

Economics and Business Review

Volume 2 (16) Number 1 2016

CONTENTS

ARTICLES

Transaction costs and their impact on industry's internationalisation degree – theoretical framework

Katarzyna Mroczek-Dąbrowska

FDI policies in Europe in the aftermath of the 2008+ crisis

Marta Götz

Determinants of inward FDI into Visegrad countries: empirical evidence based on panel data for the years 2000–2012

Krzysztof Wach, Liwiusz Wojciechowski

Co-movements of NAFTA stock markets: Granger-causality analysis

Paweł Folfas

Audit committee structure and earnings management in Asia Pacific

Qaiser Rafique Yasser, Abdullah Al Mamun

Success and failure in M&As: Is there a place for a paradigm change? Evidence from the Israeli hi-tech industry

Ofer Zaks

It's not all about the profit: an analysis of changes in arts and business relations

Kamila Lewandowska

BOOK REVIEWS

Piotr Trąpczyński, *Foundations of Foreign Direct Investment Performance*, Poznań University of Economics and Business Press, Poznań 2016 (*Svetla Trifonova Marinova*)

Maciej Szymczak, *Ewolucja łańcuchów dostaw [The Evolution of Supply Chains]*, Wydawnictwo Uniwersytetu Ekonomicznego w Poznaniu, Poznań 2015 (*Jarosław Witkowski*)



Editorial Board

Ryszard Barczyk
Witold Jurek
Cezary Kochalski
Tadeusz Kowalski (Editor-in-Chief)
Henryk Mruk
Ida Musiałkowska
Jerzy Schroeder
Jacek Wallusch
Maciej Żukowski

International Editorial Advisory Board

Udo Broll – School of International Studies (ZIS), Technische Universität, Dresden
Wojciech Florkowski – University of Georgia, Griffin
Binam Ghimire – Northumbria University, Newcastle upon Tyne
Christopher J. Green – Loughborough University
John Hogan – Georgia State University, Atlanta
Bruce E. Kaufman – Georgia State University, Atlanta
Steve Letza – Corporate Governance Business School Bournemouth University
Victor Murinde – University of Birmingham
Hugh Scullion – National University of Ireland, Galway
Yochanan Shachmurove – The City College, City University of New York
Richard Sweeney – The McDonough School of Business, Georgetown University, Washington D.C.
Thomas Taylor – School of Business and Accountancy, Wake Forest University, Winston-Salem
Clas Wihlborg – Argyros School of Business and Economics, Chapman University, Orange
Jan Winiński – University of Information Technology and Management in Rzeszów
Habte G. Woldu – School of Management, The University of Texas at Dallas

Thematic Editors

Economics: *Ryszard Barczyk, Tadeusz Kowalski, Ida Musiałkowska, Jacek Wallusch, Maciej Żukowski* •
Econometrics: *Witold Jurek, Jacek Wallusch* • **Finance:** *Witold Jurek, Cezary Kochalski* • **Management and Marketing:** *Henryk Mruk, Cezary Kochalski, Ida Musiałkowska, Jerzy Schroeder* • **Statistics:** *Elżbieta Gołata, Krzysztof Szwarc*

Language Editor: *Owen Eastel* • **IT Editor:** *Marcin Reguła*

© Copyright by Poznań University of Economics and Business, Poznań 2016

Paper based publication

ISSN 2392-1641

POZNAŃ UNIVERSITY OF ECONOMICS AND BUSINESS PRESS
ul. Powstańców Wielkopolskich 16, 61-895 Poznań, Poland
phone +48 61 854 31 54, +48 61 854 31 55, fax +48 61 854 31 59
www.wydawnictwo-ue.pl, e-mail: wydawnictwo@ue.poznan.pl
postal address: al. Niepodległości 10, 61-875 Poznań, Poland

Printed and bound in Poland by:
Poznań University of Economics and Business Print Shop

Circulation: 300 copies

Co-movements of NAFTA stock markets: Granger-causality analysis¹

*Paweł Folfas*²

Abstract: The paper scrutinizes the causal relationship between performance of American, Canadian and Mexican stock markets. It is aimed at answering the question as to whether there is a one way or two way causal link between the performance of stock markets (or possibly no causality at all) in the case of NAFTA members during 1992–1993 (pre-NAFTA period) and 1994–2013 (NAFTA in force).

The study finds bivariate Granger causality for American and Canadian indexes in the periods: 1980–1988 and 1994–2013. Additionally the American index Granger-caused Mexican index during all the included periods, apart from 1992–1993, but the Canadian index did not Granger-cause the Mexican index at all. Moreover the Mexican index was a Granger-cause of the Canadian index in years 1994–2013 and a Granger-cause of the American index during period 1992–1993.

