RELATIONSHIP BETWEEN SECTORAL EXPORTS AND ECONOMIC GROWTH - A TIME SERIES ECONOMETRIC ANALYSIS FOR VIETNAMESE FISHERY SECTOR 1997 – 2008

Nguyen Minh Duc[1], Nguyen Anh Tram[2]

ABSTRACT

Numerous literatures have documented the relationship between exports and economic growth but not so many on sectoral exports and economic growth. This paper examines the relationship with evidence from fisheries exports of Vietnam during 1997 to 2008. The contribution of fishery sector in Vietnamese Gross Domestic Products (GDP) may be mathematically calculated with statistical figures. However, the effects of fishery exports on the economic growth are yet to be thoroughly studied in an econometric approach. Descriptive and time series analyses in this study present positive effect of fishery exports on the Vietnamese economic growth in long run. The modern econometric approach with stationary and co-integration tests and vector error correction models used in this study also allows forecasting a persistence of the effects of fishery exports on Vietnamese GDP despite of different seasonal phase business. For the long run estimation, a double increase in its fishery exports value would raise the GDP by 7%. This has a great economic meaning in developing process of the economy. In reverse side, Vietnamese fishery exports would increase by 5.2% with 10% increase in its GDP. Confirming the role of fishery exports in economic growth, it is necessary for the sector to improve its competitive capacity.

INTRODUCTION

The relationship between economic growth and international trade was argued by many economists when trade comes into being. Trade indeed promotes economic growth of a country. The classical economic theories by Adam Smith, David Ricardo, Torrens, James Mill and John Stuart Mill stated that trade promoted economic growth. Evidence for a positive contribution of free trade to the productivity of nations have been widely discussed and are well documented in the economic literature (Corden 1972, Bhagwati, 1978; Krueger, 1978, Romer, 1986; Lucas, 1988; Levine and Renelt, 1992; Edwards, 1998).

In international trade, there were also some industries enjoying an international comparative advantage, recently. These sectors could produce world class commodities for modest export sectors. The sectors communicated and traded with buyers in other countries. Markets are speeding globalized. The modern theory of trade has been designed and proponed by Paul Krugman, who suggested that trade trends in countries are developing key industries for export in order to get economic gain or growth. The key industries produced sectoral exports of the countries.

[1] Correspondent author; Chair, Department of Fisheries Management and Development, Nong Lam University, Thuduc, Hochiminh City, Vietnam. Email: nmduc@hcmuaf.edu.vn, nguyenminhducts@gmail.com

[2] M.Sc. Graduate, Vietnam-Netherland Master Program in Development Economics, HCMC University of Economics, Hochiminh City, Vietnam.

Sectoral exporting is an economic development strategy of many countries. Tourism service exports in Greece are an example (Thompson and Thompson, 2010). With its thousands-year culture and birthplace of philosophy, famous tourist hotspots as its capital Athens, the northern Chalkidiki peninsula, the Ionian island of Corfu and the island resorts of Myconos, Santorini, Paros and Crete, Greece is one of the best destinations for global tourists and tourism was found to be a long run factor to economic of the country (Dritsakis, 2004). The Philippines is the paradigmatic example of a state that deliberately constructed policy for its exports of labor abroad. Yang (2004) has demonstrated that Philippine families with migrant members abroad fared considerably better than family member without migrants. The Philippines have succeeded in developing a large scale labor export regime that provides significant level of remittances to the Philippine economy. Remittances from abroad labor are seen as a particularly stable source of its finance (Ratha, 2003; Kapur, 2004) so that the Philippines try to keep labor exports as more as possible. For its important role in an economic growth of developing countries, sectoral exports are also considered one of important economic development strategy in Vietnam. .

Since joining into ASEAN in 1985, Vietnam has boosted and diversified its trade significantly, reflecting a globalization process of the Vietnamese economy. Its trade openness (exports plus imports divided by GDP) increased from 84.5 percent in 1999 to about 170 percent in 2009, indicating a rapidly increasing integration of the country into global economy. Although crude oil still stands on the first position in export revenues, products from agricultural and aquatic products are playing increasingly critical role in the structure of Vietnam's exports (Duc and Hong, 2009).

