

**EFFECTS OF BILATERAL TRADE  
AGREEMENT, US ANTIDUMPING,  
AND LABELING LAW  
ON THE WORLD CATFISH MARKET**  
-  
**AN EQUILIBRIUM DISPLACEMENT MODEL**

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**INTRODUCTION**

- international trade is facing global problems including trade barriers, environmental issues, and health problems
- import tariffs used to be a popular trade policy to protect domestic industries
- There exist researches on impacts of the tariffs on world markets of agricultural products.
  - *Cramer, Wailes and Shui (1993)* predict a large increase in both trade volumes and prices for all rice types and a significant welfare gain for most rice exporters and importers.
  - *Thilmany and Barrett (1997)* raise the need for more researches on complex economic effects of non-traditional trade barriers on international food trade
  - *Peter (2006)* proves that the tariff and non-tariff trade policies of larger countries largely affect the international shrimp price.

## INTRODUCTION

- Under WTO regulations, import tariffs are reducing oriented to globally free trade.
- However, antidumping tariff is increasingly popular by a large number of countries for last two decades (Blonigen and Haynes, 2002).
  - Antidumping duty is recently used more frequently, by more countries and against more products (Prusa, 2005)
  - anti-dumping measurement plays a crucial role as the most important non-tariff barrier (Zanardi, 2004)
- Since 1980's, the rise in international competition has led many US firms to seek protection from foreign imports (Hansen and Prusa, 1996)
  - From 1980 to 2004, US filed 1092 antidumping tariff cases and 461 of them lead to an antidumping duty imposed on targeted imports
  - With the 2000 Byrd Amendment, the US petitioners can get payments from collected duty, antidumping measurement is more favored in the country than in others.

### Antidumping cases targeted agricultural and aquatic products

Product	Year	Filing country	Target countries
Apples	1994	Canada	US
	1998	Canada	US
	1997	Mexico	US
Beef	1991	Poland	EU
Bovine meat	1993	Mexico	EU
	1994	Mexico	US
	1998	Mexico	US
Canned ham	1990	Australia	Denmark, Ireland and the Neitherlands
Canned Mushrooms	1982	US	China
Chicken	1999	Argentina	Brazil
Crawfish tail meat	1996	US	China
Dried Salted Codfish	1984	US	Canada
Fishmeal	1994	Mexico	Chile

Source: modifies from *Kinnucan and Myrland (2006)* with data searched from *Bown (2006)*

### Antidumping cases targeted agricultural and aquatic products

Product	Year	Filing country	Target countries
Fresh Atlantic Salmon	1990	US	Norway
	1997	US	Chile
	1996	EU	Norway
	1998	Mexico	US
	2002	Canada	Chile
	2004	EU	Chile, Faroe Islands and Norway
Fresh Round White Potatoes	1983	US	Canada
Fresh-Cut Roses	1983	US	Columbia
	1986	US	Canada, Columbia, Costa Rica, Ecuador, Mexico and Peru
	1994	US	Columbia and Ecuador

Source: modifies from *Kinnucan and Myrland (2006)* with data searched from *Bown (2006)*

### Antidumping cases targeted agricultural and aquatic products

Product	Year	Filing country	Target countries
Frozen Beef	1993	Mexico	EU
Frozen catfish fillets	2002	US	Vietnam
Frozen Orange Juice	1986	US	Brazil
	1991	Australia	Brazil
Garlic	1994	US	China
	1996	Canada	China
	2000	South Africa	China
	2001	Canada	China and Vietnam
Honey	1994	US	China
Kiwi fruit	1991	US	New Zealand
Large Rainbow Trout	2003	EU	Norway, Faeroe Islands
Lettuce	1992	Canada	US
Live cattle	1998	US	Canada and Mexico
Live Swine	2004	US	Canada
Non-Frozen Apple Juice Concentrate	1999	US	China
Peaches	1997	Mexico	Greece