Keywords: NAFTA, stock markets, Granger-causality.

JEL codes: F15.

Introduction

Regional integration (especially Regional Trading Arrangements – RTAs) appears to be one of the most significant topics in international economics. There are a lot of studies, both theoretical and empirical, concerning various aspects of RTA activities. The majority of studies focus on trade (FDI or migration) issues but it is also interesting as to whether economic integration is accompanied by causal links between indexes of national stock markets.

This paper scrutinizes the causal relationship between the performance of American, Canadian and Mexican stock markets. The analysis is based on the Granger causality test and it is aimed at answering a question as to whether there are one way or two way causal links between the performance of stock markets

¹ Article received 30 March 2015, accepted 11 January 2016.

² Warsaw School of Economics, Institute of International Economics, al. Niepodległości 162, 02-554 Warszawa, Poland, pawel.folfas@sgh.waw.pl.

(or possibly no causality at all) in the case of NAFTA members. The value-added of this article concerns the choice of specific periods of analysis based on the intensity of trade and FDI integration within NAFTA. Consequently, trade and FDI become a background of a Granger-causality analysis between indexes of national stock markets. The text includes three major sections: (1) literature review, (2) methodological considerations concerning testing Granger causality in the case of non-stationary time series and finally (3) an empirical study of NAFTA stock market exchange indexes. The paper ends with conclusions.

1. Literature review

The co-movements of national stock markets seem to be a popular topic in international finance [see e.g. Makridakis and Wheelwright 1974; Meric and Meric 1989; Meric et al. 2002; Sabri 2002; Dorodnykh 2014]. There are probably two fundamental areas of concern in studies on the co-movements of national stock markets: (1) low correlation between markets as evidence of the benefit of global portfolio diversification, (2) high correlation between markets as a result of globalization and economic integration.

The second area of concern covers the topic of the co-movements of stock markets in a free trade area, in a customs union, in a common market or in within bloc of countries. Studies of the co-movements between stock markets in RTAs probably still are in the minority (the majority of studies focus on the co-movements between the largest markets), but we can find a number of papers concerning RTAs from different parts of the world. Namely Meric and Meric [1997], and also Kim, Moshirian, and Wu [2005] analyze correlation between the EU stock markets. Also Horobet and Lupu [2009] focus on capital market integration in the European Union. Additionally Meric, Meric, and Ratner [2000] and also Click and Plummer [2005] scrutinize linkages between the ASEAN stock markets. Moreover Harrison and Moore [2010] study the co-movements between stock markets of CARICOM members. Additionally Menezes [2013] investigates cointegration and Granger-causality between stock market indexes for the G7 countries. Olbrys and Majewska [2013] conduct a Granger causality analysis of the CEE (Central and Eastern Europe) stock markets including the nonsynchronous trading effect. Rec [2009] scrutinizes the financial integration of stock markets in the former Yugoslav countries. Finally Vyrost, Lyocsa, and Baumohl [2014] analyze Granger causality networks constructed amongst 20 developed stock markets.

In case of NAFTA,³ Aggarwal and Kyaw [2005] examine the integration of NAFTA equity markets in the periods 1988–1993 (pre-NAFTA) and

³ North American Free Trade Agreement (NAFTA) is an agreement signed by Canada, Mexico and the United States which superseded the Canada-United States Free Trade Agreement

1994–2001 (post-NAFTA). They claim that daily, weekly and monthly equity prices in NAFTA countries are cointegrated only for the post-NAFTA period. Additionally Chukwugor-Ndu and Kasibhatla [2007] investigate the degree of integration of the North American equity markets in the post-NAFTA period (1994–2006) using daily stock closing price indices. Their estimated results lead them to the conclusion of the presence long-run equilibrium relationships (cointegration) amongst the North American equity markets in the post-NAFTA period. Moreover, Lopez-Herrera and Ortiz (2010) analyze cointegration trends amongst NAFTA equity markets using monthly series for the 1984.1 to 2012.12 based on Morgan Stanley Capital International (MSCI) indexes. According to the Johansen cointegration tests, they state that integration amongst NAFTA markets is time-varying. Finally Meric et. al [2009] conduct a study based on Granger causality tests. They use MSCI weekly U.S.dollar stock market indexes in their study for the period June 1995–May 2005. They find only one-way Granger causality between Canadian and Mexican indexes.

2. Toda-Yamamoto procedure for testing Granger causality

Granger [1969] defined a concept of causality which has become popular in recent years. In the case of two time-series variables (X and Y), X is said to Granger-cause Y if Y can be better predicted using the histories of both X and Y than it can by using the history of Y alone. The idea is that the cause cannot come after the effect. Thus if variable X affects a variable Y , the former should help improving the predictions of the latter variable (Table 1).

