Investigation on the Impact of US Anti-dumping Measures during the "Catfish War" on Vietnamese Pangasius Exports

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Abstract

The Vietnamese pangasius industry has faced anti-dumping (AD) measures imposed by the United States of America (USA). This dispute between the USA and Vietnam is known as the "Catfish War". Based on monthly time series data from January 1999 to December 2011, an econometric approach is considered, in which regression models are taken into account for investigating how the USA AD measures impact on the volume and the value of Vietnam's pangasius exports. As resulted in the estimation, the paper found that although the anti-dumping taxes imposed on Vietnam pangasius, it is not so seriously problematic for exporters in the long-term. One of the reasons is that Vietnam pangasius exporters are dynamic in developing market diversification by shifting from the USA to the European market.. However, in the short term, the trade dispute between the USA and Vietnam is a warning alarm for Vietnam pangasius exporters. In addition, the paper does not have any evidence to confirm that the upward trend of the real exchange rate between the VND and the USD is causing changes in either the pangasius export volume or the pangasius export value. Also there is no confirmation of a significant relationship between the inflation rate in Vietnam and the export value.

Keywords: Aquaculture, Vietnam pangasius, anti-dumping.

1. Introduction

The use of Anti-dumping (AD) measures has increased dramatically over the last two decades (Miranda et al, 1998; Prusa, 2001). It has been a most popular way of protecting a country's economic situation. Dumping is considered as unfair competition, although price discrimination between markets can be considered as a legitimate business strategy (Krugman and Obstfeld, 2003). The World Trade Organization (WTO) ruled for instance, that the United States of America (USA) was violating international trade rules with a tax on specific products, such as shrimp imports from Thailand and India, thus damaging the USA's credibility as a free trader[1]. AD measures are nowadays among the most customary of non-tariff barriers.

According to the WTO, dumping occurs when "a company exports a product at a price lower than the price it normally charges on its own home market". Unlike traditional forms of protection, current AD measures are selective and less transparent tariffs (Ethier and Fishcher, 1990).

Three alternative methods are considered to determine the normal value of products: the product price in the exporter's domestic market, the price charged by the exporter in another country, or the price computed as a combination of the exporter's production costs, other expenses and normal profit margins.

The USA and the European Union (EU) have laws allowing governments to investigate charges of dumping and to take antidumping actions. In the USA, industries can petition the International Trade Commission (ITC) and the Department of Commerce (DOC) to take antidumping actions to counteract dumped imports. If the DOC finds evidence of dumping and the ITC finds that the industry is "materially injured or threatened with material injury", antidumping duties can be imposed. Similarly, the EU can bring antidumping actions if it finds evidence of dumping which causes or threatens to cause material injury to a domestic industry.

Many quantitative studies have investigated how AD impacts on trade trends of exporting countries, and found evidence of trade diversion for the USA (Prusa, 1996) and for the EU (Konings et al, 2001). In addition, Cuyvers and Dumont (2005) used a panel regression to estimate the impact of AD duties on trade in some 12 products from ASEAN countries and found a significant negative impact of AD duties on both the value and the quantity of imports of the EU from ASEAN countries.

During the period 1981-2001, among the top 40 countries targeted for AD investigation (Zanardi, 2004), Asian countries were the target of more than 38 percent of AD investigations and the ASEAN countries accounted for 7 percent of the investigations (Cuyvers and Dumont, 2005). But at the same time, Vietnam was not in case. As a result, the AD has been like a warning sign for the developing countries

The purpose of this paper is to investigate the effects of the USA anti-dumping measures on the Vietnamese pangasius industry. A trade dispute between the USA and Vietnam erupted in 2002 and became known as the "Catfish War". The USA authorities conducted an AD investigation against alleged Vietnamese dumping of certain frozen pangasius fillets and imposed an AD duty. In the next section, the evolution of the trade dispute is discussed. In the third section the reasons leading to the

trade dispute and the impact of the AD measures against Vietnamese pangasius exports are discussed. Next the results of our econometric analysis are discussed. The final section offers conclusions.

2. The USA antidumping measures on Vietnamese pangasius

2.1. Background

Basa (*Pangasius bocourti*) and tra fish (*Pangasius hypophthalmus*) are the two species of pangasius cultured in Vietnam. These are also the most important freshwater products in the Mekong Delta region in the south of Vietnam. Mostly the pangasius is produced in cages anchored in ponds and nearby rivers. In the USA, catfish is raised in man-made ponds, predominantly in the states of Mississippi, Arkansas, Alabama and Louisiana. The catfish industry is by far the largest farm-raised fishing sector in the USA, accounting for 80 and 60 percent of aquaculture production in volume and value respectively (USA International Trade Commission, 2002). In the Southeast of the United States, there are over 1000 farms that raise catfish and 25 processing plants. The American catfish belongs to the family of Channel Catfish.

Before 1986, extensive fish farming was practiced in Vietnam, mainly catering to domestic demand. In 1986, supported by Australian experts and by the establishment of AGI-FISH in the An Giang province, *tra* and *basa* were produced and exported to Australia as fillet products. Until 1990, tra and basa fillets were important in the Asian market, such as Hong Kong, Japan and China. During this period, tra and basa farming expanded in many provinces in the Mekong Delta, as the demand for raw fish increased rapidly, and most of the farm households involved were shifting to intensive fish farming.

