



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

BULLETIN
of the Szent István University

SPECIAL ISSUE

PART II.

Gödöllő
2008

Editorial Board

Prof. György Füleki CSc. – *Chairman of the Editorial Board*

Prof. Miklós Mézes DSc. *editor*

Prof. Béla M. Csizmadia CSc.

Prof. Tamás T. Kiss CSc.

Prof. Gyula Huszenicza DSc.

Prof. Gábor Reischl DLA

Prof. István Szűcs DSc.

Edited by the Guest Editorial Board

Katalin Takács-György CSc, – *Chairman of the Guest Editorial Board*

József Lehota DSc

István Takács PhD

László Villányi CSc

With the support of

Faculty of Economics and Social Sciences, Szent István University

Management and Business Administration PhD School of Szent István University

Szerkesztőség

Szent István Egyetem

2103 Gödöllő, Páter Károly u. 1.

Kiadja a Szent István Egyetem

Felelős kiadó

Dr. Solti László egyetemi tanár, rektor

Technikai szerkesztő

Szalay Zsigmond Gábor

Felelős szerkesztő

Dr. Mézes Miklós egyetemi tanár

ISSN 1586-4502

Megjelent 380 példányban

Foreword

Tradition and Innovation – International Scientific Conference of (Agricultural) Economists Szent István University, Gödöllő, 3-4 December, 2007

Tradition and Innovation – International Scientific Conference was held on December 3-6, 2007, in the frames of the anniversary programme series organized by the School of Economics and Social Sciences of the Szent István University. The aim of the conference was to celebrate the 50th anniversary of introduction of agricultural economist training in Gödöllő, and the 20th anniversary of the School of Economics and Social Sciences, which was founded in 1987.

The articles published in the special edition of Bulletin 2008 of the Szent István University were selected from the 143 presentations held in 17 sections of the conference and 30 presentations held at the poster section. The presentations give a very good review of questions of national and international agricultural economics, rural development, sustainability and competitiveness, as well as the main fields of sales, innovation, knowledge management and finance. The chairmen of the sections were Hungarian and foreign researchers of high reputation. The conference was a worthy sequel of conference series started at the School of Economics and Social Sciences in the 1990s.

Előszó

Tradíció és Innováció – Nemzetközi Tudományos (Agrár)közgazdász Konferencia Szent István Egyetem, Gödöllő, 2007. december 3-4.

2007. december 3-6. között a Szent István Egyetem Gazdaság- és Társadalomtudományi Kara (SZIE GTK) által szervezett jubileumi rendezvénysorozat keretében került megrendezésre a Tradíció és Innováció – Nemzetközi Tudományos Konferencia, amelynek célja volt, hogy méltón megünnepelje a gödöllői agrárközgazdász képzés fél évszázada történet elindítását, s ugyanakkor a Gazdaság- és Társadalomtudományi Kar 1987-ben történt megalapításának 20. évfordulóját.

A Szent István Egyetem által kiadott Bulletin 2008 évi különszámában megjelentetett cikkek a konferencián 17 szekcióban elhangzott 143 előadásból, illetve a poszter szekcióban bemutatott 30 előadásból kerültek kiválasztásra. Az előadások jó áttekintést adtak a hazai és nemzetközi agrárközgazdaság, vidékfejlesztés, a fenntarthatóság és versenyképesség kérdései mellett az értékesítés, innováció, tudásmenedzsment, pénzügy fontosabb területeiről is. Az egyes szekciók elnöki tisztjét elismert hazai és külföldi kutatók töltötték be. A konferencia a Gazdaság- és Társadalomtudományi Karon az 1990-es években elkezdett konferencia sorozat méltó folytatása volt.

Dr. László Villányi
Dean / dékán

Contents / Tartalomjegyzék

Part I. / I. kötet

Agricultural and rural development and international view

Agrár- és vidékfejlesztés, nemzetközi kitekintés

ÁCS, SZ. – DALLIMER, M. – HANLEY, N. – ARMSWORTH, P.: Impacts of policy reform on hill farm incomes in UK.....	11
BIELIK, P. – RAJČÁNIOVÁ, M.: Some problems of social and economic development of agriculture.....	25
BORZÁN A. – SZIGETI C.: A Duna-Körös-Maros-Tisza Euro régió gazdasági fejlettségének elemzése a régiók Európájában.....	37
CSEH PAPP, I. Regionális különbségek a magyar munkaerőpiacon.....	45
NAGY, H. – KÁPOSZTA, J.: Convergence criteria and their fulfilment by the countries outside the Euro-zone.....	53
OSZTROGONÁCS, I. – SING, M. K.: The development of the agricultural sector in the rural areas of the Visegrad countries.....	65
PRZYGDZKA, R.: Tradition or innovation – which approach is better in rural development? The case of Podlasie Region.....	75
TAKÁCS E. – HUZDIK K.: A magyarországi immigráció trendjei az elmúlt két évtizedben.....	87
TÓTHNÉ LŐKÖS K. – BEDÉNÉ SZŐKE É. – GÁBRIELNÉ TŐZSÉR GY.: országok összehasonlítása néhány makroökonómiai mutató alapján.....	101
VINCZE M. – MADARAS SZ. Analysis of the Romanian agriculture in the period of transition, based on the national accounts.....	111