Testing for the presence or absence of Granger causality is linked with the construction of VAR (sometimes also VEC) models. The most common test for Granger causality is a Wald test. One of the most important assumptions of the Wald test for Granger-causality is stationarity of time series X and Y [see more Lütkepohl 2007: 41–51, 102–103].

When using the Wald test in the usual way to test linear restrictions on the parameters of a VAR (VEC) model, and if (some of) data are non-stationary, then the Wald statistics do not follow their usual asymptotic chi-square distribution under the null (zero). One of the approaches that can be taken to make sure that a causality test (based on the Wald test) is done properly, in spite of non-stationarity time series, is the Toda-Yamamoto [1995] procedure. The Toda-Yamamoto (T-Y) procedure assumes estimation of a modified VAR (VEC) model with $k+d_{\max}$ lags, where k is the optimal lag length in the original

(CUSFTA). It came into force on January 1, 1994. According to the World Trade Organization it is classified as a FTA&EIA (free trade area with economic integration agreement). For more about economic integration in the framework of NAFTA see: [Czarny 2013; Hufbauer and Schott 2005; Zahniser 2005; Zahniser et al. 2015].

VAR (VEC) model and d_{max} is the maximal order of integration of the variables included in VAR (VEC) model. It is essential that additional d_{max} lags of variables are treated as exogenous variables. The coefficients of these extra lags are not included when the subsequent Wald test is conducted. They are there just to set the asymptotic. Thanks to these additional lags, the Wald test is asymptotically chi-square distributed under the null (zero). The basic steps for the T-Y procedure are illustrated by Table 1.

Table 1. T-Y procedure for testing Granger causality between time series ln INDEX1 and ln INDEX2

Time series: ln INDEX1 and ln INDEX2	
↓	
Testing the stationarity of both time series using the ADF test	
↓	↓
Both time series are stationary	At least one time-series is not stationary
↓	↓
↓	Determination of d_{max} (maximal order of integration)
↓	↓
Determination of appropriate maximum lag length in the VAR model (k) using information criteria such as: AIC, HQIC and SBIC	
↓	↓
Estimation of the VAR model with k lags $\ln INDEX1_t = \gamma + \sum_{i=1}^k \alpha_i \ln INDEX1_{t-i} + \sum_{i=1}^k \beta_i \ln INDEX2_{t-i} + \varepsilon_t$ $\ln INDEX2_t = \delta + \sum_{i=1}^k \sigma_i \ln INDEX2_{t-i} + \sum_{i=1}^k \mu_i \ln INDEX1_{t-i} + \theta_t$	Estimation of the VAR model with $k+d_{max}$ lags (additional d_{max} lags are treated as exogenous variables) $\ln INDEX1_t = \gamma + \sum_{i=1}^{k+d_{max}} \alpha_i \ln INDEX1_{t-i} + \sum_{i=1}^{k+d_{max}} \beta_i \ln INDEX2_{t-i} + \varepsilon_t$ $\ln INDEX2_t = \delta + \sum_{i=1}^{k+d_{max}} \sigma_i \ln INDEX2_{t-i} + \sum_{i=1}^{k+d_{max}} \mu_i \ln INDEX1_{t-i} + \theta_t$
↓	↓
Granger causality tests (Wald test)	Granger causality tests (Wald test)

Source: Author’s study based on: [Lütkepohl 2007: 41–51, 102–103; Toda and Yamamoto 1995].

In analysed VAR models there were two variables: the stock market exchange index for country 1 (in logarithmic version – $\ln INDEX1$) and the index for country 2 (in logarithmic version – $\ln INDEX2$). Firstly, both time series were tested (the ADF test) to determine their order of integration. According to the ADF test results the d_{\max} (maximal order of integration) was determined. Secondly, the appropriate maximum length for the variables in the VAR model (k) was chosen thanks to the information criteria (AIC, HQIC and SBIC). Thirdly, the VAR model with $k+d_{\max}$ lags was estimated (additional d_{\max} lags were treated as exogenous variables). Finally, the Wald test for Granger causality was conducted.

To sum up, thanks to the T-Y procedure, testing for Granger causality is possible despite the non-stationarity of time series. Moreover, the T-Y procedure appears to be simple and does not need any complicated modification in VAR models. This procedure might be problematic only in the case of very short time-series as additional lags have to be included.

As with every econometric procedure, Granger-causality naturally has its limitations and weaknesses. Consequently, Granger-causality (or lack of it) should not be interpreted as unequivocal proof of the existence (lack) of causality. However it brings a useful set of information about reality and is quite simply to conduct.