After the lifting of the USA embargo in 1995 and the Vietnam-USA Bilateral Trade Agreement (BTA) ratified in 2001, increasing opportunities emerged for the Vietnamese pangasius industry to export to the USA, the EU, Japan, Hong Kong, Singapore and on the world market at large. Moreover, as the Mekong Delta is particularly suited for tra and basa farming, together with the high and longstanding experience of the farmers, basa and tra farming rapidly developed from 1996 onwards.

The development of the farming of tra and basa was influenced by factors such as: (i) the quality of the Vietnamese tra and basa fish meeting domestic and international standards of quality, food safety and hygiene; (ii) Vietnamese tra and basa fish showing specific product characteristics (special flavour, coloring and low-fat); (iii) an attractive price due to low production cost as a result of cheap prices of labour and fingerlings; and (iv) the fingerling socialization program being actively implemented and disseminated from 1995. Before that time, fish farmers depended much on the source of natural fingerlings and they had to catch natural fingerling fish themselves from rivers, or alternatively, to buy them from others whose main occupation was to fish and to catch natural fingerling fish. Based on the reasons just pointed out, the tra and the basa fingerling source of the farmers were paid more attention to achieve a much more stable supply.

With the increased development potential, and the Government policies of economic transition, many exporting and processing com-

panies started tra and basa business activities. Instead of just the two main companies (AGI-FISH and AFIEX) of ten years ago, many companies are currently operating in Vietnam, most of them locate in the Mekong Delta. According to the Vietnam Association of Seafood Exporters and Producers (VASEP), the top ten Vietnam pangasius exporters[2] are Vinh Hoan Corp, AGIFISH, Hung Vuong Corp, NAVICO, I.D.I Corp, CASEAMEX , Anvifish Co., DATHA-CO, Hungca Co, CL-Fish Corp.

The development of tra and basa fish farming has positively affected Vietnam's regional and national economic development. However, this has been stalled by the increased trade barriers that Vietnamese basa and tra exporters have faced. Among these barriers, mention can be made of the penal anti-dumping duty, imposed on the imports of tra and basa fillets by the USA ITC, as well as many technical barriers (e.g. the USA FDA[3] addition of prohibited antibiotics). Consequently, a lot of fish farmers had to shift their main occupation to other unskilled farming and cultivation, with many completely failing. This, evidently, had severe social consequences in Vietnam: with an increasing unemployment rate in the rural areas (Tung et al, 2004) and a complete loss of investments made, destitution, etc., at a time when fish farmers had to bear huge interest payments to the banks on the loans for their initial investment.

### 2.2. Review of the catfish war

Over the last few years, thousands of kilograms of Vietnamese tra and basa have been sold in the USA market, thus reaching a large market share, rapidly capturing 20%[4] of the USA catfish market. Imports in the USA sub-sequently soared to 21,000 tons of fillets in 2002. Advantages of cheap labour, artificial fertilizers, fingerlings, and preferential natural conditions are among the main reasons for the taking off of Vietnam's pangasius industry. Based on these advantages, more active government planning and development programs were evolved to facilitate the economic sectors addressing an effective investment. With tariffs dropped to zero for the pangasius product, Vietnam has been able to export at its normal price, which is much cheaper than the American counterpart.

A corollary of the above was, that the USA domestic producer prices dropped from 1.6 USD/kg in January 1997 to 1.2 USD/kg in December 2002, as depicted in Figure 1. Consequently, on 28 June 2002, the USA Catfish Farmers' Association (CFA) and eight seafood production companies lodged an application with the USA ITC, to sue the Vietnamese Association of Seafood Exporters and Processors (VASEP) for dumping catfish products in the USA. They claimed that since the catfish produced by them counted for 85.7 percent[5] of the total USA market, they were in effect acting on behalf of all catfish farmers in the USA. The defendants named in the case were 56 seafood processors in Vietnam, although some of the named firms had nothing to do with the varieties of catfish produced for exporting in Vietnam.

The crux of the investigation (initiated on July 18, 2002) appears to lie in the conclusion that the USA investigators have drawn. First of all, trade description legislation was used to restrict the name "catfish" solely to Ictalurids grown in the USA, so denying the basa a

Figure 1: Average monthly price for the USA farm-raised catfish
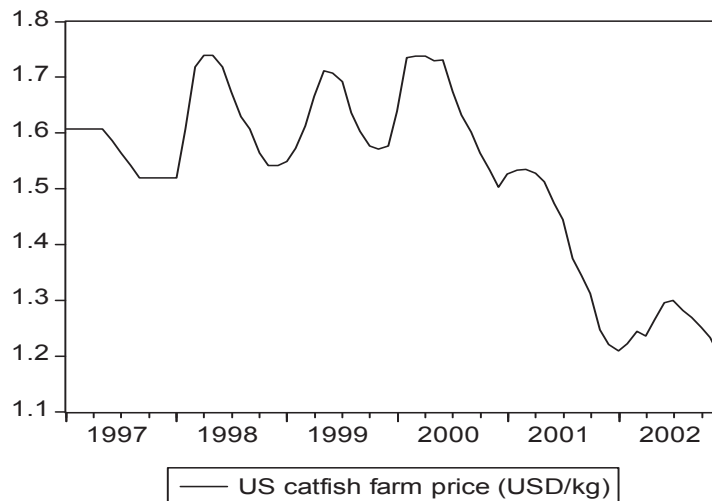
Source: Monthly catfish producing report, National Agricultural Statistics Service, USDA.

key brand advantage, especially because the Vietnamese imported fish was much cheaper than the local fish. This was the first success of the USA catfish producers in convincing the USA Congress to force Vietnamese exporters to change the name of their product to "tra" or "basa".

