

THE IMPACT OF THE EU-CARIFORUM EPA ON CARIFORUM EXPORT TRADE COMPETITIVENESS

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Presenter: Mr. Arden Modeste

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INTRODUCTION

- Historic trade relations between the European Union (EU) and the CARIFORUM states :
 - Yaoundé convention (I & II, 1963-1975)
 - Lomé convention (I, II, III & IV, 1975-2000)
 - Cotonou agreement (2000)
- The CARIFORUM-EU regional economic partnership agreement (REPA), developed to align the Cotonou terms with the world trade organization (WTO) rule of trade reciprocity (2008).
- EPA goal (a): To strengthen the framework of economic and trade relations to support conditions for improved investment, trade policy and supply capacity, competitiveness and economic growth in the CARIFORUM region.
- EPA goal (b): To strengthen the existing historical relationship between the regions with the intent to establish a long lasting partnership, which can serve as an instrument of development for the CARIFORUM states.
- **Has the EPA agreement with the EU affected the competitiveness of the CARIFORUM exports?**

METHODOLOGY

THE BALASSA (1965) INDEX – MEASURE OF EXPORT TRADE COMPETITIVENESS

- (Balassa, 1965) export share measure of RCA is defined as,

$$RCA = \frac{X_i^j / X_i^a}{X_r^j / X_r^a}$$

- For $RCA > 1$, then for country 'i' exports of commodity 'j' to a reference group r and total exports 'a', comparative advantage in trade is observed (revealed).
- For $RCA = 1$, denotes a comparative neutral position
- For $RCA < 1$ indicates a comparative disadvantage.
- The RCA measures a country's export share of a commodity in relation to the corresponding export performance with the reference countries.