3. Data and estimation results

The empirical study concerns the existence and the direction of Granger causality between stock market exchange indexes in NAFTA members. Three indexes were used in the research: S&P TSX for Canada, IPC for Mexico and S&P 500 for the US. In the case of Canada and the US daily time series began on 2nd January 1980 and ended on 31st December 2013 but the daily time series for Mexico was shorter as it begins on 2nd January 1992.⁴ In the study the daily average values of indexes (extracted from the websites feed backing the NAFTA stock market exchange) were used in terms of natural logarithm (daily data were not adjusted in any way). Data for days in which at least one stock market exchange was closed (e.g. due to holidays) were excluded from the time series. In the text S&P TSX index is denoted as *Canada*, IPC index as *Mexico* and the S&P 500 index as *US*.

Granger causality analysis between stock market exchange indexes of NAFTA members was conducted for the periods: 1992–1993 (pre-NAFTA period) and 1994–2013 (NAFTA in force). Additionally, for Canada and the US analysis was conducted also for periods: 1980–1988 (pre-CUSFTA period), 1989–1993 (CUSFTA in force). Period selection was based on external criterion (trade and

⁴ Data concerning IPC for earlier years are not available.

FDI intensity). Consequently, any statistical tool was specifically used (for example structural break model) for period selection.

Moreover a separate Granger causality analysis (value-added of the article mentioned in the introduction) was conducted for the years 2001–2003 during which trade and FDI intensity indexes concerning intra-NAFTA flows used to be the highest. The relative intensity of regional trading versus trading with the outside world was measured by the regional trade introversion index (RTII) first proposed by Iapadre [2006]. This index allows the measurement of the relative intensity of regional trading versus trading with the outsiders. The RTII can range from -1 to 1 and is independent of the size of the region. The index rises (or falls) only if the intensity of intraregional trade grows more (or less) rapidly than that of extraregional trade. If the index is equal to zero, then the region's trade is geographically neutral (it grows similarly in intraregional as well as in extraregional terms). If the index is a positive number, the region's trade has an intraregional bias. If RTII is less than zero, then the region's trade has an extraregional bias. The formula for the regional trade introversion index is:

$$RTII_i = \frac{HI_i - HE_i}{HI_i + HE_i}, \quad (1a)$$

$$HI_i = \frac{\frac{T_{ii}}{T_i}}{\frac{T_{oi}}{T_o}} \quad \text{and} \quad HE_i = \frac{1 - \frac{T_{ii}}{T_i}}{1 - \frac{T_{oi}}{T_o}}, \quad (1b)$$

where:

T_{ii} – exports of region i to region i plus imports of region i from region i ,

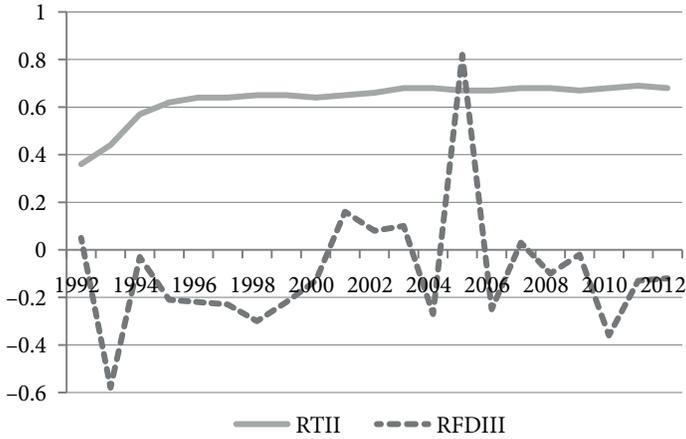
T_i – total exports of region i to the world plus total imports of region i from the world,

T_{oi} – exports of region i to outsiders plus imports of region i from outsiders,

T_o – total exports of outsiders plus total imports of outsiders.

The formula described by equations (1a) and (1b) can be also implemented for FDI – exports are substituted by FDI outflows and imports by FDI inflows – and regional FDI introversion index (RFDIII) can be constructed. Values of regional trade introversion and regional FDI introversion indexes for NAFTA are shown in Figure.

The regional trade introversion index remained quite stable as the FDI index fluctuates sharply. Consequently it was not easy to find a small number of -years period with both high indexes. However three-year period 2001–2003 was worthy of notice. During this period the FDI index was positive (the regional FDI introversion index was positive also only in single years 1992,



Regional trade and FDI introversion indexes for NAFTA (1992–2012)

Source: Author’s calculation based on WITS-COMTRADE and OECD databases

2005 and 2007) and simultaneously the trade index was not lower than 0.65. Consequently period 2001–2003 was chosen as a period with the most intensive trade and FDI relationships within NAFTA. During years 2001–2003 there was a slowdown in the world economy and it is quite typical that poorer economic performance encouraged NAFTA members to tighten regional relationships (something similar can be noticed during the last economic crisis however it was shorter (only in year 2009) than during the slowdown at the beginning of 21st century).