Agricultural trade and marketing

Agrárkereskedelem, marketing

ADAMOWICZ, M.: Consumer behavior in innovation adaptation process on fruit market	125
FÉNYES, T. I. – MEYER, N. G. – BREITENBACH, M. C.: Agricultural export and import assessment and the trade, development and co-operation agreement between South Africa and the European Union.....	137
KEMÉNYNÉ HORVÁTH ZS.: The transformation of market players on the demand-side of the grain market.....	151
LEHOTA J. – KOMÁROMI N.: A feldolgozott funkcionális élelmiszerek fogyasztói szegmentálása és magatartási jellemzői.....	159
LEHOTA J. – KOMÁROMI N.: Szarvasgomba fogyasztói és beszerzési magatartásának szegmentálása és jellemzői.....	169
NYÁRS, L. – VIZVÁRI, B.: On the supply function of the Hungarian pork market.....	177
SZAKÁLY Z. – SZIGETI O. – SZENTE V.: Fogyasztói attitűdök táplálkozási előnyökkel kapcsolatban.....	187
SZIGETI O. – SZENTE V. – MÁTHÉ A. – SZAKÁLY Z.: Marketing lehetőségek az állati eredetű hungarikumok termékpályáján.....	199
VÁRADI K.: Társadalmi változások és a marketing kapcsolatának modellezési lehetőségei.....	211

Sustainability and competitiveness
Fenntarthatóság, versenyképesség

BARANYAI ZS. – TAKÁCS I.: A hatékonyság és versenyképesség főbb kérdései a dél-alföldi térség gazdaságaiban.....	225
BARKASZI L.: A kukoricatermesztés hatékonyságának és eredményességének vizsgálata 2003-2006 évi tesztüzemi adatok alapján	237
JÁMBOR A.: A versenyképesség elmélete és gyakorlata	249
LENCSEŠ E.: A precíziós gazdálkodás ökonómiai értékelése.....	261
MAGÓ, L.: Low cost mechanisation of small and medium size plant production farms	273
SINGH, M. K. – KAPUSZTA, Á. – FEKETE-FARKAS, M.: Analyzing agriculture productivity indicators and impact of climate change on CEECs agriculture	287
STRELECEK, F. – ZDENĚK, R. – LOSOSOVÁ, J.: Influence of farm milk prices on profitability and long-term assets efficiency	297
SZÉLES I.: Vidéki versenyképesség-versenyképes vidékfejlesztés: AVOP intézkedések és azok kommunikációjának vizsgálata.....	303
SZŐLLŐSI L. – NÁBRÁDI A.: A magyar baromfi ágazat aktuális problémái.....	315
TAKÁCS I. – BARANYAI ZS. – TAKÁCS E. – TAKÁCSNÉ GYÖRGY K.: A versenyképes virtuális (nagy)üzem	327
TAKÁCSNÉ GYÖRGY K. – TAKÁCS E. – TAKÁCS I.: Az agrárgazdaság fenntarthatóságának mikro- és makrogazdasági dilemmái	341
Authors' index / Névjegyzék.....	355

Part II. / II. kötet

Economic methods and models

Közgazdasági módszerek, modellek

BARANYI A. – SZÉLES ZS.: A hazai lakosság megtakarítási hajlandóságának vizsgálata	367
BHARTI, N.: Offshore outsourcing (OO) in India's ites: how effective it is in data protection?	379
BORSZÉKI É.: A jövedelmezőség és a tőkeszerkezet összefüggései a vállalkozásoknál ...	391
FERTŐ, I.: Comparative advantage and trade competitiveness in Hungarian agriculture ...	403
JÁRÁSI É. ZS.: Az ökológiai módon művelt termőterületek nagyságát befolyásoló tényezők és az árutermelő növények piaci pozíciói Magyarországon.....	413
KODENKO J. – BARANYAI ZS. – TAKÁCS I.: Magyarország és Oroszország agrárstruktúrájának változása az 1990-es évektől napjainkig.....	421
OROVA, I. – KOMÁROMI, N.: Model applications for the spread of new products in Hungarian market circumstances	433
REKE B.: A vállalkozások egyensúlyi helyzetének változáskövető vizsgálata	445
ŠINDELÁŘ, J.: Forecasting models in management.....	453
SIPOS N.: A környezetvédelmi jellegű adók vizsgálata a fenntartható gazdálkodás vonatkozásában	463
VARGA T.: Kényszerű „hagyomány”: értékvesztés a mezőgazdasági termékek piacán.....	475
ZÉMAN Z. – TÓTH M. – BÁRCZI J.: Az ellenőrzési tevékenység kialakítási folyamatának modellezése különös tekintettel a gazdálkodási tevékenységeket érintő K+F és innovációk elszámolására	485