Fishery exports, according to Cunningham (2000), Schmidt (2003), FAO (2007), EU (2006), can act as an engine of growth for developing countries endowed with large fish resources. In addition, fishery exports can contribute to economic growth in developing countries by providing an important source of cash revenue (Valdimarsson, 2003, Ahmed, 2003, and Bostock et al., 2004). Fishery export not only contribute indirectly to economic development through new employment creation but also via increased incomes from the sector and secondary flow on effects such as migrant workers sending remittances to their dependents (Kurien, 2005). Contributing approximate 10% of whole national export revenues, fishery exports make an ongoing contribution to economic growth, poverty alleviation and people well-being as well (Duc, 2008, 2009a). Although the Vietnamese fishery sector contributes to national GDP typically varied by 2.5–4.0 percent, it also generates a wide range of tax revenues, contributing to the national budget. Moreover, the major share of fishery exports have strong backward linkages with the other sectors both in terms of primary and value added commodities. However there is lack of empirical studies on a clear relationship between Vietnamese fishery exports and its economic growth despite of that Vietnamese government has tried in practice to promote fishery export growth to boost up its economy.

This study examines causality relationship between the fishery export and economic growth based on a time series analysis with quarterly data from 1997 to 2008 and hence explores the role of fishery exports in Vietnamese economy. The national policy makers may use results in this study in making policies and strategies for economic development. The findings are also able to contribute to literature on relationship between sectoral exports and economic growth.

II. METHODOLOGY

Model specifications

To investigate the association between the growth of exports and economic performance, some theoretical models were considered. The first is the neo-classical growth model

$$Y = f(K, L) \qquad (1)$$

where Y is aggregate real output, K and L represent capital and labor, respectively.

The second theoretical base is from the framework suggested by Feder (1982) in which the economy consists of export and non-export production. However, output in the export production generates an externality effect in the non-export sector, such as efficient management and competitive environment, improved production techniques, better quality management and workers, and continuous flow of imported inputs. Feder's model of economic growth can be shown as:

$$N = f(K_N, L_N, X), \qquad (2)$$
$$X = g(K_X, L_X), \qquad (3)$$

where N - domestic non-export production
X - domestic non-export production
K_N, K_X = capital stocks, respective for non-export and export production
L_N, L_X = labor forces, respective for non-export and export production
f, g are conventional production functions

Several authors have tested the effect of exports on the economic growth in the following production function, which is referred to as the Balassa approach (1978, cited by Sheehey, 1990)

$$\Delta Y = \alpha_0 + \alpha_1 \Delta K + \alpha_2 \Delta L + \alpha_3 \Delta X + e \qquad (4)$$

where Y is the real GDP, K is the real capital stock, L is the labor force, and X is merchandise real exports. The symbol Δ indicates annual percentage rates of growth. This model is based on a hypothesis that marginal productivities are higher in export production due to the scale effects and externalities associated with export production. Given the labor force and capital stock, expansion of the export sector will raise GDP growth (Ngoc et al., 2003). In addition, not only has the economic literature adopted a supply-side approach as the basic framework to test empirically the relationship between export and growth, but also nearly all the studies mentioned have specified a linear relation.

Consequently, this study follows a conceptual model based on an augmented Cobb–Douglas production function as followings

$$Y_t = f(L_t, X_t, EXR_t) \qquad (5)$$

where Y, L, EXR are real gross domestic product, labor force, and real exchange rate, respectively.

Because tra and basa catfish is the most important product for Vietnamese fishery export and demand for catfish exports is seasonal (Kinnucan and Miao, 1999), dummy variables for quarters in a year are added in the model (5) with the first quarter is used as base variable. The dummy variable for yearly quarters, QD_i, gets value of '1' if the value is of quarter (i), otherwise it gets value of '0'. The Bilateral Trade Agreement signed in 2001 between the US and Vietnam as well as the US antidumping measures against to Vietnamese fishery products (such as frozen catfish and shrimp) since 2003 may have an effect on Vietnamese fishery exports. Two binary dummy variables, *BTA and AD,* therefore were employed into econometric models to isolate the possible effects of the trade policies.