After choosing the periods for the Granger causality study, statistical tests were conducted. Firstly, the order of integration for all the time series was established. The ADF test (for which null hypothesis is non-stationarity) was carried out. The results are reported in Table 2.

According to the ADF tests (Table 2) all the included time series were not stationary (only in three cases does the ADF test, including trend and a drift, confirm the integration of order zero (I(0)). Consequently, the T-Y procedure was necessary to check Granger causality between stock market exchange indexes of NAFTA members (Table 3).

Secondly, the optimal number of lags in the VAR model using AIC, HQIC and SBIC information criteria was found. Table 3 presents the output of the choice criteria for selecting the number of lags in the VAR model. In the majority of cases, two out of three information criteria suggest the same number of lags which was finally chosen. However, there were exceptions in which the highest number of lags (the maximum number of lags does not exceed 30) was chosen. Finally, the number of lags in the VAR model including the order of integration of times series was established (see last column in Table 3).

Table 2. The ADF test results

Variable	H_0 : unit root – I(1) H_1 : time series stationary – I(0)														
	without drift and trend						with drift						with drift and trend		
	num- ber of lags	levels	1st differ- ences	inte- gration order	number of lags	levels	1st differ- ences	inte- gration order	number of lags	levels	1st differ- ences	inte- gration order			
In Canada (1980–1988)	1	1.124	-30.449***	I(1)	1	-1.230	-30.476***	I(1)	1	-2.000	-30.470***	I(1)			
In Canada (1989–1993)	1	0.952	-20.389***	I(1)	1	-0.898	-20.412***	I(1)	1	-0.946	-20.429***	I(1)			
In Canada (1992–1993)	1	1.360	-14.000***	I(1)	1	0.316	-14.101***	I(1)	1	-1.547	-14.278***	I(1)			
In Canada (1994–2013)	1	1.315	-48.339***	I(1)	1	-1.546	-48.369***	I(1)	1	-2.562	-48.368***	I(1)			
In Canada (2001–2003)	1	1.604	-17.139***	I(1)	1	-2.410	-17.260***	I(1)	1	-2.658	-17.294***	I(1)			
In Mexico (1992–1993)	1	1.376	-14.250***	I(1)	1	-0.152	-14.305***	I(1)	1	-0.764	-14.358***	I(1)			
In Mexico (1994–2013)	1	2.053	-48.192***	I(1)	1	-0.761	-48.286***	I(1)	1	-3.167*	-	I(0)			

In Mexico (2001–2003)	1	0.389	-18.164***	I(1)	1	-1.549	-18.159	I(1)	1	-2.283	-18.146	I(1)
ln US (1980–1988)	1	1.565	-33.350***	I(1)	1	-1.070	-33.422***	I(1)	1	-2.832	-33.415***	I(1)
ln US (1989–1993)	1	1.589	-24.010***	I(1)	1	-1.681	-24.109***	I(1)	1	-3.647*	-	I(0)
ln US (1992–1993)	1	0.832	-15.499***	I(1)	1	-1.014	-15.531***	I(1)	1	-4.824***	-	I(0)
ln US (1994–2013)	1	1.508	-49.833***	I(1)	1	-1.956	-49.880***	I(1)	1	-2.179	-49.881***	I(1)
ln US (2001–2003)	1	1.945	-18.428***	I(1)	1	0.771	-18.611***	I(1)	1	-1.032	-18.739	I(1)

Significance level: *(10%), **(5%), ***(1%).

Source: Author's calculation in STATA.

Table 3. Selection of the optimal number of lags for variables in VAR model

Model	Optimal number of lags according to AIC	Optimal number of lags according to HQIC	Optimal number of lags according to SBIC	Optimal number of lags (k)	Optimal number of lags plus additional lags $(k+d_{\max})$ - T-Y procedure
CUSFTA 1980–1988	8	5	4	8	9
CUSFTA 1989–1993	6	3	3	3	4
NAFTA 1992–1993 Canada and US	3	3	3	3	4
NAFTA 1992–1993 Canada and Mexico	3	2	2	2	3
NAFTA 1992–1993 US and Mexico	3	3	2	3	4
NAFTA 1994–2013 Canada and US	13	3	3	3	4
NAFTA 1994–2013 Canada and Mexico	13	4	3	13	14
NAFTA 1994–2013 US and Mexico	14	4	3	14	15
NAFTA 2001–2003 Canada and US	3	3	3	3	4
NAFTA 2001–2003 Canada and Mexico	3	3	3	3	4
NAFTA 2001–2003 US and Mexico	4	3	3	3	4

Source: Author's calculation in STATA.