Land utilization and farm structure

Földhasználat, gazdaságstruktúra

FEHÉR, I. – MADARÁSZ I.: Hungarian land ownership patterns and possible future solutions according to the stakeholders' view	495
FEKETE-FARKAS, M. – SINGH, M. K. – ROUNSEVELL, M. – AUDSLEY, E.: Dynamics of changes in agricultural land use arising from climate, policy and socio-economic pressures in Europe	505
LAZÍKOVÁ, J. – BANDLEROVA, A. – SCHWARCZ, P.: Agricultural cooperatives and their development after the transformation	515
ORLOVITS, ZS.: The influence of the legal background on the transaction costs on the land market in Hungary.....	525
SADOWSKI, A.: Polish land market before and after transition	531
SZÚCS, I. – FARKAS-FEKETE M. – VINOGRADOV, S. A.: A new methodology for the estimation of land value	539

Innovation, education
Innováció, tudásmenedzsment

BAHATTIN, C. – PARSEKER, Z. – AKPINAR BAYIZIT, A. – TURHAN, S.: Using e-commerce as an information technique in agri-food industry.....	553
DEÁKY Z. – MOLNÁR M.: A gödöllői falukutató hagyományok: múlt és jelen.....	563
ENDER, J. – MIKÁCSÓ, A.: The benefits of a farm food safety system.....	575
FARKAS, T. – KOLTA, D: The European identity and citizenship of the university students in Gödöllő.....	585
FLORKOWSKI, W. J.: Opportunities for innovation through interdisciplinary research ...	597
HUSTI I.: A hazai agrárinnováció lehetőségei és feladatai	605
KEREKES K.: A Kolozs megyei Vidéki Magyar fiatalok pályaválasztása.....	617
SINGH, R. – MISHRA, J. K. – SINGH, M. K.: The entrepreneurship model of business education: building knowledge economy.....	629
RITTER K.: Agrár-munkanélküliség és a területi egyenlőtlenségek Magyarországon.....	639
SZALAY ZS. G.: A menedzsment információs rendszerek költség-haszon elemzése	653
SZÉKELY CS.: A mezőgazdasági vállalati gazdaságtan fél évszázados fejlődése.....	665
SZÚCS I. – JÁRÁSI É. ZS. – KÉSMÁRKI-GALLY SZ.: A kutatási eredmények sorsa és haszna	679
Authors' index / Névjegyzék.....	689

COMPARATIVE ADVANTAGE AND TRADE COMPETITIVENESS IN HUNGARIAN AGRICULTURE

FERTŐ, IMRE

Abstract

The complementarities of trade advantage and trade competitiveness measures for Hungarian agro-food trade with the European Union are analyzed. The stability and duration of the trade measures over time is investigated by the survival analysis using the nonparametric Kaplan-Meier product limit estimator and the consistency test between the trade measures is conducted by the stratified Cox proportional hazard model. Hungary experienced greater number of products with relative trade disadvantages and greater significance of one-way imports. Hungary experienced relative trade advantages for bulk raw commodities, processed intermediates, and horticulture, with the greatest significance of successful quality competition and one-way exports, and the lowest significance of unsuccessful price and unsuccessful quality competition. The duration of relative trade advantages is longer than the duration for the successful trade competition categories. Our results confirm that the relative trade advantage is consistent with the one-way export and the successful price and successful quality competition categories in two-way trade on one side, and the relative trade disadvantage with the one-way import and the unsuccessful price and unsuccessful quality competition on the other.

Keywords: analyses of trade measure methods, relative disadvantages, Kaplan-Meier product limit estimator, Cox proportional hazard model

Introduction

During the last half of century applied trade literature has developed three main concepts for measuring comparative advantages, trade specialization, and trade competitiveness: revealed comparative trade advantage measures (e.g., Liesner, 1958; Balassa, 1965; Vollrath, 1991; Hinloopen and van Marrewijk, 2006), intra-industry trade indices (e.g., Grubel and Lloyd, 1975; Greenaway et al., 1994, 1995; Fontagné et al., 1997), and categories of price vs. quality and non-price competitiveness (e.g., Aiginger, 1997, 1998; Gehlhar and Pick, 2002; Bojnec and Fertő, 2007). So far little attention and limited research is available to bridge these strands in applied literature. This motivated our research to classify trade types, complementarities and consistency between measures of comparative advantages, intra-industry trade indices, and trade competitiveness categories in the case of agro-food trade.

