

## 4. Economic diversification in Central Africa: overview and lessons learnt<sup>1</sup>

Following independence, most African countries began to diversify their economic structures by implementing import substitution industrial policies in order to gradually reduce their dependence on commodities.

These attempts at industrialisation nonetheless brought about a number of failures, in particular the debt crisis endured by developing countries during the 1980s. The widening of trade deficits, linked to the increase of imports, and the rise in public deficits, owing to state interventionism, led to a shift in development strategies and the privatisation of the industrial base as of the 1990s.

In spite of the abovementioned failures, there is still a need for a shift in Central African countries' development policies in order to promote greater diversification of the productive base. Diversification plays an essential role in the management of risks related to economic cycles and notably reduces the impact of commodity price fluctuations on economies. It should also help to improve international competitiveness.

The economies of the Central African Economic and Monetary Community (*Communauté économique et monétaire des États d'Afrique centrale* – CEMAC) are highly concentrated in the oil, mining and agricultural sectors. Although the upswing observed in recent years in the world's commodity markets has helped CEMAC macroeconomic performances to pick up considerably, these economies nonetheless remain vulnerable to the risk of an international cyclical downswing. This vulnerability should encourage decision-makers to take a fresh look at medium and long term development strategies with a view to ensuring the sustainability of recent macroeconomic performances.

In this framework, the Forum on economic diversification and the promotion of non-oil sector investment, with a view to strong and sustainable growth in the CEMAC, brought together, upon the invitation of the Bank of Central African States (*Banque des États de l'Afrique Centrale*, BEAC), senior representatives of public and private sector administrations of the various member countries. In particular, the forum examined the problem of instruments and economic policies that should be favoured in order to improve the dynamics of the diversification of companies' productive and export base instigated in recent years. This work has led to the formulation of recommendations, aimed at inspiring economic policies, both at the national and sub-regional level, while a Regional Economic Plan (REP) is being drawn up by CEMAC authorities.

This paper gives a brief overview of the debate on the opportunity of a diversification of productive bases, highlighting the challenges and determinants of the latter (4.1.). Then, by examining concentration indices, it goes on to present the dynamics of the diversification process in the CEMAC region since 1987 (4.2.).

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<sup>1</sup> This study was carried out by the Monetary Planning Department (*Service de la Programmation monétaire*) of the Bank of Central African States (*Banque des États de l'Afrique Centrale*, BEAC). The conclusions drawn were presented at the Forum on economic diversification of the Economic and Monetary Community of Central Africa (*Communauté Économique et Monétaire de l'Afrique Centrale* – CEMAC), organised by the BEAC from 1 to 3 October 2007, in Libreville (Gabon).

## 4.1. Brief overview of the literature on the challenges and determinants of economic diversification

The debate on economic diversification began in the USA and Latin America during the inter-war period crisis, which was marked by a spectacular drop in commodity prices. The arguments in favour of diversification gradually inspired the commercial and industrial policies of industrialised countries, then, more generally, the development policies of emerging markets up to the present day.

Numerous economic publications have pointed out the advantages offered by diversification in terms of dilution of macroeconomic risks, and growth and development theories have underscored the contribution of diversification to the development process (*Berthélemy, 2005*). Indeed, a country or a region where economic activity is diversified is less exposed to economic shocks, as the shocks that hit the various sectors are not positively correlated with each other. This argument is particularly important for countries that export raw materials, whose prices can fluctuate considerably, which constitutes the most obvious reason for seeking greater diversification.

This analysis in terms of risk management and distribution can be extended to the issue of an economy's or a region's vulnerability to technological changes or to the arrival of new competitors. From this viewpoint, as underscored by *Berthélemy (2005)*, the mitigation of risks through diversification is a challenge not only for developing countries, but also for industrialised countries (*Attaran and Zwick, 1987; Aiginger et al, 1999*). The different countries and industries cannot all protect themselves against the emergence of new competitors or new technologies by placing themselves at the vanguard of technological advances.

Certain analyses (*Imbs and Wacziarg, 2003*) tend to highlight an inverted u-shaped relationship between diversification and the level of economic development. Countries tend to diversify as revenue increases, then specialise once a certain threshold of per capita income is reached. Moreover, many theoretical and empirical studies dedicated to the challenges and determinants of economic diversification<sup>2</sup> have underscored the positive relationship between economic diversification and growth and/or productivity.