Subsequently, the model (5) is modified to become an empirical model:

$$Y_t = f(L_t, X_t, EXR_t, QD_{2t}, QD_{3t}, QD_{4t}, BTA_t, AD_t) \qquad (6)$$

3.2. Data description

The data for this study are obtained quarterly from first quarter of the year 1997 to the last quarter of the year 2008 including GDP, fishery exports revenue, consumer price index, labor force of Vietnam, the exchange rate VN dong against to US dollar, and the US consumer price index.

The quarterly gross domestic products of Vietnam, Y_t, is the real GDP with the base year of 1994. The value of GDP is billion VND. The three month summation of fishery exports value is considered as the value of fishery exports in respective quarter in USD, X_t. Labor variable, L_t, gets quarterly data of Vietnam labor force, collected from data of GSO (2009). Getting daily data from the website www.oanda.com, the quarterly data of exchange rate of VND against USD, EXR_t, is average value of three months of a quarter. The quarterly data of CPI, $CPI\text{-}VN_t$, and US Consumer Price Index, CPI_US_t, is the average value in three months of a quarter, collected from GSO and the US Bureau of Labor Statistics, respectively. Descriptive statistics of the variables are described in Table 1.

Table 1. Descriptive statistical spreadsheet of all variables

	GDP	Labor	Fishery exports	Exchange Rate	CPI - VN	CPI - US
Mean	84996.60	10.02	5.47E+08	6.88E-05	106.79	184.30
Median	80340.00	10.02	5.33E+08	6.73E-05	107.00	182.10
Maximum	144873.0	11.85	1.43E+09	8.86E-05	126.00	219.30
Minimum	47270.00	8.63	1.37E+08	6.03E-05	96.00	159.57
Std. Dev.	24409.37	0.95	3.06E+08	6.49E-06	6.03	17.30

For accuracy in modeling, values of variables of the model would be adjusted. First, real values of GDP with the base year of 1994 were divided by amount of labor force to get GDP per capita values for the variable of *YCAP*. Second, the real exchange rate variable, *REXR,* gets data from the nominal exchange rate divided by

the ratio between Vietnamese CPI (*CPI-VN*) and the United States CPI (*CPI-US*) when the United States CPI is collected from website of the US Department of Labor. Data for fishery exports was collected from Fistenet (2009), divided by Vietnamese CPI to get their real values before being divided by amount of Vietnamese labor to obtain values for the variable of *XCAP* – fishery exports per capita.

Consequently, this study tested the stationarity of variables *YCAP, REXR, XCAP* to make sure these time series data can be employed in an Ordinary Least Square regression, a popular and typical method in any econometric research. For stationary test, unit root tests for all series of above mentioned variables were implemented with Dickey-Fuller and Augmented Dickey-Fuller tests.

RESULTS AND DISCUSSION

Two stage least square regression

Results of unit root tests for variables *YCAP, REXR, XCAP* showed that these variables are trend stationary time series in their logarithm. Therefore, the ordinary least square regression can be applied in first step to check the relationship between *YCAP* and *XCAP* under the control of other controlling variables of *REXR, BTA, AD* and dummy variables for quarters, QD_2, QD_3 *and* QD_4. As mentioned in the previous chapter, the empirical equations to be estimated are as follows:

$$lnYCAP_t = \beta_o + \beta_1 lnREXR_t + \beta_2 lnXCAP_t + \beta_3 BTA + \beta_4 AD + \beta_5 QD_2 + \beta_6 QD_3 + \beta_7 QD_4 + e \quad (7)$$

$$lnXCAP_t = \beta'_o + \beta'_1 lnREXR_t + \beta'_2 lnYCAP_t + \beta'_3 BTA + \beta'_4 AD + \beta'_5 QD_2 + \beta'_6 QD_3 + \beta'_7 QD_4 + e \quad (8)$$

For such equation system, if the OLS was used to run the estimation, there would have simultaneous bias and inconsistent problem in the estimated results. Thus, a two-stage least squares (2SLS) method was suggested to estimate coefficients in the above equations and OLS estimation for the Equation 7 is conducted. The result is presented in Table 4.2. After run the first-stage regression and get the estimated residuals, the estimated value of *YCAP*, *YCAPhat*, was used for the second-stage estimation with the Equation 8 and the result was reported in Table 4.3.

