Domestic Demand and Export Performance in CEMAC: A country's sensitive case?

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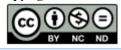1University of Douala (Cameroon)/ Higher School of Economics and Commercial Studies

Abstract

To tackle the existing negative relationship between exports and domestic sales presents into the literature from a macroeconomic perspective building on export market share equations (the difference between exports and foreign demand), in CEMAC area the literature is based on a panel data appoach using a dynamic panel data model with an error correction mechanism. The meaningful of this empirical approach is to introduce a long term relationship in investigating this negative relationship between exports and domestic sales. To take into account the presence of the endogenous (the export market shares) among the explanatory a 2SLS is used for the presence of endogeneity bias. Nevertheless the main bias in this result coming from the particular panel data structure in CEMAC area. In fact, comparing with a times series approach on Gabonese economy one of the CEMAC's economy its appears that Gabon concentrates at itself more than a half of total observations in CEMAC in investigating this negative relationship building on exports market share equation. While the literature seems to confirm the findings that the overall result seems to be country's sensitive. Then considering this particular panel structure where just one country concentrates more than a half of total observations there is certainly a bias in CEMAC area results that point as industrialized countries a negative relationship between exports and domestic sales. Then the aim of this paper was to investigate this bias, for this purpose we consider a CEMAC area without Gabon and we finds that the relationship is remains negative but not already significant as well as in the symmetric relation, the conventional econometric relation confirming thus this bias. While in than the asymmetric relation, the non linear relation according thus results with a sample of CEMAC area at 5 in the present study and the preceding into the literature with the full members States in its appear that the relationship is negative and significant only for positive changes in domestic demand. Therefore the convenient interpretation of the nexxus substitution effect between domestic sales and exports in CEMAC is that during growth periods a rebound in domestic demand would translate into contraction of exports of around 66%. An comparable elasticity to the Gabonese case at 65% in times series modeling that permits confirms the coherence between our results and the one's that exists into the literature. thus to mitigate the bias.

Keywords : Exports market share ; dynamic panel data model ; country's sensitve case ; bias ; symmetric relation ; asymmetric relation ; CEMAC

Introduction

Background information

Some studies have undertake to analyze the effects on trade of macroeconomic policies. The direction taken by these ones have been to assess a negative relationship between exports and domestic sales. As well as for industrialized countries than African countries the methodology is around the estimating the particular relationship either in panel data or in times series modeling (Blot and Clochard, 2008, pp. 70 ; Esteves and Rua, 2013 ; Bobeica et al., 2015 ; Esteves and Prades, 2016 ; Kuikeu, 2024 ; Kuikeu, 2025).There are several intuitive macroeconomic arguments that can explain a negative relationship between domestic demand and exports as capacity utilization[1]. In an environment of weak domestic demand the capacity utilisation is low and exporting firms increase their efforts to shift sales from domestic to export markets the inverse in an environment of high domestic demand.

An specific area have retained the attention into the literature. The members States of CEMAC ; CEMAC is the monetary union of the six central African countries (Cameroon, Central African Republic, Chad, Congo Republic, Equatorial Guinea and Gabon) which have in common the sharing of the CFA franc as a common currency, issued by BEAC (Bank of Central African States) and pegged by a fixed parity to the French franc, at the rate of 1 French franc per 100 CFA franc since the devaluation of 1994 or since 1st January 2002, with the advent of the euro, at the rate of 1 euro for 655.957 CFA francs, or 1 euro for 6.55957 French francs. In panel data (Kuikeu, 2024) than times series modeling with the Gabonese case (Kuikeu, 2025) he have been founded that the relationship is effectively negative for this area.

General Objective

Nevertheless confronting these two methods (panel data and times series modeling) in CEMAC revealed that there is a serious bias in panel data modeling. In fact, Gabonese economy account for itself for more than a half of total observations concerning CEMAC in investigating this relationship. Therefore there is a need for taking into account of this particular structure in panel data modeling of this relationshing between exports and domestic sales concerning CEMAC. This is the aim of this study.