### 4.1.1. The challenges of economic diversification

To better evaluate the costs and advantages of a diversification process, it is worth underlining the main characteristics. As underscored by *Berezin (2002)*:

- *Diversification of production can be horizontal and/or vertical*: horizontal diversification concerns the emergence of a new sector of activity, while vertical diversification consists in expanding the range of products manufactured in a particular sector, in order to eventually constitute an entire field, from commodities to the products or services incorporating higher value added;
- *Diversification of production responds to the law of diminishing returns*: if the diversification of a portfolio of assets reduces the risk, the marginal profit of an increase in diversification is a decreasing function of the total volume of the said portfolio. This principle also applies to the diversification of production. Diversification can prove to be counterproductive if resources allocated to sectors that post strong performances must be reallocated to new sectors;
- *The correlation of sectoral performances is critical*: the profit expected from diversification increases if the development of production in the new sectors is not perfectly correlated (and if possible, if it is

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<sup>2</sup> See *Feenstra et al [1999], Berthélemy and Chauvin [2000], Berthélemy and Söderling [2001]*.

negatively correlated) to the rest of the economy. This implies that the diversification of production should not only involve a migration towards new sectors, but also needs a shift towards sectors for which development is uncorrelated with the rest of the economy.

Moreover:

- In order to help countries to become less dependent on sectors of activity based on the exploitation and exportation of natural resources, *diversification should be able to draw on a dynamic private sector with access to skilled workers and developing in a favourable institutional and legal environment.*

#### **4.1.2. The determinants of diversification**

Diversification plays a major role in the development and growth of an economy. According to some authors, it can contribute to increasing the productivity of factors, strengthening investment and stabilising export revenues. The United Nation's Economic Commission for Africa's report on diversification in Africa (2006) identifies five categories of variables affecting the diversification process. Notably:

- *physical factors*: investment, growth and human capital;
- *public policies*: fiscal, commercial and industrial policies (owing to their impact on the strengthening of the industrial base);
- *macroeconomic variables*: foreign exchange rates, inflation rates and trade balances;
- *institutional variables*: governance, the investment environment and the security situation, (conflicts, etc.);
- *access to markets*: the degree of openness to the trade of goods, services and capital (removal of tariff and non-tariff barriers), access to bank or market financing.

In particular, at the macroeconomic level, considerable instability in the economic environment, marked, for example, by high inflation, promotes neither the creation and development of new sectors of activity nor the establishment of a business climate favourable to the diversification process.

## 4.2. The dynamics of diversification in CEMAC countries

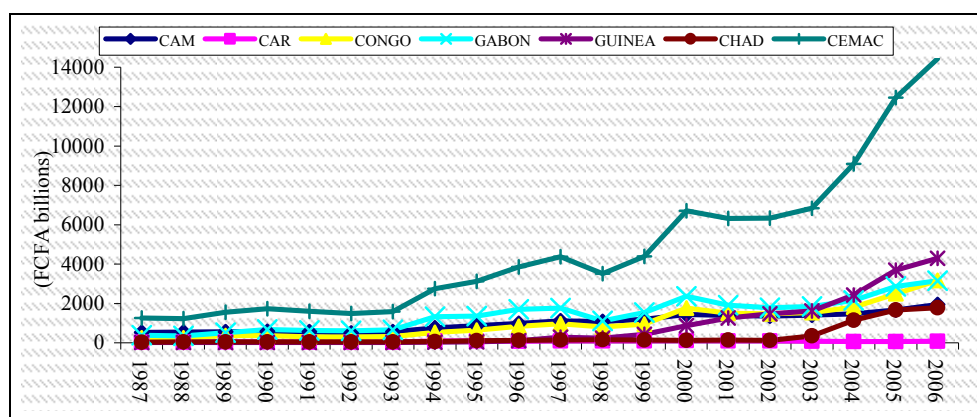
The diversification process in CEMAC countries may be assessed via developments in the structure of exports. This approach, which consists in considering that the diversification of CEMAC economies is closely linked to the dynamics of their exports, could be justified, given their production structures, which are dominated by the exploitation and exportation of commodities (Gros et al, 2006).

From this viewpoint, the analysis that follows aims to examine developments in exports and to assess the extent of vertical diversification (variety of the range of standard products) and horizontal diversification (introduction of new products into the production range over time) in CEMAC countries.

### 4.2.1. Developments in nominal terms of exports in the CEMAC region

During the 1987-2006 period, most CEMAC countries posted strong export growth, particularly during the last six years of the period under review (Chart 1).