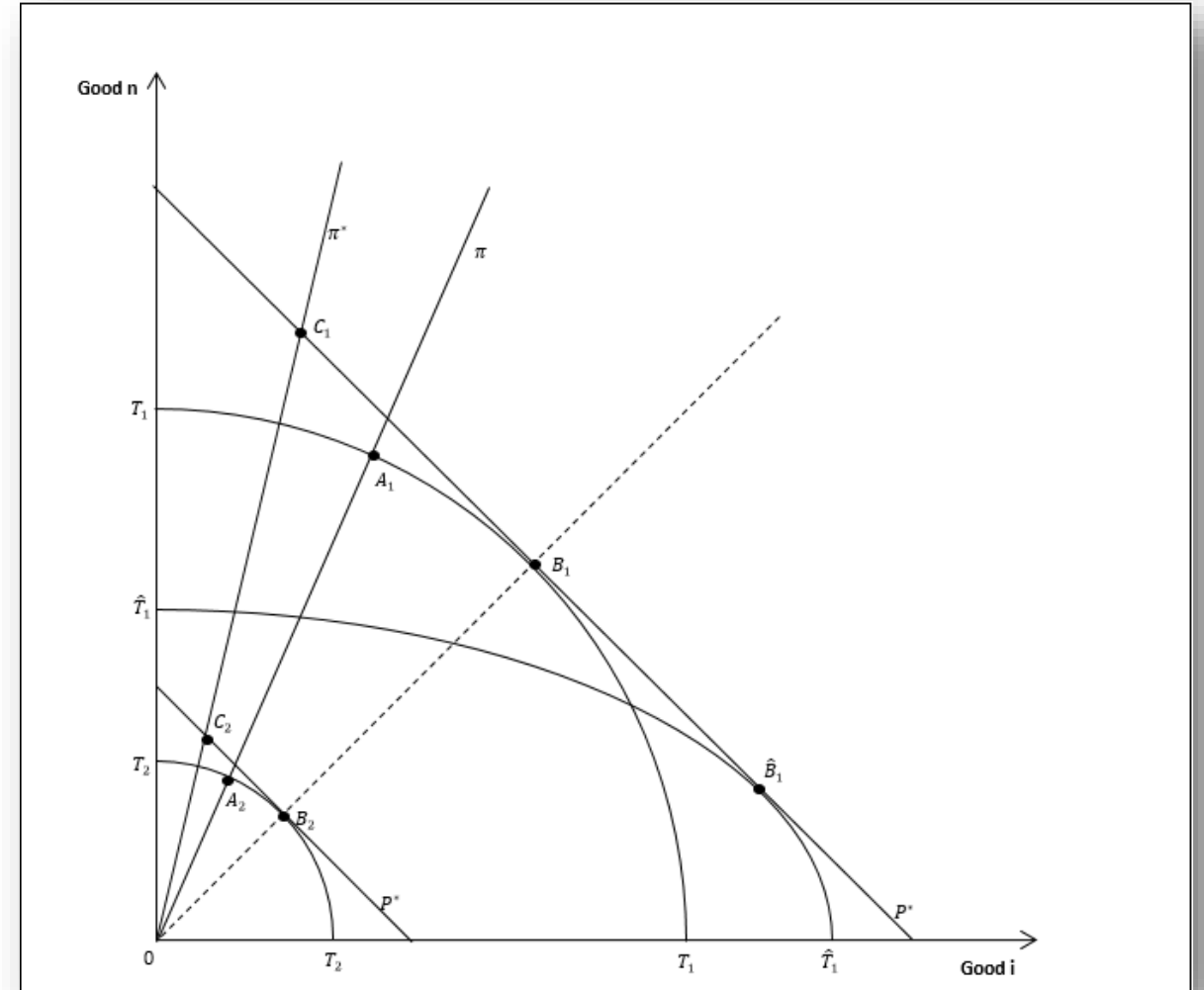
METHODOLOGY

THE HILLMAN INDEX (HI)

- The Hillman condition as an index (Marchese and De Simone, 1989).
- Examine whether the Hillman condition holds true:

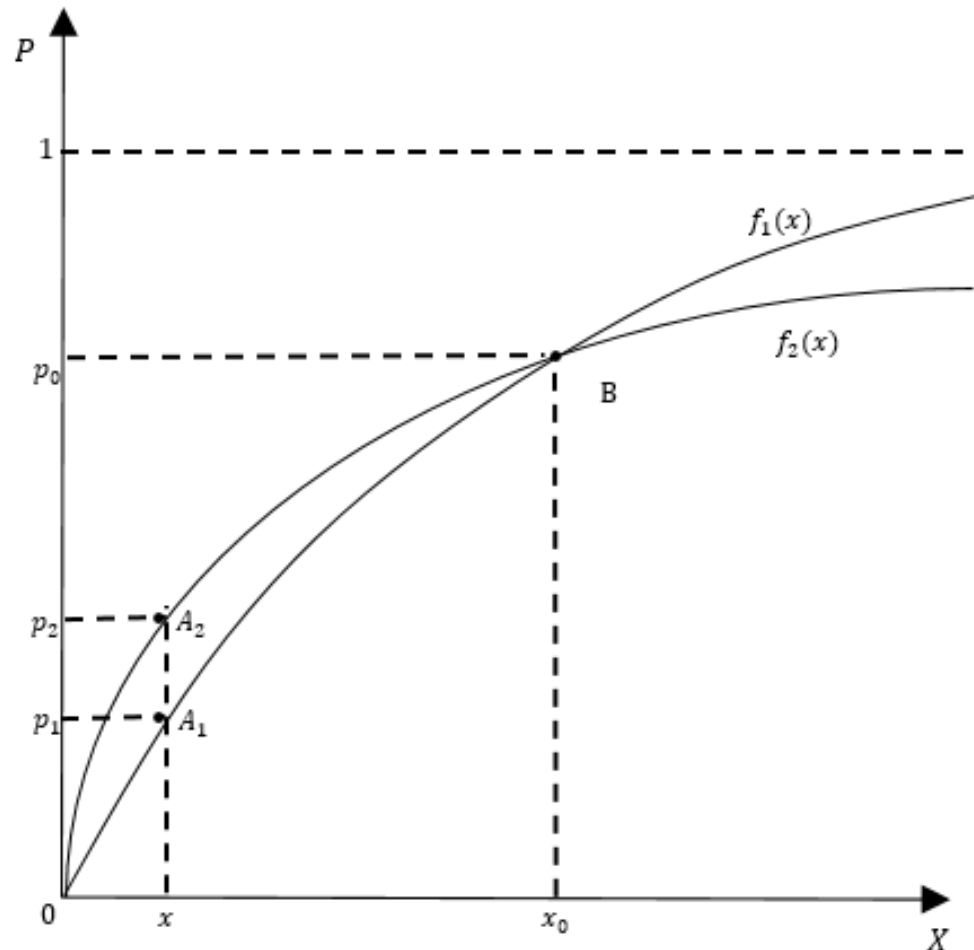
$$HI = \frac{(1 - X_i^j / X_i^a)}{(X_i^j / X_r^j)(1 - X_r^j / X_r^a)}$$

- For $HI > 1$, the Balassa index will be in alignment with free-trade relative prices and is thus a good measure of comparative advantage.
- Diagnostic Test: Discard observations violating the Hillman condition (Sanidas and Shin 2015; Hinloopen and Van Marrewijk 2004).



