

INTRA-INDUSTRY TRADE IN AGRICULTURAL AND FOOD PRODUCTS: THE CASE OF MOLDOVA

Liliana CIMPOIES, Cornel COSER

State Agrarian University of Moldova, 44 Mircesti Street, Chisinau, Republic of Moldova,
Emails: l.cimpoies@uasm.md, c.coser@uasm.md

Corresponding author: l.cimpoies@uasm.md

Abstract

Among the most discussed issues related to world trade trends in the economic literature belongs to intra-industry trade (IIT). It can be explained as the simultaneous flows of imports and exports of commodities within the same industry group. The paper analyzes the agricultural and food trade of Moldova from different aspects of intra industry trade. The aim is to estimate the trend and extent of intra-industry trade in agricultural and food products of Moldova. The time series from 2001-2015 are examined. The level of intra-industry trade in agricultural and food products for Moldova is quite high (78%). The results of the intra-industrial trade level indicate to a decrease with EU countries and increase in relation with CIS countries. For most commodity groups the GL values present average high variability over time, fact which reflects the structural changes in Moldavian agri-food trade. The values of A indices in both examined periods are very low, fact which indicates that most of changes in trade flows had been inter-industrial by nature and probably have generated high adjustment costs. The switching results of marginal intra-industry trade B index indicate that Moldova's position on these markets considerably improved and strengthened.

Key words: agriculture, intra-industry, marginal intra-industry, trade

INTRODUCTION

The level of integration in world economy for countries which passed through similar transition period was analyzed by many economists (Bergschmidt 1998; Bonjec 2004; Bonjec 2007) [1,2,3,]. In their works the level of competitiveness of one or another branch or country are established. Other scientists (Levkovich 2007; Luka 2004) [11,12]. analyze how these results were achieved using the advantages of labor division by branches or countries, or if they were obtained as result of the (successful/unsuccessful) transition process.

Among the most discussed issues related to world trade trends in the economic literature belongs to intra-industry trade (IIT). It can be explained as the simultaneous flows of imports and exports of commodities within the same industry group. It emphasizes trade in products that are similar but slightly differentiated based on imperfect competition or close substitutes goods demanded in different countries by consumers with distinct preferences (Luka et al 2004) [11].

In the works of Greenway and Milner (2003) [7]. is emphasized that intra industry trade occurs due to traditional theory of comparative costs which is not explaining the simultaneous exports and imports to a country. When IIT exists, economies face with an additional potential source of gain, larger variety, the exchange scale economies and pro-competition effects (Greenway et al 1983) [6]. It is argued that industries with higher levels of IIT, because of trade liberalization, supports less structural changes and less adjustments costs than those with lower levels (Greenaway et al 2003, Hamilton et al 1991, Kandogan 2003) [7, 9].

The international flows had developed during the last decades. The high developed countries are important exporters and producers, often net producers. In the same time, other countries belonging to the emergent economies have become important exporters of agri-food products (Popescu, 2015) [13]. Importers prefer to buy from the markets where products have the best price for the target market, while exporters choose the market with most advantageous product price

(Dinu, 2012) [5].

Agricultural sector constitutes about 12% of the GDP and together with food industry about 30%. Also, in the agricultural sector is also employed about one third of the labor force.

The paper analyzes the agricultural and food trade of Moldova from different aspects of intra industry trade. The aim is to estimate the trend and extent of intra-industry trade in agricultural and food products of Moldova.

MATERIALS AND METHODS

The most common index used to measure the intra-industry trade is the Grubel-Lloyd (1975) [8] index. To calculate the intra-industry trade level (IIT) for an industry i will be:

$$GLIIT_i = \frac{(X_i + M_i) - |X_i - M_i|}{(X_i + M_i)} \times 100 \quad (1)$$

or, it can be written as:

$$GLIIT_i = \left(1 - \frac{|X_i - M_i|}{X_i + M_i}\right) \times 100, \quad (2)$$

where $GLIIT_i$ is the Grubel Lloyd index of intra-industry trade i , X_i and M_i represents the values of exports and imports in industry i .

GL index can take values from 0 to 100. When the GLIT value is zero it indicates that there is no IIT (because exports or imports are zero). When the value is equal to zero, then all trade is IIT (exports equals' imports).

