Workshop on Trade Policy and Trade Indicators

Module 2.3

UNITED NATIONS

ECLAC

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Balassa Index

- Belongs to the family of indicators of comparative advantage.
- Measures the degree of importance of one product within the exports of a country compared to the importance of exports of the same product in the total exports of a group of countries.

$$BI = \frac{x_{iw}^{k} / xT_{iw}}{x_{w}^{k} / xT_{w}} \qquad Normalize = \frac{Index - 1}{Index + 1}$$

- To interpret the normalized indicator, the following scale is recommended:
  - Between +0.33 and +1: advantage for the country
  - Between -0.33 and -1: disadvantage for the country
  - Between -0.33 and +0.33: neither advantage nor disadvantage for the country

Analysis of the Balassa Index

Jamaica's Revealed Comparative Advantage in CARICOM: Balassa Index, Top ten product categories, 2015

Harmonized System 6-Digit Level	Jamaica's BI Value
Frozen salmon, excluding livers and roes	1.00
Live Horses	1.00
Frozen salmon fillets	1.00
Fresh or chilled salmon fillets	1.00
Frozen tilapia fillets	0.99
Cuttlefish	0.98
Catfish fillets	0.98
Fresh eggs (other than of chickens)	0.97
Smoked salmon	0.97
Sugarless milk and cream	0.97

Source: ECLAC, based on data from the UN COMTRADE database

Revealed Comparative Advantage

- Measures the degree of importance of a product within the exports of a country to another compared to the importance of the imports of the same product in the imports of the destination country from the world.

$$IRCA = \frac{X_{ij}^{k} / XT_{ij}}{MT_{jw}^{k} / MT_{jw}}$$

E.g. Jamaican exports of a single product to the Dominican Republic as a share of total Jamaican exports to the Dominican Republic

E.g. The Dominican Republic's imports of a single product as a share of total Dominican imports

$$Normalize = \frac{Index - 1}{Index + 1}$$

- To interpret the normalized indicator, the following scale is recommended:
  - Between +0.33 and +1: advantage for the country
  - Between -0.33 and -1: disadvantage for the country
  - Between -0.33 and +0.33: neither advantage nor disadvantage for the country

Analysis of Revealed Comparative Advantages

Jamaica: Revealed Comparative Advantages in products imported by the Dominican Republic, the Bahamas and Haiti, 2015

Harmonized System 6-Digit Level	IVCR-Dominican Republic	IVCR-Bahamas	IVCR-Haiti
Vermouth/other flavoured grape wines	0.91	0.69	0.74
Aluminium sulphate	0.89	-0.86	-0.61
Cement clinkers	0.83	0.26	0.88
Infant foods of cereals, flour, starch or milk, retail	0.81	-0.03	0.47
Rum and tafia	0.79	0.94	0.94
Animal feed preparations nes	0.78	0.23	-0.52
Cereal foods obtained by swelling, roasting of cereal	0.72	0.64	0.21
Office duplicating machines	0.71	0.93	N/A
Single fruit, veg juice nes, not fermented or spirited	0.70	0.58	0.64
Beans, small red (Adzuki) dried, shelled	0.62	-0.81	N/A