METHODOLOGY

THE HARMONIC MASS INDEX- THE EMPIRICAL PROBABILITY DISTRIBUTION



- The focus of cross-country analysis should be on the distribution of RCA over all sectors (Brakman and Van Marrewijk, 2015).
- The harmonic Mass index can be used to measure how the probability mass of the two underlying distributions differ (Hinloopen and van Marrewijk, 2005).

METHODOLOGY

THE HARMONIC MASS INDEX- THE PERCENTILE-PERCENTILE PLOT (P-P PLOT)

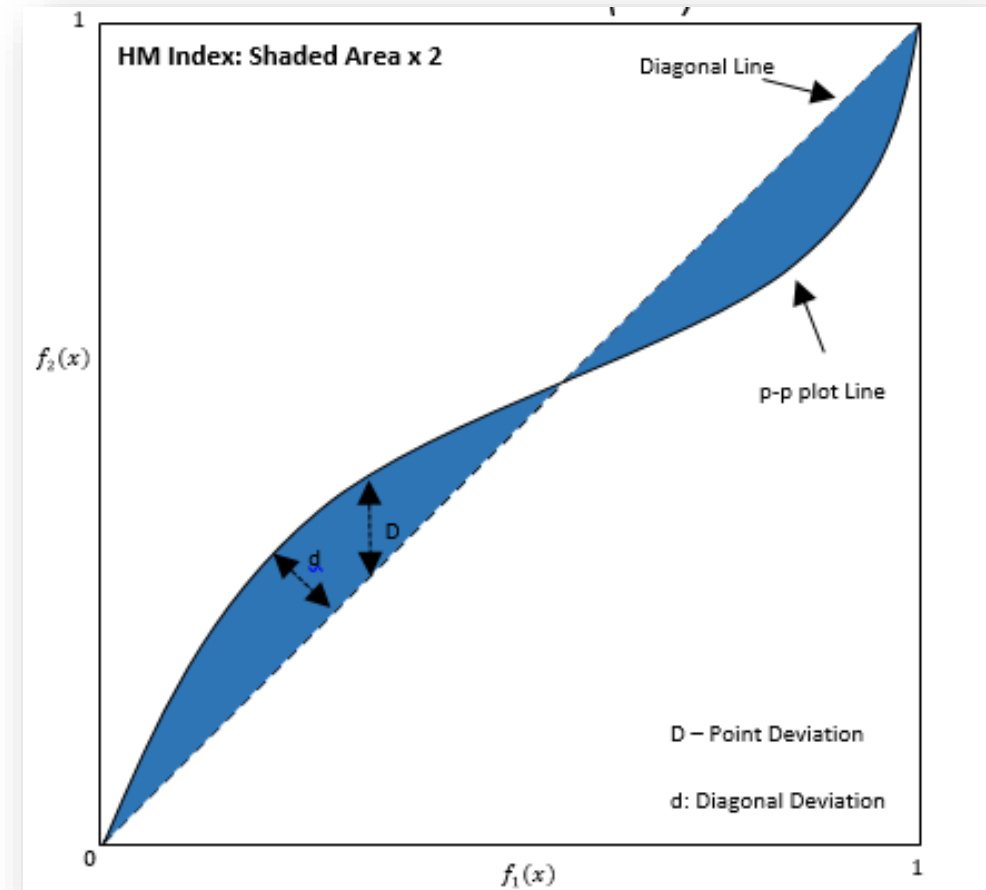
- **The p-p plot** depicts the relationship between the two samples in the probability space such that;

$$p_2 = F_2 \left(F_1^{-1}(p_1) \right), 0 \leq p_1 \leq 1$$

- The HM index is measured as twice the shaded region of the p-p plot as follows.

$$HM(F_1, F_2) \equiv 2 \int_0^1 \left| p_1 - F_1 \left(F_2^{-1}(p_1) \right) \right| dp_1$$

- For statistical inference, $H_0: F_1 = F_2$, the distributions of both samples are equal.
- (Hinloopen and van Marrewijk, 2005) provided critical percentiles values for the HM index to aid in statistical inference.