There are many limitations for the GL index to include the dynamics of changes in IIT. Thus indicators based on marginal trade flows that could provide reliable conclusions are needed. First attempt to build an index of marginal intra-industry trade was made by Hamilton and Kniest (1991) [9]. They argued that for the purpose of evaluating the adjustment consequences of trade expansion it was important to focus on how IIT changes at the margin. This index effectively calculated the proportion of the changes in exports or imports.

The most used measures of MIIT is A index (a transposition of GL index to trade changes), developed by Brulhart (1994).

$$MIIT = A = 1 - \frac{|(X_t - X_{t-n}) - (M_t - M_{t-n})|}{|X_t - X_{t-n}| + |M_t - M_{t-n}|}, \quad (3)$$

where n represent the number of years of the relevant adjustment period. It can be written as:

$$A = 1 - \frac{|\Delta X - \Delta M|}{|\Delta X| + |\Delta M|} \quad (4)$$

Similar to GL index, A takes values from 0 to 100. A zero value indicates marginal trade in a particular industry to be completely of inter-industry type, and 100 represents marginal trade to be totally of the inter-industry type. (Greenway and Milner, 1983) [6].

Nevertheless, the A index does not include information concerning the relative trade performance of industries in particular countries. Also, for net exports it reflects trade specialization into or out of particular industries. Thus, Brulhart (1994) [4] proposed the B index:

$$B = \frac{\Delta X - \Delta M}{|\Delta X| + |\Delta M|}, \quad (5)$$

or $|B| = 1 - A$.

The B coefficient takes values from -100 to 100. The closer the B is to zero, the higher is the MIIT and country's specific sector performance. When B is higher than zero, the change in exports was higher than the change in imports. The opposite is true when B is below zero.

This paper is based on secondary data from the National Bureau of Statistics. The research focuses on Moldova's IIT and MIIT in agricultural and food commodities, analyzing time series from 2001-2015

In the present paper the 24 chapters, according to international nomenclature for the classification of products Harmonized Sections (HS) 2012 in two digits for agricultural and food products were analyzed. They were separated into HS 01-15 agricultural products and chapters HS 16-24 – food products. As well, the IIT trade indicators for agricultural and food products in relation with distinct groups of countries: EU, CIS, OECD and other countries is analyzed.

RESULTS AND DISCUSSIONS

Analyzing the trends in Moldova's foreign trade, during the covered time series period an increasing in value of both exports and

imports is observed. Exports increased with 11% and imports with 13%, the overall trade balance remaining negative. The negative trade balance is mainly due to high imports of energy and gas resources (Table 1).

Agri-food products are main exports commodities having a share of 45% in total exports. Unfortunately, their share diminished during the analyzed period with 18%, fact

which affected the agri-food trade balance. Despite agri-food trade balance still remains positive, the amount of agri-food imports increased much more than exports, fact which affects the foreign trade turnover. The average annual growth rate for agri-food exports is 9%, while for agri-food imports reached 13% (Table 1).

Table 1. Value and share of Moldova’s external trade and agri-food trade flows, 2001-2015 (selected years)

	2001	2003	2005	2007	2009	2011	2013	2015	Average growth rate
Exports, Thousands USD	565,494	789,933	1,090,919	1,340,050	1,282,981	2,216,815	2,428,303	1,966,837	1.11
Imports, Thousands USD	892,228	1,402,347	2,292,292	3,689,524	3,278,270	5,191,271	5,492,393	3,986,820	1.13
Agri-food exports, Thousands USD	356,857	463,076	582,715	506,210	604,745	917,103	1,015,546	914,488	1.09
Agri-food imports, Thousands USD	143,298	204,589	279,575	465,914	513,583	687,784	783,795	586,576	1.13
Trade balance, Thousands USD	-326,734	-612,414	-1,201,373	-2,349,474	-1,995,289	-2,974,456	-3,064,090	-2,019,983	x
Agri-food trade balance, Thousands USD	213,559	258,487	303,140	40,296.4	91,162.7	229,318	231,749	327,912	x
Share of Agri-Food exports, %	63.10	58.62	53.41	37.77	47.13	41.37	41.82	45.53	X
Share of Agri-Food imports, %	16.06	14.58	12.19	12.62	15.66	13.24	14.27	13.52	x

Source: own calculations based on data from the National Bureau of Statistics

Summarizing the evolution of agri-food trade flows, also an increasing trend is noticed in agri-food exports from 356,857 thousands USD in 2001 to 914,488 thousands USD in 2015. In 2006-2007 a slight decrease in agri-food exports was noticed, as result of Russia’s first interdiction on wines, one of the main trade partners for Moldova among CIS countries.

