countries with closer financial linkages are associated with more synchronised business cycles (e.g. Kalemli-Ozcan et al., 2001; Imbs, 2004).

On the other hand, Imbs (2004) argues that financial integration could be negatively associated with output co-movements through its influence on specialization. It is suggested that strong financial linkages will encourage production and consumption in member countries, induce higher specialization in production and less synchronised business cycles (Garcia-Herrero and Ruiz, 2008). Kalemli-Ozcan et al., (2001) argue that economic integration can lead to better income insurance in member countries through the integration of capital markets, which in

turn promotes greater specialization in production and trade and reduces the synchronisation of business cycles. Kalemli-Ozcan et al., (2013) stressed the opposing views regarding the influence of financial integration on business cycle co-movements, induced through negative shocks to the banking sector or productivity shocks to firms. They concluded that through increased financial integration, a negative shock to the collateral or productivity of firms in a given country would reduce lending to domestic firms, with capital reallocated to other countries not hit by the shock which creates divergence in output growth. Other studies have also shown that financial linkages are negatively associated with the synchronisation of business cycles (Garcia-Herrero and Ruiz, 2008; Abiad et al., 2013; Kalemli-Ozcan et al., 2013; Duval et al., 2014; Nzimande and Ngalawa, 2017). Specifically, Abiad et al., (2013) illustrate that financial linkages are negatively associated with business cycle synchronisation in normal times. Kalemli-Ozcan et al., (2013) showed that financial integration, proxied by banking integration, reduces the synchronisation of business cycles. Similarly, Duval et al., (2014) employed different measures of financial integration (banking, portfolio and FDI integration) and found evidence of the negative effect of banking and portfolio integration on output growth co-movements.

### **2.3 Fiscal policy and business cycle synchronisation**

The literature on the influence of fiscal policy on business cycle co-movements is less developed. Darvas et al. (2005) argue that idiosyncratic shocks are created when countries are engaged in fiscally irresponsible behavior, which is reflected in large and persistent fiscal deficits. This is particularly so when fiscal policy is procyclical, generating idiosyncratic shocks that distort business cycles and reduce co-movements in economic activity across countries (Bunyan et al., 2019). As such, reducing the budget deficits or adopting prudent fiscal policies will reduce the likelihood of transmission of idiosyncratic fiscal shocks and lead to closer co-movement of business cycles between countries. Fiscal policy divergence can either emanate from fiscal policy interventions aimed at mitigating the impact of idiosyncratic shocks or in response to common shocks that trigger idiosyncratic shocks. Fiscal policy interventions to mitigate cyclical fluctuations in response to economic shocks could increase the synchronisation of economic activities across countries (Bunyan et al., 2019).

The empirical literature on the role of fiscal policy in driving co-movements in business cycles across countries shows that countries with similar fiscal positions have more closely synchronised business cycles. A few studies have illustrated that fiscal convergence increases output growth co-movements (Atenga and

Martial, 2017; Bunyan et al., 2019; Inklaar et al., 2008; Nzimande and Ngalawa, 2017). Employing a time-varying approach, some studies found that fiscal policy significantly influences business cycle synchronisation and that the effect varies across countries over time (Degiannakes et al., 2016). Considering the OECD countries, Darvas et al., (2005) found that fiscal convergence would lead to more closely synchronised business cycles. In a similar vein, Rozmahel et al., (2014) showed that fiscal indiscipline and dissimilarity were associated with less synchronised business cycles among the EU countries. In the ECOWAS region, there is scant evidence on the impact of fiscal policy harmonization on business cycle synchronisation across countries. One of the few studies, Kebalo (2019), considered how the existence of dissimilar fiscal positions of the economies in West Africa has influenced the degree of synchronisation of business cycles. The study showed that fiscal divergence is associated with reduced business cycle synchronisation.

#### **2.4 Monetary policy and business cycle synchronisation**

One important source of the transmission of asymmetric economic shocks across countries is through different monetary policy regimes (Beck, 2013). In addition to the transmission of monetary policy shocks, asymmetric shocks can also stem from macroeconomic shocks that hit member countries (De Grauwe, 2003). The

propagation of these shocks across countries influence the synchronisation of business cycle in different ways. The literature suggests that when countries with similar monetary policy stance are faced with monetary policy shocks, they are affected and respond in a similar way to these shocks (Bower and Guillemineau, 2006; Dai, 2014), which facilitates the transmission of symmetric shocks and induces more closely synchronised business cycles. In the case of macroeconomic shocks that hit member countries with different monetary policy regimes, countries adopting a coordinated monetary policy stance would not be able to adopt independent policy stance in response to idiosyncratic shocks, which leads to lower synchronisation of business cycles (Bower and Guillemineau, 2006; Dai, 2014). To the extent that monetary policy stance is not coordinated, member countries can undertake country-specific adjustment policies in response to these shocks (Fidrmuc, 2004). Under a single currency area, however, member countries do not pursue country-specific monetary policy stance when their economies are hit by economic shocks.

Using the correlation of short-term interest rate between countries as a proxy for similarity in monetary policy stance, Inklaar et al., (2008) show that monetary policy coordination is associated with more synchronised business cycles in the OECD countries. Nzimande and Ngalawa (2017) arrive at the same conclusion for the Southern African Development

Community (SADC) region, using the absolute differences in inflation rates between countries as a proxy for monetary policy similarity.

In sum, the endogenous OCA theory points to the potential endogeneity of policy coordination variables, notably bilateral trade integration, fiscal and monetary policy convergence, and financial integration in explaining bilateral output growth co-movements. There is strong evidence supporting the theory that stronger intra-industry trade linkages directly increase business cycle synchronisation through the promotion of similar economic structures across countries, while inter-industry trade reduces business cycle coherence. Trade integration also indirectly leads to closer output co-movements through strong financial linkages. Similarly, financial

integration influences output co-movements either directly, or indirectly through trade or its effect on industrial specialization. The impact of fiscal policy on business cycle synchronisation is ambiguous, depending on the nature of the response of fiscal policy to economic shocks. Monetary policy convergence induces closer synchronisation of business cycles.

From the foregoing review, our paper considers whether increased bilateral trade intensity, strengthening of financial linkages, and monetary and fiscal policy convergence will promote business cycle synchronisation in ECOWAS. It explores whether there are indirect effects of trade intensity on business cycle synchronisation through its potential complementary effect on fiscal policy and financial linkages in the region.



### 3.0 MODEL, DATA AND ESTIMATION TECHNIQUE

In line with the empirical literature (e.g. Frankel and Rose, 1998; Abiad et al., 2013; Duval et al., 2014), we adopted the gravity framework of international trade to assess the impact of policy harmonization on business cycle synchronisation in the ECOWAS. As discussed above, policy harmonization is broadly defined to capture the effects of bilateral trade intensity, financial linkages, fiscal policy convergence and similarity in monetary policy on output growth correlations between countries in the ECOWAS. This paper employs a panel consisting of eight countries, namely the six member countries of the WAMZ (The Gambia, Ghana, Guinea, Liberia, Nigeria and Sierra Leone), Cape Verde, an observer member and Cote d'Ivoire, the largest economy in the West African Economic and Monetary Union (WAEMU). It is worthwhile to note that countries in the WAEMU Zone have made significant progress towards harmonising policy frameworks and strengthening relevant institutions as part of efforts to sustain the use of the CFA currency. We therefore consider only Ivory Coast in the panel, to determine how business cycles in other countries co-move with the largest economy in this Zone.

