Assessing the SADC's potential to promote intra-regional trade in agricultural goods

Vinaye Ancharaz

African Development Bank

Presented at the 2nd AGRODEP workshop, June 6, 2011, Dakar, Senegal

Background

- Treatment of agriculture in RTAs
- Importance of agriculture:
  - Contributes 35% of SADC's GDP;
  - About 70 percent of the region's people depend on agriculture for food, income and employment;
  - Dominant source of exports: contributes about 13% to total export earnings and about 66% to the value of intra-regional trade.
- Role of agricultural trade and development in SADC's RISDP.
- Trade as an engine of growth; agricultural trade as an instrument for poverty reduction.
- However, intra-SADC agricultural trade is reported to be marginal: explanations

Figure 1: Key Players in Agricultural Trade in the SADC (2007)

Biggest Exporters (% of Total SADC Agricultural Exports)

Country	Value ($ million)	Percentage
South Africa	4213.90	49.70
Namibia	952.64	11.24
Malawi	742.96	8.76
Mauritius	638.34	7.53
Zimbabwe	564.53	6.66

Smallest Exporters (% of Total SADC Agricultural Exports)

Country	Value ($ million)	Percentage
Madagascar	380.89	4.49
Zambia	345.06	4.07
Mozambique	268.39	3.17
Swaziland	228.61	2.70
Botswana	143.26	1.69

Biggest Exporter (% of Intra SADC Agricultural Exports)

Country	Value ($ million)	Percentage
South Africa	534.39	29.97
Namibia	508.18	28.50
Malawi	210.28	11.79
Zimbabwe	153.89	8.63

Smallest Exporter (% of Intra SADC Agricultural Exports)

Country	Value ($ million)	Percentage
Mauritius	26.52	1.49

Biggest Exporters (% of Intra-SADC Agricultural Exports)

Country	Value ($ million)	Percentage
Zambia	145.84	8.18

Smallest Exporters (% of Intra SADC Agricultural Exports)

Country	Value ($ million)	Percentage
Botswana	77.91	4.37
Swaziland	64.72	3.63
Mozambique	54.57	3.06
Madagascar	6.66	0.37

(Percentage of Intra SADC Agricultural Exports)

	South Africa	Namibia	Malawi	Zimbabwe
o Coffee and Coffee substitutes	12.45	0.82	3.37	13.02
o Cane sugar and confectionery	5.65	2.33	2.26	6.09
o Maize, unmilled	5.53	0.52	0.07	6.27
o Other livestock and meat	3.43	13.24	0.01	0.97
o Tea and Mate	3.21	0.01	47.66	0
o Dairy products and eggs	2.49	28.76	0.01	4.88
o Live Bovine, sheep and horses	2.23	19	0	0.04

Trade Intensity Indices

$$TII = \frac{X_{SADC,SADC} / X_{SADC}}{X_{world,SADC} / X_{world}}$$

Table 1: Trade Intensity Indices for SADC, 2000-2007

	2000	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*
Total exports	19.7	19.0	19.8	19.0	16.5	16.8	15.7	17.7
Agricultural exports	30.9	34.8	35.9	33.2	28.3	29.4	27.3	29.7