**Chart 1: Developments in goods exports in CEMAC countries**



Source: Monetary Planning Department of the Bank of Central African States (BEAC)

The increase in exports at the regional level, which led to a sharp increase in the proportion of exports of goods in the CEMAC's GDP (increasing from 23.6% on average during the 1987-1993 period to 36.1% between 1994 and 2000, and 44.8% during the 2001-2006 period) helped to strengthen the degree of openness of the economies in this sub-region.

Nonetheless, these performances vary according to the country and the sub-period. The strongest increases during the periods under review were recorded in the Republic of Congo and Equatorial Guinea. During the recent period, the latter have been the most economically open countries in the region.

**Average proportion of goods exports in CEMAC countries' nominal GDP***as a percentage*

	1987-1993	1994-2000	2001-2006
Cameroon	16.2	20.5	18.7
Central African Republic	10.1	16.3	11.6
Republic of the Congo	42.4	66.4	76.5
Gabon	39.4	55.6	56.4
Equatorial Guinea	29.8	82.1	99.2
Chad	11.0	14.6	36.0
<b>CEMAC</b>	<b>23.6</b>	<b>36.1</b>	<b>44.8</b>

Source: Monetary Planning Department, BEAC

Moreover, an analysis cumulating exports of goods and services gives similar results/trends: the proportion of these flows in relation to the CEMAC's nominal GDP increased from 28% to 41% then 49% during the three periods under review. Service exports thus remained stable at around 4% of GDP over the entire period.

**Average structure of goods exports from CEMAC countries***As a percentage*

		1987-1993	1994-2000	2001-2006
<b>Cameroon</b>	Crude oil	53	42	53
	Cocoa	10	10	11
	Coffee	10	8	3
	Cotton	5	6	6
	Wood	11	22	17
	Aluminium	6	7	6
	Bananas	3	4	3
	Natural rubber	2	3	2
<b>Central African Republic</b>	Cotton	10	14	4
	Diamonds	57	48	45
	Coffee	12	10	1
	Tobacco	2	0	0
<b>Republic of Congo</b>	Wood	18	28	50
	Crude oil	83	92	92
	Petroleum products	2	1	1
	Tropical wood	12	5	6
	Eucalyptus logs	2	2	0
<b>Gabon</b>	Sugar	1	1	1
	Crude oil	76	80	85
	Manganese	9	5	5
	Uranium	4	1	0
<b>Equatorial Guinea</b>	Wood	11	14	10
	Crude oil	15	75	92
	Methanol and other gases	0	0	6
	Wood	57	22	2
	Cocoa	27	2	0
<b>Chad</b>	Coffee	1	0	0
	Cotton fibre	61	57	19
	Livestock	39	43	30
	Oil	0	0	51

Source: Monetary Planning Department, BEAC

Analysis of the structure of exports therefore does not reveal the horizontal diversification process that would help to reduce significantly the vulnerability of the sub-region's economies. The development of new sources of exports in the oil and gas sector in Chad and Equatorial Guinea are notable exceptions. Over the entire period, Cameroon managed to maintain an identical export base of eight products. The Central African Republic, Gabon, the Republic of Congo and Equatorial Guinea, on the other hand, recorded the disappearance and/or decline of a number of their revenue-generating products.

#### 4.2.2. Diversification process of CEMAC countries since 1987

The dynamics of the diversification of exports from CEMAC countries may be assessed by analysing three indicators: i) the Ogive index, which measures the deviation from an equitable distribution of employment in all sectors, ii) the normalised Hirschman index which assesses the degree of diversification/concentration of trade and iii) the specialisation composite index (similar to the Hirschman index). The results of this analysis carried out on CEMAC countries are presented hereinafter.

***In Cameroon***, thanks to the relatively high number of export products (eight products), this country ranks first in terms of economic diversification within the sub-region. Diversification efforts in Cameroon have undergone three unfavourable periods (1989-1991, 1998-2000 and 2004-2006) (Chart 2). The diversification process there is thus characterised by relative instability. Coffee, cocoa and crude oil accounted for almost 70% of exports from Cameroon during the past six years, with raw wood in the phase of becoming a standard product. The period under review has not been marked by the introduction of new products.

***In the Central African Republic***, the structure of goods exports is highly concentrated, with only five main export products (Chart 3). The instability of the Ogive index reflects the poor result of the diversification policies implemented. Coffee, tobacco and wood constitute standard export products. Raw wood has become the main export product, its relative proportion of exports having increased from an average of 18% of goods exports during the 1987-1993 period to 50% over the past six years. Diamond production seems to have remained stable during the period.