Source: modifies from *Kinnucan and Myrland (2006)* with data searched from *Bown (2006)*

## INTRODUCTION

- Previous literatures discussed on the effects of the antidumping tariff
  - *Blonigen and Haynes (2002)*: an antidumping duty on import products would depress the terms of trade of domestic industry
  - *Kinnucan (2003)*: US tariff imposition on Vietnamese catfish imports is ineffective although it lowers the import price and raises domestic price.
  - *Kinnucan and Myrland (2005)* an equilibrium displacement model to explore the effects of US antidumping tariff and income on world market of salmon.
  - *Peter (2006)* uses a world model of the shrimp market to justify that the US antidumping measures in 2003 drove shrimp exports to lower-income markets and as a consequence, world shrimp price decreased.

## THIS STUDY

- Use an equilibrium displacement model (EDM) for the world catfish market
- examines effects of the US antidumping measurement imposed on catfish import from Vietnam.
- Catfish represents a useful case study because
  - shares characteristics with other agricultural products subject to antidumping measurements,
  - data availability to measure impacts,
  - Kinnucan (2003) predicts that the tariff would be ineffectual in a simulation model
- The 2001 bilateral trade agreement (BTA) between the US and Vietnam and the 2002 labeling law to differentiate the US product from imported catfish provides a chance for an empirical estimation to test whether such institutions affect price and trade flow of catfish.

## Brief review on the catfish war

### Vietnamese catfish industry globalizes...

- developed since the country joined into globalization (*Cohen and Hiebert, 2001*)
- employed almost a half of million Vietnamese people in southern Vietnam (*Narog, 2003*)
- Under a closely cooperation with French and Vietnamese researchers, Vietnamese producers created low-cost breeding techniques of catfish in 1998 and developed a catfish breeding industry involving 15,000 families (*Kuntzman, 2003*)
- VN catfish farmers use high protein pellet feed from foreign feed companies as Cargill, an American company (*Cohen and Hiebert, 2001; Sengupta, 2003*) and also adopted advanced feeding technologies to improve fish meat quality, meeting the quality and taste requirements of US consumers.
- VN catfish processors have learned catfish fillet techniques from an Australian importer and used processing equipments purchased from the US for their production (*Cohen and Hiebert, 2001*), following the quality control protocols of HACCP recommended by US FDA and Good Aquaculture Practice (GAP) by FAO.

### ...to export over the world...

#### Vietnamese Catfish Exports (mt)

		Total exports	EU	Japan	US
	1997	425	54	0	55
APEC join	1998	2263	188	22	261
	1999	1715	192	91	903
	2000	3,689	19	28	3,191
US-VN BTA signed	2001	10,955	140	9	7,765
	2002	27,980	2,979	632	4,361
	2003	33,304	7,388	464	1,929
	2004	82,962	23,637	932	3,010
	2005	140,707	55,172	579	8,623

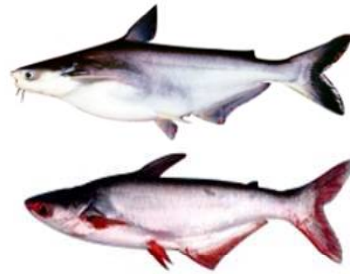
## ...with similarity to US catfish

- the “most similar product in characteristics and uses”, Vietnamese catfish has similarity of texture and taste but lower price, (*US ITC, 2002*)



### US catfish

- are Ictaluridae family,
  - channel catfish (*Ictalurus punctatus*)
  - blue catfish (*Ictalurus furcatus*)
- farmed in closed ponds  
in southern states



### Vietnamese catfish

- are Pangasius family -
  - basa (*Pangasius bocourti*) +
  - tra (*Pangasianodon hypophthalmus*) +
- farmed mostly in cages, pens and ponds  
along the Mekong River, southern provinces