Thirdly, the Granger causality test including the T-Y procedure was conducted. The results of the Wald test are presented in Table 4. The study finds bivariate Granger causality for American and Canadian indexes in the periods: 1980–1988 and 1994–2013. Additionally the American index Granger-caused Mexican index during all periods included apart from 1992–1993, but the Canadian index did not Granger-cause the Mexican index at all. Moreover the Mexican index was as a Granger-cause of the Canadian index in the years 1994–2013 and a Granger-cause of the American index during the period 1992–1993.

Table 4. Granger causality test results (Wald test and Toda-Yamamoto procedure)

Model	$H_0: \ln \text{Canada} \nexists \ln \text{US}$ $H_1: \ln \text{Canada} \rightarrow \ln \text{US}$	$H_0: \ln \text{US} \nexists \ln \text{Canada}$ $H_1: \ln \text{US} \rightarrow \ln \text{Canada}$	$H_0: \ln \text{Canada} \nexists \ln \text{Mexico}$ $H_1: \ln \text{Canada} \rightarrow \ln \text{Mexico}$	$H_0: \ln \text{Mexico} \nexists \ln \text{Canada}$ $H_1: \ln \text{Mexico} \rightarrow \ln \text{Canada}$	$H_0: \ln \text{US} \nexists \ln \text{Mexico}$ $H_1: \ln \text{US} \rightarrow \ln \text{Mexico}$	$H_0: \ln \text{Mexico} \nexists \ln \text{US}$ $H_1: \ln \text{Mexico} \rightarrow \ln \text{US}$
CUSFTA 1980–1988	191.400**	77.616***	•	•	•	•
CUSFTA 1989–1993	6.1449	4.0171	•	•	•	•
NAFTA 1992–1993	0.26403	4.4401	0.42767	2.8067	2.3313	8.2686*
NAFTA 1994–2013	50.712***	180.2***	17.96	48.915***	32.664**	10.61
NAFTA 2001–2003	5.7767	4.6233	0.99016	4.2387	7.7025*	5.2922

→ Granger causality.
 ∃ Lack of Granger causality.
 Significance level: *(10%), **(5%), ***(1%).

Source: Author’s calculation in STATA.

Conclusions

Making one general conclusion concerning causal links between NAFTA stock market exchange indexes in NAFTA is not possible. Firstly, study generally confirms bivariate Granger causality for the American and Canadian indexes, but during the periods 1989–1993 and 2001–2003 there were no causal links between them. Thus in the long-term Canadian and American stock exchange markets seem to be strongly related,⁵ however causality did not take place during the period with the strongest intra-NAFTA trade and FDI (2001–2003) and for the years 1989–1993 (CUSFTA in force). Secondly, the American index generally is a Granger cause of the Mexican index, but the reverse causality is only confirmed during the years 1992–1993 (and only at a 10% level of significance). Thirdly, causality between the Mexican and Canadian indexes is only one-way causality.

According to the Granger-causality analysis there are no two-way causal links between all NAFTA stock market exchange indexes. Additionally the

⁵ Wald tests confirm bivariate Granger causality between American and Canadian index for period 1980–2013.

presence of Granger-causality between indexes is not always accompanied by an intensification of trade and FDI relationships between NAFTA members (lack of causality during 2001–2003). Also a free trade agreement in force is not accompanied by Granger causal links between stock market indexes. It is worth remembering that a Granger-causality analysis, as with every econometric procedure, naturally has its limitations and weaknesses. Consequently Granger-causality (or lack of it) should not be interpreted as unequivocal proof of the existence (lack) of causality. However it brings a useful set of information about reality. The reality seems to be quite complicated as there is no simple connection between the integration in the framework of NAFTA and the integration of stock market exchanges in Canada, Mexico and the United States.