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[1] Defined as the capacity of firms to sold production in the foreign market depending on the demand pressure (Belke et al. (2014, pp. 4)) and this one can be measured at the macro level as the output gap (Belke et al. (2014, pp. 7)).

General hypotheses

To appreciate the finite sample properties of given parameters estimates as the bias one issue lies on the use of Monte Carlo experiments (Kuikeu, 2012) an usuable instrument when the use of alternative issue the asymptotic development is not readily feasible to the fact of the contain of Mathematical knowing when this is not readily available to the user. Then from the point of view of Monte Carlo experiments there is a bias on given parameters estimates when the estimate parameter value during the experiment differs from the one choose in cheking or in defining the Data Generation Process. Then if the use of asymptotic developments lies on important Mathematical knowledge the use of the alternative issue with the Monte Carlo experiments lies on important knowledge in the related domain of computer science as the language programing of avaible software. Then for this purpose to account for this particular panel data structure in CEMAC for investigating this relationshing between exports and domestic sales we will consider an CEMAC area at 5 without the Gabonese economy. Then is when considering in panel data modeling an CEMAC area at 5 without the Gabonese economy the relationship between exports and domestic sales remains negative as in the standard case with the 6 CEMAC's economies with Gabon as in Kuikeu (2024)?

Contribution to research

It's generally said that the instrumental variables (2SLS) result's output lies on the choice of instruments ; then with the Hansen's J statistic (Hansen, 1982) we cannot reject the overall validity of the instruments choice at the standard level. Then the present study contributes to the research by examing the robustness of the results output that comes from this modeling with 2SLS estimates in two differents samples from an common set of individuals the CEMAC's members countries, one with the full members States (Kuikeu 2024) the other in the present study with just 5 over six of the total members States.

Structure of the study

We adopt the following organisation, in the next section (section 1) as literature review we present the developments about the singularity raised by this particular panel structure coming from CEMAC in investigating this relationshing between exports and domestic sales, in section 2 the Methods for outstanding this bias coming from this particular structure, in section 3 the Results and finally a summary of the main results as concluding remarks.

1. Literature Review

This Literature review is about the singularity raised by this particular panel structure coming from CEMAC. The fact that Gabonese economy oncentrated more than a half of total observations concerning CEMAC area raises a bias outcome in investigating parameters estimates. In fact, the literature seems to confirm the findings presented in Bobeica et al. (2015), that if the coefficient and its significance depend clearly on the countries included in the sample, it could be interpreted as a signal that the overall result seems to be country's sensitive. Esteves and Prades (2016) in order to motivate the objective done an initial exercise was done covering the former 12 euro area countries. In this initial exercise, the coefficient of domestic demand has the expected sign but is clearly less significant than the ones previously obtained (Bobeica et al., 2015). After several experiments, the previous estimation was replicated excluding Ireland and Greece: The results allow a stronger significance of the domestic demand coefficient.

After this initial estimation, another illustrative exercise is computed. Specifically, regression was replicated several times, (i) excluding one country at a time from the sample; (ii) including each country excluded from this partial sample, i.e. Ireland and Greece,. It seems clear that the relevance of domestic demand pressures on exports confirm the findings presented in Bobeica et al. (2015), as the overall result seems to be sensitive only to a few number of countries.: On the one hand, including just one of the two excluded countries (Greece or Ireland) will be sufficient to jeopardize the overall results, as the domestic demand coefficient continues to be negative but not significant. On the other hand, concerning the remaining countries included in the baseline, excluding each one alternately does not significantly affect the results.