It is known from the literature that measures of comparative advantages and intra-industry trade are more clearly defined than measures of competitiveness both theoretically and empirically (e.g. Porter, 1990; Krugman, 1994; Kennedy et al., 1997). The theory of comparative advantage predicts that trade flows exist as a result of relative cost differences between trading partners. It suggests that countries are competitive in goods and services in which they have a relative cost advantage. The comparative advantage captures structural features of the sector and economy, which are more stable in long-run. The only difference between comparative advantage and competitiveness is that the latter includes also market distortions. Barkema et al. (1991) emphasized the role of distortion in agricultural markets and thus asserted that competitiveness takes a more realistic view about the world. The competitiveness is changing in short-run under impacts of different sector-specific,

macroeconomic and other influences that can be related to market and policy distortions with associated transfers such as from the use of agricultural subsidies. Lafay (1992) explains two significant differences between comparative advantage and trade competitiveness. Firstly, competitiveness usually involves a cross-country comparison for a particular product, whilst comparative advantage is measured between products within a country. Secondly, competitiveness is subject to changes in macroeconomic variables, whereas comparative advantage is structural in nature. Thus empirical analyses that focus on comparative advantage and trade competitiveness may lead different results as a reason for inconsistencies and dissimilarities in results and findings (e.g. Fertő and Hubbard 2003). However, comparative advantage and competitiveness share all interdependencies and dynamic aspects of an economy. According to Aiginger (1998) there might be some significant complementarities and consistencies in measures of comparative advantage and trade competitiveness.

The main novelty of this paper is in clear differentiation between price, quality and non-price competitiveness in trade data combining the knowledge from trade competitiveness (Aiginger, 1997, 1998; Gehlhar and Pick, 2002) and intra-industry trade literature (Greenaway et al., 1994, 1995; Fontagné et al, 1997), and bridging the gap in applied trade literature establishing complementarities and consistencies between comparative advantages, categories of price and quality competition in two-way matched trade flows, and categories of non-price competition in one-way trade flows. As empirical applied examples are employed data on agro-food trade between Hungary and EU-15 member countries. The paper investigates comparative advantages and categories of competitiveness in trade data, magnitude and dynamics of comparative advantages and different competition categories, their dynamics, causalities and consistencies.

The rest of the paper is structured as follows. In the next section we explain methodology and data used. After then we present the empirical results of the nature of comparative advantages, price and quality competitiveness, and one-way trade. We describe the evolving pattern in magnitude, structures, and dynamics of agro-food trade in Hungary employing recently developed empirical procedures based on the modified revealed comparative advantage index proposed by Vollrath (1991). We separate the one-way trade from the two-way price competition and quality competition trade categories adopting Gehlhar and Pick (2002) to investigate successful price and successful quality competition categories in the matched two-way trade flows. Then we check the consistency and similarity between revealed comparative advantage and trade competitiveness. The final section concludes.

Methodology and data

The nature of comparative advantage and trade competitiveness are the main methodological approaches that are applied in this paper. The ability to compete in international and domestic markets depends on price competitiveness and/or product quality in two-way matched trade or on some other factors that are important for one-way trade. Export-to-import unit value approach and trade balance allow us to investigate the price and quality competitiveness in two-way trade. In addition, employing trade data this can contribute to a better understanding of the evolution in the revealed comparative advantage of Hungarian agro-food sector.

The concept of 'revealed' comparative advantage was introduced by Liesner (1958), but refined and popularized by Balassa (1965) and therefore known as the 'Balassa index', is widely used empirically to identify a country's weak and strong export sectors. Porter (1990)

uses it to identify strong sectoral clusters, Amiti (1998) analyses specialization patterns in Europe, Proudman and Redding (2000) and Redding (2002) focus on the dynamics of comparative advantage, Bojnec (2001) analyses agricultural trade, Hinloopen and Van Marrewijk (2001, 2004) study the dynamics of the empirical distribution of European and Chinese trade, and Fertő and Hubbard (2003) analyze comparative advantage and trade competitiveness in Hungarian agro-food sectors. The Revealed Comparative Advantage (RCA) index is defined by Balassa (B) (1965) as follows:

$$B = (X_{ij} / X_{it}) / (X_{nj} / X_{nt})$$

where X represents exports, i is a country, j is a commodity, t is a set of commodities, and n is a set of countries. B is based on observed trade patterns. It measures a country's exports of a commodity relative to its total exports and to the corresponding export performance of a set of countries, e.g., the EU-15. If $B > 1$, then a comparative advantage is revealed.