METHODOLOGY

SPEARMAN'S CORRELATION COEFFICIENT

- The Spearman's rank-order correlation coefficient can be used to identify and test the strength of the relationship between two data distributions i.e. similarity in the pattern of comparative advantage of the EU and CARIFORUM states.
- Spearman's rank-order correlation coefficient (r_s) across countries is defined as:

$$r_s (C_{1t_a}, C_{2t_b}) = 1 - 6 \left[\frac{\sum_{i=1}^n d^2_{R_j}}{n^3 - n} \right]$$

Where $r_s (C_{1t_a}, C_{2t_b})$ = Spearman rank-order coefficient for a country C_1 and C_2 for time periods t_a and t_b

R_j = Rank of a country's RCA for a group of products j

d = rank difference of two ordinal RCA distribution

$$d^2 = (RCA_{jC_1t_1} - RCA_{jC_2t_2})^2$$

n = number of pairs of data points of the data distributions

METHODOLOGY

AUGMENTED DICKEY-FULLER TEST

- A shift in the similarity in comparative advantage can be observed through the level of persistence i.e. mean reversion.
- The ADF test simulates a random walk, of a nature of a first order autoregressive process. This is represented as:

$$\Delta\rho_t = \beta_0 + \beta_1\rho_{t+1} + \sum_{i=1}^{\rho} \alpha_i\Delta\rho_{t-i} + \delta_t + \varepsilon_t$$

Where Δ = difference operator, ε_t = random error term, t = time and (β, α) are constant parameters.

The null and alternative hypotheses for the ADF test are as follows:

$H_0: \phi = 0$ (the series has one unit root and is non-stationary)

$H_1: \phi < 0$ (the series does not have a unit root and is stationary)

DATA

- Trade volume data (annual) was sourced from the World Integrated Trade Solutions (WITS) online United Nations Commodity Trade Database (UNCOMTRADE).
- Data used consisted of 3-digit product aggregation, SITC Revision 3, from the WITS database (1990-2016).

RESULTS

Harmonic Mass Index of RCA (Period Average) Distributions: EU-27 and World Trade with Selected CARIFORUM Countries

Home Country	Years		Trade Partner							
			EU-27			WORLD				
			HM_S	Critical Percentiles			HM_S	Critical Percentiles		
				1%	5%	10%		1%	5%	10%
Suriname	2007-09	2013-14	0.0804	=	=	=	0.0642	=	=	=
St. Lucia	2007-09	2013-14	0.2324	≠	≠	≠	0.0845	=	=	=
Guyana	2007-09	2013-15	0.0200	=	=	=	0.0568	=	=	=
Trinidad & Tobago	2007-09	2013-15	0.0526	=	=	=	0.1382	≠	≠	≠
St. Vincent	2007-09	2012-15	0.0935	=	=	=	0.0867	=	=	=
Barbados	2007-09	2013-15	0.0436	=	=	=	0.0738	=	=	=
Jamaica	2007-09	2013-15	0.0351	=	=	=	0.0538	=	=	=
CARICOM	2007-09	2013-15	0.0623	=	=	=	0.0408	=	=	=

Source: Own calculations. The sample harmonic mass index (HM^s), using SITC3, 3-digit data from WITS COMTRADE database. The results for the hypothesis of distribution equality is represented by '=' and distribution inequality by '≠', at the 1%, 5% and 10% levels of significance.

RESULTS

Export Trade to the EU-27 by Product Group for Selected CARIFORUM Countries (Percentage of Total Exports, 2008/ 2015)

Country	SUR		LCA		GUY		TTO		VCT		BRB		JAM		CAR	
Year	2008	2014 (a)	2008	2014 (a)	2008	2015	2008	2015	2008	2015	2008	2015	2008	2015	2008	2015
Product Group																
3-digit sectors not classified	85%	82%	0%	0%	19%	26%	0%	0%	--	--	1%	2%	--	7%	5%	8%
Human-capital intensive products	1%	1%	12%	15%	0%	9%	3%	3%	10%	10%	16%	22%	1%	1%	5%	6%
Natural-resource intensive products	0%	0%	1%	0%	7%	3%	2%	4%	0%	0%	7%	7%	0%	2%	4%	3%
Primary products	13%	15%	73%	57%	72%	61%	75%	53%	87%	86%	53%	42%	93%	89%	64%	47%
Technology intensive products	1%	2%	12%	26%	0%	1%	20%	39%	2%	3%	20%	24%	7%	1%	18%	29%
Unskilled-labour intensive products	0%	0%	2%	1%	1%	0%	1%	0%	1%	0%	3%	2%	0%	0%	4%	7%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Source: Own calculations.