#### 3.1 Model Specification

Our empirical specification follows the literature on the endogenous OCA theory that allows for endogeneity of policy coordination in explaining the drivers of

co-movement in output growth. This strand of the literature points towards the possibility of strong policy coordination among member countries in a currency union in response to the adoption of common economic policies as part of the economic integration process. To explore the effects of bilateral trade intensity, financial linkages, fiscal and monetary policy convergence on business cycle synchronisation, we estimate the following baseline model over the period 2001-2018:

$$ycorr_{ijt} = \alpha_{ij} + \alpha_t + \gamma' P_{ijt} + \delta' Q_{ijt} + \varepsilon_{ijt} \quad (1)$$

Where the dependent variable,  $ycorr_{ijt}$  is quasi-correlation of real GDP growth rates between countries  $i$  and  $j$  at time  $t$ .  $P_{ijt}$  is a vector of the policy harmonization variables- bilateral trade intensity, financial linkages, fiscal policy convergence and monetary policy similarity.  $Q_{ijt}$  is a vector of control variables such as an index of specialization, exchange rate, oil prices, an external shock dummy variable and a dummy variable to control for the effect of WAEMU countries belonging to a common currency union on business cycle synchronisation in ECOWAS.  $\alpha_{ij}$  denotes country-pair fixed effects, which captures the influences of gravity-type variables such as bilateral distance, cultural similarity or colonial links, common language, etc. that do not affect output co-movements directly but correlated with

bilateral trade intensity; or other unobservable time-invariant characteristics specific to country-pair  $i$  and  $j$  (see Duval et al., 2014).  $\alpha_t$  is time fixed effects to control for additional time-varying business cycle effects. Following nearly two decades of economic cooperation among Member States (2001-2018), the study was confined to this period to allow us to determine whether strengthening of policy coordination would increase the synchronisation of business cycles among countries.

The literature reviewed suggests that greater trade intensity can lead to increased or less synchronised business cycles, depending on whether bilateral trade is driven by intra-industry or inter-industry trade flows, respectively. Strong trade intensity will foster more closely synchronised business cycle co-movements if driven by intra-industry trade between countries. However, greater bilateral trade through inter-industry flows can induce higher specialization and lead to lower synchronisation of business cycles (Garcia-Herrero and Ruiz, 2008 and Duval et al., 2014). Bilateral trade also influences business cycle synchronisation indirectly through its influence on the productive structure, financial linkages, and fiscal policy.

Similarly, financial integration influences business cycle synchronisation either directly, or indirectly through trade linkages or its effect on specialization (Garcia-Herrero and Ruiz, 2008, Imbs, 2004). However, the impact of financial

linkages on the co-movement of output is predicted to be ambiguous a priori, depending on the transmission mechanism of the shocks (Kalemli-Ozcan et al., 2013; Ductor and Leiva-Leon, 2016).

To capture the indirect effects of trade intensity, financial integration, and fiscal policy, equation (1) is extended to include the interactions effects between trade intensity and financial integration, as well as trade intensity and fiscal policy. Augmenting equation (1) to accommodate these indirect effects yields the model specified in equation (2).

$$ycorr_{ijt} = \alpha_{ij} + \alpha_t + \gamma'P_{ijt} + \delta'R_{ijt} + \varepsilon_{ijt} \quad (2)$$

where  $R_{ijt}$  is a vector of control variables, including all the control variables in the vector  $Q_{ijt}$  in equation (1) and the interactions between trade intensity and financial integration, and trade intensity and fiscal policy synchronisation.

Fiscal policy convergence would be positively associated with business cycle co-movements if countries undertake prudent fiscal policy interventions to mitigate cyclical fluctuations triggered by economic shocks. The converse is true when countries are fiscally indisciplined, as reflected in large and persistent budget deficits and increasing public debt-to-GDP ratio, which induce the propagation of idiosyncratic or asymmetric fiscal shocks that reduce business cycle synchronisation (Davas et al., 2005).

The impact of monetary policy coordination on business cycle synchronisation is ambiguous on a priori ground (Bower and Guillemineau, 2006; Dai, 2014). The authors have argued that countries that implement similar monetary policy stance will respond in a similar way to monetary policy shocks, which causes close co-movements in business cycles between countries. However, when countries adopt different monetary policy regimes and are hit by macroeconomic shock, they are unable to respond to the shocks independently under monetary policy coordination, causing lower synchronisation of business cycles. Apart from these policy harmonization variables, other drivers of business cycle synchronisation such as industrial specialization, exchange rate, oil prices and dummy variables to control for the effects of external shocks and belonging to the WAEMU union are included as control variables.

### 3.2 Data and description of variables

The dependent variable, business cycle synchronisation ( $ycorr_{ijt}$ ) is measured as the quasi-correlation of real GDP growth rates between countries  $i$  and  $j$ . Following Abiad et al., (2013) and Duval et al., (2014), we used a time-varying quasi-correlation measure to compute business cycle synchronisation, defined as:

$$ycorr_{ijt} = \frac{(y_{it} - y_i^*) * (y_{jt} - y_j^*)}{\sigma_i^y * \sigma_j^y}$$

Where  $ycorr_{ijt}$  is bilateral output co-movement between countries  $i$  and  $j$ ;  $y_{it}$  is real GDP growth rate of country  $i$  in year  $t$ ;  $y_i^*$  and  $\sigma_i^y$  denote the mean and standard deviation of real GDP growth of country  $i$  over the period 2001-2018.

To test whether the results obtained are robust, an alternative measure of output growth synchronisation is used as the dependent variable. This variable is measured as the negative of the absolute differences in real GDP growth rates between countries  $i$  and  $j$  in each period

$$ysync_{ijt} = -|y_{it} - y_{jt}|$$

Fiscal policy convergence is defined by the correlation of cyclically adjusted primary fiscal balances. Following the approach by Duval et al., (2014), cyclically-adjusted primary fiscal balance is obtained by regressing primary fiscal balance (% of GDP) on the output gap to purge off the effects of the cycle. This transformation is carried out to mitigate the problem of endogeneity of fiscal policy in explaining output growth co-movements. The output gap is measured as the difference between actual and potential real GDP (long-run trend), scaled by the long-run trend of real GDP. Consistent with suggestions by Ravn and Uhlig (2002), a smoothing parameter of 6.25 is used (annual observations) to obtain the long-run trend using the Hodrick-Prescott (HP) filter. To test the robustness of the results, a second measure of fiscal policy convergence is employed, defined by the correlations of the cyclically-adjusted overall fiscal

balance expressed as a percentage of GDP (Duval et al., 2014; Inklaar et al., 2008). Thus, the quasi-correlations of these fiscal policy variables are computed using the formula:

$$fpc_{ijt} = \frac{(f_{it} - f_i^*) * (f_{jt} - f_j^*)}{\sigma_i^f * \sigma_j^f}$$

Where  $fpc_{ijt}$  is the quasi-correlation of the cyclically-adjusted primary fiscal balance or overall fiscal balance for countries  $i$  and  $j$  in year  $t$ ;  $f_{it}$  denotes the cyclically-adjusted primary fiscal balance or overall fiscal balance for country  $i$  in year  $t$ ;  $f_i^*$  and  $\sigma_i^f$  are the mean and standard deviation of the cyclically-adjusted fiscal balance over the period under consideration. Data on real GDP growth and fiscal balance were obtained from the IMF's World Economic Outlook (WEO) database.

Monetary policy similarity is obtained by taking the absolute difference in inflation rates between countries  $i$  and  $j$  (Nzimande and Ngalawa, 2017). Other studies have utilized the differences in short-term interest rate between countries (Bower and Guillemineau, 2006; Dai, 2014) or correlation of short-term interest rate between countries (Inklaar et al., 2008) as proxy for similarity in monetary policy stance of member countries.

Monetary policy similarity is proxied by the absolute difference in inflation rates between countries for two reasons. First, data on monetary policy rate is limited since most countries in the WAMZ only

implemented a policy rate recently. In the absence of sufficient data on policy rates to mirror the monetary policy stance of central banks, the interest rate on Treasury bills is also not a suitable rate, particularly in the WAMZ countries due to the problem of fiscal dominance. Second, the policy rate may not accurately reflect the efforts of central banks in the WAMZ to curb inflation due to the weak monetary policy transmission mechanism in most countries. One factor contributing to the weak transmission of monetary policy actions is the problem of relatively less developed financial systems, with low level of financial inclusion and the associated large informal sector in these countries. Data on inflation rates were sourced from the World Development Indicators (WDI) published by the World Bank.

Bilateral trade intensity is measured by the time average of bilateral exports and imports between country  $i$  and country  $j$  divided by the sum of total trade of country-pairs. In line with the approach by Frankel and Rose (1998), bilateral trade intensity is constructed by taking the natural logarithm of the average bilateral trade intensity between countries  $i$  and  $j$ :

$$T_{ij} = \ln \left( \frac{1}{|T|} \sum_t \frac{X_{ijt} + M_{ijt}}{X_{i,t} + X_{j,t} + M_{i,t} + M_{j,t}} \right)$$

Where  $T_{ij}$  is bilateral trade intensity between country  $i$  and country  $j$ ;  $X_{ijt}$  denotes bilateral exports from country  $i$  to country  $j$  in year  $t$ ;  $M_{ijt}$  are imports of

country  $i$  from country  $j$  in year  $t$ .  $X_{i,t}$  represents total global exports from country  $i$  in year  $t$ ; and  $M_{i,t}$  denotes total global imports of country  $i$  at time  $t$ . Data on bilateral trade flows between Member States was sourced from the WAMI database, while total global trade volume was obtained from the IMF's Direction of Trade Statistics database.