The geographical structure also experienced many changes during the analyzed period. Most of agri-food exports until 2006 were oriented to CIS markets (Table 2). In 2007 the share of Moldavian agri-food exports to CIS countries decreased with 30%. This fact denotes a gradual decrease of Moldova’s trade dependence in CIS markets, and closer trade relations with EU and other countries. An

important factor was also the accession of Romania and Bulgaria to EU family in 2007 which also strengthen the relations to EU, as Romania is an important trade partner for Moldova. Also, during this period Moldova benefited of various facilities from EU as through General System of Preferences (GSP+) in 2006 and Autonomous Trade Preferences (ATP) in 2008. Preferences were given for alcoholic drinks, sugar and some agricultural products and others. In 2014 Moldova signed a Deep and Comprehensive Free Trade Agreement (DCFTA) with EU that contributes to deeper trade liberalization with EU.

In general, during 2001-2015 agri-food exports of Moldova in relation to EU countries, OECD countries and other

countries increased considerably, but decreased in relation to CIS countries by 13% (related with several interdictions imposed). In agri-food imports geographical distribution changes also occurred. During analyzed time series, had decreased agri-food imports from EU and other countries, but had increased those from CIS countries. The most important EU agri-food importers come from Romania, Germany, France, Greece, Italy, and Netherlands. The average growth rate of agri-food imports increased with 25% in respect to CIS countries and with 12% and 13% with EU and other countries (Table 2).

Table 2. Geographical structure of Moldavian agri-food trade, thousands USD, 2001-2015

Group of countries		Average		
		2001-2015	2001-2007	2008-2015
EU countries	export	229,918.8	116,310	329,326.6
	import	160,409.68	92,226.29	220,070.2
CIS countries	export	342,601.01	320,812.6	361,665.9
	import	199,341.54	101,087.4	285,314
OECD countries	exports	81,156.21	38,378.97	123,933.5
	imports	66,044.05	47,199.53	84,888.59
Other countries	exports	22,759.66	10,097	35,422.33
	imports	26,659.2	16,895.7	36,422.7
World	export	668,546.17	472,124.4	840,415.3
	import	469,221.8	254,429.9	657,164.7

Source: own calculations based on data from the National Bureau of Statistics

Despite the fact that the share of CIS countries decreased it still represent an important market for Moldova's agri-food exports and any negative event or trend related to this market can threaten the trade stability in the long run. Also, it does not stimulate and strengthen the diversification of Moldova's trade relations with other countries, particularly the EU. The European market is highly competitive and it imposes strong barriers to enter it in terms of quality and food security which makes it difficult to enter it. Thus a boost in the competitiveness of the exported Moldavian agri-food products is needed, and the full use of the existing potential to increase the trade flows with EU. Despite a decrease in the last years, the CIS countries still account about 45% from total agri-food exports. From them, an important trade partner remains Russian Federation which registered a growth of only 3% in agri-food exports. It has a share of about 30% in

exports and 10% in agri-food imports. It includes mostly vegetable products (about 50%), beverages and other alcoholic drinks (35%). The agri-food exports to Russia decreased for the first time in 2006 after the first imposed interdiction on Moldavian wines and other alcoholic drinks. After signing the DCFTA agreement with EU new sanctions were imposed (on wine and other alcoholic drinks, fruits etc), thus decreasing the agri-food exports in 2014-2015. The second largest trade partners for Moldova among CIS countries are Ukraine and Belarus. The trade flows with both increased with 11% and 13% during this period

Regarding the main export destination of Moldova's agri-food exports among the EU countries, the structure of territorial distribution of exports is stable and the main trading partners among EU partners remains the same. Thus the highest share in both exports and imports belongs to Romania. Other important trade partners are Italy, UK, Germany, Poland, France, Greece and Austria. The share of agri-food export to these countries is 85%. The exports to all mentioned countries expanded, particularly a high increase is observed for Italy and Poland (about 5 folds) followed by Greece (almost 3 folds).