## ... involve to the catfish war with the US catfish industry

- when 90% of the catfish imported by US in 2000 came from Vietnam (*Cohen and Hiebert, 2001*)
- but catfish production is the biggest aquaculture industry in the US and frozen catfish fillets is the most important product of the US catfish industry (*Harvey, 2005*).
- First step: requesting the US Congress to pass a labeling law in 2002 restricting the use of the word “catfish” for labeling to only those Ictaluridae varieties farmed in US
- The second step is lobbying for renegotiation of the 2001 bilateral trade agreement between US and Vietnam to set limits on catfish imports
- The third is the antidumping suit filed by US producers in 2002 that led to tariffs ranging from 45% to 64% levied on frozen catfish fillets imported from Vietnam since 2003.
- *The war is still going on with non-tariff barriers; e.g. “Sales Ban” orders in Oct 2005 in Alabama, Mississippi and Louisiana*

## **THEORETICAL FRAMEWORK**

### *Assumptions*

- US domestic and imported catfish are considered perfect substitutes
- the “rule of one price” is hold.
- US export and Vietnam import of catfish are neglected
- Free trade
- Transaction cost and insurance are also assumed constant.
- The world market is limited for pangasius and ictalurus catfish only.

## **THEORETICAL FRAMEWORK**

### *Demand (Import) side*

- 1)  $M_{eu} = M(P_{eu}, X_{eu})$  EU demand for catfish imports
- 2)  $M_{us} = M(P_{us}, Y_{us})$  US demand for catfish imports
- 3)  $M_r = M(P_{rd}, Z_r)$  Rest-of-world demand for catfish imports

where  $X_{eu}$ ,  $Y_{us}$  and  $Z_r$  are demand shifters of catfish imports in US, EU and ROW, respectively.

$P_i$  ( $i=us, eu$  and  $rd$ ) are the consumer prices in markets of the US, EU and the ROW

### *Supply (Export) side*

- 4)  $X_v = X(P_v, C_v)$  Vietnamese export quantity of catfish
- 5)  $X_r = X(P_{rs}, C_r)$  ROW export quantity of catfish

where  $P_i$  and  $C_i$  ( $i=v, r$ ) are export prices and costs of Vietnamese and ROW’s exporters.

## THEORETICAL FRAMEWORK

### Price Linkages

$$6/ P_{us} = P(P_v, T)$$

$$7/ P_{eu} = P(P_v)$$

$$8/ P_{rd} = P(P_v)$$

$$9/ P_{rs} = P(P_v)$$

where  $T = (1+t)$  with  $t$  is the *ad valorem* US tariff rate imposed on the Vietnamese catfish imports

