PRICE AND QUALITY COMPETITION STRATEGIES OF POLISH AGRI-FOOD PRODUCTS EXPORTERS

Łukasz Ambroziak

Abstract

The aim of the paper is to present changes in competitive position of Polish agri-food exports to the selected countries in 2003-2011. The study covers the world market and several EU countries: Germany, the United Kingdom, France, the Netherlands, Ireland, Austria, the Czech Republic, Slovakia, Hungary, and some non-EU countries: Ukraine, Russia, the United States, and Turkey. To follow and asses those changes, the Aiginger's method has been employed. It gives information on both the type of competing strategy (price or quality competition) and the effectiveness of adopted strategy (surplus or deficit in volume terms). Research results show that after the EU accession, successful quality and price competition strategy prevailed in Polish agri-food exports in the world market. However, substantial changes in adopted strategies occurred in the individual countries in question. Polish agri-food products' exporters differentiated their competing strategies both across foreign markets and across product groups.

Key words: Polish agri-food exports, Aiginger's method, competition strategy, competitiveness

JEL Code: F14, F15

Introduction

Poland's accession to the EU stimulated Polish foreign trade in agri-food products and revealed significant comparative advantages of producers of such products. The position of Polish food producers in the world market has been systematically strengthening. In 2003-2011 the agri-food exports rose 4.8 times and the agri-food imports 4.4 times. As a result of faster growth in exports than in imports, the Polish foreign trade balance in foodstuffs has been systematically improving. A surplus in agri-food products recorded by Poland in 2011 amounted to 3.6 billion USD and was 7.5 times higher than in 2003. The competitiveness of Polish agri-food products exporters in the EU market and in the world market is based both on

competition in prices and in quality of exported goods. These factors enhance the competitiveness and are decisive for the acceptance of the Polish products by potential consumers from other countries (Ambroziak & Szczepaniak 2009, Szczepaniak 2010).

The aim of the paper is to present the changes in competitive position of Polish agri-food exporters to selected countries in 2003-2011. The study covers the world market and several EU countries: Germany, the United Kingdom, France, the Netherlands, Ireland, Austria, the Czech Republic, Slovakia, Hungary, and some non-EU countries: Ukraine, Russia, the United States, and Turkey. Data on foreign trade flows come from the Comtrade database provided by the World Bank and UNCTAD.

1 Theoretical background

In the evaluation of trade flows quality analysis has been principally undertaken with the use of unit value indices which measure the average price of a bundle of items from the same general product grouping. The rationale for using unit values as an indicator of quality is that, assuming perfect information, a variety sold at a higher price must be of higher quality than a variety sold more cheaply (Greenaway, Hine & Milner, 1994). Even with imperfect information, prices will reflect quality (Stiglitz, 1987). In the short run, however, consumers may buy a more expensive product out of ignorance, or inertia, or because it is costly to switch suppliers (Oulton, 1990). Price is then an (imperfect) indicator of quality, and is certainly the most accessible source of information about consumer assessments of products. In one way or another, all studies of quality in international trade start from the position that, at least at a very disaggregated level, relative prices reflect relative qualities (Greenaway, Hine & Milner, 1994).

The price-quality concept was developed by K. Aiginger to assess whether the external performance of a country depends on pure price competitiveness (i.e. low costs) or non-price competitiveness (i.e. quality or innovations). The methodology is based on the unit value of exports and imports, and enables to discriminate between good markets where the quantity trade depends more on price competitiveness, and those markets where quantity traded reflects more quality competition (Aiginger, 1997).

Price competition prevails in those markets where products are homogeneous, and where the production technique is not country-specific. For these products, unit values should reflect average costs and countries with lower costs should be net exporters, while countries

with higher costs should be net importers. On the other hand, when quality and product innovation are the important competitive factors, a higher unit value will reflect the ability to set prices. A country will be a net exporter despite the fact that it has higher unit values, because of quality matters (Aiginger, 1998).

2 Method of the study and data

An important assumption of the analysis is a presence of the intra-industry trade on the level of a given product group, here on the level of HS chapter. The absence of trade flows in Poland's trade with a given country makes it impossible to calculate unit value for the products group (HS chapter). To follow and asses the competition strategy in Polish agri-food exports, the Aiginger's method is employed. It is based on two variables, that is a relation between unit values (price) in exports and unit values (price) in imports and trade balance in volume terms.