With the regression results, mutual effects of the economic growth and fishery exports are statistically significant and economically meaningful. However, Durbin-Watson values of the estimated equations are 0.67 and 1.06, indicating a possible serial correlation problem in both equations. Therefore, another econometric method is employed for more concise estimation. The alternative would be first difference regression method. The first difference equations used for estimation are described as follows:

$$dlnYCAP_t = \alpha_o + \alpha_1 dlnREXR_t + \alpha_2 dlnXCAP_t + \alpha_3 BTA + \alpha_4 AD + \alpha_5 QD_2 + \alpha_6 QD_3 + \alpha_7 QD_4 + e \quad (9)$$

$$dlnXCAP_t = \alpha'_o + \alpha'_1 dlnREXR_t + \alpha'_2 dlnYCAP_t + \alpha'_3 BTA + \alpha'_4 AD + \alpha'_5 QD_2 + \alpha'_6 QD_3 + \alpha'_7 QD_4 + e \quad (10)$$

Table 2. OLS regression results for *lnYCAP*

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.490880	1.554282	2.889361	0.0062
lnREXR	-0.185155	0.164092	-1.128361	0.2659
lnXCAP	0.203035	0.037764	5.376469	0.0000
BTA	-0.013674	0.031418	-0.435249	0.6657
AD	0.117630	0.026146	4.498962	0.0001
QD_2	0.230970	0.025114	9.196952	0.0000
QD_3	0.121037	0.028607	4.231006	0.0001
QD_4	0.285728	0.028010	10.20097	0.0000
R-squared	0.943417	Mean dependent var		9.010557
Adjusted R-squared	0.933515	S.D. dependent var		0.208338
S.E. of regression	0.053719	Akaike info criterion		-2.859086
Sum squared resid	0.115429	Schwarz criterion		-2.547219
Ln likelihood	76.61807	F-statistic		95.27591
Durbin-Watson stat	0.673965	Prob(F-statistic)		0.000000

Table 3. The regression result for *lnXCAP* in the second stage

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.009333	5.441702	-0.369247	0.7139
lnREXR	0.408959	0.527754	0.774905	0.4430
lnYCAPhat	2.066446	0.384301	5.377152	0.0000
BTA	0.352853	0.083538	4.223859	0.0001
AD	-0.035066	0.102205	-0.343089	0.7333
QD_2	-0.289265	0.133789	-2.162100	0.0366
QD_3	0.031216	0.109683	0.284605	0.7774
QD_4	-0.329869	0.161355	-2.044365	0.0475
R-squared	0.900740	Mean dependent var		12.98224
Adjusted R-squared	0.883369	S.D. dependent var		0.501760
S.E. of regression	0.171357	Akaike info criterion		-0.539120
Sum squared resid	1.174532	Schwarz criterion		-0.227254
Ln likelihood	20.93889	F-statistic		51.85455
Durbin-Watson stat	1.063037	Prob(F-statistic)		0.000000

Table 4. Regression for *dlnYCAP*

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.346992	0.011683	-29.70106	0.0000
dlnREXR	0.047700	0.118016	0.404180	0.6883
dlnXCAP	0.003831	0.023826	0.160771	0.8731
BTA	0.005777	0.010663	0.541757	0.5911
AD	0.001690	0.009871	0.171162	0.8650
QD_2	0.638230	0.018648	34.22448	0.0000
QD_3	0.266059	0.015590	17.06568	0.0000
QD_4	0.503245	0.012591	39.96791	0.0000

R-squared	0.991715	Mean dependent var	0.017083
Adjusted R-squared	0.990228	S.D. dependent var	0.243995
S.E. of regression	0.024120	Akaike info criterion	-4.457719
Sum squared resid	0.022689	Schwarz criterion	-4.142800
Ln likelihood	112.7564	F-statistic	666.8921
Durbin-Watson stat	1.992224	Prob(F-statistic)	0.000000