### Equilibrium

$$10/ X_v + X_r = M_{us} + M_{eu} + M_r$$

## THEORETICAL FRAMEWORK

### Equilibrium Displacement Model

$$1') M_{eu}^* = -\mu_{eu} P_{eu}^* + \xi_{eu} X_{eu}^*$$

$$2') M_{us}^* = -\mu_{us} P_{us}^* + i_{us} Y_{us}^*$$

$$3') M_r^* = -\mu_r P_{rd}^* + \zeta_r Z_r^*$$

$$4') X_v^* = \varepsilon_v P_v^* - \varepsilon_{vc} C_v^*$$

$$5') X_r^* = \varepsilon_r P_{rs}^* - \varepsilon_{rc} C_r^*$$

$$6') P_{us}^* = P_v^* + T^*$$

$$7') P_{eu}^* = \sigma_{eu} P_v^*$$

$$8') P_{rd}^* = \sigma_{rd} P_v^*$$

$$9') P_{rs}^* = \sigma_{rs} P_v^*$$

$\mu_i$	Price elasticity (in absolute value) of import demand for catfish in $i^{\text{th}}$ market ( $i = \text{US, EU and ROW}$ )
$i_{us}$	elasticity of US import demand for catfish respected to $Y_{us}$
$\xi_{eu}$	elasticity of EU import demand for catfish respected to $X_{eu}$
$\zeta_r$	elasticity of ROW's import demand for catfish respected to $Z_r$
$\varepsilon_i$	Supply price elasticity of catfish from $i^{\text{th}}$ source ( $i = \text{Vietnam, ROW}$ )
$\varepsilon_{vc}$	Supply elasticity of Vietnamese catfish exports respected to $C_v$
$\varepsilon_{rc}$	Supply elasticity of ROW's frozen catfish exports respected to $C_r$
$\sigma_{eu}$	Transmission price elasticity between EU market price and Vietnamese catfish price
$\sigma_{rd}$	Transmission price elasticity between ROW's purchase price and Vietnam's export price
$\sigma_{rs}$	Transmission price elasticity between export prices of ROW and Vietnam
$k_{us}, k_{eu}, k_{mr}$	Global import shares of US, EU and ROW respectively
$k_v, k_{xr}$	Global export shares of Vietnam and ROW

$$10') k_v X_v^* + k_{xr} X_r^* = k_{us} M_{us}^* + k_{eu} M_{eu}^* + k_{mr} M_r^*$$

where the asterisks represent for percentage changes of variables (for example,  $X^* = d \ln X = dX/X$ ).

Table 2. General elasticities of endogenous variables respected to exogenous variables