Vollrath (1991) offered an alternative specification of revealed comparative advantage, called by the relative trade advantage (RTA), which accounts for exports as well as imports. It is calculated as the difference between relative export advantage (RXA), which equates to the Balassa (B) index, and its counterpart, relative import advantage (RMA):

$$RTA = RXA - RMA$$

where,

$$RXA = B$$

and

$$RMA = (M_{ij} / M_{it}) / (M_{nj} / M_{nt})$$

where M represents imports. Thus,

$$RTA = [(X_{ij} / X_{it}) / (X_{nj} / X_{nt})] - [(M_{ij} / M_{it}) / (M_{nj} / M_{nt})]$$

If $RTA > 0$, then a comparative advantage is revealed, i.e. a sector in which the country is relatively more competitive in terms of its trade. Similarly as the $RXA=B$ index, the RTA is based also on observed trade patterns. It measures a country's exports and imports of a commodity relative to its total exports and imports, respectively, to the corresponding export and import performance of a set of countries (EU-15), which are used as the benchmark of comparison. We classify RTA index in three categories: $RTA < 0$ refers to all those product groups with a comparative trade disadvantage. $RTA = 0$ refers to all those product groups in a break even point without trade advantage or trade disadvantage. $RTA > 0$ refers to all those product groups with a comparative trade advantage. These boundaries are consistent with theoretical interpretation appropriate for cross-country comparisons.

Besides the nature of comparative advantage, we also employ the methodological approach that distinguishes between price and quality competitiveness in matched two-way trade from non-price competitiveness in the one-way trade. Unit values of exports and imports by products have been used for assessing price competitiveness and product quality in two-way matched trade data (e.g. Abd-el-Rahman, 1991; Aiginger, 1997; Ulff and Nielsen, 2000). Aiginger (1997, 1998) and Gehlhar and Pick (2002) employ the unit value difference and the trade balance by product to categorize trade flows in four categories:

Category 1. $TB_{(i,j)} > 0$ (or $X_{(i,j)} > M_{(i,j)}$) and $UVD_{(i,j)} < 0$ (or $UV_{(i,j)}^x < UV_{(i,j)}^m$)

Category 2. $TB_{(i,j)} < 0$ (or $X_{(i,j)} < M_{(i,j)}$) and $UVD_{(i,j)} > 0$ (or $UV_{(i,j)}^x > UV_{(i,j)}^m$)

Category 3. $TB_{(i,j)} > 0$ (or $X_{(i,j)} > M_{(i,j)}$) and $UVD_{(i,j)} > 0$ (or $UV_{(i,j)}^x > UV_{(i,j)}^m$)

Category 4. $TB_{(i,j)} < 0$ (or $X_{(i,j)} < M_{(i,j)}$) and $UVD_{(i,j)} < 0$ (or $UV_{(i,j)}^x < UV_{(i,j)}^m$)

where the trade balance ($TB_{(i,j)}$) is calculated as $TB_{(i,j)} = X_{(i,j)} - M_{(i,j)}$ where $X_{(i,j)}$ is the value of the i -th product exports from a home (domestic) country (CE-5, respectively) to the j -th partner country (EU-15) and $M_{(i,j)}$ is the value of the i -th product imports to the home country from the j -th partner country. In other words, one country's exports are another country's imports, and vice versa. The unit value difference ($UVD_{(i,j)}$) is calculated as $UVD_{(i,j)} = UV_{(i,j)}^x - UV_{(i,j)}^m$ where $UV_{(i,j)}^x$ is the export unit value, which is calculated as $UV_{(i,j)}^x = X_{(i,j)} / Q_{(i,j)}^x$ and $UV_{(i,j)}^m$ is the import unit value, which is calculated as $UV_{(i,j)}^m = M_{(i,j)} / Q_{(i,j)}^m$. In these calculations, $Q_{(i,j)}^x$ and $Q_{(i,j)}^m$ are quantities of exports and imports, respectively, between the home country i and the partner country j . Trade balances indicate successful or unsuccessful competition in trade and export-import unit values determine price or quality competition. The four price and quality competition categories approach is applied only on the matched *two-way* trade flows satisfying the simultaneous conditions of the unit value difference and the trade balance by product. In the matched two-way trade flows in the first and third categories the home country i is successful in price and quality competition, respectively, and vice versa in the second and fourth categories where the home country is unsuccessful in price and quality competition.

We disentangle the one-way trade from the two-way matched trade. When the one-way trade occurs then the net direction of trade is either surplus, which consists only from exports or deficit, which consists only from imports. For the *one-way* trade we distinguish the two possible one-way non-price competition categories, i.e. only one-way export category or only one-way import category, that occur when holds the following conditions (Bojnec and Fertő, 2007):

Only export category: $TB_{(i,j)} > 0$ (or $X_{(i,j)} > 0, M_{(i,j)} = 0$) and $UV_{(i,j)}^m = 0$

Only import category: $TB_{(i,j)} < 0$ (or $X_{(i,j)} = 0, M_{(i,j)} < 0$) and $UV_{(i,j)}^x = 0$.

Moreover, our investigations are focused on the stability and duration of the RTA indices and trade competitiveness categories over time for particular product groups by the survival analysis (Jenkins, 2005). Furthermore, the consistency of the RTA indices with trade competitiveness categories is analyzed by a stratified Cox proportional hazard model.