Concerning agri-food imports, the top EU importers are: Romania, Germany, Greece, Italy, France, Hungary and Netherlands accounting 67%.

Most of them traditionally have a positive trade balance. A negative trade balance is reached in relation with Hungary and Netherlands.

The analysis of Moldova' intra-industrial agricultural and food products over 2001-2015 is based on Grubel Lloyd (GL) index, calculated by commodity groups and by all trading partners, with respect to a specific group of countries as: EU, CIS, OECD and others.

According to the results (Table 3) the level of intra-industry trade in agricultural and food products for Moldova is quite high. From total trade in this sector, 78% belongs to the intra-industry type.

Table 3. Grubel Lloyd indices of intra-industry trade in agricultural and food trade between Republic of Moldova and its main trading partners, 2001-2015

Group of countries	2001	2003	2005	2007	2009	2011	2013	2015	Average
EU countries	94.2	91.02	93.3	86.9	87.7	71.3	82.7	60.5	85.03
CIS countries	18.2	40.08	40.3	91.9	86.9	83.5	92.2	96.5	68.4
OECD countries	29.5	92.7	76.9	97.06	92.8	95.4	70.7	60.6	81.6
Other countries	40.9	87.10	87.8	61.6	90.1	99.14	94.4	76.1	79.09
World total	57.3	61.2	64.8	95.8	91.8	85.7	87.12	78.1	78.32

Source: own calculations

During the analyzed time series, the GL index tends to decrease with EU countries and increase in relation with CIS countries. The downward trend for EU countries, regarding exports can be explained as the lack of competitiveness for Moldavian agricultural and food products which make it difficult to

access those markets. The upward trend in relation to CIS countries might be caused by the increase of imports from those countries, mainly Ukraine.

The evolution of GL index results by commodity groups is presented in Table 4.

Table 4. Intra industry trade by commodity groups between Moldova and all trading partners, 2001-2015

HS Code	2001	2003	2005	2007	2009	2011	2013	2015	Average
01 Live animals	63.3	35.0	90.5	94.8	37.5	82.5	90.4	89.5	69.4
02 Meat and edible meat offal	66.8	80.6	11.1	46.2	20.2	82.2	58.3	50.7	51.3
03 Fish and fish products	3.7	2.3	2.9	0.83	1.8	0.3	0.04	0.64	2.1
04 Dairy, eggs; honey etc	25.8	89.2	89.2	50.2	37.1	40.4	38.1	71.6	56.9
05 Products of animal origin	10.6	5.8	6.9	10.7	23.4	18.7	18.8	14.1	13.3
06 Live trees, cut flowers	81.3	15.0	7.7	54.8	13.5	36.7	22.4	23.9	31.2
07 Edible vegetables etc	94.8	27.2	70.9	23.7	28.04	78.4	55.7	52.9	57.02
08 Edible fruit and nuts	37.1	28.8	45.1	47.1	48.5	53.5	49.4	55.4	45.9
09 Coffee, tea, mate	1.0	7.9	18.9	15.2	10.2	5.9	4.1	21.4	11.2
10 Cereals	32.0	79.0	15.3	95.3	24.9	24.5	19.0	21.9	36.5
11 Milling products; malt; starches;	7.5	8.6	9.5	0.54	6.9	15.07	5.1	13.3	7.9
12 Oil seeds, seeds etc	66.7	83.9	58.05	78.2	38.2	19.8	27.1	29.3	49.5
13 Lac; gums, resins	1.7	0	0	7.1	4.05	0.096	0.57	12.5	3.01
14 Vegetable plaiting materials	42.9	77.8	78.5	100	37.5	43.9	68.6	4.6	52.3
15 Animal or vegetable fats etc	53.5	31.9	41.4	44.9	48.09	48.8	81.06	43.9	49.1
16 Preparations of meat, of fish	59.2	84.9	26.1	38.07	8.93	0.49	0.30	0.22	27.1
17 Sugars and sugar confectionery	99.2	76.6	95.09	47.4	58.42	77.5	89.5	50.6	74.1
18 Cocoa and cocoa preparations	26.2	26.4	30.2	19.4	24.2	17.8	35.3	43.4	26.8
19 Preparations of cereals, flour	83.4	45.2	36.9	32.2	37.2	43.3	53.5	57.5	45.8
20 Preparations of vegetables	14.2	25.4	45.2	41.5	57.06	53.5	51.3	50.4	47.04
21 Miscellaneous edible preparations	30.5	21.4	14.1	15.2	10.9	16.03	23.4	24.6	18.2
22 Beverages, spirits and vinegar	14.4	15.0	19.5	52.5	46.18	43.4	46.3	40.0	36.02
23 Residues food industry etc	84.2	54.9	71.5	98.2	69.2	95.7	57.01	76.1	78.7
24 Tobacco etc	75.4	58.0	46.8	37.7	30.1	47.2	50.1	35.0	48.7
01-15 Agricultural products	75.9	86.1	82.8	99.2	81.7	72.2	78.5	67.9	81.0
16-24 Food products	47.7	45.2	54.2	92.8	98.4	96.3	97.1	94.5	78.8
01-24 Total agricultural and food products	57.3	61.2	64.8	95.8	91.8	85.7	87.1	78.1	78.3