Table 5. Regression for *dlnXCAP*

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.245987	0.379429	-0.648307	0.5206
dlnREXR	0.136645	0.794256	0.172041	0.8643
dlnYCAP	0.172906	1.075475	0.160771	0.8731
BTA	-0.044219	0.071561	-0.617925	0.5402
AD	0.003289	0.066341	0.049583	0.9607
QD_2	0.546563	0.692456	0.789310	0.4347
QD_3	0.448400	0.296220	1.513740	0.1382
QD_4	0.211754	0.546925	0.387171	0.7007
R-squared	0.730289	Mean dependent var		0.035983
Adjusted R-squared	0.681880	S.D. dependent var		0.287314
S.E. of regression	0.162051	Akaike info criterion		-0.647969
Sum squared resid	1.024163	Schwarz criterion		-0.333051
Ln likelihood	23.22728	F-statistic		15.08562
Durbin-Watson stat	3.020624	Prob(F-statistic)		0.000000

The first difference regression results show that mutual effects of economic growth and fishery exports are not statistically significant and Durbin-Watson statistic in Table 4.10 is 3.02, indicating a possible negative correlation. Because the first difference regression have just to capture the short-run but the regression showed insignificant relationships, the datasets of *lnYCAP* and *lnXCAP* are suspected to be cointegrated. The cointegration test thus needs to be conducted to employ the error correction method for the datasets. Johansen test indicates a cointegration between the two datasets of *lnYCAP* and *lnXCAP*. The cointegration allows use Error Correction Modeling method to reconcile the short-run behavior of these variables with their long-run behavior. With a possible endogeneity between *lnYCAP* and *lnXCAP* datasets, Vector Error Correction estimation is conducted. The estimation results are presented in Table 4.6.

The regression estimated that, in short-run, fishery exports affect much on GDP (absolute value of t-stat is 3.386) but the sign of this relationship is minus. Values of both GDP and fishery exports in all three quarters 2, 3 and 4 increase relative to that in quarter 1 because annual quarter 1 is the holiday season of Vietnamese people. Most of the people are likely to relax and get fun after one working hard year, leading to an decease in the productivity in Vietnamese economy and a reduction in GDP values. Further, in the first quarter of each year, most of Vietnamese fishery outputs are prioritized to serve domestic market, thus, there is not much surplus in fishery production to export. Values of fishery exports in second quarters are higher than that in first quarters because all production activities in Vietnam start in normal operation

after holiday. The figures are improved well in third and fourth quarters in efforts to achieve annual export targets of fisheries enterprises.

Table 4.6 Vector Error Correction Estimates

Cointegrating Eq:	CointEq1	
$lnYCAP_{(-1)}$	1.000000	
$lnXCAP_{(-1)}$	-0.353490	
	[-3.47723]	
C	-4.417842	
Error Correction:	*dlnYCAP*	*dlnXCAP*
CointEq1	-0.186955	0.524847
	[-2.58688]	[1.13754]
$dlnYCAP_{(-1)}$	0.152659	0.731477
	[0.99666]	[0.74804]
$dlnXCAP_{(-1)}$	-0.084653	-0.443494
	[-3.38643]	[-2.77897]
Constant	-0.918004	1.353921
	[-1.40072]	[0.32359]
lnREXR	-0.063581	0.205208
	[-0.87808]	[0.44391]
BTA	-0.017598	0.003412
	[-1.36845]	[0.04156]
AD	0.011578	-0.032475
	[1.15793]	[-0.50871]
QD_2	0.649421	0.996612
	[8.87885]	[2.13429]
QD_3	0.268454	0.564955
	[11.3991]	[3.75762]
QD_4	0.521871	0.641232
	[14.7913]	[2.84679]
R-squared	0.993699	0.812120
Adj. R-squared	0.992124	0.765150

Notes: t-statistics in [ ]

Real exchange rate and the bilateral trade agreement between Vietnam and the US seem to decrease Vietnamese GDP and increase fishery exports but these effects are not statistically significant. The results are unlikely to favor the recent argument that a devaluation of Vietnam dong against to US dollar would increase exports and in its turn, increase GDP. The US anti-dumping measures in 2003 against to catfish, and then in 2004 to shrimp imports from Vietnam seem to depress Vietnamese fishery exports but the effects has not enough significance to derive an economic implication.