Source: Author's computation using COMTRADE data

Revealed Comparative Advantages

SITC CODE	Description	Botswana	Madagascar	Malawi	Mauritius	Mozambique	Namibia	South Africa	Swaziland	Zambia	Zimbabwe
S3-0011, 0012, 0015	Live bovine, sheep and horses	88.88	0.45	0.00	2.08	0.27	751.57	21.84	5.05	0.96	3.83
S3-0013,0014,01	Other livestock and meat (chilled and unchilled)	1655.09	2.05	0.25	2.67	0.24	385.66	43.71	19.61	42.69	33.98
S3-02	Dairy products and eggs	0.01	0.01	0.00	0.02	0.00	0.04	0.15	0.10	0.45	0.31
S3-0341,0342,0371	Fish and fish preparations	0.01	3.14	2.25	7.83	0.25	9.30	1.10	0.02	0.03	0.03
S3-042	Rice	0.10	0.03	0.02	0.01	0.00	0.01	0.04	0.02	0.07	0.00
S3-044	Maize, unmilled	2.01	0.49	48.06	0.40	14.13	0.23	31.19	3.39	94.02	0.18
S3-0461	Flour of wheat or of meslin	0.10	0.00	0.13	0.41	0.21	0.03	0.05	0.05	1.99	n.a.
S3-04711	Maize (corn) flour	0.02	0.00	0.00	0.00	0.02	0.07	0.07	0.00	0.32	0.00
S3-054, 05421,0579	Vegetables and fruits	0.20	2.40	1.08	0.15	1.01	0.44	3.15	0.38	4.44	12.25
S3-05892	Nuts, groundnuts and other seeds, prepared or preserved, n.e.s.	0.84	0.01	3.83	0.04	n.a.	0.02	2.28	0.17	0.52	0.91
S3-06111, 062	Cane sugar and confectionery	5.97	0.23	5.80	33.90	9.97	0.40	3.13	42.26	18.19	4.44
S3-071	Coffee and coffee substitutes	0.05	2.83	0.48	0.00	0.00	0.01	0.17	0.04	2.95	0.26
S3-072	Cocoa	0.01	13.16	0.01	0.00	n.a.	0.03	0.07	0.02	n.a.	0.02
S3-074	Tea	0.02	0.14	11.47	0.06	3.65	0.02	0.27	0.26	0.28	1.44
S3-07521	Vanilla	0.00	17.38	n.a.	0.01	n.a.	0.00	0.01	0.00	0.00	0.00

Trade Complementary Indices

$$TCI_{ijt} = 100 - \sum_{i} \left(\left| m_{it} - x_{it} \right| / 2 \right)$$

Importing country	Countries	Exporting Country								
		Botswana	*Madagascar*	*Malawi*	*Mauritius*	*Mozambique*	*Namibia*	*South Africa*	*Swaziland*	*Zambia*
	Botswana	_..	26.52	38.98	18.23	37.78	24.73	51.97	26.49	57.16
	Madagascar	17.74	_..	28.78	35.61	40.26	25.32	32.91	21.33	51.90
	Malawi	11.25	28.75	_..	8.71	34.62	10.90	28.11	11.37	62.45
	Mauritius	20.94	12.54	30.53	_..	49.37	52.51	43.13	17.78	45.72
	Mozambique	13.20	7.87	25.39	13.29	_..	18.02	48.84	14.36	48.68
	Namibia	26.89	39.98	38.97	35.41	54.43	_..	53.52	39.81	61.30
	South Africa	26.32	19.12	36.62	16.18	29.46	35.77	_..	21.43	51.19
	Swaziland	24.22	17.16	32.84	17.00	32.63	27.71	42.38	_..	55.70
	Zambia	16.81	14.15	30.24	15.36	30.32	20.02	36.30	19.65	_..
	Zimbabwe	12.48	20.83	38.60	9.23	33.48	13.32	28.45	17.18	59.67

Empirical model

$$X_{ijt} = \beta_0 Y_{it}^{\beta_1} Y_{jt}^{\beta_2} N_{it}^{\beta_3} N_{jt}^{\beta_4} L_{ij}^{\beta_5} Z_{ijt}^{\beta_6} D_{ij}^{\beta_7} RTA_{ij}^{\beta_8} \eta_{ijt},$$

Following Soloaga and Winters (2001), and Endoh (1999), we define the RTA dummies, for each bloc, as follows:

- RTA = 1 if both the importer and the exporter are members of a given RTA; zero otherwise;
- RTA1 = 1 if only the exporter is a member of the RTA; zero otherwise; and
- RTA2 = 1 if only the importer is a member of the RTA; zero otherwise.

Regression methodology

- Tobit applied to log-linear specification
- However, recent evidence suggests that Tobit estimates are not unbiased and consistent in the presence of heteroscedasticity
- Alternative estimation procedure: the Poisson Pseudo Maximum Likelihood (PPML) technique
- Gourieroux et al. (1984) and Cameron and Trivedi (1998): PPML estimators are numerically equivalent to the Generalized Method of Moments (GMM) estimators and thus, the data does not have to follow a Poisson distribution to generate consistent estimators.