An another piece of evidence is that the panel data structure in CEMAC is such that the number of periods is large and the cross-section is small indicating the use of the usual fixed effects estimator. The presence of the lagged endogenous variable might suggest the use of the Arellano and Bond (1991) procedure. However, this method has been developed for panels with a short time dimension and a very large number of cross-section observations. When the number of periods is large and the cross section is small, the use of this alternative estimator may lead to a loss of efficiency, while the fixed effects estimator becomes consistent (see Nickell (1981) and Alvarez and Arellano (2003)). Then dropping Gabonese economy from the CEMAC sample remains to have an another panel structure even where the number of in the case that

the cross sections is small as and the time dimension is small large a case for which there is few or not panel data estimators. Nevertheless, the estimations were replicated using the Arellano and Bond procedure.

Then as policy recommendations nevertheless, the understanding of these countries differences could be very important for economic policy discussion, namely to understand their different behaviour. Esteves and Prades (2016) suggest the product concentration index that is the export specialization, implying that a high product concentration index will reducre this trade-off between sales to domestic and foreign markets. Into the literature this idea have given full consideration into the literature received well address with one the one hand the using of the United Nations Conference on Trade and Development (UNCTAD) Herfindahl-Hirschman index on export concentration convering goods product concentration index despite the fact that there is no concentration index for exports covering goods and services, it is normalized in order to obtain values between 0 (zero concentration) and 1 (maximum concentration). On the other hand, into a regression including the domestic demand changes and the cross term between domestic demand changes and the concentration index the coefficient of domestic demand is negative while the coefficient of the cross term is positive, implying that the coefficient between domestic demand and exports becomes less negative when exports are more concentrated (Esteves and Prades, 2016 ; Kuikeu, 2024).

2. Methods

This paper investigates the relationship between domestic demand and exports from a macroeconomic perspective, building on the export market share (the difference between exports of goods and services and the foreign demand) equations. The macroeconomic data set covers 1974 to 2021 in annual frequency thus 48 observations measured in real terms. To account for this particular panel structure we consider the CEMAC area at 5 without the Gabonese economy.

Data Set

The variables used in the analysis are as in Kuikeu (2025, 2024), with the country's exportations of goods and service (X); the country's foreing demand (D) or the imports of goods and services of the main trading partners computed as the geometric weighted average of the imports in real terms of goods and services of the main trading partners, where the weights correspond to the export shares of the CEMAC countries to the respective trading partner countries; the country's real effective exchange rate ($REER$) or the price/cost competitiveness indicator of the home

economy compare to the foreign partner. It's defined such as an increase represents an appreciation. The real exchange rates are based on the most commonly used price series, i.e. Consumer Price Index (CPI) against the top 30 trading partners for each country (narrow-based indices) using weights based on trade; and finally the country's Domestic Demand (DD) or the final demand including private and public consumption and gross fixed capital formation (Esteves and Rua, 2013, pp. 15). All the variables are coming from the World Bank's WDI except the $REER$ (Base 100 = 2010) that comes from cepii's EQCHANGE database (Couharde et al. 2018).

Empirical Model

Thus considering a dynamic panel data with an error correction mechanism for the export market shares equations in annual data. We consider in the one hand the Symmetric relation. (The Symmetric relation states that the export market share for each country *i* at time *t* follows both short run and long-run determinants. For the long-run dynamics, we consider the Real effective exchange rate $REER_{it}$ a price/cost competitiveness indicator defined such as an increase represents an appreciation. For the short-run behavior, the export market share is explained by its own evolution in the previous year, and the present and past developments of the real exchange rate $REER_{it}$) as given by :

$$\Delta X_{it} - \Delta D_{it} = \alpha_i + \beta(\Delta X_{it-1} - \Delta D_{it-1}) + \sum_{k=0}^{1} \varphi_k \Delta REER_{it-k} + \sum_{l=0}^{1} \omega_l \Delta DD_{it-l} +$$
$$\theta(X_{t-1} - D_{t-1}) + \lambda REER_{t-1} + \varphi t \qquad (1)$$

where Δ is the first difference operator. The model considers all the variables except the trend measured in log allowing for a maximum of one lag. The interpretation of the time trend is not straightforward as it can capture the long-run effects of the so-called non-price competitiveness factors.