On August 8, 2002, the USA ITC issued its affirmative preliminary determination that there was a reasonable indication that an industry in the USA was threatened with material injury by imports from Vietnam of certain frozen fish fillets. On August 9, 2002, the DOC requested quantity and value information from a total of fifty-three Vietnamese companies, which were identified in the Petition for the Imposition of Antidumping Duties: Frozen Fish Fillets from Vietnam, dated June 28, 2002 ("Petition"). The DOC chose to pick India and Bangladesh as surrogate economies for comparing catfish price levels. The DOC found the price levels in these countries much higher than in Viet-

nam. Despite protests by the VASEP, the DOC concluded in its preliminary order on January 27, 2003 that "Vietnamese producers/exporters have made sales to USA customers at less than fair value" and recommended anti-dumping duties on all major producers' products of fish fillets (Table 1). This preliminary determination was based on the AD investigation on imports of certain frozen fish fillets. The DOC made its preliminary determination with the AD duties for the producers/exporters, who voluntarily responded to Section A[6] of the Department's questionnaire. The DOC and the ITC made final affirmative determinations that critical circumstances existed regarding the imports of frozen fish fillets, and that antidumping duties would be assessed retroactively on goods imported up to ninety days prior to the publication of the Department's preliminary determination.

On August 6, 2003, the ITC notified the DOC of its final determination pursuant to section 735(b)(1)(A)(e)[7] of the Tariff Act that "an

Table 1: Preliminary anti-dumping duties

Vietnamese Exporter	Preliminary Anti-dumping (27January 2003)
AGIFISH Co	61.88%
CATACO	41.06%
NAVICO	53.96%
VINH HOAN CO., LTD	37.94%
Respondents who voluntarily submitted Section A responses	49.16%
Vietnam-wide	63.88%

Source: ITC Dataweb; http://ia.ita.doc.gov/download/factsheets/factsheet-vietnam-catfish-prelim-012703.pdf

industry in the USA is materially injured by reason of less than fair value imports of subject merchandise from Vietnam". The AD duty would be assessed on all unliquidated entries of certain frozen fish fillets from Vietnam entered, or withdrawn from the warehouse, for consumption on or after January 31, 2003, the date on which the Department published the Notice of Preliminary Determination of Sales at Less Than Fair Value, Affirmative Preliminary Determination of Critical Circumstances and Postponement of Final Determination: Certain Frozen Fish Fillets From the Vietnam[8].

The product covered by the investigation was frozen fish fillets, including regular, shank, and strip fillets and portions thereof, whether or not breaded or marinated, of the species *Pangasius Bocourti, Pangasius Hypophthalmus* (also known as *Pangasius*), and *Pangasius Micronemus*. The merchandise would be referred to as frozen "basa" and "tra" fillets, which are the Vietnamese common names for these species of fish. These products are classifiable under tariff article codes 0304.20.60.30 (Frozen Catfish Fillets), 0304.20.60.96 (Frozen Sole Fillets, NESOI), 0304.20.60.43 (Frozen Freshwater Fish Fillets) and 0304.20.60.57 (Frozen Sole Fillets) of the Harmonized Tariff Schedule of the United States (HTSUS).

As mentioned above, the DOC decided to raise tariffs on the Vietnamese frozen tra and basa fillets. A number of Vietnamese exporters had to bear anti-dumping duties as high as shown in Table 2.

The dumping charges shocked the VASEP, the Vietnamese Government and practically all those familiar with the catfish industry in Vietnam, including the USA Embassy and a number of USA businesses based in Vietnam. Vietnam had been in transition from a centrally planned, to a market economy since 1986 and for all practical purposes, was now a market economy. It was under an IMF-World Bank structural adjustment regime and had dismantled whatever meager subsidies it was able to provide in the past to its agriculture producers and fishers. In fact, proof of Vietnam's status as a market economy was one of the preconditions of the USA-Vietnam BTA that was signed by the two countries in 2000. Moreover, compared with the USA, Vietnam is a poor country, and simply does not have the resources to provide its industrial sectors with the levels of subsidies and supports that the USA provides to its own producers.

The dumping investigation and the anti-dumping measures were regrettable for a lot

Table 2: Anti-dumping duties levied by the USA DOC

Vietnamese Exporters	Anti-dumping Duty (18-June-2004)	Anti-dumping Duty (18-July-2003)
AGIFISH Co	44.76%	47.05%
CATACO	45.55%	45.81%
NAVICO	52.90%	53.68%
VINH HOAN CO., LTD	36.84%	36.84%
Respondent with "separate rates"	44.66%	45.55%
Vietnam-wide	63.88%	63.88%

Source: VASEP, Final determination in the Anti-duping duty investigation of certain frozen fish fillets from Vietnam[9]

of reasons. From an economic perspective, they were not justified. The conclusion of Vietnam not being a market economy was unwarranted. First, while Vietnam is not yet an adult market economy, the domestic tra and basa market in Vietnam has many characteristics of a competitive market, in which the forces of supply and demand largely determine market outcomes. Secondly, from a purely theoretical point of view, even though Vietnam is not a market economy, the USA and Vietnam can still engage in mutually beneficial trade. Thirdly, the label of a non-market economy can be conveniently applied to many transitional economies (including China and the East European countries) with potentially harmful consequence for free trade[10].