To assess the impact of financial linkages on business cycle synchronisation, financial integration is measured by the absolute differences in the net foreign asset (NFA) positions between country  $i$  and country  $j$  (Imbs, 2004; Inklaar et al., 2008). This variable is constructed as:

$$FI_{ijt} = \left| \left( \frac{NFA}{GDP} \right)_{it} - \left( \frac{NFA}{GDP} \right)_{jt} \right|$$

Where  $FI_{ijt}$  financial integration and NFA denotes the net foreign asset position of a country. Data on NFA as a percentage of GDP is obtained from the IMF website, which is constructed based on the approach by Lane and Milesi-Ferreti (2017). As Lane and Milesi-Ferreti (2017) indicate, the NFA position captures the assets and liabilities of each country as reflected in the Balance of Payments (BOP) statistics. This variable comprises foreign direct investment (FDI); portfolio equity; portfolio debt; other investment; and financial derivative; including foreign exchange reserves on the asset side of the BOP accounts.

Regarding the control variables, we consider an index of the similarity or

differences in industrial composition as proxy for the pattern of specialization in production between countries. Following Imbs (2004), the specialization variable is computed as the time average of the differences in economic structures between countries  $i$  and  $j$ . To compute this variable, we consider the relative sectoral real value-added contributions of agriculture, industry, manufacturing, and services sectors to GDP, to obtain the differences in sectoral composition between countries. Thus, the specialization variable is computed as

$$S_{i,j} = \frac{1}{T} \sum_t \sum_n^N |s_{n,i} - s_{n,j}|$$

where  $s_{n,i}$  represents the real value added contribution of each sector to GDP in country  $i$ . This variable ranges between 0 and 2, with zero reflecting the case of complete similarity in economic structures and 2 indicating completely different economic structures between country-pairs (Ductor and Leiva-Leon, 2016). It is anticipated that greater similarity in economic structures between countries would lead to more synchronised business cycles as sector-specific shocks are readily propagated between countries. As such, this variable is expected to be negatively associated with business cycle synchronisation when countries are characterized by completely different economic structures. Data on these sectoral contributions to output is obtained from the World Development Indicators (WDI).

The effect of oil prices on business cycle synchronisation is ambiguous, depending on whether countries are net oil exporters or net oil importers (see Nzimande and Ngalawa, 2017). An increase in oil prices would stimulate domestic income in oil exporting countries, through different channels, including increased expenditure and investment spending, which promotes productivity and job creation (Geise and Pilatowska, 2013). By contrast, net oil importing countries would experience an increase in production costs, which reduces consumer spending and domestic demand. This may lead to a reduction in domestic production and decline in employment in oil importing countries. The oil price variable is measured by the logarithm of the West Texas Intermediate (WTI) prices obtained from the World Economic Outlook (WEO) database.

The effect of exchange rate on business cycle synchronisation partly depends on its indirect effects through other policy coordination variables, such as financial integration and bilateral trade intensity (see Hou and Knaze, 2019). The literature suggests that a less flexible exchange rate could lead to more synchronised business cycles through increased financial integration and bilateral trade.

To further capture the effects of global common shocks on business cycle synchronisation, in addition to oil prices, we include an external shock dummy variable coded 1 in periods of external shocks, such as the terrorist attack in the United States and associated commodity

price shocks in 2001/2002, the global financial crisis in 2007/2008 and commodity price shock in 2014/2015. Abiad et al., (2013) have illustrated that the global common shocks may lead to more synchronised business cycles, although the negative effects of the shocks transmitted through financial linkages could lower co-movements in output growth. A dummy variable is also included to control for the impact of countries in the WAEMU zone on business cycle synchronisation. This variable is coded 1 if the country is a member of the WAEMU sub-region (Ivory Coast) and zero otherwise.

### 3.3 Estimation technique

To explore the effects of the policy harmonization variables on real GDP co-movements, we begin by first estimating the baseline equation (1) using the pooled ordinary least squares (OLS) regression. However, one problem with the OLS estimation is that the effects of the unobserved country-pair fixed effects ( $\alpha_{ij}$ ) are ignored. Hence, the OLS approach is not suitable to address potential endogeneity problem associated with bilateral trade intensity, fiscal policy, financial integration, and the index of specialization in production. The literature on gravity model specification suggests that  $\alpha_{ij}$  is correlated with bilateral trade intensity as it captures factors that explain bilateral trade but do not directly influence output growth co-movements. These factors include distance, the existence of a common border, colonial links and common language between countries.

Building on the endogeneity OCA theory, Imbs (2004) shows that bilateral trade intensity, financial integration, and specialization in production are endogenous to business cycle correlations. Explaining further, Imbs (2004) argues that specialisation in production could affect bilateral trade flows, while both trade and financial integration induce specialization in production. Fiscal policy convergence could be endogenous to business cycle synchronisation, since the adoption of common economic policies to foster economic integration would provide incentives for fiscal prudence. This in turn mitigates the propagation of asymmetric fiscal shocks across countries and thus increases output co-movements.

One approach to dealing with these problems is to estimate a fixed effects linear panel data model. This estimation is, however, not appropriate due to the inclusion of the time-invariant variables in the regression. By construction, one of our key policy harmonization variables of interest, bilateral trade intensity is essentially time-invariant between country-pairs. This variable is measured as the time average of bilateral trade between countries  $i$  and  $j$  scaled by total trade. In contrast, the alternative linear panel data model, random effects model assumes that the country-pair unobserved heterogeneity ( $\alpha_{ij}$ ) is not correlated with the explanatory variables. Estimating the random effects model is also not suitable as it does not address endogeneity issues, leading to

biased and inconsistent parameter estimates.

In trying to deal with the above weaknesses, we adopted the Hausman–Taylor estimation technique. The Hausman-Taylor (HT) instrumental variable regression (Hausman and Taylor, 1981) offers a useful way to mitigate the endogeneity issues and explore the impact of the policy harmonization variables of interest on output growth co-movements. Because a gravity approach is adopted, country-pair variables are captured repeatedly over time. It is useful, therefore, to include  $\alpha_{ij}$  in the model to address the problem of omitted variable bias and thus endogeneity (Baltagi et al., 2014; Duval et al, 2014). The HT estimation technique ensures the identification of both time-varying and time-invariant drivers of business cycle synchronisation.

In line with the specification of the HT estimator by Cameron and Trivedi (2010) and Baltagi et al., (2014), the extended model (equation 2) can be specified as:

$$ycorr_{ijt} = X_{1it}\beta_1 + X_{2it}\beta_2 + Z_{1i}\delta_1 + Z_{2i}\delta_2 + v_{ijt}$$

$$v_{ijt} = \alpha_{ij} + \varepsilon_{ijt} \quad (3)$$

Where  $X_{1it}$  is a vector of time-varying regressors that are uncorrelated with the country-pair fixed effects ( $\alpha_{ij}$ ) such as monetary policy similarity, oil prices, nominal exchange rate, lagged specialisation index, external shock

dummy and time fixed effects dummies.  $X_{2it}$  denotes time-varying endogenous covariates (fiscal policy convergence, financial integration and interaction term between bilateral trade intensity and financial integration).  $Z_{1i}$  denotes time-invariant exogenous explanatory variables (WAEMU dummy variable); and  $Z_{2i}$  captures time-invariant endogenous variable (s) (bilateral trade intensity). To ensure the identification of the parameters of the model, the HT technique requires that the number of time-varying exogenous variables ( $X_{1it}$ ) should be at least equal to

the number of time-invariant endogenous regressor(s) ( $Z_{2i}$ ). The correlation between the time-invariant endogenous regressor(s) ( $Z_{2i}$ ) and the time-varying exogenous regressors ( $X_{1it}$ ) should also be significant to guard against the problem of weak instruments in the estimation. In order to test for the validity of the instruments derived internally from the information within the model, the Sargan-Hansen test of over-identifying restrictions is performed, with non-rejection of the null hypothesis suggesting that the instruments used in the estimation are valid.