On other hand, we introduce non linearity by testing for the existence of an Asymmetric relationship between domestic demand and exports. This is done by splitting domestic demand in two different variables, as this have been done into the literature (Esteves and Rua, 2013 ; Bobeica and al., 2015 ; Esteves and Prades, 2016) depending of its change being positive ($\Delta DD+$) or negative ($\Delta DD-$). The estimate equation becomes:

$$\Delta X_{it} - \Delta D_{it} = \alpha_i + \beta(\Delta X_{it-1} - \Delta D_{it-1}) + \sum_{k=0}^{1} \varphi_k \Delta REER_{it-k} + \sum_{s=0}^{1} \omega_s \Delta DD_{it-s}^{+} +$$

$$\sum_{p=0}^{1} \omega_p \Delta DD_{it-p}^{-} + \lambda REER_{t-1} + \theta(X_{t-1} - D_{t-1}) + \varphi t \tag{2}$$

Estimaton Method : the issue of endogeneity

The presence of the lagged endogenous might suggest the use of instrumental variables ; based on the Hansen's J statistic (Hansen, 1982), we not reject the overall validity of the instruments at the standard level this suggests the orthogonality conditions hold. This is performed by the Arrelano and Bond (1991) estimator and so 2SLS is probably also a good idea assuming that we trust the instruments (see the developments in Wooldridge (2002, pp.118-120) on the endogeneity tests).

3. Results

We will first focus on the symmetric relation (equation 1) and then on the asymmetric relation (equation 2). Given the annual periodicity of the data, as in Esteves and Prades (2016) it is assumed that the substitution effect between domestic and foreign markets sales occurs contemporaneously. The results are presented in the following Tables 1 and 2 respectively.

Table N°1 : Symmetric relation--------------

$\Delta X_t - \Delta D_t$	(1) 2SLS	(1) AB
Error Correction Term		
$X_{t-1} - D_{t-1}$	−0,03 (0.01)***	−0,02 (0.01)*
Long run parameters		
t	0.01 (0.00)***	0.00 (0.00)*
$REER_{t-1}$	−1.20 (0.14)***	−0.90 (0.46)*
Short run parameters		
Constant	4.98 (0.69)***	3.79 (2.07)*
$\Delta X_{t-1} - \Delta D_{t-1}$	−0.24 (0.05)***	−0.17 (0.09)*
$\Delta REER$	−2.22 (1.18)*	−1.05 (0.49)**

ΔDD	−0.28	−0.01
	(0.14)*	(0.11)
Statistics		
Nobs	32	62
Sample	1974-2021	1974-2021
N	5	5
J Statistic	7.85	170.76
Chi square	**(0.55)**	**(0.00)**

Source : Author, *** (**, *) null hypothesis is rejected at the *1% (5%, 10%)*. *Nobs* is available observations, (.) standard deviation. **(.)** the significance level.

The coefficients are clearly significant and their sign is as expected from the theory. As obtained on European economies the existence of a correction mechanism towards the long run equilibrium is confirmed by the statistically significant and negative error correction term suggesting thus that the endogeneity of export market share is well established. As for the European countries this term is not sizeable. The real effective exchange rate appears with a negative sign in the long-run, that is, an appreciation hurts exports performance. The time trend is strongly significant, evidencing an increase in exports market shares of CEMAC countries with what could not be explained by the real effective exchange rate itself. Concerning the short-run dynamics, the real effective exchange rates series appear to impact market share growth with a negative sign. The one period lag of export market share change exhibit negative coefficients. Over the traditional export determinants, domestic demand appears to significantly influence export market shares on the short-run with a negative elasticity around 25 per cent.