References

- Aggarwal, R., Kyaw, N.A., 2005, *Equity Market Integration in NAFTA Region: Evidence from Unit Root and Co-integration Tests*, International Review of Financial Analysis, vol. 14, no. 2: 393–406.
- Chukwuogor-Ndu, Ch., Kasibhatla, K., 2007, *Post NAFTA Integration of North American Stock Markets: Implications for Financial Decision Making*, North American Journal of Finance and Banking Research, vol. 1: 37–53.
- Click, R.W., Plummer, M.G., 2005, *Stock Market Integration in ASEAN after the Asian Financial Crisis*, Journal of Asian Economics, vol. 16, no. 1: 5–28.
- Czarny, E., 2013, *Regionalne ugrupowania integracyjne w gospodarce światowej*, PWE, Warszawa.
- Dorodnykh, E., 2014. *Stock Market Integration. International Perspective*, New York, Palgrave Macmillan.
- Granger, C.W.J., 1969, *Investigating Causal Relations by Econometric Models and Cross-spectral Methods*, Econometrica, vol. 37, no. 3: 424–438.
- Harrison, B., Moore, W., 2010, *Stock Market Co-Movement in the Caribbean*, Economic Issues, vol. 15, no. 2: 1–15.
- Horobet, A., Lupu, R., 2009, *Are Capital Markets Integrated? A Test of Information Transmission within the European Union*, Romanian Journal of Economic Forecasting, no. 2: 64–80.
- Hufbauer, G.C., Schott, J.J., 2005, *NAFTA Revisited: Achievements and Challenges*, Institute for International Economics, Washington.
- Iapadre, L., 2006, *Regional Integration Agreements and the Geography of World Trade: Statistical Indicators and Empirical Evidence*, in: De Lombaerde (ed.), *Assessment and Measurement of Regional Integration*, London, Routledge.
- Lopez-Herrera, F., Ortiz, E. 2010, *Cointegration Trends among NAFTA Equity Markets*, Revista de Economía Mundial, vol. 26: 155–176.
- Lütkepohl, H., 2007, *Introduction to Multiple Time Series Analysis*, Berlin, Springer.
- Kim, S.J., Moshirian, F., Wu, E., 2005, *Dynamic Stock Market Integration Driven by European Monetary Union: An Empirical Analysis*, Journal of Banking and Finance, vol. 29, no. 10: 2475–2502.

- Makrikadis, S.G., Wheelwright, S.C., 1974, *An Analysis of the Interrelationships among the Major World Stock Exchanges*, Journal of Business Finance and Accounting, vol. 1, no. 2: 195–215.
- Menezes, R., 2013, *Globalization and Granger Causality in International Stock Markets*, International Journal of Latest Trends in Finance & Economic Sciences, vol. 3, no. 1: 413–421.
- Meric, I., Coopersmith, L.W., Wise, D., Meric, G., 2002, *The Linkages between the World's Major Stock Markets in 2000–2001 Bear Market*, Journal of Investing, vol. 11: 55–62.
- Meric, I., Goldberg, I.V., Dunne, K., Meric, G., 2009, *Co-movements of NAFTA Stock Markets*, Troy University Business and Economic Review, vol. 3: 21–27.
- Meric, I., Meric, G., 1989, *Potential Gains from International Portfolio Diversification and Inter-temporal Stability and Seasonality in International Stock Market Relationships*, Journal of Banking and Finance, vol. 13, no. 4–5: 627–640.
- Meric, I., Meric, G., 1997, *Co-movements of European Equity Markets before and after the Crash of 1987*, Multinational Finance Journal, vol. 1, no. 2: 137–152.
- Meric, I., Meric, G., Ratner, M., 2000, *1997–1998 Emerging Markets Crisis and the ASEAN-5 Stock Markets*, International Journal of Finance, vol. 12, no. 3: 1835–1853.
- Mexican Stock Exchange, <http://www.bmv.com.mx>.
- New York Stock Exchange, <http://www.nyse.com>.
- OECD database, <http://stats.oecd.org>.
- Olbrys, J., Majewska, E., 2013, *Granger Causality Analysis of the CEE Stock Markets Including Nonsynchronous Trading Effects*, Argumenta Oeconomica, vol. 31, no. 2: 151–172.
- Rec, A., 2009, *Financial Integration of Stock Markets in the Selected Former Yugoslav Countries*, Helsinki School of Economics, http://epub.lib.aalto.fi/en/ethesis/pdf/12196/hse_thesis_12196.pdf.
- Sabri, N., 2002, *Increasing Linkages of Stock Markets and Price Volatility*, Financial Risk and Financial Risk Management, vol. 16: 349–73.
- Toda, H.Y., Yamamoto, T., 1995, *Statistical Inference in Vector Autoregressions with Possibly Integrated Processes*, Journal of Econometrics, vol. 66, no. 1–2: 225–250.
- Toronto Stock Exchange, <http://www.tmx.com>.
- Vyrost, T., Lyocsa, S., Baumohl, E., 2014, *Granger Causality Stock Market Networks: Temporal Proximity and Preferential Attachment*, University of Economics in Bratislava, <http://arxiv.org/ftp/arxiv/papers/1408/1408.2985.pdf>.
- WITS-COMTRADE database, <http://wits.worldbank.org>.
- Zahniser, R., 2005, *NAFTA at 11: The Growing Integration of North American Agriculture*, United States Department of Agriculture, Economic Research Service, http://www.ers.usda.gov/media/871201/wrs0502_002.pdf.
- Zahniser, R., Angadjivand, S., Hertz, T., Kuberka, L., Santos, A., 2015, *NAFTA at 20: North America's Free-Trade Area and Its Impact on Agriculture*, United States Department of Agriculture, Economic Research Service, <http://www.ers.usda.gov/media/1764579/wrs-15-01.pdf>.