The unit values in exports and imports were calculated according to the following equations:

Equation 1.

$$UV_{kk'}^{ex(im)} = \sum_{j=1}^{m}\sum_{i=1}^{n}\frac{V_{ij}^{ex(im)}}{Q_{ij}^{ex(im)}} \cdot \frac{V_{ij}^{ex(im)}}{\sum_{j=1}^{m}\sum_{i=1}^{n} V_{ij}^{ex(im)}},$$

where:

$UV_{kk'}^{ex(im)}$ – unit value in exports (imports) of product groups *k* (here: HS chapter or total agri-food trade) in Polish trade with a given country or country group *k* (here: world),

$V_{ij}^{ex(im)}, Q_{ij}^{ex(im)}$ – value and volume (in kg) of Polish exports (imports) of a product *i* to (from) country *j*,

i – product at the six-digit level of HS classification,

n – number of products in a product group *k*,

j – country,

m – number of countries in a country group *k'*.

In other words, the unit value was calculated bilateral (in Polish trade with each trade partner) at the six-digit level of HS classification and then aggregated to the level of chapter HS in Polish trade with selected countries or in total trade.

Trade balance was calculated in volume terms at the level of HS chapter in Polish trade with selected countries or in total trade.

Application of those two variables allows to divide Polish agri-food exports into four segments:

Segment 1: successful quality competition strategy. The segment combines product groups where the exported quantities exceed import ones, despite a higher unit value in exports than in imports ($UV_{ex} > UV_{im}, Q_{ex} > Q_{im}$). This has to be the consequence of a quality lead, which is reflected in demand or, signals successful specialisation in the most sophisticated market segment.

Segment 2: successful price competition strategy. The segment contains goods, where unit value is lower in exports than in imports, which allows to indicate a trade surplus in volume terms ($UV_{ex} < UV_{im}, Q_{ex} > Q_{im}$).

Segment 3: potentially successful quality competition strategy. The segment combines product groups which are characterised by higher unit value in exports and imports, but a trade deficit in volume terms is still recorded ($UV_{ex} > UV_{im}, Q_{ex} < Q_{im}$).

Segment 4: unsuccessful price competition strategy. Product groups run a trade deficit (in volume terms) despite unit value lower in exports than in imports ($UV_{ex} < UV_{im}, Q_{ex} < Q_{im}$).

Tab. 1: Competition profile of a country (matrix of competitiveness)

	$UV_{ex} > UV_{im}$	$UV_{ex} < UV_{im}$
$Q_{ex} > Q_{im}$	**Segment 1: successful quality competition strategy**	**Segment 2: successful price competition strategy**
$Q_{ex} < Q_{im}$	**Segment 3: potentially successful quality strategy**	**Segment 4: unsuccessful quality competition strategy (structural problem area)**

Source: Own studies based on Aiginger (1997).

Thus, the Aiginger's method gives information on both the type of competing strategy (price or quality competition) and the effectiveness of adopted strategy (trade surplus or deficit in volume terms).

3 Research results

3.1. Competition strategies of Polish agri-food products exporters in the world market

Successful quality competition segment after Poland's accession to the EU encompassed three groups of products, that is meat and edible meat offal, preparations of meat and fish as well as preparations of cereals and pastrycooks' products (tab. 2). It means that export quantities of products of these HS chapters exceeded import quantities despite of higher unit values in exports than in imports. In the whole period in question Polish food producers competed also as regards the quality (higher prices in exports than in imports) in foreign sales of tobacco and tobacco products as well as cocoa and cocoa preparations in the global market. However, the adopted strategy became successful in 2008 and 2011 respectively.

Tab. 2: Competition strategies of Polish agri-food products exporters in the world market in 2003-2011