NOTE: (a) Data availability limited to the year indicated. (b) NCP - 3-digit sector not classified products, HCIP- Human-capital intensive products, NRIP- Natural resource intensive products, PP:-Primary products, TIP- Technology intensive products and ULIP- Unskilled-labour intensive products.

Spearman's Correlation Coefficient of the RCA (World) of the EU-27 and Selected CARIFORUM Countries (1990-2016)

Correspondence with EU (2009)									Correspondence with EU (Joint)									
Year	BRB	CAR	GUY	JAM	LCA	SUR	TTO	VCT	Year	BRB	CAR	GUY	JAM	LCA	SUR	TTO	VCT	
1990	--	0.07	--	--	0.05	--	--	--	1990	-	0.02	-	-	-	-	-	-	
1991	--	0.03	--	0.10	0.00	--	0.03	--	1991	-	0.07	-	.179**	0.04	-	.141*	-	
1992	.248**	0.04	--	0.12	0.02	--	0.04	--	1992	.235**	0.04	-	.153*	0.05	-	0.10	-	
1993	.274**	0.05	--	0.09	0.10	--	.145*	0.03	1993	.269**	0.07	-	0.11	0.04	-	.193**	0.01	
1994	.207**	0.01	--	0.09	0.07	0.05	0.09	0.02	1994	.223**	0.05	-	.134*	0.07	0.07	0.10	0.02	
1995	.178**	0.03	--	0.12	0.05	0.08	0.09	0.04	1995	.217**	0.00	-	0.11	0.05	0.10	.129*	0.04	
1996	.221**	0.04	--	0.12	0.01	0.05	0.10	0.03	1996	.270**	0.06	-	.178**	0.09	0.03	.170**	0.02	
1997	.224**	0.01	.131*	0.09	0.02	0.09	0.12	0.05	1997	.278**	0.03	0.11	.135*	0.02	0.05	.198**	0.02	
1998	.242**	0.02	0.05	.132*	0.04	0.04	.167**	0.04	1998	.314**	0.06	0.04	.159*	0.01	0.04	.231**	0.07	
1999	.226**	0.04	0.11	0.07	0.02	.164*	.131*	0.05	1999	.233**	0.07	0.09	0.06	0.05	0.07	.186**	0.08	
2000	.192**	0.03	.126*	0.10	0.08	.240**	.147*	0.00	COTONOU	2000	.250**	0.10	.123*	0.12	0.01	.228**	.214**	0.02
2001	.171**	0.03	.202**	0.12	0.11	.288**	.159*	0.06	2001	.212**	0.06	.128*	0.12	0.05	.279**	.207**	0.04	
2002	.216**	0.03	0.08	0.10	0.08	.230**	.175**	0.11	2002	.231**	0.00	0.04	0.10	0.09	.217**	.211**	0.12	
2003	.191**	0.08	0.09	0.10	0.11	.197**	0.05	0.09	2003	.211**	0.05	0.04	0.11	0.07	.204**	0.11	0.11	
2004	.254**	0.05	0.03	0.10	0.11	.212**	.123*	0.05	2004	.278**	0.01	0.02	0.11	0.13	.201**	.169**	0.06	
2005	.257**	0.06	0.10	0.12	.154*	.199**	0.11	0.04	2005	.283**	0.02	0.10	.133*	.140*	.175**	.139*	0.05	
2006	.244**	0.06	0.05	0.10	.188**	.219**	.137*	0.07	2006	.271**	0.02	0.05	0.11	.166**	.248**	.176**	0.07	
2007	.278**	0.06	0.12	.129*	.129*	.264**	.129*	0.00	2007	.273**	0.05	0.11	.129*	.205**	.275**	.137*	0.01	
2008	.270**	0.07	0.05	.134*	.167**	.230**	.145*	0.01	EPA	2008	.265**	0.05	0.06	.123*	.141*	.218**	.150*	0.01
2009	.260**	0.08	0.01	0.11	.245**	.231**	0.12	0.04	2009	.260**	0.08	0.01	0.11	.167**	.231**	0.12	0.04	
2010	.270**	0.03	0.01	0.04	.161*	.313**	.153*	0.05	2010	.272**	0.01	0.05	0.07	.257**	.331**	.173**	0.06	
2011	.207**	0.04	0.04	0.05	.161*	.298**	.148*	0.05	2011	.222**	0.02	0.07	0.07	.198**	.313**	.148*	0.06	
2012	.241**	0.02	0.04	0.06	.242**	.295**	.186**	0.12	2012	.244**	0.02	0.00	0.08	.155*	.297**	.198**	.131*	
2013	.216**	0.04	0.04	0.04	.240**	.249**	.169**	--	2013	.231**	0.00	0.01	0.06	.239**	.240**	.177**	-	
2014	.208**	0.05	0.06	0.04	--	.259**	.160*	--	2014	.225**	0.01	0.03	0.06	.247**	.262**	.176**	-	
2015	.165**	0.06	0.12	0.05	--	--	.177**	0.06	2015	.171**	0.02	0.12	0.05	0.05	-	.170**	0.04	
2016	0.09	0.04	0.09	0.03	--	0.04	--	--	2016	0.12	0.02	0.08	0.04	0.04	0.04	0.04	0.04	