***In the Republic of Congo***, analysis of the diversification indices (Chart 4) shows that the economy is also highly concentrated, with five main products. The Ogive index has remained stable there during the period, which is indicative of weak diversification. Eucalyptus log exports ceased in the early 2000s, reducing the country's export product range for a number of years before exports picked up again in 2006.

***Gabon's*** economy is highly concentrated (Chart 5). The range of export products, essentially comprising crude oil, manganese and wood, has barely changed during the period under review. These products have expanded slightly in nominal terms, but their proportion of total exports has remained relatively constant. Uranium was also a conventional export product, but its extraction ceased in 1999.

***In Equatorial Guinea***, the structure of goods exports is highly concentrated (Chart 6). The economy underwent a shock as of 1997 following the development of the oil and gas sectors, with an attempt to polarise the economy around these sectors. Prior to the oil and gas boom, wood, cocoa and coffee were the only export products, but the two latter products virtually disappeared from the range of export goods at the beginning of the 2000s.

***In Chad***, the economy is highly concentrated overall, particularly since 2003-2004, owing to the advent of the country's oil sector (Chart 7). Chad seems to be, for the whole of the period under review, the most concentrated CEMAC economy, with just two, then three export products: cotton fibre, the exports of which have increased at a virtually constant rate, livestock, and crude oil, which became a new export

product in 2003. Crude oil accounts for the sharp growth in export revenues (which reached over 200% in 2004) and the increase in concentration indices, particularly at the end of the period under review.

In summary, the CEMAC economies are characterised by a low level of diversification. The different diversification experiences in the CEMAC region have varied from country to country. However, generally speaking, most have not managed to direct their conventional exports towards new more dynamic and expanding sectors. Moreover, the effects of efforts undertaken in matters of diversification appear to have reached a peak in 1988, when the CEMAC economies followed a concentration trend, as illustrated by the upturn in the indices observed up until 2006 (Chart 8).

However, this analysis of diversification, based on a synthetic index of diversification, has a number of drawbacks (Berthélemy, 2005). For example, data on international trade in general and on exports in particular only cover part of the economic activity, as services are by definition excluded. Furthermore, rather than capturing the whole of production, only the international aspect of trade is assessed, thus limiting the analysis of the diversification to the component linked to the analysis of international specialisation. Lastly, this analysis, which is macroeconomic in nature, conceals developments at micro-economic and meso-economic levels, and therefore does not enable us to assess vertical diversification efforts (intra-industry).

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## APPENDIX 1: Some indicators used to measure economic diversification<sup>3</sup>

The Ogive index, Hirschman index and the specialisation composite index are the concentration rates amongst the most commonly used to assess the extent of an economy's concentration or diversification.

### i) Ogive index

$$OGV = N \cdot \sum_{i=1}^N (P_i - 1/N)^2 \quad \text{or} \quad OGV = \sum_{i=1}^N \frac{(P_i - 1/N)^2}{1/N}$$

where  $P_i = (x_i / X)$  is the real share of the product  $i$  ( $x_i$ ) in total exports ( $X = \sum x_i$ ),  $N$  the total number of products exported, and  $1/N$  the "ideal" share of export revenues which is the average share of the export of each product.

- i)  $OGV = 0$  when the share of exports is evenly distributed between the different products;
- ii)  $OGV \rightarrow 0$  when the economy in question is considered to be highly diversified;
- iii) A high OGV value reflects a relatively low level of diversification (i.e. the economy has a narrow range of export products).

### ii) Hirschman index

$$H_1 = \sqrt{\sum_{i=1}^N \left( \frac{x_i}{X} \right)^2}$$

where  $x_i$  is the value upon exportation of a product  $i$ ,  $X$  is total exports, and  $N$  is the number of groups of products.

Here also, the higher  $H_1$ , the greater the concentration of exports on a small number of products, and vice versa.

### iii) Normalised Hirschman index

$$NH_1 = \frac{\sqrt{\sum_{i=1}^N P_i^2} - \sqrt{\frac{1}{N}}}{1 - \sqrt{\frac{1}{N}}}$$

where  $P_i = \frac{x_i}{X}$ ,  $x_i$  is the value of exports of the product  $i$ ,  $X = \sum_{i=1}^N x_i$ , and  $N$  is the number of products.

The closer the  $NH$  value to 1 the greater the concentration, and vice versa.