	Original Model		Add Cultural Dummies		Adding SADC Dummy		Adding Other RTA Dummies	
	Coefficients	*P-value*	*Coefficients*	*P-value*	*Coefficients*	*P-value*	*Coefficients*	*P-value*
log GDP Importer	0.662	(0.000)	0.664	(0.000)	0.692	(0.000)	0.706	(0.000)
log GDP Exporter	0.274	(0.000)	0.272	(0.000)	0.254	(0.000)	0.240	(0.000)
log Population_ Exporter	0.320	(0.000)	0.323	(0.000)	0.228	(0.000)	0.202	(0.000)
log Population_ Importer	-0.068	(0.180)	-0.072	(0.305)	-0.063	(0.377)	-0.023	(0.629)
log Remoteness	-0.043	(0.661)	-0.044	(0.647)	-0.075	(0.467)	-0.086	(0.362)
log Distance	-0.957	(0.000)	-0.873	(0.000)	-0.780	(0.000)	-0.897	(0.000)
Common Language			-0.015	(0.897)	0.173	(0.131)	0.510	(0.000)
Adjacency			0.930	(0.000)	0.923	(0.000)	0.646	(0.000)
SADC					0.739	(0.117)	0.590	(0.116)
SADC1					-12.742	(0.000)	-12.288	(0.000)
SADC2					-0.198	(0.381)	-0.188	(0.353)
COMESA							1.512	(0.000)
COMESA1							-2.425	(0.000)
COMESA2							-0.250	(0.063)
ASEAN							0.845	(0.001)
ASEAN1							0.013	(0.940)
ASEAN2							0.052	(0.711)
EU							-0.023	(0.914)
EU1							-0.006	(0.970)
EU2							0.091	(0.653)
NAFTA							0.364	(0.452)
NAFTA1							0.225	(0.375)
NAFTA2							0.442	(0.263)
MERCOSUR							-1.247	(0.220)
MERCOSUR1							1.508	(0.000)
MERCOSUR2							-0.002	(0.997)
Andean							1.257	(0.010)
Andean1							-0.265	(0.416)
Andean2							-0.987	(0.000)
Constant	-16.704	(0.000)	-17.441	(0.000)	-16.902	(0.000)	-16.200	(0.000)
Pseudo R2	0.371		0.371		0.373		0.375	
Wald χ^2 test	25.24.66 [0.000]		3105.46 [0.000]		8652.26 [0.000]		62786.40[0.000]	
No of observation	91581		91582		91583		91584	

Results and interpretation

- On the whole, the results are robust to variable addition.
- The model yields a reasonably good fit, characteristic of similar models, as measured by the Pseudo-R^2.
- The basic variables – income and population – exhibit the expected signs and are significant.
- Remoteness shows up with the opposite sign and is never significant.
- Physical distance comes up with a negative, and strongly significant, coefficient in all variants of the model.

Results and interpretation/2

- The dummies for common language and common border are both positive and significant in the full model.
- The RTA dummies yield a mix bag of evidence:
  - Few RTAs have stimulated intra-regional trade in agriculture in a significant manner.
  - ASEAN stands out as an outlier: the evidence shows an increase in intra-bloc trade without any significant trade diversion.
- African RTAs – SADC and COMESA – present the same pattern of effects: while there is some evidence of intra-bloc trade creation, this effect has been more than offset by the size of trade diversion.
- In Frankel's (1997) terminology, these two RTAs will be described as "stumbling blocs" in agricultural trade.

SADC's Agricultural Export Potential

	2000			2005			2007		
	Actual	Predicted	Trade Potential	Actual	Predicted	Trade Potential	Actual	Predicted	Trade Potential
Botswana	7.60	204.78	26.96	67.26	212.10	3.15	78.00	200.61	2.57
Madagascar	8.73	184.62	21.15	4.32	188.83	43.72	6.66	178.95	26.87
Malawi	36.52	190.87	5.23	71.04	197.05	2.77	214.11	187.17	0.87
Mauritius	8.07	192.78	23.89	18.40	200.74	10.91	12.32	188.64	15.31
Mozambique	39.03	191.03	4.89	78.20	198.10	2.53	20.10	186.16	9.26
Namibia	172.66	200.86	1.16	488.50	209.60	0.43	322.44	197.96	0.61
South Africa	437.44	206.93	0.47	708.39	215.26	0.30	578.28	203.27	0.35
Zambia	53.37	250.34	4.69	153.19	257.64	1.68	265.74	246.47	0.93

Conclusion and implications for policy

- Consistent with other studies of intra-SSA trade that explain low levels of trade in terms of trade complementarity (Yeats, 1998) or low levels of GDP (Foroutan and Fazeh, 1993)
- Implications for poverty reduction
- Systemic factors?
- Sensitive nature of agricultural products in the SADC's liberalization schedules?