## 4.0 ANALYSIS

This section examines the summary statistics for the variables in the model and assesses the degree of synchronisation of business cycles between countries in the ECOWAS and the potential drivers of output growth synchronisation. We then analyse the estimation results to examine the role of policy harmonization in explaining business cycle co-movements in the ECOWAS.

### 4.1 Summary Statistics

Table 1 presents the summary statistics for the model variables. This table reveals high divergence in the correlation of real GDP growth between the countries, as shown by a negative mean (-0.04), which supports the analysis of cross-country correlations in output gaps. Similarly, bilateral trade linkages, which is expected to contribute immensely to the

synchronisation of business cycles, was found to be insignificant. During the period 2001-2018, intra-regional trade averaged 0.2 percent for the countries covered, reaching a maximum of 4.4 percent of total trade.

The monetary policy similarity variable also points to low convergence in inflation rates across the countries in the region. At 8.0 percent, the average inflation rate of member countries was higher than the long-term inflation target of 5.0 percent before the start of the union in 2020. Similarly, the correlations of the cyclically adjusted overall fiscal balance shows fiscal policy divergence, with an average fiscal balance of 0.27 percent of GDP and minimum and maximum correlations of -3.53 percent and 5.20 percent, respectively.

*Table 1 - Descriptive Statistics*

Variable	Obs	Mean	Std.Dev.	Min	Max
Output synchronisation	1,008	-0.045	1.023	-8.387	4.983
Trade intensity	945	0.002	0.00523	0	0.0443
Fiscal policy convergence	1,008	0.265	0.993	-3.527	5.203
Monetary policy similarity	1,008	7.973	6.250	0.0132	32.64
FI (NFA/GDP) difference	1,008	1.730	2.591	0.00333	11.63
Index of specialization	1,008	0.476	0.253	0.050	1.429

*Source: Authors' computations*

*Note: Cyclically adjusted overall fiscal balance (% of GDP); FDI-foreign direct investment inflows; and NFA denotes net foreign assets.*

## 4.2 Trends in Business Cycle

### Synchronisation in West African

#### Countries

There is considerable heterogeneity in production and export structures across Member States, with some countries relying excessively on oil and mineral exports to shore up public finances and support growth. This pattern of economic structures exposes countries to terms of trade shocks, amid divergent inflation rates and output gaps across countries (see Coleman, 2011). There is, therefore, a clear role for policy harmonization in such a heterogeneous environment to increase co-movements in business cycles among countries for the actualization of the Eco in the region.

The WAMZ countries are mostly low-income countries and depend heavily on the production and export of primary commodities. Jarju et al. (2017) have shown that a key feature of the WAMZ economies is the high degree of vulnerability to economic shocks, characterized by excessive dependence on strategic imports, external sources of finance and greater concentration of exports. Ghana has a diverse and rich resource base which includes gold, timber, cocoa, diamond, bauxite, and manganese. Its economy has traditionally been dependent on the export of cocoa and minerals, especially gold, and has recently joined the league of oil exporters. Nigeria, on the other hand, is the largest producer of crude oil in Africa. In addition, it has

abundant natural gas reserves, and the country depends heavily on the export of crude oil and natural gas for foreign exchange earnings and government revenues. Guinea, Liberia, and Sierra Leone are also richly endowed with mineral resources including bauxite, diamonds, rubber, gold, rutile, and iron ore and have remained commodity export-dependent economies in recent times.

While Guinea possesses about a quarter of the world's proven bauxite reserves and depends on the export of significant quantities of bauxite, diamond and gold, Liberia relies on the export of rubber and iron ore for its foreign exchange earnings with Sierra Leone a top producer and exporter of diamond and rutile in the world. The Gambian economy, however, is characterized by traditional subsistence agriculture, a historic reliance on peanuts or groundnuts for export earnings, a re-export trade built around its ocean port and a vibrant tourism industry. Outside the WAMZ, Cape Verde depends largely on tourism, development aid, remittances, and foreign investments. Cote d'Ivoire is the world's largest producer and exporter of cocoa beans and cashew nuts and a significant producer of coffee and palm oil. Consequently, most of the economies are subject to fluctuations in the international prices of their primary commodity exports and, are therefore, bound to face differing shocks to their economies overtime. For instance, the fall in crude oil prices and disruptions in crude oil production and export in Nigeria in 2016 severely affected

the country's economic performance and contributed to the economic recession experienced during the period. The other countries, which were mostly oil importing, however, benefitted immensely from the fall in oil prices.

To examine how synchronised business cycles in the eight countries are, we computed cross-country correlations of real GDP growth during the period 2001-2018. The results are reported in table 2. From the results, there is considerable divergence in output growth in most of the paired countries, as the correlation coefficients were mostly negative, while the positive ones were all found to be insignificant.<sup>6</sup> For instance, The Gambia recorded negative coefficients with all the countries except Cote d'Ivoire (for which

the coefficient was less than 0.5), implying that The Gambia has different growth paths with all the countries. Similarly, Nigeria has negative coefficients with five countries while Cape Verde, Cote d' Ivoire and Ghana have negative coefficients with four paired countries each. The highest coefficient was recorded by Nigeria/Sierra Leone pair at 0.40. This indicates that all the countries exhibit differing business cycles overtime. Output growth appeared to have been more synchronised after the global financial crises (2009-2018) judging by the magnitude of the coefficients. After the crisis, synchronised business cycles were evident between Liberia and three other countries (Guinea, Nigeria, and Sierra Leone) as well as Cape Verde/Guinea and Cote d' Ivoire/Gambia.

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<sup>6</sup> Of the 28 pairs of correlation coefficients computed, the full sample (2001-2018) and the sub-sample (2001-2008) recorded 15 negatives and 13

positives each. The sub-sample (2009-2018) had 13 negatives and 15 positives.

*Table 2: Correlations in Real GDP Growth*

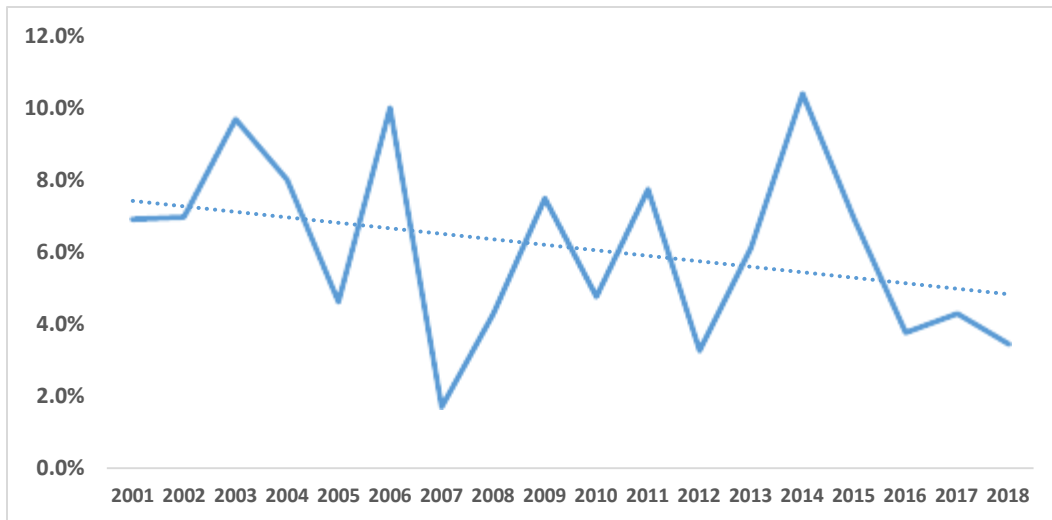
<b>Sample: 2001-2018</b>								
	<b>CPV</b>	<b>CIV</b>	<b>GMB</b>	<b>GHA</b>	<b>GIN</b>	<b>LBR</b>	<b>NGA</b>	<b>SLE</b>
<b>CPV</b>	1	-0.5193	-0.1232	-0.0582	0.1462	-0.1290	0.1235	0.1641
<b>CIV</b>		1	0.3386	-0.3254	0.3284	0.1195	-0.6165	-0.2455
<b>GMB</b>			1	-0.3670	-0.2099	-0.2583	-0.0211	-0.2001
<b>GHA</b>				1	0.1193	0.2561	-0.0497	0.1570
<b>GIN</b>					1	0.1721	-0.6043	0.0631
<b>LBR</b>						1	-0.0237	0.0967
<b>NGA</b>							1	0.4048
<b>SLE</b>								1
<b>Sample: 2001-2008</b>								
	<b>CPV</b>	<b>CIV</b>	<b>GMB</b>	<b>GHA</b>	<b>GIN</b>	<b>LBR</b>	<b>NGA</b>	<b>SLE</b>
<b>CPV</b>	1	0.2645	-0.0100	-0.0912	0.1701	0.0526	-0.5122	-0.4011
<b>CIV</b>		1	0.1094	0.5521	0.1659	0.6253	-0.7054	-0.7618
<b>GMB</b>			1	0.1317	-0.2916	-0.3984	-0.2544	-0.2573
<b>GHA</b>				1	-0.1869	0.0871	-0.2523	-0.5019
<b>GIN</b>					1	0.6512	0.1039	0.3612
<b>LBR</b>						1	-0.1978	-0.0543
<b>NGA</b>							1	0.6818
<b>SLE</b>								1
<b>Sample: 2009-2018</b>								
	<b>CPV</b>	<b>CIV</b>	<b>GMB</b>	<b>GHA</b>	<b>GIN</b>	<b>LBR</b>	<b>NGA</b>	<b>SLE</b>
<b>CPV</b>	1	-0.1444	-0.3024	0.2729	0.8179	-0.3513	-0.6784	0.0155
<b>CIV</b>		1	0.5422	-0.7101	0.1998	-0.3299	-0.3896	0.0337
<b>GMB</b>			1	-0.5471	-0.2070	-0.0964	0.0989	-0.1836
<b>GHA</b>				1	0.0945	0.7016	0.1704	0.4123
<b>GIN</b>					1	-0.3462	-0.7523	0.1104
<b>LBR</b>						1	0.5673	0.6190
<b>NGA</b>							1	0.1427
<b>SLE</b>								1