After one year of the imposition of AD measures, the AD duties were adjusted according to Table 3. Due to compliance with what the AD requirements and the US regulations on good cooperation to supply information asked, some Vietnamese exporters had a good chance for the AD duty being reduced. Illustratively, the AD duty against VINH HOANG CO, LTD came down to 6.81% in 2004, instead of 36.84% in 2003. In contrast, CATACO was confronted with a higher duty level of 80.88%, instead of 45.81% in 2003, which CATACO did not cooperate so well and failed to meet DOC's requirements during a re-investigation two years later. Based on the advantage of the AD tax being reduced after two years after the AD duty was ratified, some companies with a

Table 3: The first adjustment of USA Anti-dumping duties on Vietnamese catfish (1/8/2004 – 2006)

Vietnamese Exporters	Anti-dumping Duty
AGIFISH Co.	47.05%
CATACO	**80.88%**
NAVICO	45.81%
VINH HOAN Co., LTD	**6.81%**
Respondent with "separate rates"	45.55%
Vietnam-wide	63.88%

Source: Magazine BT37-2006 VASEP (Vietnam Association Seafood of Exporters and Producers)

Figure 2: Vietnamese pangasius exported to the USA

Export value (ton/month)

Real exchange rate (VND versus USD)

Export value (Million USD/month)
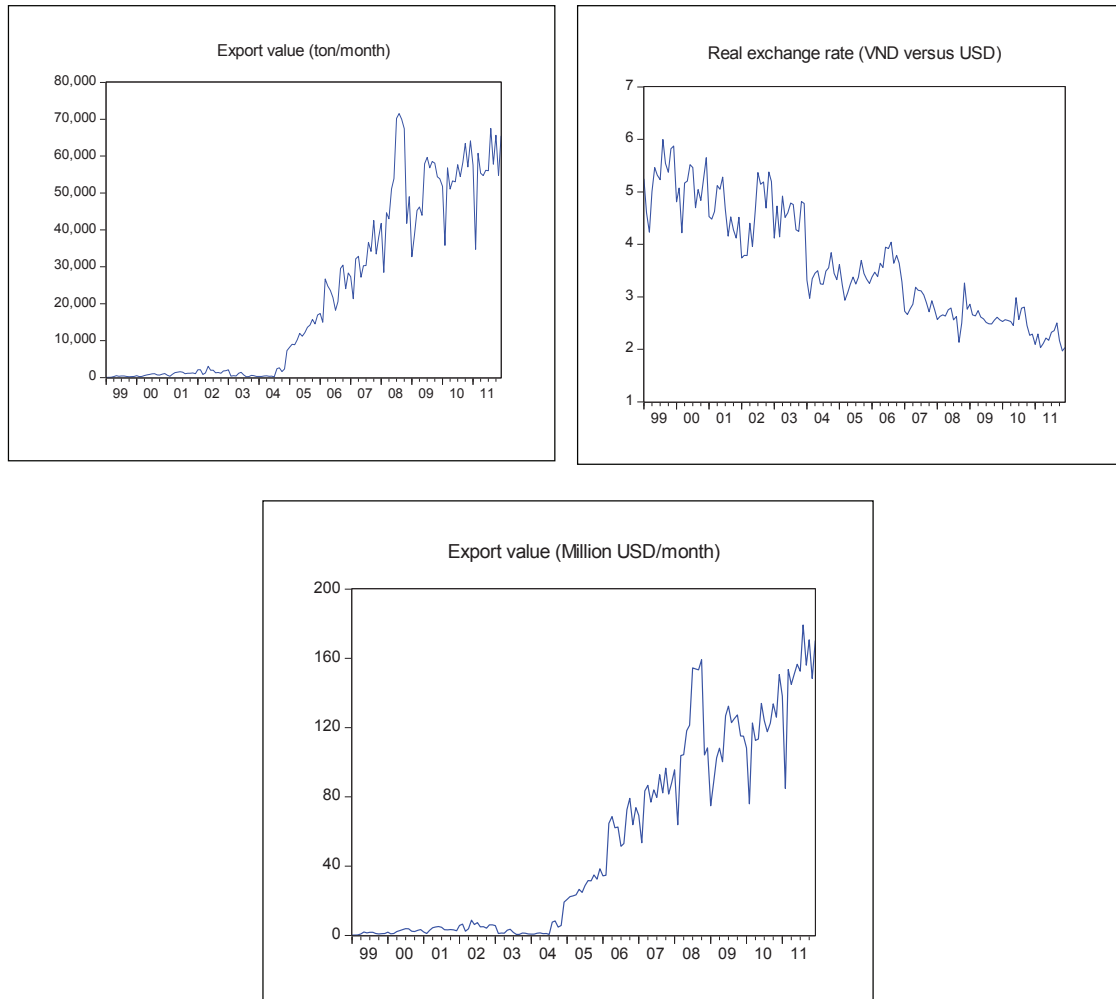
Source: VASEP, Daily price information of An Giang province-Vietnam, the USA Bureau of Census;
VND/USD is the exchange rate ratio between VND (Vietnamese Dong) and USD.
1 USD = 13772 VND in 1999; 1 USD = 14065 VND in 2000, 1 USD = 14663 in 2001; 1 = USD
= 15441 VND in 2002; 1 USD = 15450 in 2003; 1 USD = 15730 VND in 2004; 1 USD = 15807 in
2005; 1 USD = 15971 VND in 2006; 1 USD = 16064 VND in 2007; 1 USD = 16572 VND in 2008;
1 USD = 17573 VND in 2009; 1 USD = 19196 in 2010; 1 USD = 20545 VND in 2011