Aims and Scope

Economics and Business Review is the successor to the Poznań University of Economics Review which was published by the Poznań University of Economics and Business Press in 2001–2014. The Economics and Business Review is a quarterly journal focusing on theoretical and applied research work in the fields of economics, management and finance. The Review welcomes the submission of articles for publication dealing with micro, mezzo and macro issues. All texts are double-blind assessed by independent reviewers prior to acceptance.

Notes for Contributors

1. Articles submitted for publication in the Economics and Business Review should contain original, unpublished work not submitted for publication elsewhere.
2. Manuscripts intended for publication should be written in English and edited in Word and sent to: review@ue.poznan.pl. Authors should upload two versions of their manuscript. One should be a complete text, while in the second all document information identifying the author(s) should be removed from files to allow them to be sent to anonymous referees.
3. The manuscripts are to be typewritten in 12' font in A4 paper format and be left-aligned. Pages should be numbered.
4. The papers submitted should have an abstract of not more than 100 words, keywords and the Journal of Economic Literature classification code.
5. Acknowledgements and references to grants, affiliation, postal and e-mail addresses, etc. should appear as a separate footnote to the author's name^{a, b, etc} and should not be included in the main list of footnotes.
6. Footnotes should be listed consecutively throughout the text in Arabic numerals. Cross-references should refer to particular section numbers: e.g.: See Section 1.4.
7. Quoted texts of more than 40 words should be separated from the main body by a four-spaced indentation of the margin as a block.
8. Mathematical notations should meet the following guidelines:
 - symbols representing variables should be italicized,
 - avoid symbols above letters and use acceptable alternatives (Y^*) where possible,
 - where mathematical formulae are set out and numbered these numbers should be placed against the right margin as... (1),
 - before submitting the final manuscript, check the layout of all mathematical formulae carefully (including alignments, centring length of fraction lines and type, size and closure of brackets, etc.),
 - where it would assist referees authors should provide supplementary mathematical notes on the derivation of equations.
9. References in the text should be indicated by the author's name, date of publication and the page number where appropriate, e.g. Acemoglu and Robinson [2012], Hicks [1965a, 1965b]. References should be listed at the end of the article in the style of the following examples:
Acemoglu, D., Robinson, J.A., 2012, *Why Nations Fail. The Origins of Power, Prosperity and Poverty*, Profile Books, London.
Kalecki, M., 1943, *Political Aspects of Full Employment*, The Political Quarterly, vol. XIV, no. 4: 322–331.
Simon, H.A., 1976, *From Substantive to Procedural Rationality*, in: Latsis, S.J. (ed.), *Method and Appraisal in Economics*, Cambridge University Press, Cambridge: 15–30.
10. Copyrights will be established in the name of the E&BR publisher, namely the Poznań University of Economics and Business Press.

More information and advice on the suitability and formats of manuscripts can be obtained from:

Economics and Business Review

al. Niepodległości 10

61-875 Poznań

Poland

e-mail: review@ue.poznan.pl

www.ebr.ue.poznan.pl

Subscription

Economics and Business Review (E&BR) is published quarterly and is the successor to the Poznań University of Economics Review. The E&BR is published by the Poznań University of Economics and Business Press.

E&BR is listed in ProQuest, EBSCO, and BazEkon.

Subscription rates for the print version of the E&BR: institutions: 1 year – €50.00; individuals: 1 year – €25.00. Single copies: institutions – €15.00; individuals – €10.00. The E&BR on-line edition is free of charge.

Correspondence with regard to subscriptions should be addressed to: Księgarnia Uniwersytetu Ekonomicznego w Poznaniu, ul. Powstańców Wielkopolskich 16, 61-895 Poznań, Poland, fax: +48 61 8543147; e-mail: info@ksiegarnia-ue.pl.

Payments for subscriptions or single copies should be made in Euros to Księgarnia Uniwersytetu Ekonomicznego w Poznaniu by bank transfer to account No.: 96 1090 1476 0000 0000 4703 1245.