With the Vector Error Correction estimation, the empirical model for *dlnYCAP* are estimated as following

$$dlnYCAP_t = -0.19*(lnYCAP_{(t-1)} - 0.35*lnXCAP_{(t-1)} - 4.42) + 0.15*dlnYCAP_{(t-1)} - 0.08*dlnXCAP_{(t-1)} - 0.92 + 0.65*QD_2 + 0.27*QD_3 + 0.52*QD_4 + e \quad (11)$$

Expanding the differences, the long run equation for *lnYCAP* is derived as:

$$lnYCAP_t = 0.96*lnYCAP_{(t-1)} - 0.15*lnYCAP_{(t-2)} - 0.01*lnXCAP_{(t-1)} + 0.08*lnXCAP_{(t-2)} - 0.08 + 0.65*QD_2 + 0.27*QD_3 + 0.52*QD_4 + e \quad (12)$$

The result estimates that GDP of Vietnam increases in all three quarters 2, 3, and 4 relative to that of the first quarter annually. Economic growth of Vietnam was estimated not to be affected significantly by the BTA between Vietnam and USA as expected.

Although fishery exports depress Vietnamese GDP in its first lag, it was estimated to increase the GDP in its second lag with larger effect. In long run, with summation of the two lags, fishery exports are likely to increase the GDP. For the long run estimation, a conclusion can be pointed out that Vietnamese GDP will increase 0.7% with a 10% *c.p.* increase in its fishery exports revenues. This finding has a great economic meaning in the developing process of Vietnamese economy. For example, if value of fishery export revenue doubles, Vietnamese GDP would increase by 7% if other variables hold constant, it is so meaningful. The estimation results also confirm the role of sectoral exports in national economic growth, consistent with previous findings by Awokuse (2003), Anh (2008), Dritsakis (2004), and Thompson and Thompson (2010). In further implication, the results have also confirmed the contribution of exports to economic growth as documented in lots of literature. Vohra (2001), for instance, finds exports have a positive impact on economic growth when a country achieves some level of development, examining India, Pakistan, the Philippines, Malaysia, and Thailand from 1973 to 1993. In another study, Lee and Pan (2000) provide evidence of Granger causal relations from exports to GDP in Hong Kong, Indonesia, South Korea, Malaysia, the Philippines, Singapore, Taiwan, and Thailand.

In similar derivation, the empirical estimation for ln(XCAP) (Equation 11) is expressed as follows:

$$dlnXCAP = 0.52*(lnYCAP_{(-1)} - 0.35*lnXCAP_{(-1)} - 4.42) + 0.73*dlnYCAP_{(-1)} - 0.44*dlnXCAP_{(-1)} + 1.35 + 0.99*QD_2 + 0.56*QD_3 + 0.64*QD_4 + e \quad (13)$$

The above equations are expanded and calculated as below:

$$LNXCAP = 0.38*lnXCAP_{(-1)} + 0.44*lnXCAP_{(-2)} + 1.25*lnYCAP_{(-1)} - 0.73*lnYCAP_{(-2)} + 1.35 + 0.99*QD_2 + 0.56*QD_3 + 0.64*QD_4 + e \quad (14)$$

The long run estimation derived in Equation 14 confirms an increase in fishery exports of Vietnam in all three yearly quarters 2, 3, and 4 relative to the first quarter. Vietnamese GDP is likely to raise fishery exports in its first lag. Although fishery exports were estimated to be lowered by GDP in second lag, with summation of the two lags, the GDP were likely to increase the fishery exports in long run. Vietnamese fishery exports would increase by 5.2% with 10% increase in its GDP.

The estimated result is likely to be consisting with the findings of Siddique and Selvanathan (2002) mentioning about a positive effect of an economic growth on exports in Thailand during 1953-1993 through cointegration and Granger causality

tests for exports, imports, and economic growth. The US antidumping measures against to Vietnamese frozen catfish fillets and shrimp was estimated not to give a significant effect on Vietnamese GDP growth nor fishery exports revenues, consistent with the previous finding of Duc (2010) working specifically on catfish trade.