lower AD duty imposed also earned more benefits than other companies with a high AD duty. In order to maintain a continuous business, the high AD duty companies tried to expand the market, e.g. into Europe, Asia, etc., at the same time looking for a way to enter the USA market through organizing business in neighboring countries who have the same natural conditions

as Vietnam and who can produce pangasius. e.g. Cambodia.

The DOC yearly reconsiders the decision and tax of anti-dumping on certain frozen tra and basa fillets from Vietnamese fish exporters. Yet, some companies who meet DOC's requirement during administrative reviews, will have their AD duty level reduced. Evidently, QVD, Vinh Hoang, Samefico and Cadovimex II, all of these companies from Vietnam, are not subjected to AD taxes, enjoying a zero percent tax rate during 2007-2008. At the same time other Vietnamese exporters, e.g. AGIFISH and EAST SEA, were subjected to an AD tax rate of 0.02%.

However, there was some change at the end of 2008, when the US Department of Commerce (DOC) made a preliminary decision on charging anti-dumping tariffs on imported Vietnamese pangasius from 1 August 2008 until 31 July 2009. Therefore, Vietnamese firms had to pay a high tax rate of USD 4.22 per kg, a 100-120 per cent jump from the previous year, even though the fish sold for a lot less than the tax in the American market.

In short, during the trade dispute, the USA was the major market for tra and basa catfish of Vietnam with the USA market accounting for 20% of the American market. Due to the constraints of the AD duty imposed by the USA, Vietnamese exporters reacted positively by looking for and entering new markets. The EU has become a big market for Vietnamese catfish products since the trade dispute, accounting for a 50 percent share of the total volume of catfish exported.

Within just a few months after June 2003 Vietnam's exports of pangasius to the USA fell by about 50% due to the penal AD duties imposed by the USA. However, as shown in figure 2, the Vietnamese exporters recovered quickly after one year of the "catfish war" (Binh, 2006). In particular, either the export volume or the export value increased. As a result, the USA is still an important traditional market for Vietnam, although in the meantime the Vietnamese exporters have been diversifying and expanding into new markets such as the EU[11]. Another important factor which contributed to the increasing export volumes was the real exchange rate[12] of the Vietnamese Dong (VND) against the USD.

3. Econometric analysis

3.1. Data

In the present study, the monthly data on export volume (ton/month), the export value (million USD/month), the average monthly real exchange rate between VND[13] and USD, and the monthly time series of inflation rate of Vietnam, are used, relating to Vietnamese pangasius exports to the USA and covering the period from January 1999 to December 2011. These data are from various Vietnamese sources, including VASEP and the daily market price information of the An Giang province in the Mekong Delta, and the USA Bureau of Census. The monthly export volume and the value data were tested for the presence of outliers. The Jarque-Bera normality test was not rejected.

3.2. Unit root and co-integration test

As shown in Table 4, the null hypothesis of ADF and PP is rejected for the export volume (y), the export value (z), the real exchange rate (r), log(y(t-1))/log(y(t-2)), and log(z(t-1))/log(z(t-2)). As a result, suggesting that the variables in table 4 are stationary in levels. From

Table 4: Unit root tests at level

Variable	Augmented Dickey-Fuller t-Statistic	Phillips-Perron Adj. t-Statistic
log(y)	-3.69 (0.00)***	-3.55 (0.00)***
log(z)	-3.70 (0.00)***	-3.57 (0.00)***
log(r)	-1.82 (0.07)*	-2.60 (0.09)*
log(y(t-1))/log(y(t-2))	-8.66 (0.00)***	-10.80 (0.00)****
log(z(t-1))/log(z(t-2))	-8.74 (0.00)***	-10.55 (0.00)***

*Note: P-values are given in brackets; *** significant at 1%, **significant at 5%, * significant at 10%.*
 y = Export Volume (ton/month); z = Export Value (USD/month); r = Real Exchange Rate

the two tests above it seems safe to assume that all time series are stationary in levels.

According to Engle and Granger (1987) and Selover and Round (1996), the results of the Johansen-Juselius cointegration test shown in Table 5 indicate that there is cointegration among the variables (e.g. the export volume (ton/month), log(y(t-1))/log(y(t-2)), and the real exchange rate). Thus, the trace and maximum eigenvalue (Max-Eigen) test both reject the null hypothesis at the five percent significance level, indicating that there is a statistically significant cointegrating vector, i.e., one linear long-run equilibrium relationship among the three series just mentioned. Similarly, table 6 also presents a conclusion that there is a statis-

tically significant cointegrating vector among the three series, e.g. the export value (Million USD/month), log((z(t-1))/log((z(t-2)), and the real exchange rate. Likely, there is a long term relationship between the export value, the real exchange rate and log((z(t-1))/log((z(t-2)).