HS chapter	Chapter description	2003	2004	2005	2006	2007	2008	2009	2010	2011
01	Live animals	2	2	2	2	2	2	1	4	4
02	Meat and edible meat offal	1	1	1	1	1	1	1	1	1
03	Fish and seafood	3	3	3	3	3	3	3	3	3
04	Dairy produce	2	2	2	2	2	2	2	2	2
05	Products of animal origin n.e.s.	4	4	4	4	2	2	2	2	2
06	Live trees and other plants	3	3	3	4	3	3	3	3	3
07	Vegetables	2	2	2	1	2	2	2	2	2
08	Fruit and nuts	3	4	4	3	3	3	2	4	4
09	Coffee, tea and spices	3	3	3	3	3	3	3	3	3
10	Cereals	4	4	2	2	4	4	2	2	4
11	Products of the milling industry	3	4	3	3	3	3	3	3	3
12	Oil seeds and oleaginous fruits	4	2	2	4	2	4	4	2	4
13	Vegetables saps and extracts	4	4	3	3	3	4	4	4	4
14	Vegetable products n.e.s.	2	2	2	4	2	4	3	4	3
15	Animal or vegetable fats and oils	4	4	4	4	4	4	4	4	4
16	Preparations of meat and fish	1	1	2	1	1	1	1	1	1
17	Sugars and sugar confectionery	2	2	2	2	1	1	3	1	3
18	Cocoa and cocoa preparations	3	3	3	3	3	3	3	3	1
19	Preparations of cereals and pastrycooks' products	1	1	1	1	1	1	1	1	1
20	Preparations of vegetables and fruits	1	2	2	1	2	1	2	2	1
21	Miscellaneous edible preparations	2	2	2	2	2	2	2	2	2
22	Beverages and spirits	4	4	4	2	4	4	4	4	4
23	Residues and prepared animal fodder	3	3	3	3	3	3	3	3	3
24	Tobacco and tobacco products	3	3	3	3	3	1	1	1	1

Notes: 1 – successful quality competition strategy, 2 – successful price competition strategy, 3 – potentially successful quality competition strategy, 4 – unsuccessful price competition strategy.
Source: Own calculations based on WITS-Comtrade.

In exports of some groups of products, the price competition (unit values in exports lower than in imports) allowed to reach a surplus in volume terms. The successful price competition segment contained in the whole post-accession period tree chapter HS, namely dairy produce, vegetables and miscellaneous edible preparations. In the first several years after EU accession Polish exporters competed in the world market as regards the price of exported live animals and the adopted strategy was successful. However, since 2010 a deficit (in volume terms) in trade of live animals was observed. Successful price competition strategy characterised also sugar and sugar confectionery at the beginning of post-accession period. Since 2007 Polish exporters competed in terms of quality in foreign sales of these products and the adopted strategy was usually successful. In the period of 2003-2011 substantial changes in the relation between unit values in exports and unit values in imports of preparations of vegetables and fruits were noticed. Despite of variable competition strategy Poland had permanent surplus in trade of these products. Since 2007 a successful strategy characterised also trade in products of animal origin n.e.s. These products had a marginal share in Polish agri-food exports, however.

In 2003-2011 Poland competed as regards quality in exports of some groups of products but the adopted strategy proved unsuccessful. It concerned fish and seafood, live trees and other plants, coffee, tea and spices, products of the milling industry as well as residues and prepared animal fodder. A competition strategy in exports of fish and seafood as well as coffee, tea and spices was mainly an effect of reexports development, in means processing using imported materials[1].

In the period in question the unsuccessful price competition strategy characterised Polish exports of animal or vegetable fats and oils as well as beverages and spirits. Although unit values in exports were lower than in imports, Poland did not obtain surpluses in the trade of these products.

[1] For example, Poland specialises in Atlantic salmon processing using imported materials. Poland exports smoked salmon of a relatively high unit value (quality), while imports a larger amount of fresh or chilled salmon of a relatively low unit value (quality). The main recipient of Polish smoked salmon is Germany.

3.2. Competition strategies of Polish agri-food products exporters in the selected markets[2]

The competition strategy of Polish agri-food products' exporters differed across a sample of selected countries (tab. 3)[3]. The unit values in Polish exports of meat and edible meat offal to the EU-15 countries in question were higher than in imports, while in exports to the new Member States in question higher prices were recorded in imports (except for the Czech Republic). The quality competition strategy was successful in exports to Austria, France, the Netherlands, the Great Britain, Italy, the Czech Republic and Germany (until 2007), while in trade with Denmark and Germany (after 2007) a trade deficit (in volume terms) was observed. Polish trade of meat and edible meat offal with Denmark is a good example of inefficient quality competition strategy. Denmark is one of the largest meat suppliers to Poland (mainly pork carcases and half-carcases), while Poland exported only a small amount of pork hams and shoulders. Therefore, the prices in meat exports were higher than in imports and import quantities exceeded the export quantities. Furthermore, in Polish exports of meat to Hungary, Slovakia and Lithuania a successful price competition strategy was noticed.

In Polish exports of dairy produce to the countries in question, a successful price strategy prevailed and it was very stable after the EU accession. Higher prices in imports than in exports resulted from the commodity structure of trade. Poland exported relatively cheap products (i.e. powdered milk, powdered whey, yogurts) and imported relatively expensive ones (i.e. cheeses). The exceptions were only the Czech Republic, Ukraine, Hungary (only in some years) and Lithuania, where Polish exporters competed on quality of sold dairy products and the adopted strategy was successful (except for Lithuania).