<sup>3</sup> Source: Ben Hammouda et al, UNECA report, 2006



**iv) Specialisation composite index**

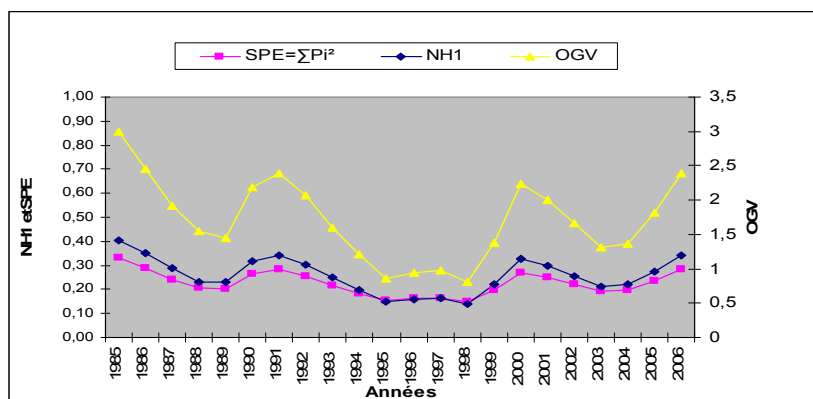
$$\text{SPE} = \sum_{i=1}^N \left( \frac{x_i}{X} \right)^2$$

where  $x_i$  represents the exportation of product  $i$ ,  $X$  the total amount of exports and  $N$  the number of products exported.

- i)  $\text{SPE} \rightarrow 1 \Rightarrow$  indicates the presence of a single export product (high degree of specialisation);
- ii)  $\text{SPE} \rightarrow 0 \Rightarrow$  shows a high level of diversification of exports;
- iii) When the share of exports is evenly distributed between the different products, then  $\text{SPE} = 1/N$  which is also the minimum value.

## APPENDIX 2: measuring economic diversification in CEMAC countries

**Chart 2: Export diversification indices for Cameroon**

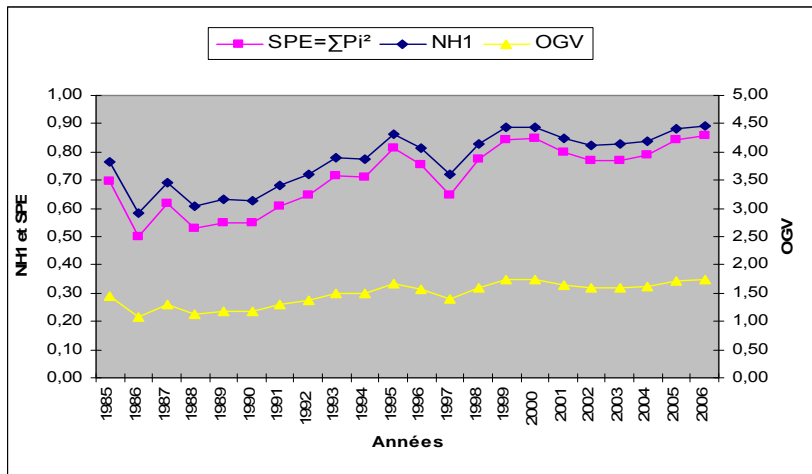


Source: Monetary Planning Department, BEAC

**Chart 3: Export diversification indices for the Central African Republic**

Source: Monetary Planning Department, BEAC

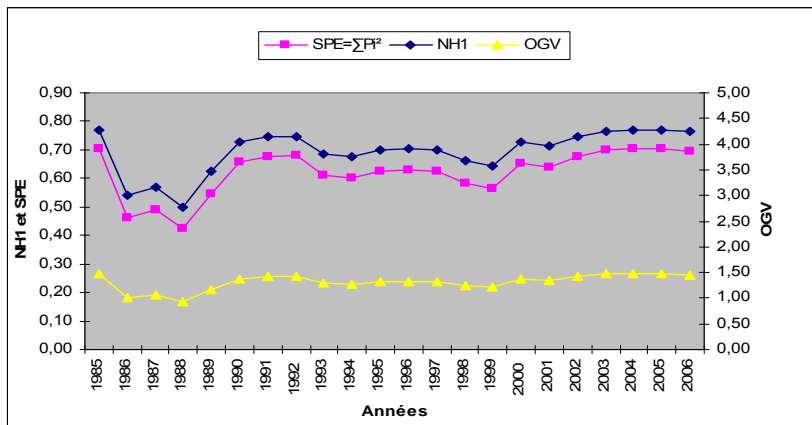
**Chart 4: Export diversification indices for the Republic of Congo**