The duration analysis of comparative advantage and trade competitiveness categories is estimated by the survival function, $S(t)$, across product types by using the nonparametric Kaplan-Meier product limit estimator. We assume that a sample contains n independent observations denoted $(t_i; c_i)$, where $i = 1, 2, \dots, n$, t_i is the survival time, and c_i is the censoring indicator variable C taking a value of 1 if failure occurred, and 0 otherwise of observation i . Moreover, we assume that there are $m < n$ recorded times of failure. The rank-ordered survival times are denoted as $t(1) < t(2) < \dots < t(m)$. Yet, n_j denotes the number of

subjects at risk of failing at $t(j)$ and d_j denotes the number of observed failures. The Kaplan-Meier estimator of the survival function is then:

$$\hat{S}(t) = \prod_{t^{(i)} < t} \frac{n_j - d_j}{n_j},$$

with the convention that $\hat{S}(t) = 1$ if $t < t(1)$. Given that many observations are censored then we note that the Kaplan-Meier estimator is robust to censoring and use information from both censored and non-censored observations.

Finally, we also conducted the consistency tests as a cardinal measure between pairs of comparative trade advantage (RTA indices) and trade competition types' categories. We estimate a stratified Cox proportional hazard model:

$$h_s(t, \mathbf{x}, \beta) = h_{s0}(t) \exp(\mathbf{x}' \beta),$$

where \mathbf{x} denotes a vector of explanatory variables and β is to be estimated. The baseline hazard, $h_{s0}(t)$, characterises how hazard function changes as a function of time and is different strata, s .

To conduct the empirical analysis on comparative advantages and trade competitiveness types in the Hungarian agro-food trade, respectively, with the EU-15, we use detailed trade data from Organisation for Economic Cooperation and Development (OECD) by the years 1995-2003. Agro-food trade is defined by EU-Commission (1999). Sample consists of 255 items at four-digit level in Standard International Trade Classification (SITC) system. Following Chen et al. (2000) we classify agro-food trade into four commodity groups: bulk raw commodities, processed intermediates, consumer-ready food, and horticulture.

Empirical results

1 Comparative advantage and trade competitiveness

Our results indicate a large variation in the RTA indices (Table 1). Negative value of median indicates that the greater number of agro-food products experience $RTA < 0$ on the EU-15 markets. According to the degree of processing, the RTA is negative for consumer-ready food. Hungary explores comparative trade advantage for bulk raw commodities, processed intermediaries and for horticulture.

Two-way trade is prevailing for agro-food products between the Hungary and the EU-15. Whithin two-way trade the successful quality competition (Category 3) is the most significant following by the successful price competition (Category 1). Successful price and successful quality competition represent almost three-fourth of two-way trade in Hungary. Unsuccessful quality competition is the least significant for Hungary, whilst the share of unsuccessful price competition (Category 2) is somewhat higher in two-way trade.

Table 1 Description statistics for RTA (1995-2003)

RTA	
Maximum	644.27
Minimum	-544.48
Standard deviation	77.18
Median	-0.03
Mean value	4.02
RTA<0 (number of products)	959
RTA>0 (number of products)	742
Mean value of RTA	
Bulk raw commodities	18.83
Processed intermediates	8.89
Consumer-ready food	-6.27
Horticulture	3.04

Source: own calculations based on OECD data

Table 2 Classifying trade flows (structures in %, mean values, 1995-2003)

Competitiveness categories	Share
One-way trade	7.3
Two-way trade	92.7
One-way export	2.6
One-way import	97.4
Category 1	32.9
Category 2	10.1
Category 3	41.0
Category 4	16.1

Source: own calculations based on OECD data

2 Duration of comparative advantage and trade competitiveness

We test whether comparative advantage or trade competitiveness is more stable over time using the duration analysis. Table 3 reports the survival rates for the years 1, 5 and 9 and the survival rates for the year 9 by product groups. Our results confirm a priori expectation that the duration of comparative advantages is longer than the duration for the successful trade competitiveness categories. Within the successful trade competitiveness categories, the duration of successful price competition is longer than the duration of successful quality competition and much longer than the duration of the one-way exports. The RTA and successful price competition are more stable for bulk of commodities and to a lesser extent for processed intermediates than for consumer-ready food and horticulture. The RTA and the successful trade competition categories are the most stable for Hungary. These results suggest the importance of factor endowments and structural determinants for long-term sustainability of comparative advantages and successful price competition.