In most markets Polish producers competed on quality of exported tobacco and tobacco products. The adopted strategy was successful in the whole post-accession period in the case of Austria, the Czech Republic, Hungary and Slovakia or became successful after the EU accession – in France, Great Britain, Italy and Turkey. In turn, successful price competition strategy characterised exports of tobacco and tobacco products to Denmark, the

[2] The analysis covered only those chapters, which didn't have marginal significance in Polish agri-food trade.
[3] In Polish agri-food exports to some markets, the indication of the competition strategy was impossible. It was a result of three reasons: lack of exports, lack of imports and lack of both exports and imports of a group of products. Lack of one of trade flows makes it impossible to calculate a relation between unit value in exports and unit value in imports. Such relation is one of two variables which enable to determine the competition strategy.

Netherlands, Germany (until 2009) and Russia. The structural problem area, where unit values in imports were lower than in exports but imports quantities nevertheless exceeded exports quantities, concerned Polish supplies to the United States.

Competition strategies in exports of preparations of meat and fish were relatively less diversified across countries. In most markets Polish producers competed in terms of price and the adopted strategy proved successful (surplus in volume terms). Higher unit values in exports than in imports characterised only Polish trade of these products with Germany and Denmark (since 2008).

Competition strategies in Polish exports of cocoa and cocoa preparations were especially diversified and unstable during the period in question. In the whole post-accession period, Poland had successful quality competition strategy in exports of these products to Denmark, Great Britain, the Czech Republic and Turkey, potentially successful competition strategy (higher prices in exports than in imports but deficit in volume terms) in exports to France and Germany and successful price competition strategy in exports to Austria and the United States. It is worth to mention that Poland exported relatively cheap cacao and cacao to the Netherlands, but imports quantities nevertheless exceeded exports quantities (unsuccessful price competition strategy).

After Poland's accession to the EU, a quality competition strategy prevailed in exports of preparations of cereals and pastrycooks' products to most countries in question. The adopted strategy allowed to reach surpluses (in volume terms) in trade with Denmark, Great Britain, the Czech Republic, Hungary, Lithuania, Russia, Turkey, Ukraine. Higher unit values in exports of preparations of cereal and pastrycooks' products were also recorded in case of Germany, Austria and Italy but Poland did not reach surpluses in the trade of these products. In turn, lower prices in exports allowed to reach surpluses (in volume terms) in the trade with Slovakia and United States. Unsuccessful price competition strategy concerned Polish trade with the Netherlands and France.

Conclusion

Using price and quality competition method, exports of Polish agri-food products was divided into four segments containing products of different competition strategy in the global market. After Poland's accession to the EU the export pattern was less stable than in the pre-accession period. Unstable were mainly the shares of exports being an effect of successful price and quality strategy. It means that Polish agri-food products' exporters were flexible in adopting competition strategy and rapidly reacted to the changing situation in the foreign markets. As a

result, 48% of Polish agri-food exports in 2011 was a result of successful quality competition strategy (15 p.p. more than in 2003) and 23% was a result of successful price competition strategy (10 p.p. less than in 2003). The share of agri-food exports resulting from the two other strategies was significantly lower and amounted to nearly 30% (Ambroziak & Szczepaniak 2012).

After Poland's accession to the EU successful quality competitive strategy characterised Polish exports of meat and edible meat offal, preparations of meat and fish as well as preparations of cereals and pastrycooks' products, tobacco and tobacco products (since 2008) as well as cocoa and cocoa preparations (since 2011). In turn, the price competition strategy allowed to reach a surplus (in volume terms) in trade of the following product groups: dairy produce, vegetables, miscellaneous edible preparations and – at the beginning of the post-accession period – also sugar and sugar confectionery. Substantial changes in the competitive position of Polish agri-food products in the analysed countries occurred in the period in question. Polish agri-food exporters differentiated their competing strategies both across foreign markets and across product groups. The relatively less diversified across countries were competition strategies in Polish exports of the following product groups: dairy produce, preparations of meat and fish, beverage and spirits as well as fruits and nuts.

References

Aiginger, K. (1997). The use of unit values to discriminate between price and quality competition. *Cambridge Journal of Economics*, *21*, 571-592.

Aiginger, K. (1998). Unit values to signal the quality position of ceecs. In Y. Wolfmayr (Ed.), *The Competitiveness of Transition Countries* (pp. 93-121). OECD Publishing.