Source: ECLAC, based on data from the UN COMTRADE database

Economic (or Trade) Environment Index

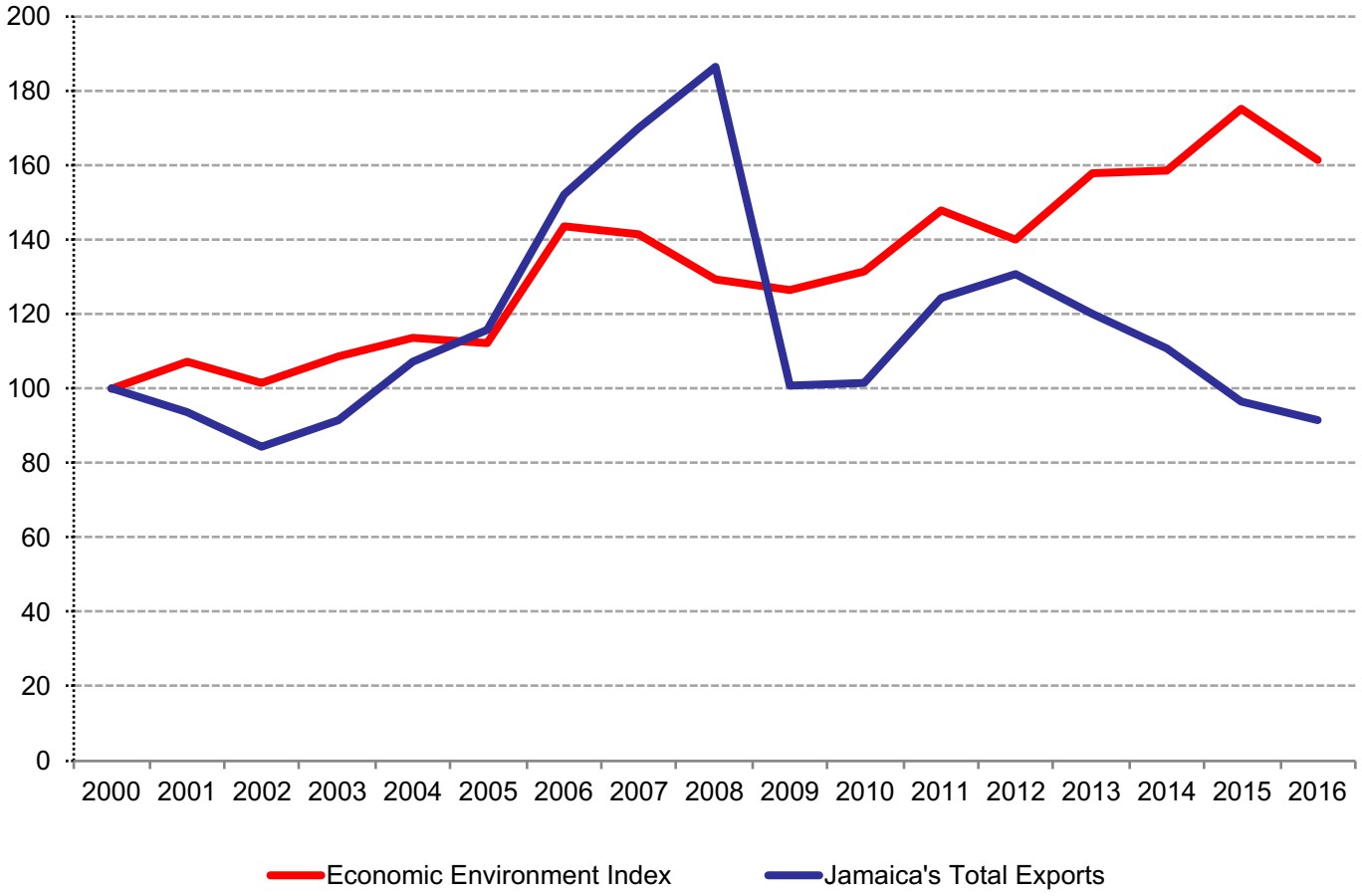
- An indicator to project a country's level of exports based on the economic performance of their main trading partners.

$$EEI = \sum_{j=1}^{n} \left(\frac{X_{ij}}{X_{in}} * GDP_{jt} \right)$$

- Captures the movements in the economic activity of a country's main trade partners weighted by their relative importance in the total exports of the group.

Analysis of the Economic Environment Index

Jamaica : EEC of 10 main trade partners, 2000-2016 (2000 = 100)



Source: ECLAC, based on data from COMTRADE and the World Bank Development Indicators

Elasticities of Trade

- Measures the impact of a change in income or prices on international trade
- Different forms: Bilateral vs Multilateral
- Econometric models
  - Gravity Model
  - Auto Regressive Distributive Lags (ARDL) Model
  - Vector Error Correction Model (VECM)

Income Elasticity of Trade

- ARDL: Jamaica example

$$\Delta lnXd_t = \alpha_0 + \alpha_1 t + \sum_{i=1} \beta_i \Delta lnXd_{t-i} + \sum_{j=0} \emptyset_j \Delta lnY_{t-j} + \sum_{k=0} \delta_k \Delta lnRER_{t-k} + \varphi_1 lnY_{t-1} + \varphi_2 lnRER_{t-1} + \varphi_3 lnXd_{t-1} + \varepsilon_t ,$$

- Is there a long run relationship between Jamaica's exports and income of these 7 group of countries?
  - USA (42,9%)
  - European Union (26,9%)
  - Rest of the World (23,7%)
  - China (2,8%)
  - Japan (1,7%)
  - Latin America and the Caribbean (1,5%)
  - Other Asia (0,4%)