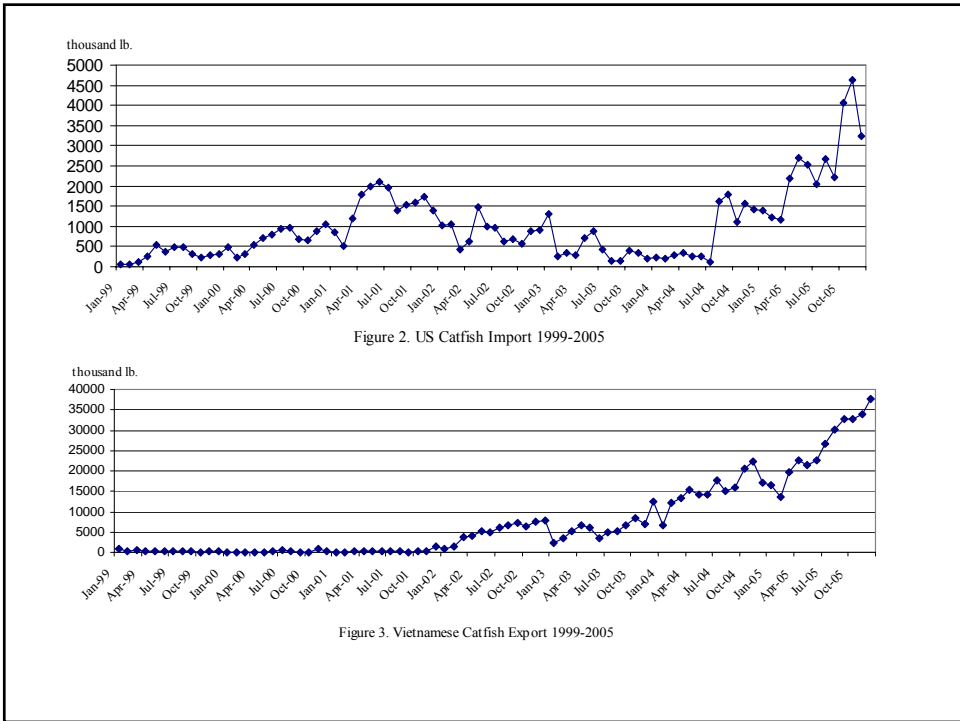
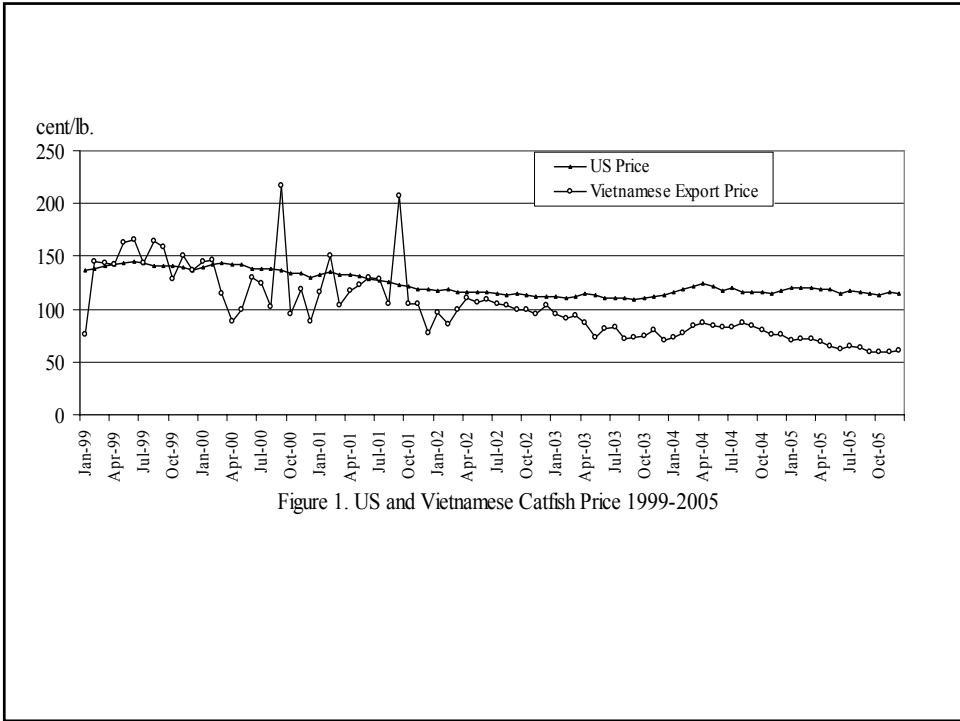
	$C_v^*$	$C_r^*$	$X_{eu}^*$	$Y_{us}^*$	$Z_r^*$	$T^*$
$M_{us}^*$	$-(\mu_{us} k_v \varepsilon_{vt})/\psi$	$-\mu_{us} k_{xt} \varepsilon_{rt}/\psi$	$-\mu_{us} k_{eu} \varepsilon_{eu}/\psi$	$+i_{us}(\psi - \mu_{us} k_{us})/\psi$	$-\mu_{us} k_{mr} \zeta_r/\psi$	$-\mu_{us}(\psi - k_{us} \mu_{us})/\psi$
$M_{eu}^*$	$-\mu_{eu} \sigma_{eu} k_v \varepsilon_{vt}/\psi$	$-\mu_{eu} \sigma_{eu} k_{xt} \varepsilon_{rt}/\psi$	$+\varepsilon_{eu}(\psi - \mu_{eu} \sigma_{eu} k_{eu})/\psi$	$-\mu_{eu} \sigma_{eu} k_{us} i_{us}/\psi$	$-\mu_{eu} \sigma_{eu} k_{mr} \zeta_r/\psi$	$+\mu_{eu} \sigma_{eu} k_{us} \mu_{us}/\psi$
$M_r^*$	$-\mu_r \sigma_{rd} k_v \varepsilon_{vt}/\psi$	$-\mu_r \sigma_{rd} k_{xt} \varepsilon_{rt}/\psi$	$-\mu_r \sigma_{rd} k_{eu} \varepsilon_{eu}/\psi$	$-\mu_r \sigma_{rd} k_{us} i_{us}/\psi$	$+\zeta_r(\psi - \mu_r \sigma_{rd} k_{mr})/\psi$	$+\mu_r \sigma_{rd} k_{us} \mu_{us}/\psi$
$X_v^*$	$-\varepsilon_v(\psi - \varepsilon_v k_v)/\psi$	$+\varepsilon_v k_{xt} \varepsilon_{rt}/\psi$	$+\varepsilon_v k_{eu} \varepsilon_{eu}/\psi$	$+\varepsilon_v k_{us} i_{us}/\psi$	$+\varepsilon_v k_{mr} \zeta_r/\psi$	$+\varepsilon_v k_{us} \mu_{us}/\psi$
$X_r^*$	$+\varepsilon_r \sigma_{rs} k_v \varepsilon_{vt}/\psi$	$-\varepsilon_{rt}(\psi - \varepsilon_r \sigma_{rs} k_{xt})/\psi$	$+\varepsilon_r \sigma_{rs} k_{eu} \varepsilon_{eu}/\psi$	$+\varepsilon_r \sigma_{rs} k_{us} i_{us}/\psi$	$+\varepsilon_r \sigma_{rs} k_{mr} \zeta_r/\psi$	$-\varepsilon_r \sigma_{rs} k_{us} \mu_{us}/\psi$
$P_{eu}^*$	$+\sigma_{eu} k_v \varepsilon_{vt}/\psi$	$+\sigma_{eu} k_{xt} \varepsilon_{rt}/\psi$	$+\sigma_{eu} k_{eu} \varepsilon_{eu}/\psi$	$+\sigma_{eu} k_{us} i_{us}/\psi$	$+\sigma_{eu} k_{mr} \zeta_r/\psi$	$-\sigma_{eu} k_{us} \mu_{us}/\psi$
$P_{rd}^*$	$+\sigma_{rd} k_v \varepsilon_{vt}/\psi$	$+\sigma_{rd} k_{xt} \varepsilon_{rt}/\psi$	$+\sigma_{rd} k_{eu} \varepsilon_{eu}/\psi$	$+\sigma_{rd} k_{us} i_{us}/\psi$	$+\sigma_{rd} k_{mr} \zeta_r/\psi$	$-\sigma_{rd} k_{us} \mu_{us}/\psi$
$P_{rs}^*$	$+\sigma_{rs} k_v \varepsilon_{vt}/\psi$	$+\sigma_{rs} k_{xt} \varepsilon_{rt}/\psi$	$+\sigma_{rs} k_{eu} \varepsilon_{eu}/\psi$	$+\sigma_{rs} k_{us} i_{us}/\psi$	$+\sigma_{rs} k_{mr} \zeta_r/\psi$	$-\sigma_{rs} k_{us} \mu_{us}/\psi$
$P_{us}^*$	$+k_v \varepsilon_{vt}/\psi$	$+k_{xt} \varepsilon_{rt}/\psi$	$+k_{eu} \varepsilon_{eu}/\psi$	$+k_{us} i_{us}/\psi$	$+k_{mr} \zeta_r/\psi$	$+(\psi - k_{us} \mu_{us})/\psi$
$P_v^*$	$+k_v \varepsilon_{vt}/\psi$	$+k_{xt} \varepsilon_{rt}/\psi$	$+k_{eu} \varepsilon_{eu}/\psi$	$+k_{us} i_{us}/\psi$	$+k_{mr} \zeta_r/\psi$	$-k_{us} \mu_{us}/\psi$