Table 3 Kaplan-Meier Survival Rates for comparative advantage and trade competitiveness

	Product groups (9 year)						
	<i>1 year</i>	<i>5 year</i>	<i>9 year</i>	bulk raw commodities	processed intermediates	consumer- ready food	horticulture
RTA>0	0.94	0.65	0.12	0.29	0.12	0.09	0.07
Categories 1 and 3, and one-way export	0.93	0.63	0.12	0.23	0.11	0.12	0.04
Category 1	0.91	0.56	0.05	0.16	0.04	0.04	0.02
Category 3	0.90	0.49	0.02	0.01	0.02	0.03	0.02
One-way export	0.89	0.45	0.00	0.00	0.00	0.00	0.00

Source: own calculations based on OECD data

3 Consistency between comparative advantage and trade competitiveness

We want to establish complementarities and consistencies between the measures of comparative advantages, categories of price and quality competition in two-way matched trade, and categories of non-price competition in one-way trade. We first present the mean value of the RTA>0 and RTA<0 by trade competitiveness categories (Table 4). The negative RTA's values are (absolutely) the largest for one-way import, the unsuccessful price competition (Category 2) and unsuccessful quality competition (Category 4). On the other hand, the positive RTA's values are the largest for one-way export, the successful price competition (Category 1) and successful quality competition (Category 3). These results reveal the consistency between the comparative advantage and the successful price and successful quality competition and one-way exports on one side, and between the comparative disadvantage and the unsuccessful price and unsuccessful quality competition and one-way imports on the other.

Table 4 Mean of RTA by trade competitiveness categories

	Category 1	Category 2	Category 3	Category 4	One-way export	One-way import
Hungary						
RTA<0	-1.874	-4.76	-4.17	-4.04		-21.41
RTA>0	30.432	0.27	14.03	0.30	42.209	

Source: own calculations based on OECD data

The Cox proportional hazard estimates using the trade competitiveness categories and product groups as a dependent variable are presented in Table 5. Dummy variables for the trade competitiveness categories are defined as one for the successful competitiveness categories and zero otherwise. We present the results as hazard rates. An estimated hazard rate coefficient less than (greater than or equal to) one is interpreted that the variable lowers (increases or has no impact on) hazard rate. The empirical results confirm our expectations that being a competitive product this decreases significantly the hazard rate of the comparative advantage for the trade competitiveness categories. The hazard rate is found to be lower for trade competitiveness in general than for successful price or non successful price competitiveness, respectively. The lowest hazard rate can be observed for one-way export.

Table 5 Cox Proportional Hazard Estimates for Competitiveness Groups

	Competitiveness groups				Product groups			
	Total	Category 1	Category 3	one-way export	bulk raw commodities	Processed intermediates	consumer-ready food	horticulture
Hungary	0.15	0.16	0.26	0.00	1.57	1.01	0.82	0.83
p-value	0.000	0.000	0.000	0.000	0.000	0.811	0.004	0.076

Source: own calculations based on OECD data

The hazard rates show a mixed result by product groups by the degree of processing. Bulk raw commodities increase the hazard rate significantly, while consumer-ready foods horticultural products lower the hazard rate.

Conclusions

The comparative advantage, price and quality competition, and non-price competitiveness in Hungarian agro-food trade on the EU-15 markets have been analyzed. The complementarities and consistencies in measures of comparative advantages and trade competitiveness are clearly confirmed. In our example of agro-food trade between Hungary and the EU-15 we have found that Hungary experiences greater number of products with comparative trade disadvantages and much greater significance of one-way imports. The duration rate to stay the comparative advantage is a bit longer than the duration rate to stay the successful price competition or successful quality competition or one-way export. This confirms that the comparative advantage captures more stable long-run structural features of the sector and economy than trade competitiveness measures. Hungary has comparative advantages for several agro-food products, particularly for bulk raw commodities, processed intermediates, and horticulture, with the greatest significance of successful quality competition and one-way exports, and the lowest significance of unsuccessful price and unsuccessful quality competition. Finally, our results confirm that irrespective that measures of comparative advantages and trade competitiveness are not the same measure, there is a greater consistency between comparative advantage and trade competitiveness measures when trade competitiveness types are decomposed at highly disaggregated trade data. In our specific analyzed case the comparison of measures of comparative advantages and trade competitiveness and the estimated hazard rates confirm that the comparative advantage measure is consistent with the one-way export, the successful price and successful quality competition in two-way trade on one side, and the comparative disadvantage with the one-way import, the unsuccessful price and unsuccessful quality competition on the other.

Acknowledgements

The author gratefully acknowledges financial support from the Hungarian Scientific Research Fund No. 37868 'The International Agricultural Trade: Theory and Practice'.