Income Elasticity of Trade

VARIABLES	(1) ARDL(6 5 0)	(2) ARDL(1 0 0)
L.lnx	-0.104	-0.283***
	(0.402)	(0.000524)
L.lny	0.748	-0.699
	(0.839)	(0.294)
L.lnrer	1.169	-0.376
	(0.768)	(0.666)
Constant	0.157	6.421*
	(0.978)	(0.0650)
Observations	87	87
IC	aic	bic
CUSUM	Stable	37.8%
CUSUMSQ	Stable	33.3%
Sample range	93Q1-16Q3	93Q1-16Q3
Portmanteau Q	0.975	0.00187
B.Godfrey LM 2	0.901	0.192
B.Godfrey LM 4	0.986	0.0605
Durbin alt 2	0.918	0.203
RESET	0.231	0.785
Bounds F-t	0.956	4.481
r2_a	0.240	0.108
df_r	73	83

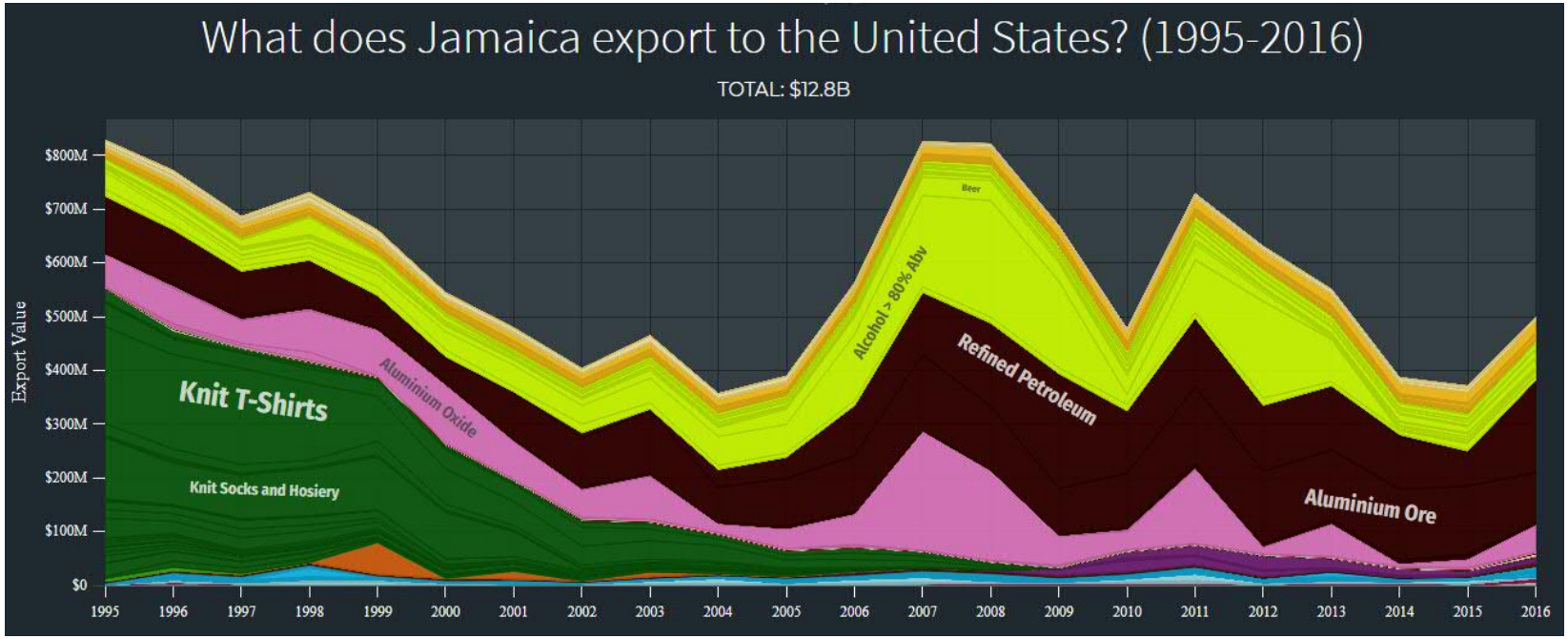
pval in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Bound Test F - Critical values from Narayan (2005), N=70, 6.88(1%), 5.02(5%), 4.28(10%)

Source: Authors based on data from DOTS, IMF and Bloomberg.