*Source: Authors' computations*

Another method used to assess business cycle synchronisation is by examining the dispersion of output gaps among the case countries. The dispersion would be close to 0 if all the countries display similar output gaps. The lower the dispersion of output gaps, the higher is the degree of synchronisation of business cycles across the countries and the more appropriate to adopt a common monetary policy among the countries. Figure1 presents the standard deviation of output gaps for the group of countries.

It indicates that the countries' output gaps witnessed severe fluctuations during the period even though it trended downwards. The countries recorded higher convergence in 2007, but a mild pick-up was witnessed afterwards due largely to the global financial crises. The dispersion of output gaps was highest in 2014 owing principally to the slide in global commodity prices and the Ebola Virus Disease (EVD), which negatively impacted economic performance in most of the case countries.

**Figure 1:** Standard Deviation of Output Gaps in all Countries (2001 - 2018)



*Source:* Authors' computations

Terms of trade shocks are important sources of fluctuations in the economic performance of countries that depend on primary commodity exports. To ensure synchronised business cycles among regional countries, countries would be expected to have similar terms of trade shocks, implying high correlation in changes in the terms of trade between the countries. Table 3 presents the correlation coefficients of changes in the terms of trade shocks between the eight countries. From the table, only Ghana/Cote d'Ivoire, Ghana/The Gambia and Nigeria/Liberia

had similar trade shocks during the period 2001 – 2018. This shows that most country-pairs witnessed dissimilar shocks. In addition, some of the country pairs recorded negative coefficients, with Guinea having differing terms of trade shocks with five other countries (Cape Verde, Cote d'Ivoire, The Gambia, Ghana, and Sierra Leone). The shocks tended to be more similar in country pairs before the global financial crises (2001-2008), implying that the crises affected the countries in different magnitudes

*Table 3: Correlation in Terms of Trade*

<b>Sample: 2001-2018</b>								
	<b>CPV</b>	<b>CIV</b>	<b>GMB</b>	<b>GHA</b>	<b>GIN</b>	<b>LBR</b>	<b>NGA</b>	<b>SLE</b>
<b>CPV</b>	1	0.2243	-0.3381	0.0863	-0.0255	-0.3659	-0.3117	-0.0078
<b>CIV</b>		1	0.3976	0.7316	-0.1154	-0.0113	-0.3476	0.0437
<b>GMB</b>			1	0.5671	-0.0892	-0.0584	0.0057	0.1893
<b>GHA</b>				1	-0.1328	0.1227	-0.0547	0.3279
<b>GIN</b>					1	0.3668	0.4066	-0.0869
<b>LBR</b>						1	0.5325	0.2170
<b>NGA</b>							1	-0.3205
<b>SLE</b>								1
<b>Sample: 2001-2008</b>								
	<b>CPV</b>	<b>CIV</b>	<b>GMB</b>	<b>GHA</b>	<b>GIN</b>	<b>LBR</b>	<b>NGA</b>	<b>SLE</b>
<b>CPV</b>	1	0.0899	-0.2793	-0.0201	0.1796	0.0402	0.4445	-0.5430
<b>CIV</b>		1	0.7402	0.8933	-0.2087	0.1501	-0.5114	0.6288
<b>GMB</b>			1	0.9129	-0.1939	-0.0302	-0.3811	0.8096
<b>GHA</b>				1	-0.2793	0.0167	-0.4033	0.6583
<b>GIN</b>					1	0.6056	0.1411	0.1647
<b>LBR</b>						1	0.2182	0.3190
<b>NGA</b>							1	-0.5615
<b>SLE</b>								1
<b>Sample: 2009-2018</b>								
	<b>CPV</b>	<b>CIV</b>	<b>GMB</b>	<b>GHA</b>	<b>GIN</b>	<b>LBR</b>	<b>NGA</b>	<b>SLE</b>
<b>CPV</b>	1	0.4928	-0.4186	0.3566	-0.1859	-0.5203	-0.7065	0.1437
<b>CIV</b>		1	-0.3108	0.3735	-0.1168	-0.0584	-0.4657	-0.1483
<b>GMB</b>			1	-0.3192	0.0134	-0.1126	0.2673	-0.0497
<b>GHA</b>				1	-0.0230	0.2186	0.0884	0.3828
<b>GIN</b>					1	0.4809	0.5447	-0.1371
<b>LBR</b>						1	0.6204	0.2370
<b>NGA</b>							1	-0.2080
<b>SLE</b>								1

*Source: Authors' computations*

Frankel and Rose (1998) have shown that countries with more trade ties tend to have more similar business cycles. Similarly, countries with close international trade links would benefit from a common currency and are more likely to be members of an optimum currency area (OCA). Consequently, the nature and extent of international trade is one criterion for membership in an OCA. Available data showed that the WAMZ countries have lower trade ties in recent periods. For instance, intra-WAMZ trade, which was

0.94 percent of total trade of the WAMZ countries in 2014, increased to 2.57 percent in 2016 before declining to 0.93 percent in 2018. Similarly, intra-ECOWAS trade rose to 15.70 percent in 2016, from 11.37 in 2014. However, it fell to 10.25 percent of total trade in ECOWAS in 2018. These were significantly low compared to 64.0 percent share of intra-EU trade in its total trade in 2017 (EU, 2018).

### 4.3 Estimation Results

The descriptive analysis above suggests that business cycles were less synchronised over the period 2001-2018. This is reflected in the considerably low average of bilateral output growth correlation of -0.0447 over the period 2001-2018. It further suggests that bilateral trade between countries is quite low and there are marked divergence in fiscal and monetary policy outcomes across countries. The question then remains whether strengthening of efforts to promote policy harmonization would foster business cycle synchronisation between countries in the region.

A useful extension of the analysis is to empirically assess the effects of policy coordination through trade integration, financial linkages, monetary and fiscal policy convergence on output co-movements in ECOWAS. This section therefore analyses the results obtained from the estimation of equations 1 and 2 using the HT estimation technique. As discussed, the estimated parameters of the pooled OLS and random effects are biased, due to their failure to capture the country-pair unobserved heterogeneity ( $\alpha_{ij}$ ) effects. This implies that the potential problem of endogeneity of bilateral trade intensity, financial integration, and fiscal policy to business cycle synchronisation cannot be addressed using these estimation techniques. Therefore, the results of the pooled OLS and random effects are presented to illustrate the magnitude and direction of the bias in the parameter

estimates. The interpretation of the results relies on the reliable and consistent estimates obtained using the HT estimation technique.