Source: own calculations

For some commodity groups the GL values present high variability over time, fact which reflects the structural changes in Moldavian agri-food trade. High and average magnitudes of intra-industry trade presents the following commodities: Live animals (HS01), Meat and edible meat offals (HS02), Dairy, honey

(HS04), Edible vegetable (HS07), Edible fruit and nuts (HS08), Oil seeds (HS12), Vegetable planting materials (HS13), Animal or vegetable fats (HS14), Sugars (HS 17), Preparations of cereals (HS 19), Preparations of vegetables (HS20), Residues food industry (HS23), Tobacco (HS24). Low levels of intra-

industry trade exhibits Fish and fish products (HS03), Products of animal origin (HS 05), Coffee, tea, mate (HS09), Milling products, malt, starches (HS01). The commodities with low levels are mostly imported, mainly exotic products that are not produced in Moldova.

According to Kandogan (2003) [10] intra-industrial trade is more common in sector with significant product differentiation, but in those with standardized products trade tends to be more inter-industrial.

The measure of the extent of intra-industrial trade through changes in GL index, so far do not include potential adjustment costs. Thus, in order to complement the traditional intra-industry analysis we use measures of marginal intra-industry trade (MIIT), which according to Brulhart (1994) [4] is measured through A and B indices.

Table 5 presents the results for A indices for agricultural and food commodities during two time periods 2001-2007 and 2008-2015 of the trade flows with the specific group of countries. The highest share belonged to CIS countries in the first period and lately it decreased to 0.97 in 2008-2015. A decreasing tendency is valid also for EU countries. Also higher shares benefit other countries presenting and increasing tendency.

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In general all values of A indices in both period are very low, fact which indicates that most of changes in trade flows had been inter-industrial by nature and probably have generated high adjustment costs.

Table 5. Marginal intra industry trade in agro-food products of Moldova, by trade partners 2001-2015 (A indices)

Group of countries	2001-2007	2008-2015
EU countries	0.73	0.17
CIS countries	1.96	0.97
OECD countries	0.65	0.91
Other countries	1.18	1.58
World total	1.36	0.27

Source: own calculations

To measure the sectoral trade performance and marginal intra-industry trade, B index is used (Brulhart, 1994) [4]. The analysis of marginal intra industry trade using B index is applied for Moldova's agricultural and food trade with EU countries, CIS countries, OECD countries, and other countries.

From B index results (Table 6), all groups except OECD countries have negative values of B index in the first period indicating that there are more agricultural and food products with low performance.

Contrary during 2008-2015 most groups of countries present positive values for B index.

Table 6. Allocation of Marginal IIT B indices for Moldova's agricultural and food trade by main trade partners, 2001-2015

Group of countries	2001-2007	2008-2015
EU countries	1.01	0.81
CIS countries	-1.56	0.01
OECD countries	0.47	-0.083
Other countries	-0.16	0.58
World total	-0.68	1

Source; own calculations.

It indicates that Moldova's position on these markets improved substantially and strengthened during the second period. Then an increase of Moldavian trade position on the world agricultural markets is observed.

CONCLUSIONS

Moldova's agri-food trade flows experiences important changes during the examined time series. Both Moldova's exports and imports flows increased considerably, while agri-food imports increased faster than exports.