Source: Monetary Planning Department, BEAC

A changer dans le graphique : NH1 et SPE = NH1 and SPE  
 Années = Years  
 Remplacer les virgules par des points

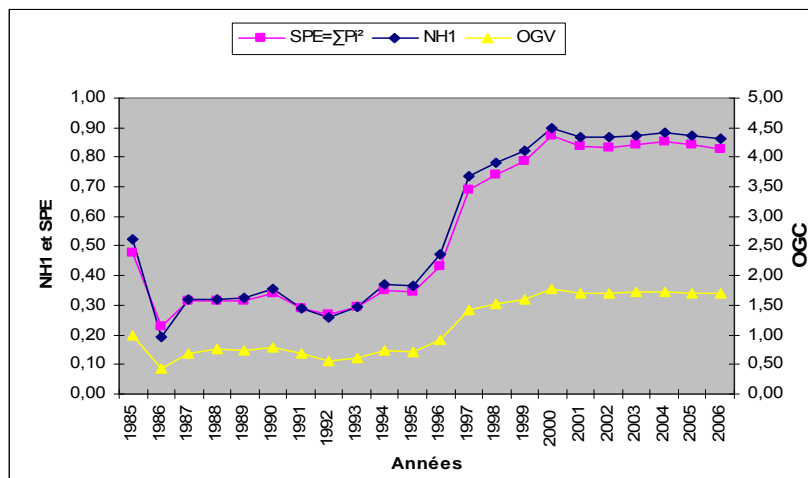
**Chart 5: Export diversification indices for Gabon**



Source: Monetary Planning Department, BEAC

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 Années = Years  
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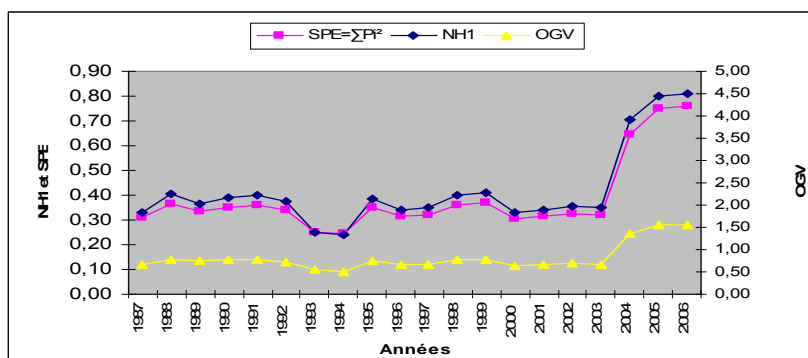
**Chart 6: Export diversification indices for Equatorial Guinea**



Source: Monetary Planning Department, BEAC

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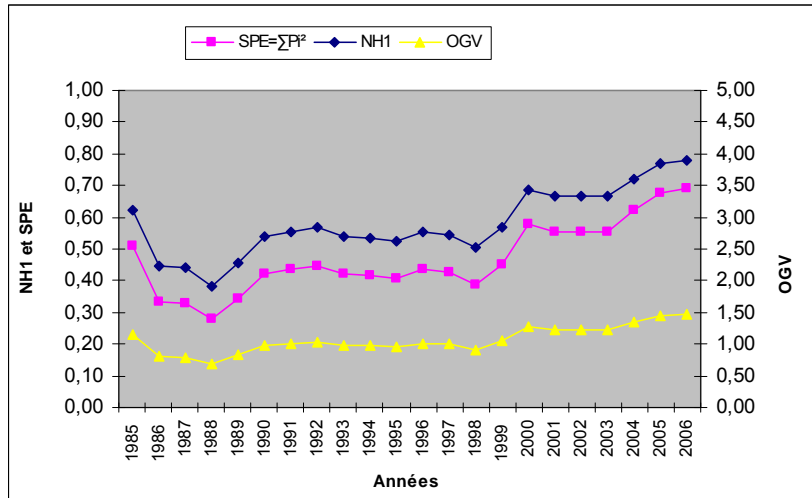
**Chart 7: Export diversification indices for Chad**



Source: Monetary Planning Department, BEAC

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 Années = Years  
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**Chart 8: Export diversification indices for the CEMAC region**



Source: Monetary Planning Department, BEAC

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Années = Years

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