Ambroziak, Ł., & Szczepaniak, I. (2009). Ocena wskaźnikowa konkurencyjności handlu produktami rolno-spożywczymi. In I. Szczepaniak (Ed.), *Ocena konkurencyjności polskich producentów żywności po akcesji do Unii Europejskiej (synteza)*Warsaw: Institute of Agricultural and Food Economics - National Research Institute.

Ambroziak, Ł., & Szczepaniak, I. (2012). Jakościowo-cenowe wskaźniki konkurencyjności w handlu produktami rolno-spożywczymi Polski. In I. Szczepaniak (Ed.), *Monitoring i ocena ocena konkurencyjności polskich producentów żywności (2)* Warsaw: Institute of Agricultural and Food Economics - National Research Institute.

Greenaway, D., Hine, R., & Milner, C. (1994). Country specific factors and the pattern of horizontal and vertical intra-industry trade in the United Kingdom. *Weltwirtschaftliches Archiv*, *130*(1), 77-100.

Oulton, N. (1990). Quality and performance in United Kingdom trade 1978-1987. *NIESR Discussion Paper*, *197*.

Stiglitz, J. E. (1987). The causes and consequences of the dependence of quality price. *The Journal of Economic Literature*, *25*, 1-48.

Szczepaniak, I. (2010). The competitiveness of Polish food producers after accession to the European Union. In R. Urban, I. Szczepaniak & R. Mroczek (Eds.), *The Polish food sector in the first years of membership: (synthesis)* Warsaw: Institute of Agricultural and Food Economics - National Research Institute.

Contact

Łukasz Ambroziak
Institute of Agricultural and Food Economics - National Research Institute
Świętokrzyska 20, 00-002 Warsaw
lukasz.ambroziak@ierigz.waw.pl

Tab. 3. Competition strategies in Polish agri-food products in the selected markets after Poland's accession to the EU

Country	Meat and edible meat offal (2)	Fish and seafood (3)	Dairy produce (4)	Vegetables (7)	Fruit and nuts (8)	Coffee, tea and spices (9)	Animal or vegetable fats and oils (15)	Preparations of meat and fish (16)	Sugars and sugar confectionery (17)	Cocoa and cocoa preparations (18)	Preparations of cereals and pastrycooks' products (19)	Preparations of vegetables and fruits (20)	Miscellaneous edible preparations (21)	Beverages and spirits (22)	Residues and prepared animal fodder (23)	Tobacco and tobacco products (24)
Austria	1		2	1	1	4 3	4 2	2 3	2	2	3	2 1	3	4	2 1	1
Denmark	3	1	2	1			4	3 1		1	2 1	1	4		2	2
France	1	1	2	1	2	2	4	2	3	3	4					3 1
Germany	1 3	1	2	1	2	3		1	2	3	3	2	4	2	3	2 1
Great Britain	1	3	2		1 2			2	2 1	1	1	2	2	2	2 1	3 1
Italy	1	1	2	3	3	4	4	2			3	3	4	4	4	3 1
Netherlands	1	3	2	3	1	3	4		3	4	2 4	1 3	4 2	2 4	3 2	2
Czech Rep.	1	1	1	1	2	1 2	3 1	2		1	1	1	1	4	3	1
Hungary	2	3	2 1		3	1		2	1	2 1	1	3	1	2	4 3	1
Lithuania	2	4	1 3	2	2	1	4 1	2	1 2	2 1	1	1	1 2	2	3	
Slovakia	2		2	2	2	2	1	2	3		2	1 2	1	2	3	1
Russia		4		2	2	1	2 3	2		2 1	1	2	1	2	1	2
Turkey				4 3		3 4			4 3	1	1	4	2	2	1	3 1
Ukraine		2	1	2	2	1	3		2 3	2 1	1	1	1	3	3	
USA		3	1 2	1	4 3	2	2	2	2 2	2	2	2	2	2	3	4

Notes: The analysis covered eight years of Poland's membership in the EU. Three different situations were specified: 1) one strategy was reported (for a given country and for a given product group) only in those cases, where a given strategy was observed during at least five years; 2) two strategies were reported if there were a visible change of adopted strategy noticed (for example, at the beginning of post-accession period, a successful quality competition strategy was recorded and then a successful price competition strategy); none strategy was recorded if the adopted competition strategies were changeable. 1 – successful quality competition strategy, 2 – successful price competition strategy, 3 – potentially successful quality competition strategy, 4 – unsuccessful price competition strategy.

Source: Own calculations based on WITS-Comtrade.