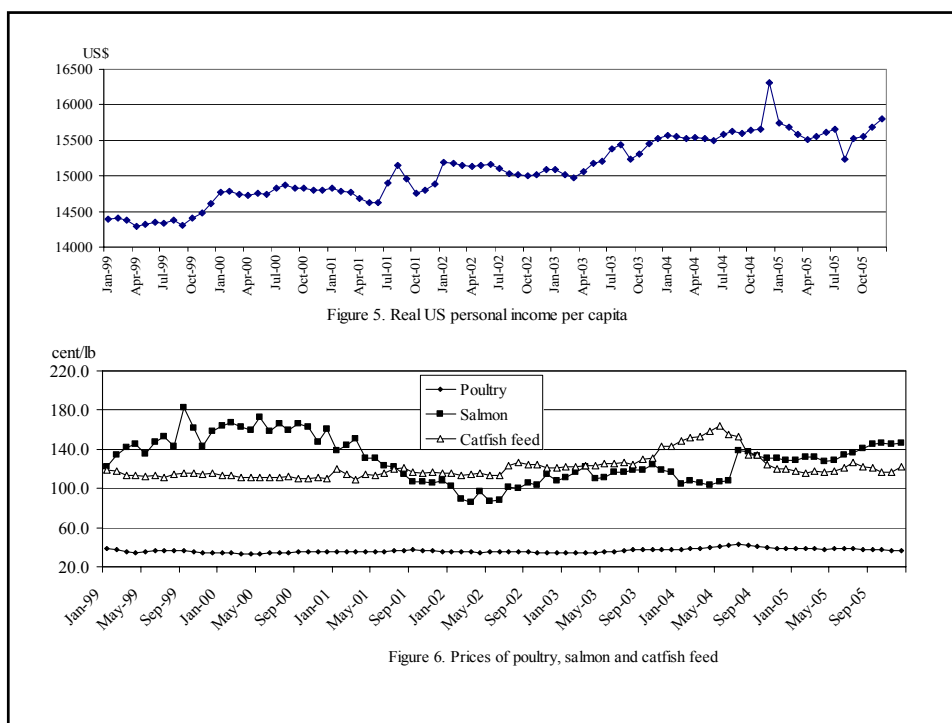
Note: Signs represent for direction of the effects;  $\psi = (k_v \varepsilon_v + k_{us} \mu_{us} + k_{xt} \varepsilon_r \sigma_{rs} + k_{eu} \mu_{eu} \sigma_{eu} + k_{mr} \mu_r \sigma_{rd}) > 0$