3.3. Model and estimation results

Empirical studies indicate that AD measures significantly reduce the imports from countries that are targeted by such measures, both for the USA (Staiger and Wolak, 1994; Krupp and Pollard, 1996; Prusa, 1996) and the EU (Messerlin, 1989; Brenton, 2001; Cuyvers and Dumont, 2005).

To test the export volume and the export value for seasonality, the Census Bureau's

Table 5: Johansen-Juselius cointegration tests

Hypothesized No. of CE(s)	Trace Statistic	Max-Eigen Statistic	Critical Values (5%)	
			Trace	Max-Eigen
None*	82.81	74.03	29.79	21.13
At most 1	8.79	7.03	15.49	14.26
At most 2	1.76	1.75	3.84	3.84

Note: Trace and Max-Eigen tests indicate no cointegration at the 5% level.
 * denotes rejection of the hypothesis (the null hypothesis, no cointegration) at the 5% level.

Table 6: Johansen-Juselius cointegration tests

Hypothesized No. of CE(s)	Trace Statistic	Max-Eigen Statistic	Critical Values (5%)	
			Trace	Max-Eigen
None*	85.94	76.98	29.79	21.13
At most 1	8.96	6.74	15.49	14.26
At most 2	2.22	2.22	3.84	3.84

Note: Trace and Max-Eigen tests indicate no cointegration at the 5% level.
 * denotes rejection of the hypothesis (the null hypothesis, no cointegration) at the 5% level.

X12 seasonable adjustment program (Shiskin, Young and Musgrave, 1967) is concerned. The result of testing is that there is no evidence of stable seasonality for the export volume and the export value at the five percent level. As a result, the seasonable dummies are not concerned in the model.

Following Prusa (1996) and Cuyvers and Dumont (2005), equation (1) and (2) will be used to estimate the anti-dumping impact on the export volume and on the export value of pangasius, respectively.

$$\ln y_t = \alpha + \beta_1 \ln y_{t-1} + \beta_2 \left(\ln y_{t-1} \Big/ \ln y_{t-2} \right) + \beta_3 \ln r$$

$$+ \beta_4 \ln duty + \sum_{j=0}^{13} \gamma_j t_j + \sum_{j=6}^{13} \delta_j (t_j \ln duty) + \varepsilon_{i,t} \quad (1)$$

$$\ln z_t = \alpha + \beta_1 \ln z_{t-1} + \beta_2 \left(\ln z_{t-1} \Big/ \ln z_{t-2} \right) + \beta_3 \ln r$$

$$+ \beta_4 \ln duty + \beta_5 Inflation + \sum_{j=0}^{13} \gamma_j t_j$$

$$+ \sum_{j=6}^{13} \delta_j (t_j \ln duty) + \varepsilon_{i,t} \quad (2)$$

Where y_t is the volume of the export (ton/ month) and z_t the value of the export (million USD/month) to the USA of Vietnamese pangasius at time t. Duty is the AD duty level imposed on pangasius products. The real exchange rate (r) between VND and USD is measured by the core equation r = $eP*/P$, where, in our paper, e is the nominal VND – USD exchange rate, $P*$ is the average price of pangasius in the USA, and P is the average price of the pangasius at farm in Vietnam (Kipici and Kesriyeli, 1997).

The specification considers dummy variables for four different periods, with t_0, t_1, t_2, t_3, t_4, t_5 equal to 1 in the months July up to December 2002 (the period of the AD investigation) and 0 otherwise; t_6, t_7, t_8, t_9, t_{10}, t_{11} equal 1 in the months January up to June 2003 (the period of preliminary AD duties) and 0 otherwise; t_{12}, t_{13} equal 1 in July and August 2003 (final AD duties) and 0 otherwise, and finally t_{14}, t_{15}, t_{16}, t_{17} equal 1 in the months September up to December 2003 (the period after the final AD duties were imposed) respectively and 0 otherwise. These dummy variables are based on the process of investigation and the AD determination as shown in Table 7. Because the dummy variables t_0, t_1, t_2, t_3, t_4, t_5 consider the months of investigation they are not interacted with the AD duty level in columns 3 and 5 in table 8,

Table 7: Process of investigation toward final determination

Event	Date
Petition Filed	June 28, 2002
Initiation Deadline – Investigation Started	July 18, 2002
ITC Preliminary Determination	August 9, 2002
ITA Preliminary Determination*	January 24, 2003
DOC Final Determination**	June 16, 2003
ITC Final Determination***	July 31, 2003
Order****	August 7, 2003

Source: U.S. International Trade Commission (2002); ITA: International Trade Administration, http:// www.ita.doc.gov/media/FactSheet/0603/catfish_final_061703.html.
Note: * This deadline was fully extended in accordance with the governing statue
*   ** Estimated deadline with full extension in accordance with the governing statute*
*   *** Estimated deadline.*
*   **** This will take place only in the event of a final affirmative determination from the Department and the International Trade Commission (ITC).*

as are the dummies that consider the months in which duties were imposed (t_6 - t_{17}).

Recent analysis shows that the real exchange rate has a sizeable effect on the export volume and the export value. Nielsen (2002) argued that the exchange rate is one of the main factors affecting export volumes. To expand Nielsen's argument for the case of the Vietnamese fishery, the real exchange rate (r) between the VND and USD is therefore included in the econometric specification for both model (1) and model (2).