Table 4 reports the estimation results of the panel over the period 2001-2018. Looking at the estimated results of the pooled OLS and random effects models in columns (1) and (2), respectively, show that bilateral trade intensity is positively related to business cycle synchronisation. This relationship is, however, not statistically significant. While the coefficient on bilateral trade remains positive using the HT estimation technique (column 3), its impact on output growth co-movements is, however, not statistically significant.

The absence of a significant positive association between bilateral trade intensity and business cycle synchronisation may underline the relevance of the indirect effects of trade intensity on business cycle synchronisation. It is worth noting that most member countries in ECOWAS have undiversified production and export sectors, and they depend heavily on oil, minerals, and agricultural exports to support government budgets. As such, bilateral trade could have a positive effect on business cycle synchronisation through the fiscal policy channel. Similarly, as predicted in the OCA literature, strong bilateral trade intensity can facilitate closer financial linkages through the allocation of capital across countries and the promotion of FDI in member countries.

In this respect, the HT model (column 3) is extended to capture the indirect effects of bilateral trade intensity on business cycle synchronisation. The inclusion of the interaction terms allows for non-linearities in the effect of trade intensity on business cycle synchronisation. This yields the estimation results displayed in column (4) of Table 4. The results clearly underline the importance of taking non-linearities into account in explaining the effects of bilateral trade intensity on output growth co-movements. Fiscal policy convergence is captured by cyclically adjusted primary balance convergence, which is a measure of discretionary fiscal policy (Darvas et al., 2005; Annett, 2006). As expected, the interaction term between trade intensity and fiscal policy is positive and statistically significant. This result points

to the fact that strengthening bilateral trade will provide additional resources to governments, which will support efforts to implement structural reforms aimed at stimulating growth in member countries. These resources could also be used to enhance macroeconomic stabilization efforts to reduce output fluctuations in the face of economic shocks and promote convergence in business cycles between member countries. Similarly, the interaction term between bilateral trade intensity and financial integration is positively associated with business cycle synchronisation.<sup>7</sup> This result supports our argument that stronger trade linkages between countries facilitates capital flows and leads to close co-movements in output growth.

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<sup>7</sup> *Financial integration is measured (in column 4) as the absolute difference in net foreign assets positions (% of GDP) between member countries.*



**Table 4: Business Cycle Synchronisation (2001-2018)**

Variables	(1) POLS	(2) RE	(3) HT	(4) HT
Bilateral trade intensity	0.001 (0.014)	0.001 (0.014)	0.030 (0.047)	-0.025 (0.036)
Fiscal policy (primary balance) convergence	-0.054 (0.048)	-0.054 (0.047)	-0.053 (0.049)	0.196** (0.092)
Monetary policy similarity	0.010 (0.006)	0.010* (0.006)	0.009 (0.006)	0.011* (0.006)
Financial integration (NFA/GDP) difference	0.001 (0.017)	-0.001 (0.017)	-0.015 (0.032)	0.217*** (0.077)
Lagged specialization index	0.292** (0.143)	0.285** (0.141)	0.375** (0.155)	0.312** (0.146)
Exchange rate variation	-0.351 (0.344)	-0.394 (0.346)	-0.465 (0.380)	-0.378 (0.352)
Log of oil prices	0.272 (0.169)	0.153 (0.352)	0.258 (0.162)	0.282* (0.165)
WAEMU dummy	-0.103 (0.154)	-0.108 (0.154)	-0.193 (0.199)	-0.155 (0.191)
External shock dummy	0.049 (0.288)	0.312 (0.228)	0.062 (0.119)	0.088 (0.118)
Bilateral trade intensity*(NFA/GDP) difference				0.025*** (0.008)
Bilateral trade intensity*primary balance				0.031*** (0.012)
Constant	-1.339** (0.636)	-0.821 (1.482)	-1.066 (0.777)	-1.637** (0.807)
Observations	952	952	952	952
R-squared	0.025			
Country-fixed effects	No	No	Yes	Yes
Year-fixed effect	Yes	Yes	Yes	Yes
Number of country-pairs		56	56	56
Sargan-Hansen statistic (p-value)			1.63(0.44)	3.36(0.34)

*Notes: Dependent variable-bilateral correlation of real GDP growth rates ( $QCORR_{ijt}$ ). POLS, RE and HT represent pooled OLS, random effects and Hausman-Taylor estimation techniques. Standard errors are reported in parenthesis and clustered at the country-pair level. In the Hausman-Taylor (HT) estimations, bilateral trade intensity is treated as time-invariant endogenous variable, while the time-varying endogenous variables are fiscal policy convergence, financial integration and interaction term between bilateral trade intensity and fiscal policy convergence. The WAEMU dummy is treated as a time-invariant exogenous regressor. The lagged specialization index and all other independent variables are treated as time-varying exogenous variables. The probability values of the Sargan-Hansen test statistics suggest that the instruments used in the HT estimations are valid. '\*\*\*', '\*\*' and '\*' denote significant at 1%, 5% and 10 % respectively.*

Column 4 reveals that despite the strong positive indirect influences of trade intensity, the coefficient on bilateral trade intensity turns out to be negative and shows no statistically significant effect on business cycle synchronisation. To assess the overall impact of bilateral trade intensity on output co-movements, we compute the marginal effects of trade, considering the coefficients of its

constitutive term (trade intensity) and the interaction term, while evaluating fiscal policy and financial integration variables at their mean values (see Brambor et al., 2006). Table 5 reports the combined effects of bilateral trade intensity, fiscal policy convergence and financial integration on business cycle synchronisation.

**Table 5: Marginal Effects**

<b>Variables</b>	<b>Coefficient</b>	<b>z-value</b>
Bilateral trade intensity	0.031	0.81
Fiscal policy convergence	0.227	2.20**
Financial integration	0.242	2.86***

*Note: \*, \*\*, \*\*\* denote significant at 10%, 5% and 1% respectively*

The combined estimated coefficient obtained on bilateral trade intensity (0.031) is positively related to business cycle, although not statistically significant. This reflects the structure and limited level of bilateral trade between countries in ECOWAS as shown in the analyses above. A look at the pattern of bilateral trade flows between members countries in ECOWAS suggests that trade is largely driven by inter-industry trade instead of intra-industry trade. For example, oil imports of The Gambia from Cote d'Ivoire represent a significant share of the country's imports from Cote d'Ivoire. As the theory predicts, inter-industry trade leads to higher specialization in production, which induces the transmission of asymmetric shocks across

different industries in member countries and lowers output co-movements. Our analysis is, however, constrained by the absence of data on bilateral intra-industry trade flows to explore its direct effect on business cycle synchronisation.

Table 5 shows that fiscal policy convergence is positively associated with business cycle synchronisation and statistically significant at the 5 percent level. As is the case with bilateral trade intensity, we compute the marginal effects of the fiscal policy synchronisation variable, taking into consideration its constitutive term and the interaction term between fiscal policy and bilateral trade intensity. The marginal effect derived, as reported in Table 5, yields a positive

combined coefficient of (0.227) and statistically significant at the 5 percent level. This finding implies that efforts to reduce fiscal indiscipline or divergent fiscal policies would increase the synchronisation of business cycles, through the transmission of symmetric fiscal shocks across countries. Equally, it suggests that fiscal policy interventions targeted at reducing cyclical fluctuations in the wake of external shocks would lead to more synchronised business cycles. The positive association between fiscal policy convergence and business cycle synchronisation is consistent with the results of previous studies on the subject (Atenga and Martial, 2017; Bunyan et al., 2019; Inklaar et al., 2008; Nzimande and Ngalawa, 2017).

The results reported in Table 4 (column 3) show that monetary policy similarity induces more closely synchronised business cycles. The coefficient in column (4) is statistically significant although at the 10 percent level. Achieving monetary policy convergence in ECOWAS would allow countries to respond in a similar way to monetary policy shocks, thereby inducing the propagation of symmetric shocks and increasing the synchronisation of business cycles. This is despite the fact member countries in the WAMZ currently operate two different monetary policy regimes, with The Gambia, Guinea, Nigeria and Sierra Leone using monetary targeting, while Ghana implements inflation targeting (IT) framework with Liberia recently towing the line and

commenced the implementation of IT framework. The results are qualitatively in line with the findings in previous studies by (Bower and Guillemineau, 2006; Dai, 2014; Inklaar et al., 2008; Nzimande and Ngalawa, 2017).