Moldova is a landlocked country, and its geographic position imposes difficulties in terms of costs for trade collaboration with many countries. In the same time close trade relations with neighboring countries are maintained. A strengthen of trade relations with EU was accentuated due to the trade agreements signed, as GSP plus, ATP and the DCFTA.

The level of intra-industry trade in agricultural and food products for Moldova is quite high (78%). The results of the intra-industrial level (GL) indicate a decrease with EU countries and increase in relation with CIS countries. The downward trend for EU countries, regarding exports can be explained as the lack of competitiveness for Moldavian agricultural and food products which make it difficult to access those markets. For most commodity groups the GL values present average high variability over time, fact which reflects the structural changes in Moldavian agri-food trade.

The values of A indices in both examined periods are very low, fact which indicates that most of changes in trade flows had been inter-industrial by nature and probably have generated high adjustment costs. The

switching results of marginal intra-industry trade B index from positive to negative values during 2001-2007 and 2008-2015 indicates that Moldova's position on these markets improved substantially and strengthened during the second period. Then an increase of Moldavian trade position on the world agricultural markets is observed.

Trade liberalization has as a positive outcome an increase in the volume of agri-food exports of Moldova, particularly in terms of specialization and concentration of production and diversification of the geographical distribution. Another positive result is the decrease in the dependence on traditional markets. This fact imposed the increase in both quality and variety of exported articles. It is important to maintain the positions in relation with the main trading partners and to gather new market shares.

REFERENCES

- [1] Bergschmidt, A., Hartmann, M., 1998, Agricultural Trade Policies and Trade relations in transition economies, Discussion Paper 12, Institute of Agricultural Development in Central and Eastern Europe (IAMO). Halle (Saale).
- [2] Bonjec, S., Hartmann, M., 2004, Agricultural and Food Trade in Central and Eastern Europe: The Case of Slovenian Intra-Industry Trade and Induced Structural Adjustment Costs. IAMO Discussion Paper 65, Institute of Agricultural Development in Central and Eastern Europe (IAMO). Halle (Saale).
- [3] Bonjec, S., Ferto, I., 2007, Comparative advantages in agro-food trade of Hungary, Croatia and Slovenia with the European Union. Discussion paper 106, Institute of Agricultural Development in Central and Eastern Europe (IAMO). Halle (Saale).
- [4] Blurhart, M., 1994, Marginal intra-industry trade: Measurement and the relevance for the pattern of industrial adjustment, *Weltwirtschaftliches Archiv*, 103(3), pp.600-613.
- [5] Dinu, T. A., Arghiroiu, G. A., Stoian, E., Darie, O. D., Pătrașcu, G., 2012, The Romanian external trade in sugar and confectionary products. *AgroLife Scientific Journal*, Vol. 1(1): pp 202-206.
- [6] Greenway, D., Milner C., 1983, On the measurement of intra-industry-trade, *Economic Journal* 93, pp.900-908.
- [7] Greenway, D., Milner, C., 2003, What have we learned from a generation's research on intra-industry trade?, *Leverhulme Centre for Research on Globalization and Economic Policy: GEP Research Paper 2002/44*.
- [8] Grubel, H.G., Lloyd, P.J., 1975, Intra-industry trade:

the theory and measurement of international trade in differentiated products, Wiley, London and New York.

[9]Hamilton, C., Kniest, P., 1991, Trade liberalization, structural adjustment and intra-industry trade, *Weltwirtschaftliches Archiv*, 127(2), pp. 356-367.

[10]Kandogan, T., 2003, Intra-industry trade of transition countries: trends and determinants, William Davidson Working Paper Nr.566.

[11]Luka, O., Levkovich, I., 2004, Intra-industry trade in agricultural and food products: the case of Ukraine. Discussion paper 78, Institute of Agricultural Development in Central and Eastern Europe (IAMO). Halle (Saale).

[12]Levkovich, I., Hockmann, H., 2007, Foreign Trade and Transition process in agri-food sector of Ukraine. Discussion paper 114, Institute of Agricultural Development in Central and Eastern Europe (IAMO). Halle (Saale).

[13]Popescu, A., 2015, Some considerations on the world agri-food trade and the positions of the EU-28. *Scientific Papers Series "Management, Economic Engineering in Agriculture and rural development"*, Vol. 15(4): pp 247-256.