For exporters, the market price is one of the important criteria that they use to decide the target market to export to. In addition, exporters also try to look for a good exchange rate between their home currency and the foreign currency, in which the inflation rate indirectly contributes to changes in that exchange rate. To find out the relationships between the inflation rate in Vietnam and the export value of Vietnamese companies, the inflation rate variable

is only added in model 2. As a result, the coefficient β_5 in model 2 is expected to be positive, which Binh (2009) found was evidence of uni-directional causality from the Vietnamese inflation rate to the export value of Vietnamese fishery products.

Following Prusa (1996), we expect the coefficients β_4 and δ_j of the duty level and the variable dummies integrated, to be negative. β_3 is expected to be positive, meaning that trading firms can increase their international trade volume when the exchange rate between VND and USD increases. Results estimated of model (1) and (2) are presented in Table 8.

Using model (1) with the export volume as the dependent variable, the estimated coefficients of the lagged export volume, the duty level, the real exchange rate and the dummy variables t_7, t_{13}, t_{14}, t_{17} have the expected sign and are statistically significant, as shown in the second and the third column in Table 8. Un-

Table 8: Estimation results of the impact of anti-dumping duties on the Vietnamese pangasius export volume and value to USA (January 1999 – December 2011)

Variables	Fixed Effects			
	Export Volume		Export Value	
Constant	1.897***	1.897***	0.662*	0.662*
ln y_{t-1} and ln z_{t-1}	0.891***	0.891***	0.890***	0.890***
Ratio Δ volume/value between t-1 and t-2	-0.540	-0.540	-0.050*	-0.050*
ln r	-0.353	-0.353	-0.281	-0.281
ln *duty*	0.043	0.043	0.031	0.031
Inflation			0.005	0.005
Dummy t0	0.008	0.008	0.198	0.198
Dummy t1	-0.372	-0.372	-0.352	-0.352
Dummy t2	0.029	0.029	0.002	0.002
Dummy t3	-0.184	-0.184	-0.221	-0.221
Dummy t4	0.411	0.411	0.370	0.370
Dummy t5	0.100	0.100	0.036	0.036
Dummy t6	0.087		-0.128	
Dummy t7	-1.609***		-1.659***	
Dummy t8	-0.088		-0.059	
Dummy t9	-0.306		-0.163	
Dummy t10	0.750		0.685	
Dummy t11	0.250		0.361	
Dummy t12	-0.735*		-0.774**	
Dummy t13	-1.479**		-1.491***	
Dummy t14	-0.412		-0.517	
Dummy t15	0.539		0.567	
Dummy t16	-0.321		-0.449	
Dummy t17	-0.737*		-0.718*	
Dummy t6* ln *duty*		0.167		-0.246
Dummy t7* ln *duty*		-3.032***		-3.127***
Dummy t8* ln *duty*		-0.159		-0.106
Dummy t9* ln *duty*		-0.626		-0.334
Dummy t10* ln *duty*		1.414		1.291
Dummy t11* ln *duty*		0.434		0.627
Dummy t12* ln *duty*		-1.262*		-1.330**
Dummy t13* ln *duty*		-0.380***		-0.383***
Dummy t14* ln *duty*		-0.106		-0.133
Dummy t15* ln *duty*		0.139		0.146
Dummy 16* ln *duty*		-0.083		-0.116
Dummy 17* ln *duty*		-0.190*		-0.185*
Number of observations	154	154	154	154
Adjusted R Squares	0.972	0.972	0.968	0.968

*Note: *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.*

like the signs of the AD and the real exchange rate that are expected, they are positive and negative respectively, but those coefficients are not significant at any level. As a result, the export volume of pangasius is not affected by the real exchange rate and the AD. This means an increase in the nominal exchange rate between VND and USD causing a rise in the export volume did not happen. However, the AD presented negative impacts on the volume of export for the months during the trade dispute between the USA and Vietnam. Therefore, after the preliminary duties imposed in January 2003, there was a continuous decrease in Vietnamese exports of pangasius to the USA, but the effect was only significant in February 2003 (t_7). Significant impacts of the US AD duties on the volume of Vietnamese pangasius exports are also found in August 2013 (t_{13}), September 2003 (t_{14}), and December 2013 (t_{17}). Because those signs are negative, there is evidence to conclude that the final determination of the AD measures imposed by the USA in June 2003 reduced the export volumes in August, 2003, and caused a decrease in the export volume during the period after the AD duties were affected, particularly for September and December 2013.

Model (2) using the export value as the dependent variable (fourth and the fifth column of table 8) provides results with signs of coefficients looking the same as those in model (1). The coefficients of the dummy variables t_7, t_{13}, t_{14}, t_{17} also have the expected sign and are statistically significant, except for the coefficients of the duty level and the real exchange rate. Similarly, model (2) also shows that there is not evidence of impacts of the real exchange rate and the AD on the export value of Vietnamese

pangasius. In addition, model (2) does not find an evident relationship between the inflation rate in Vietnam and the export value of Vietnamese companies. This result is consistent with the actual situation, because the inflation during 1999-2006 was stable at 3.07 percent on average. Also, although there was a big change in Vietnam's inflation between November 2010 and December 2011, this is not presently serious for Vietnam pangasius exporters. However, based on the general fishery industry of Vietnam, the inflation rate causes effects on exporters. Accordingly, Binh (2009) found an increase in the inflation rate in Vietnam significantly causes a rise in the fishery export value of Vietnamese companies; however monthly time series concerned in the term from January 2003 to June 2009 show an average inflation rate of 8.04 percent.