CONCLUSION AND SUGGESTION

With data values of Vietnamese fishery exports and its GDP presents a co-integration, Vector Error Correction Modeling was an appropriate alternative. The long run estimation confirms an increase in fishery exports of Vietnam in all three last quarters (2, 3, and 4) relative to the first quarter yearly. The regression results also exhibit an economic impact of fishery exports in Vietnam. Although causing an estimated decrease in economic growth in short time, Vietnamese fishery exports, generally, are estimated to raise its national GDP in long time with its positive effects in accumulated two lags, during the period 1997 – 2008. For the long run estimation, a conclusion can be pointed out that Vietnamese GDP would increase 7% with a double *ceterus parabus* increase in its fishery exports value. This finding has a great economic meaning in developing process of the economy. An increase in exports of a sector like fishery is likely to create a growth in economy and in its turn, economic growth also boosts up a growth of a sector. Vietnamese fishery exports would increase by 5.2% with 10% increase in its GDP. Confirming the role of export-led growth strategy in development economics, this study merits contributing to academic literature on international trade and economics with its empirical time series analyses.

Vietnam became a WTO's member since 2007 and it would remove or reduce import tariff imposed on foreign aquatic products and also on aquaculture inputs leading to a forecasted increase in fishery import expenditure. Further analyses which include the expenditure, therefore, should be implemented to confirm the findings of this study.

REFERENCES

Ahmed, M., 2003. "Fish for the poor in a globalized economy - macro benefits vs. micro impacts". Presentation given at the expert consultation on international fish trade and food security. Casablanca Morocco 27-30 Jan 2003, Rome: *FAO Fisheries Report No.708*, Food and Agriculture Organization.

Anh, P.T.M, 2008. *Can Vietnam's Economic Growth Be Explained by Investment or Export: a VAR Analysis*. http://www.vdf.org.vn/workingpapers/vdfwp0815, accessed on 4 May, 2009

Balassa, B., 1978. Exports and economic growth: further evidence. *Journal of Development Economics* 5, pp. 181-9

Bhagwati, J., (1978). *Anatomy and Consequences of Exchange Control Regimes: Liberalization Attempts and Consequences*. Cambridge, MA: Ballinger.

Blanchard, O., 1997. *Macroeconomics*. 2nd. New Jersey: Prentice Hall International, Inc.

Bostock, T.,P. Greenhalgh and U. Kleih , 2004. *Policy research - implications of liberalization of fish trade for developing countries. Synthesis report*. Chatham, UK: Natural Resources Institute, University of Greenwich, 68 p.

Corden, W.M., 1972. The theory of protection. *Journal of International Economics*, 1972, vol. 2, issue 1, pages 106-107

Cunningham, S., 2000. *Fishing agreement: trade and fisheries management*, In Hatcher, A. and D. Tingley (eds.), pp.255-272. Portsmouth: Center for the Economics and Management of Aquatic Resources.

Dritsakis, N., 2004. Tourism as long-run economic growth factors: an empirical investigation for Greece using causality analysis. *Tourism Economics*, Vol. 10, pp 305-16

Duc, N.M 2008. Economic contribution of fish culture in farm income. *Aquaculture International* 17(1):15-29.

Duc, N.M., 2009a. Contribution of fish production in farmers' subjective well-being. *Journal of The World Aquaculture Society* 40(3): 417-424.

Duc, N.M, 2009b. *Effects of US Antidumping in Perfect and Imperfect Competition – The Case of Catfish*. VDM Verlag

Duc, N.M., 2010**. "**Application of Econometric Models for Price Impact Assessment of Antidumping Measures and Labeling Laws on Global Markets: A Case Study of Vietnamese Striped Catfish**".** *Reviews in Aquaculture*. 2(2):86-101.

Duc, N.M. and T.T.K. Hong, 2009. Vietnamese Export in the Global Economic Crisis – Challenges and Opportunities. In "*From Crisis to Restructuration*" (Le Bao Lam ed.), HCMC National University, pp: 45-50 (In Vietnamese).