Income Elasticity of Trade



Gregory-Hansen Test for Cointegration with Regime Shifts

Model: Change in Regime — Number of obs = 95

Lags = 0 chosen by Akaike criterion — Maximum Lags = 10

	Test Statistic	Breakpoint	Date	Asymptotic Critical Values 1%	5%	10%
ADF	-7.13	51	2005q3	-5.97	-5.50	-5.23
Zt	-7.16	51	2005q3	-5.97	-5.50	-5.23
Za	-66.29	51	2005q3	-68.21	-58.33	-52.85

Source: Authors based on data from DOTS, IMF and OEC

Income Elasticity of Trade

VARIABLES	ARDL (1 5 1)	ARDL (1 0 0)	ARDL (1 5 3 1)	ARDL (1 0 0 1)	ARDL (1 5 2 1)	ARDL (1 0 0 1)	ARDL (1 5 2 0 1)	ARDL (1 0 0 0 1)
L.lnx	-0.584***	-0.594***	-0.648***	-0.663***	-0.655***	-0.654***	-0.656***	-0.662***
	(5.3e-08)	(3.5e-08)	(3.3e-09)	(2.8e-09)	(3.2e-09)	(4.8e-09)	(1.9e-09)	(2.9e-09)
L.lny	-2.552***	-2.756***	-2.393***	-2.623***	-2.434***	-2.792***	-2.256***	-2.595***
	(2.5e-08)	(1.3e-09)	(1.1e-07)	(6.2e-10)	(3.9e-09)	(0)	(1.4e-07)	(7.4e-10)
L.lnrer	0.0709	0.0832	0.106	0.0560	-0.0350	0.0167	0.0352	0.0111
	(0.860)	(0.830)	(0.755)	(0.866)	(0.932)	(0.968)	(0.929)	(0.978)
L.blny			-1.326	-1.058			-1.164	-1.080
			(0.172)	(0.248)			(0.243)	(0.255)
L.blnrer					0.468	0.215	0.240	0.0529
					(0.474)	(0.750)	(0.719)	(0.937)
Constant	22.15***	23.62***	23.46***	25.62***	24.42***	26.46***	23.14***	25.54***
	(1.0e-05)	(5.2e-06)	(6.7e-06)	(1.2e-06)	(3.0e-06)	(7.6e-07)	(1.0e-05)	(1.5e-06)
Observations	87	87	88	88	88	88	89	89
IC	aic	bic	aic	bic	aic	bic	aic	bic
CUSUM	Stable	Stable	2.7%	Stable	Stable	Stable	Stable	Stable
CUSUMSQ	5.1%	20.2%	24%	28.7%	Stable	13.8%	26.7%	27.9%
Break	2005Q3	2005Q3	2005Q3	2005Q3	2005Q3	2005Q3	2005Q3	2005Q3
Sample range	93Q1-16 Q3	93Q1-16 Q3	93Q1-16 Q3	93Q1-16 Q3	93Q1-16 Q3	93Q1-16 Q3	93Q1-16 Q3	93Q1-16 Q3
Portmanteau Q	0.873	0.0821	0.750	0.170	0.888	0.234	0.804	0.161
B.Godfrey LM 2	0.108	0.129	0.523	0.584	0.972	0.762	0.802	0.626
B.Godfrey LM 4	0.0645	0.145	0.234	0.531	0.644	0.707	0.407	0.542
Durbin alt 2	0.136	0.139	0.588	0.613	0.977	0.782	0.836	0.657
RESET	0.122	0.368	0.160	0.527	0.268	0.320	0.312	0.502
Bounds F-t	12.49	12.53	11.95	11.39	11.86	11.01	9.998	9.163
r2_a	0.335	0.282	0.390	0.314	0.374	0.306	0.379	0.307
df_r	76	82	73	81	74	81	74	81

pval in parentheses*** p<0.01, ** p<0.05, * p<0.1

Bound Test F - Critical values from Narayan (2005), N=80, k2: 6.78(1%), 5.04(5%), 4.25(10%); k3: 5.96(1%), 4.51(5%), 3.88(10%); k4: 5.51(1%), 4.22(5%), 3.64(10%)

Source: Authors based on data from DOTS, IMF and Bloomberg.

Relative Indicators of Foreign Trade

- Trade Openness Indices: measures the degree of the internationalization of an economy. This index can be calculated in different ways and according to the particular interest of the researcher who might be more interested in exports or imports, or above all in total trade.