Although the USA offered trade barriers to Vietnam pangasius exporters with anti-dumping rates after the catfish war, the actions of the DOC could not stop the increasing growth of pangasius, as found, because there were a big shift of Vietnamese from the USA to European markets after 2003. As a result, we could not find a significant of the duty rate (β_4) of two models. The conclusion is that the anti-dumping tax of the USA was not so seriously problematic for the Vietnam pangasius industry. Although the findings don't meet the expectations as pointed out previously, they present a real picture of the Vietnamese pangasius industry. Brenton (2001) found that a 10 percent AD duty overall decreases the value of EU imports from targeted ASEAN countries by 1.2 percent. On the other hand, according to Cuyvers and Dumont (2005) a 10 percent AD duty decreases

the value of EU imports from targeted ASEAN countries by 1.6% in the year that the duty is levied.

4. Conclusion

Our model (1) and (2) show that the signs and significance of coefficients between them are homogenous. Therefore, during the months of the USA anti-dumping investigation, we found no evidence of an investigation effect as the decrease in the exports after the USA started the AD investigation on pangasius, for both the volume and value of the exports.

The impact of the anti-dumping duty imposed by the USA, however, is not seriously problematic, because there were active changes of Vietnam pangasius exporters shifting from the USA to the European market. Although we couldn't find a significant impact of the AD tax rate over a long time, but it did happen for a short time. Therefore, after the preliminary duties imposed in January 2003, there was a continuous decrease in Vietnamese exports of pangasius to the USA, but the effect was only significant in February 2003 (t_7). In addition, significant impacts of the USA AD duties on the volume of Vietnamese pangasius exports are also found in August 2013 (t_{13}), September 2003 (t_{14}), and December 2013 (t_{17}). These mean that there is evidence to conclude that the final determination of the AD measures imposed by the USA in June 2003 reduced the export volumes in August, 2003, and caused a decrease in the export volume during the period after the AD duties were affected, particularly for September and December 2013.

Based on the coefficient of the real exchange rate, we don't have any evidence to confirm that the upward trend of the real exchange rate

between USD and VND the 1999-2011 period, has partly contributed to the increasing or decreasing of either the pangasius export volume or of the pangasius export value. As a result, this finding can not be a real proof for policy makers to think exchange rate policies to support pangasius exporters toward to the USA. In addition, we do not find an evident relationship between the inflation rate in Vietnam and the export value of Vietnamese companies. This result is not surprising, because the inflation of the period of 1999-2006 was stable at around 3.07 percent on average. Also, although there was a big change in Vietnam's inflation between November 2010 and December 2011, this is not presently serious for Vietnam pangasius exporters.

The AD duty imposed by the USA is really a terrible tragedy for the Vietnamese pangasius industry, and indicates a shock in income (via lower prices and quantities). Not only many companies must get out of the business, but also a lot of farmers must shift from their professional pangasius farming to other unfamiliar occupations. As a response to the shock, some pangasius exporters have re-organized market development strategies and set up pangasius subsidies. The government has actively promoted the search for other markets to diversify exports away from the U.S. Although this paper could not estimate the magnitude of the income loss to the Vietnamese pangasius industry because of the USA policy, we can still claim that the estimated losses are the consequence of such a policy.

To avoid the problem of anti-dumping tax imposed by the USA or any country the government should be watching over the overall price

strategy of Vietnamese exporters, in which the Vietnam Association of Seafood Exporter and Producers (VASEP) plays a key role. Besides, the government also offers support programs in response to international market information and the law of importers. Once this is considered, a market diversification of Vietnamese seafood exporters will be paid much attention, and dependence on the main market limited. This means that the exporters will have less risks in the event that an anti-dumping tax is imposed by importing countries, e.g. USA or EU.

Notes:

1. http://www.enn.com/wildlife/article/32901
2. http://www.pangasius-vietnam.com/Daily-News/58_4632/Top-10-Vietnam-pangasius-exporters-Jan-Aug-2013.htm
3. Food and Drug Administration.
4. www.aseanfocus.com/asiananalysis/article.cfm?articleID=716
5. The Mississippi-Mekong Catfish warm, www.peoplesfoodsovereignty.org/docs/doc9.htm.
6. http://ia.ita.doc.gov/download/factsheets/factsheet-vietnam-catfish-prelim-012703.pdf
7. U.S. International Trade Commission.
8. http://www.thefederalregister.com/d.p/2003-08-12-03-20509.
9. www.ita.doc.gov/media/FactSheet/0603/catfish_final_061703.html.
10. Prof. Binh Tran-Nam, Australian Taxation Studies Program (Atax) University of New South Wales.
11. Can see more in Cuyvers and Binh (2008).
12. The Real Exchange Rate (RER) between two currencies is the product of the nominal exchange rate (the Vietnamese Dong cost of a USA dollar, for example) and the ratio of prices between the two countries. The core equation is RER=eP^*/P, where, in our example, e is the nominal dollar -Vietnamese Dong (VND) exchange rate, P^* is the average price of pangasius in the USA, and P is the average price of the pangasius in Vietnam (Kipici and Kesriyeli, 1997).
13. VND = Vietnamese Dong.

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