Equally in Table 4, the results illustrate strong positive relationship between financial integration and the synchronisation of business cycles among member countries. This finding could be explained by efficiency gains from greater financial integration, considering the limited degree of financial sector development and integration of financial systems in the ECOWAS region into the global financial system. Hence, there is lower likelihood of the propagation of financial contagion across countries since most economies are not well-integrated with the global financial system. Complementing the direct effects of financial integration on business cycle synchronisation are its indirect effects, evidenced by the strongly positive and significant effect of the interaction between financial integration and bilateral trade intensity. The interaction term between bilateral trade and financial integration suggests that financial integration can improve business cycle synchronisation by facilitating bilateral trade flows. The overall effect of financial integration on business cycle synchronisation is confirmed by the marginal effect coefficient of 0.242 reported in Table 5, which is statistically significant at the 1% level. This outcome affirms that strong financial linkages can lead to more synchronised business cycles between member countries. Our finding is consistent with that of Imbs (2004).

#### 4.4 Robustness

To check for the robustness of the results, the HT estimations are repeated using a second measure of fiscal policy convergence and bilateral trade intensity to assess both the direct and indirect effects of these policy harmonization variables. Fiscal policy convergence is captured in terms of cyclically adjusted overall fiscal balance as defined above. Bilateral trade intensity is measured by bilateral exports from country  $j$  recorded as imports in country  $i$ .

Column (2) of Table 6 displays the results derived from the HT estimation using the correlation of cyclically adjusted overall fiscal balance as a second measure of fiscal policy convergence. The results are qualitatively similar to those obtained in column (1) when the correlation of the cyclically adjusted primary fiscal balance is used as the proxy for fiscal policy

synchronisation. The findings reveal the presence of positive and significant direct and indirect effects of financial linkages and fiscal policy convergence on business cycle synchronisation. As shown in Table 7, the overall effects of financial integration and fiscal policy convergence variables are strongly positively associated with business cycle synchronisation. An evaluation of the marginal effects of bilateral trade intensity as shown on Table 7 returns a positive coefficient of 0.031 but not statistically significant. This finding is consistent with the analysis above, and points to the fact that bilateral trade mostly occurs through inter-industry rather than intra-industry trade. As discussed, bilateral trade facilitated through intra-industry flows induces a symmetric propagation of economic shocks across similar industries in member countries and ensures close synchronisation of business cycles.

**Table 6: Business Cycle Synchronisation (2001-2018)**

Variables	(1) HT	(2) HT	(3) HT
Bilateral trade intensity	-0.025 (0.036)	-0.025 (0.036)	
Fiscal policy (primary balance) convergence	0.196** (0.092)		
Fiscal policy (overall fiscal balance) convergence		0.198** (0.092)	0.138* (0.083)
Monetary policy similarity	0.011* (0.006)	0.011* (0.006)	0.011* (0.006)
Financial integration (NFA/GDP) difference	0.217*** (0.077)	0.217*** (0.077)	0.451*** (0.066)
Lagged specialization index	0.312** (0.146)	0.312** (0.146)	0.233 (0.166)
Bilateral trade (export) intensity			-0.083 (0.072)
Bilateral trade intensity*(NFA/GDP) difference	0.025*** (0.008)	0.025*** (0.008)	
Bilateral trade intensity*primary balance convergence	0.031*** (0.012)		
Bilateral trade intensity* fiscal balance convergence		0.031*** (0.012)	
Bilateral trade (export) intensity**(NFA/GDP) diff.			0.052*** (0.007)
Bilateral trade (export) intensity*fiscal balance convergence			0.020*** (0.010)
Exchange rate variation	-0.378 (0.352)	-0.378 (0.352)	-0.465 (0.349)
Log of oil prices	0.282* (0.165)	0.282* (0.165)	0.235 (0.161)
External shock dummy	0.088 (0.118)	0.088 (0.118)	0.060 (0.118)
WAEMU dummy	-0.155 (0.191)	-0.155 (0.191)	-0.112 (0.335)
Constant	-1.637** (0.807)	-1.637** (0.807)	-1.881** (0.927)
Observations	952	952	952
Number of country-pairs	56	56	56
Country-fixed effects	Yes	Yes	Yes
Year-fixed effects	Yes	Yes	Yes
Sargan-Hansen statistic (p-value)	3,354(0.3401)	3,012(0.3898)	5,569(0.3504)

**Notes:** Dependent variable-bilateral correlation of real GDP growth rates ( $QCORR_{ijt}$ ). POLS, RE and HT represent pooled OLS, random effects and Hausman-Taylor estimation techniques. Standard errors are reported in parenthesis and clustered at the country-pair level. In the Hausman-Taylor (HT) estimations, bilateral trade intensity is treated as time-invariant endogenous variable, while the time-varying endogenous variables are fiscal policy convergence, financial integration and interaction term between bilateral trade intensity and fiscal policy convergence. The WAEMU dummy is treated as a time-invariant exogenous regressor. The lagged specialization index and all other independent variables are treated as time-varying exogenous variables. The probability values of the Sargan-Hansen test statistics suggest that the instruments used in the HT estimations are valid. '\*\*\*', '\*\*' and '\*' denote significant at 1%, 5% and 10 % respectively.

*Table 7: Marginal Effects*

<b>Variables</b>	<b>Coefficient</b>	<b>z-value</b>
Bilateral trade intensity	0.031	0.81
Fiscal policy convergence	0.229	2.23***
Financial integration	0.242	2.86****

*Note: \**, *\*\**, *\*\*\** denote significant at 10%, 5% and 1% respectively

In another check for the robustness of the above results, we considered an alternative measure of bilateral trade intensity, measured as the natural logarithm of the time average of bilateral exports between countries *i* and *j*, scaled by total global exports of both countries. To minimize statistical discrepancies, the paper uses the value of country *i*'s imports from country *j* as a measure of bilateral exports between countries *i* and *j*. Table 8 reports the marginal effects of fiscal policy convergence, bilateral export intensity and financial integration, which are evaluated

from column (3) of Table 6. A look at the results affirms the analysis above, revealing qualitatively similar findings that strong financial linkages and fiscal policy convergence are associated with more closely synchronised business cycles. Similarly, column (3) of table 6 shows that monetary policy similarity increases business cycle synchronisation. However, marginal effects of bilateral trade intensity reported in Table 8 is not statistically significant. These findings are consistent with the analysis above.

*Table 8: Marginal Effects*

<b>Variables</b>	<b>Coefficient</b>	<b>z-value</b>
Bilateral export intensity	-0.011	-0.15
Fiscal policy convergence	0.159	1.72*
Financial integration	0.503	6.89****

*Note: \**, *\*\**, *\*\*\**, *\*\*\*\** denote significant at 10%, 5% and 1% respectively

To enable us draw inferences from the effects of bilateral trade, financial integration, and policy convergence indicators on business cycle

synchronisation, we further assess whether the findings are sensitive to the estimation of the panel two-stage least squares (2SLS) model. It is worth noting that the Hausman

Taylor (HT) estimator does not adequately treat the endogeneity bias as it only captures the bias due to the correlation between the explanatory variables and unobserved individual effects (see Baltagi et al., 2014). The panel 2SLS estimator considers a broader picture by treating endogeneity bias due to the correlation between the regressors and the disturbances (including the unobserved individual effects). One challenge, however, in identifying these causal effects is to determine the appropriate instruments for the endogenous regressors: bilateral trade, financial integration, specialization index and interaction term between bilateral trade and financial integration. Following the literature (e.g. Frankel and Rose, 1998; Imbs, 2004), we consider four gravity variables as instruments for these endogenous variables: the natural logarithm of distance between the capital cities of the two countries, product of real GDP per capita between countries, and dummy variables describing whether both countries share a common border and have the same official language. However, in trying to estimate this model, we treat the cyclically adjusted primary balance convergence variable as an exogenous variable in the panel 2SLS. Taking this variable into consideration allows us to mitigate endogeneity due to cyclical fluctuations (Duval et al, 2014). Similarly, the interaction term between bilateral trade and the cyclically adjusted primary

balance convergence is treated as an exogenous regressor in the estimation. We also include time-fixed effects, in addition to an external shock dummy and oil prices to capture the effects of common global shocks on business cycle synchronisation. The standard errors are clustered at the country-pair level.