Source: Own calculations

Note: ** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Augmented Dickey-Fuller (ADF) Test - Spearman's Correlation Coefficients (1990-2015)

Correspondence with EU (2009)				
Pattern of RCA	Test Statistic	Level of Significance	Critical Value	Decision
EU-BRB	-1.0543	1%	-2.6649	Stationary
		5%	-1.9557	Stationary
		10%	-1.6088	Stationary
EU-GUY	-0.3661	1%	-3.9204	Stationary
		5%	-3.0656	Stationary
		10%	-2.6735	Stationary
EU-LCA	-3.4047	1%	-4.4407	Stationary
		5%	-3.6329	Stationary
		10%	-3.2547	Non-Stationary
EU-TTO	-3.6716	1%	-3.7379	Stationary
		5%	-2.9919	Non-Stationary
		10%	-2.6355	Non-Stationary
EU-CAR	-2.3105	1%	-3.7115	Stationary
		5%	-2.981	Stationary
		10%	-2.6299	Stationary
EU-JAM	-1.8335	1%	-3.7241	Stationary
		5%	-2.9862	Stationary
		10%	-2.6326	Stationary
EU-SUR	-2.8968	1%	-4.5326	Stationary
		5%	-3.6736	Stationary
		10%	-3.2774	Stationary
EU-VCT	-2.0928	1%	-3.8315	Stationary
		5%	-3.03	Stationary
		10%	-2.6552	Stationary

Correspondence with EU (Joint)				
Pattern of RCA	Test Statistic	Level of Significance	Critical Value	Decision
EU-BRB	-3.5772	1%	-3.7115	Stationary
		5%	-2.981	Stationary
		10%	-2.6299	Stationary
EU-GUY	-1.6584	1%	-2.6607	Stationary
		5%	-1.955	Stationary
		10%	-1.6091	Stationary
EU-LCA	-2.2752	1%	-4.4679	Stationary
		5%	-3.645	Stationary
		10%	-3.2615	Non-Stationary
EU-TTO	-4.5984	1%	-3.7115	Stationary
		5%	-2.981	Non-Stationary
		10%	-2.6299	Non-Stationary
EU-CAR	-2.0475	1%	-2.6569	Stationary
		5%	-1.9544	Stationary
		10%	-1.6093	Stationary
EU-JAM	-1.3471	1%	-3.7241	Stationary
		5%	-2.9862	Stationary
		10%	-2.6326	Stationary
EU-SUR	-1.0255	1%	-4.3561	Stationary
		5%	-3.595	Stationary
		10%	-3.2335	Stationary
EU-VCT	-3.4744	1%	-3.7115	Stationary
		5%	-2.981	Stationary
		10%	-2.6299	Stationary

Source: Own calculations

CONCLUSION

THE EU-CARIFORUM EPA

- There was no substantial impact on the distribution of RCA of the CARIFORUM group trade with the EU.
- The similarity in the structures of specialization of the EU and the CARICOM group is neutral.
- A weak positive, but historic relationship exist between the EU specialization structures (for individual states), which does not develop over the period of the EPA.
- The relationship or similarity in specialization structures is relatively stable.
- This suggest slow adjustments of CARIFORUM region towards developments in trade.
- Need to focus on endogenous factors to promote developments in trade.
- Need to fully utilize provisions of the agreement in all aspects of trade.
- “[...] the CF, as the weaker economic partner to the agreement, should aim to harness the benefits of the agreement sooner rather than later [...] as it is the CF states who will lose out in the long run [...]” Williams (2015).





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