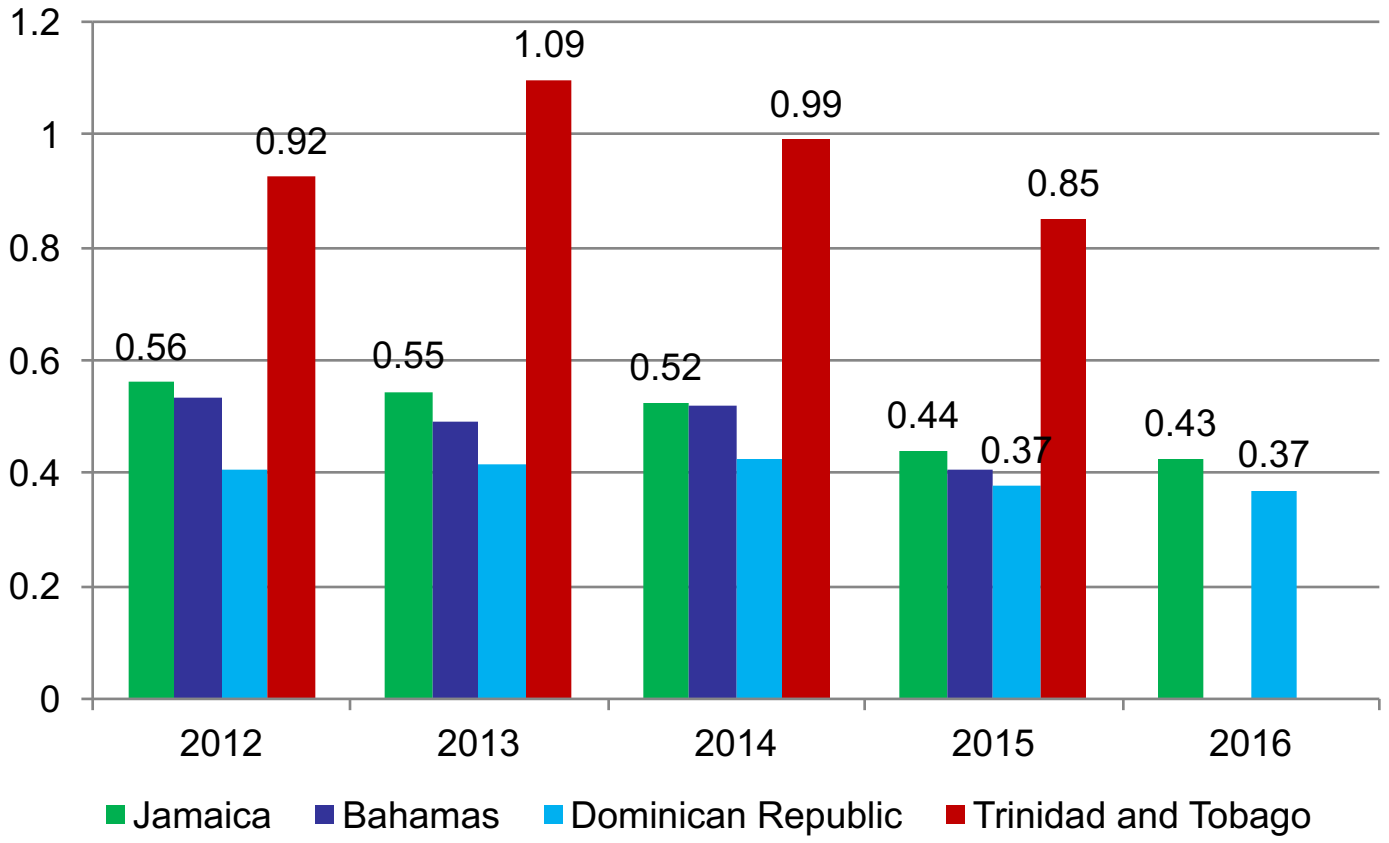
- The per capita indicators allow to compare the trade volume in relative terms, i.e. that would correspond to each individual in an economy.

Relative Indicators of Foreign Trade

- Some possible indices

Type of Index	Calculation	Description
Per capita indices	X_i/N_i	Exports per capita
	M_i/N_i	Imports per capita
	$(X_i+M_i)/N_i$	Trade per capita
Openness indicators	X_i/GDP_i	Openness measured by exports
	M_i/GDP_i	Openness measured by imports
	$(X_i+M_i)/GDP_i$	Openness measured by total trade
	$((X_i+M_i)/2)/GDP_i$	Openness measured by trade average

Openness Indicator



Source: Authors based on data from World Bank and COMTRADE

Exercises

- How are Jamaican exports (HS 6 digit level) positioned in the Mexican market?
  - Calculate IRCA for Mexican imports from Jamaica and identify products (HS 6 digit) with biggest comparative advantage.
  - Calculate IRCA for Mexican imports from countries which compete with Jamaica's biggest exports to Mexico.

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