Table 9 reports regression results from the Error Components panel two-stage least squares (EC-2SLS) IV estimation. The probability value of the Sargan-Hansen statistic [5.569(0.3504)] shows that the instruments used are valid. The table shows results qualitatively similar to those obtained using the HT estimation technique. Assessing the marginal effects of the variables as reported in Table 10, illustrates strong positive association between fiscal policy convergence and business cycle synchronisation. This finding underscores the fact that policy harmonization matters in fostering business cycle synchronisation in the ECOWAS region. Similarly, the marginal effect suggests that financial integration would increase the synchronisation of business cycles. However, the overall impact of bilateral trade intensity on cycle synchronisation is not statistically significant. Equally, the results in table 9 show that monetary policy convergence does not enhance the synchronisation of business cycles.

**Table 9: Error Components two-stage least squares (EC-2SLS) results (2001-2018)**

Variables	
Bilateral trade intensity	-0.092** (0.043)
Fiscal policy (primary balance) convergence	0.252*** (0.079)
Financial integration (NFA/GDP) difference	0.504* (0.290)
Bilateral trade intensity*(NFA/GDP) difference	0.059* (0.036)
Bilateral trade intensity*primary balance convergence	0.036*** (0.010)
Monetary policy similarity	0.011 (0.007)
Specialization index	0.301 (0.522)
Exchange rate variation	-0.237 (0.315)
Log of oil prices	0.111 (0.130)
WAEMU dummy	-0.102 (0.200)
External shock dummy	0.136 (0.098)
Constant	-12.109 (17.650)
Observations	952
Number of country-pairs	56
Year-fixed effects	Yes
Sargan-Hansen statistic (p-value)	5.569(0.3504)

*Notes: Dependent variable-bilateral correlation of real GDP growth rates ( $QCORR_{ijt}$ ). Endogenous variables are bilateral trade intensity, specialisation index, financial integration, and interactions between bilateral trade and financial integration. Additional instruments included are log of distance between the capital cities of two countries, product of real GDP per capita of country-pairs, dummy variables for common border and common official language between two countries. Standard errors are reported in parenthesis and clustered at the country-pair level. The probability values of the Sargan-Hansen test statistics suggest that the instruments used are valid. '\*\*\*', '\*\*' and '\*' denote significant at 1%, 5% and 10 % respectively.*



*Table 10: Marginal Effects (EC-2SLS)*

<b>Variables</b>	<b>Coefficient</b>	<b>z-value</b>
Bilateral export intensity	0.003	0.18
Fiscal policy convergence	0.287	3.26***
Financial integration	0.563	1.73*

*Note: \**, *\*\**, *\*\*\** denote significant at 10%, 5% and 1% respectively

## 5.0 CONCLUSION AND POLICY RECOMMENDATIONS

Concern about the adoption of a single currency in a heterogeneous economic environment in ECOWAS has revived the debate on the degree of synchronisation of business cycles, following the announcement by the Authority of the Heads of State and Government to launch the single currency (eco) in 2020. While a few studies have analyzed the degree of synchronisation of business cycles between countries, the question of whether policy harmonization matters in fostering business cycle synchronisation has received little attention in the empirical literature on ECOWAS. This paper analysed the effects of bilateral trade, financial integration, and convergence in fiscal and monetary policy on business cycle synchronisation in the ECOWAS region over the period 2001-2018. It offers a time-varying assessment of the level of business cycle synchronisation in the region.

To estimate the effects of these factors on business cycle synchronisation, an Error Components two-stage least squares (EC-2SLS) estimation was applied to test the robustness of the findings from the Hausman-Taylor estimation. The paper presents a robust and stimulating evidence that member countries would be able to achieve more closely synchronised business cycles through well-coordinated policy responses. Results show that strengthening of trade linkages increases the synchronisation of business cycles indirectly, via providing resources to

support governments budgets and promoting financial integration in the ECOWAS region. While the direct effect of bilateral trade intensity on business cycle synchronisation is not established, the existence of significant indirect effects underscores its relevance to improve the synchronisation of business cycles. This paper further demonstrates that increased financial integration and fiscal policy convergence would lead to more synchronised business cycles in the ECOWAS region.

The policy implications of these findings are worth noting. The analysis points to a considerably low degree of synchronisation of business cycles between member countries in ECOWAS over the period 2001-2018. Achieving more synchronised business cycles would facilitate the adoption of a single currency and thus reduce the cost of joining a monetary union, as symmetric shocks are propagated across countries. Because business cycles are less synchronised, it would be costly for member countries in the ECOWAS region to adopt a common monetary policy if deliberate efforts are not taken to strengthen policy coordination across countries. This is so because member countries are exposed to asymmetric shocks. It raises the possibility of policy conflicts among member countries when a common central bank is established, and it conducts stabilization policies in response to economic shocks.

The existence of the indirect effects of bilateral trade intensity on business cycle synchronisation suggests that measures should be enhanced to promote the level of bilateral trade flows. Such policy measures should include those targeted at promoting intra-industry trade to facilitate the development of similar economic structures and transmission of symmetric shocks across countries, which would increase co-movements in business cycles. One policy option to improve intra-industry trade is to undertake structural reforms that would promote diversification. This would reduce dependence on primary commodity exports that are highly susceptible to global price shocks. Promoting economic diversification is vital to achieving similarity in economic structures across countries, which expectedly will foster the transmission of symmetric shocks and enhance more closely synchronised business cycles. It is worthwhile, therefore, to encourage investments in agriculture, light manufacturing and services sectors and promote the development of regional value chains. Building human capacity is vital to encourage the participation of local firms in regional value chains, ensuring that exporting firms are not only suppliers of primary inputs, but will, in addition, enhance their competitiveness in the export market through value addition. This in turn will promote bilateral FDI flows and further reinforce trade ties between countries through trade in similar products, which would mitigate the negative impact

of external shocks on business cycle synchronisation.

The evidence suggests that fiscal policy synchronisation is positively associated with business cycle synchronisation between member countries. This finding suggests the need to ensure fiscal prudence through the sustained reduction in fiscal deficits and public debt levels. This would in turn will induce the transmission of symmetric fiscal shocks and increase the synchronisation of business cycles. Member countries should adopt policies to reduce fiscal deficits to the convergence criterion target of at most 3 percent of GDP to achieve fiscal policy convergence. Thus, the implementation of fiscal consolidation measures is key to improving the fiscal positions of member states and providing resources to support structural reforms needed to achieve sustainable growth and improve their fiscal positions. The Fiscal Authorities in Member States should also ensure adherence to the provisions of the Fiscal Responsibility Act to ensure fiscal prudence.

The results further show strong positive relationship between financial integration and the synchronisation of business cycles. Given the underdeveloped nature of financial markets in the ECOWAS region, developing strong financial linkages that promote credit and capital markets development will facilitate the adoption of a common monetary policy, improve the transmission of monetary policy in these countries when a common central bank is established to conduct monetary policy

across countries. The authorities should support efforts to promote the development of relevant institutions such as the West African Capital Markets to facilitate the integration and regulation of capital markets across countries in the region. The development of the Pan-African Payment and Settlement System (PAPSS) would also promote quoting and trading in local currencies, facilitate the development and integration of credit and capital markets of member countries and enhance the transmission of monetary policy in ECOWAS countries.

In summary, the results reveal that measures to promote the synchronisation of business cycles should focus not only on satisfying the macroeconomic convergence criteria to ensure similarity in macroeconomic policies across countries. Rather, a comprehensive approach is required to also enhance trade and financial integration to increase the scope for macroeconomic cooperation and ensure the sustainable adoption of the Eco in the region.

There are, however, some limitations that are worth noting, although they do not affect the qualitative nature of the relationships investigated. The analysis was constrained by the absence of data on intra-industry trade flows between countries. Therefore, this paper could not establish the direct impact of intra-industry trade on business cycle correlations. Equally, the volume of bilateral trade is likely to have been underestimated due to the absence of official statistics on informal trade flows between countries. Future research work could consider the possibility of investigating the role of intra-industry trade in driving business cycle synchronisation in the ECOWAS region. Lastly, Member States in ECOWAS, particularly the WAMZ, have pursued fiscal consolidation measures in recent years as part of efforts to reduce fiscal deficits and preserve debt at sustainable levels. Given the differences in the intensity of fiscal consolidation pursued across countries over time, it would be useful in future research to explore the time-varying impact of fiscal policy on business cycle synchronisation.

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