References

- ABD-EL-RAHMAN, K. (1991): Firms' competitive and national comparative advantages as joint determinants of trade composition, *Weltwirtschaftliches Archiv*, 127, No. 1: pp. 83-97.
- AIGINGER, K. (1997): The use of unit values to discriminate between price and quality competition, *Cambridge Journal of Economics*, 21, No. 5: pp. 571-592.
- AIGINGER, K. (1998): A framework for evaluating the dynamic competitiveness of

- countries, *Structural Change and Economic Dynamics*, 9: 159-188.
- AMITI, M. (1998): New trade theories and industrial location in the EU, *Oxford Review of Economic Policy*, 14, No. 2: pp. 45-53.
- BALASSA, B. (1965): Trade liberalization and revealed comparative advantage, *The Manchester School of Economic and Social Studies*, 33, No. 1: pp. 99-123.
- BARKEMA, A., DRABENSTOTT, M. AND TWEETEN, L. (1991): The competitiveness of U.S. agriculture in the 1990s in agricultural policies, In: Allen, K. (Ed.) *The 1990s in Agricultural Policies in the New Decade. Resources for the Future*, National Planning Association, Washington, D.C. pp. 253-284
- BOJNEC, Š. (2001): Trade and revealed comparative advantage measures: regional and Central European agricultural trade, *Eastern European Economics*, 39, No. 2: pp. 72-98.
- Bojnec, Š., and Fertő, I. (2007). Catching-up process of European enlargement: Hungarian and Slovenian agricultural, food and forestry trade. *Eastern European Economics*, 45, No. 5: pp. 5-34
- CHEN, K., XU, L., and DUAN, Y. (2000). Ex-post competitiveness of China's export in agri-food products: 1980-1996. *Agribusiness*, 16, No. 3: pp. 281-294.
- EU-Commission (1999): The Agricultural Situation in the European Community. 1998 Report. Brussels.
- FERTŐ, I., and HUBBARD, L.J. (2003): Revealed comparative advantage and competitiveness in Hungarian agri-food sectors, *The World Economy*, 26, No. 2: pp. 247-259.
- FONTAGNÉ, L., FREUNDENBERG, M., and PERIDY, N. (1997). Trade patterns in the Single Market. CEPII, Working paper N° 97-07.
- GEHLHAR, M.J., and PICK, D.H. (2002): Food trade balances and unit values: what can they reveal about price competition?, *Agribusiness*, 18 No. 1: pp. 61-79.
- GREENAWAY, D., HINE, R.C., and MILNER, C.R. (1994). Country-specific factors and the pattern of horizontal and vertical intra-industry trade in the UK. *Weltwirtschaftliches Archiv*, 130, No. 1: pp. 77-100.
- Greenaway, D., Hine, R.C., and Milner, C.R. (1995). Vertical and horizontal intra-industry trade: A cross-industry analysis for the United Kingdom. *Economic Journal*, 105, No. 5: pp. 1505-1518.
- GRUBEL, H.G., and Lloyd, P.J., (1975) *Intra-Industry Trade: The Theory and Measurement of International Trade in Differentiated Products* (London).
- HINLOOPEN, J. and VAN MARREWIJK, C. (2001): On the empirical distribution of the Balassa index, *Weltwirtschaftliches Archiv*, 137, No. 1: pp. 1-35.
- HINLOOPEN, J. and VAN MARREWIJK, C. (2004): Dynamics of Chinese Comparative Advantage. Tinbergen Institute Working Paper, 2004-034/2, Amsterdam.
- HINLOOPEN, J. and VAN MARREWIJK, C. (2004): Comparative Advantage, the Rank-size Rule, and Zipf's Law. Tinbergen Institute Discussion Paper, TI 2006-100/1, Amsterdam.
- JENKINS, S.P. (2005). Survival Analysis. Colchester, UK: Institute for Social and Economic Research, University of Essex.
- KENNEDY, P.L., HARRISON, R.W., KALAITZANDONAKES, N.G., PETERSON, H.C. and RINDFUSS, R.P. (1997): Perspectives on evaluating competitiveness in agribusiness industries, *Agribusiness*, 13, No. 4: 385-392.
- KRUGMAN, P. (1994): Competitiveness: a dangerous obsession, *Foreign Affairs*, 73, No. 2: 28-44.
- LAFAY, G. (1992): The Measurement of Revealed Comparative Advantages. In: Dagenais, M.G. and Plunet, P-A. (Eds.) *International Trade Modelling*. Chapman & Hall, London, pp. 209-236.

- LIESNER, H.H. (1958): The European Common Market and British industry, *Economic Journal*, 68: 302-316.
- PORTER, M. (1990): *The Competitive Advantage of Nations*. London: MacMillan.
- PROUDMAN, J. and REDDING, S. (2000): Evolving patterns of international trade, *Review of International Economics*, 8 No. 3: pp. 373-396.
- ULFF, J., and NIELSEN, M. (2000): Price-quality competition in the exports of the Central and Eastern European countries, *Intereconomics*, March/April: pp. 94-101.
- VOLLRATH, T.L. (1991). A Theoretical Evaluation of Alternative Trade Intensity Measures of Revealed Comparative Advantage, *Weltwirtschaftliches Archiv*, 127 No. 2: pp. 263-279.

Author:

Imre Fertő, DSc, Senior advisor
Institute of Economics, Hungarian Academy of Sciences
Budapest, Budaörsi út 45, H-1112
ferto@econ.core.hu