Table N°2 : Asymmetric relation---------------

$\Delta X_t - \Delta D_t$	(2) AB
Error Correction Term	
$X_{t-1} - D_{t-1}$	−0,02 (0.00)**
Long run parameters	
$REER_{t-1}$	−0.53 (0.20)***
Short run parameters	
Constant	2.46 (0.95)***
$\Delta X_{t-1} - \Delta D_{t-1}$	−0.14 (0.08)*
$\Delta REER$	−0.67 (0.40)*
ΔDD_t^+	−0.66 (0.19)***
Statistics	
Nobs	62
Sample	1974-2021
N	5
J Statistic	27.14
Chi square (16)	**(0.04)**

Source : Author, *** (**, *) null hypothesis is rejected at the *1% (5%, 10%)*. *Nobs* is available observations, (.) standard deviation. **(.)** the significance level.

The results are qualitatively unchanged than in the symmetric case. However, regarding the time trend it have been dropped has it appears non significant during the compilation of the results. Concerning domestic demand variable, it appears that a positive changes in domestic demand present a statistical significant negative effect on exports dynamics, conforming to a negative relationship between exports and domestic sales when we introduce non linearity as previously obtained (Kuikeu, 2024).

Conclusion

Building on export market share equations from a macroeconomic appoach we reassess the negative relationship between exports and domestic sales found in Kuikeu (2024) for CEMAC area based on a panel data methodolody. In fact, comparing with Kuikeu (2025) based on times series data with the Gabonese experience it's appears that one CEMAC's economy the Gabonese economy concentrated more than a half of total observations for assessing this relationship between exports and domestic sales from a macroecoeconomic approach building on export market share equations. The exports market shares equations are such that there exist a symmetric relation between exports and domestic sales, this is the conventional econometric relation. When the effect of domestic demand on export market share depends on the split of the former following its changes being positive or negative, we speak of them as the asymmetric relation or the non linear relation. To tackle these preceding results in Kuikeu (2024) coming from this particular panel data structure in CEMAC we reestimate the relationship on CEMAC area without Gabon. This new panel structure is such that the cross-sections dimensions is practically even short than the times series dimension. a structure for which the panel data estimators does not practically exist. Then the estimations relies on the Arrelano and Bond (1991) procedure and the instrumental variables estimates (2SLS). On this basis following the obtained results there is a any bias in Kuikeu (2024) coming from this particular structure in CEMAC where just one country the Gabonese economy concentrated more than a half of total observations. In fact, its appears that the relationship between exports and domestic sales remains negative as well as in the case of the symmetric than asymmetric relation. These results seems to confirm contrast the literature following which the findings presented in Bobeica et al. (2015) indicated that the overall result seems to be country's sensitive. Therefore the correct interpretation of the nexxus substitution effect between domestic sales and exports in CEMAC is that during growth periods a rebound in domestic demand would translate into contraction of exports of around 66%. An comparable elasticity to the Gabonese case at 65% in times series modeling that permits thus permits thus to mitigate the bias to according results from the sample here with just 5 CEMAC's members States and the preceding in Kuikeu (2024) with the full CEMAC's members States.

Then as policy recommendations nevertheless, the understanding of these countries differences could be very important for economic policy discussion, namely to understand their different behaviour. Esteves and Prades (2016) suggest the product concentration index that is the export

specialization, implying that a high product concentration index will reducre this trade-off between sales to domestic and foreign markets. Into the literature this idea have received well adress with one the one hand the using of the United Nations Conference on Trade and Development (UNCTAD) Herfindahl-Hirschman index on export concentration convering goods product concentration index despite the fact that there is no concentration index for exports covering goods and services, it is normalized in order to obtain values between 0 (zero concentration) and 1 (maximum concentration). On the other hand, into a regression including the domestic demand changes and the cross term between domestic demand changes and the concentration index the coefficient of domestic demand is negative while the coefficient of the cross term is positive, implying that the coefficient between domestic demand and exports becomes less negative when exports are more concentrated (Esteves and Prades, 2016 ; Kuikeu, 2024).

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