Edwards, S., 1998. Openness, productivity and growth: What do we really know? *Economic Journal*, 108, 2, (March): 383-98.

EU, 2006. *Fisheries and Maritime Affairs*. Fact sheet 4.2. Bi-Lateral Agreement. http://ec.europa.eu/comm/fisheries/doc_et_publ/factsheets/facts/en/pcpa4_2.htm, accessed on 22 June, 2009

FAO, 2007. *The State of World Fisheries and Aquaculture 2006*. Rome: Food and Agriculture Organization of the United Nations, 160 p.

Feder, G., 1982. On Exports and Economic Growth. *Journal of Development Economics*, Vol. 12, 59-73

Fistenet, 2009. http://www.fistenet.gov.vn/index_e.asp, accessed on 20 June, 2009

GSO 2009. http://www.gso.gov.vn, accessed on 18 May, 2009

GSO, 2006. *Statistic Year Book*. Ha noi: The Statistics Publisher.

Kapur, D., 2004.Remittances: The New Development Mantra? *G24 Discussion Paper Series, No.29.*

Kinnucan H.W. and Miao Y., 1999. Media-Specific Returns to Generic Advertising: the Case of Catfish. *Agribusiness* 15: 81–99

Krueger, A.O., 1978. *Foreign Trade Regimes and Economic Development: Liberalization Attempts and Consequences*. Cambridge, MA: Ballinger.

Kurien, J., 2005. *Responsible fish trade and food security.* FAO Fisheries Technical Paper. No 456, Rome: Food and Agriculture Organization, 102 p.

Lee, D.Y. and M.S. Pan, 2000, On Exports and Economic Growth in East Asian Countries: Linear and Nonlinear Causality Analyses, *Pennsylvania Economic Review*, **9**(2), pp. 66-78.

Levine, R. and Renelt, D., 1992. A sensitivity analysis of Cross-Country Growth Regressions. *American Economic Review*, 82, 4 (September): 942-63.

Lucas, R.E., 1988. On the Mechanics of Economic Development. *Journal of Monetary Economics* 22: 3–42.

Ngoc P.M, Anh N.T.P, and Nga P.T., 2003. Exports and Long-run Growth in Vietnam, 1976-2001. *ASEAN Economic Bulletin*, 20 (3), pp. 211-232

OANDA, 2009. http://www.oanda.com/convert/fxhistory, accessed on 25 June, 2009.

Ratha, D. (2003) "Workers' Remittances: An Important and Stable Source of External Development Finance" in Global Development Finance Report the World Bank Washington D.C.

Romer P.M., 1986. Increasing Returns and Long-Run Growth. *Journal of Political Economy*, 94(5):1002-1037

Schmidt, C.C., 2003. *Globalisation, industry structure, market power and impact of fish trade- Opportunities and challenges for developed (OECD) countries*. Paper prepared for the FAO Industry and Expert Consultation on International Trade., Rio de Janeiro, Brazil, and 3-5 December 2003.

Siddique, M.A.B. and E.A. Selvanathan, 2002, Export Performance and Economic Development in Thailand, *Empirical Economics Letters*, **1**(1), pp. 33-42.

Sheehey, E.J., 1990. Exports and Growth: A Flawed Framework. *Journal of Development Studies*, 27(1):111-125

Thompson, A. and H. Thompson, 2010. The Exchange Rate, Euro Switch, and Tourism Revenue in Greece. *Tourism Economics*, 16(3):773-780

Valdimarsson, G. (2003). *International fish trade*. Presentation given at the expert consultation on international fish trade and food security. Casablanca Morocco 27-30 Jan 2003, Rome: *FAO Fisheries Report No.708*, Food and Agriculture Organization.

Vohra, R., 2001. Export and Economic Growth: Further Time Series Evidence from Less-Developed Countries, *International Advances in Economic Research*, **7**(3): 345-350.

Yang, D., 2004. *International Migration, Human Capital, and Entrepreneurship: Evidence from Philippine Migrants' Exchange Rate Shocks*. Ford School of Public Policy Working Paper Series 02- 011, University of Michigan.