**EMPIRICAL FRAMEWORK**

$$P_{us}^* = \beta_0 + \beta_1 BTA + \beta_2 TAX + \beta_3 LABEL + \beta_4 Y_{us}^* + \beta_5 P_f^* + \beta_6 P_{salm}^* + \beta_7 P_{poul}^* + \beta_8 F_v^* + \beta_9 F_a^* + \beta_{10} Q1^* + \beta_{11} Q2^* + \beta_{12} Q3^* + \varepsilon$$

	Unit	Source	Mean	Min	Max	Definition
$P_{us}$	cent/lb.	USDA	223	202	245	US price of processed catfish
$P_v$	cent/lb.	VN MOF	144	101	284	fob VN price of catfish
$M_u$	1000 lb.	NMFS	1007	53	4638	US import of catfish
$X_v$	1000 lb.	VN MOF	7602	4	37708	VN catfish export
$Y_{US}$	\$	BEA	27267	23647	31094	US disposable income per capita
$P_{poul}$	cent/lb.	IMF	66	57	81	price of US poultry
$P_{salm}$	cent/lb.	IMF	233	155	306	price of Atlantic salmon
$P_f$	cent/lb.	USDA	220	186	310	price of catfish feed in US
$F_a$	-	BLS	107	89	133	freight index from Atlantic
$F_v$	-	BLS	105	73	130	freight index from Pacific
$BTA$	Dummy variable, BTA=0 before December 2001, otherwise, BTA=1					
$TAX$	Dummy variable, TAX=0 before August 2003, otherwise, TAX=1					
$LABEL$	Dummy variable, LABEL=0 before December 2002, otherwise, BTA=1					
$Q_i$	Dummy variables for quarters (i=1,2,3), Qi=1 if data in quarter i, otherwise, Qi=0					





First difference models of some empirical reduced equations								
	US Price		VN Price		US Import		VN Export	
	Coef.	<i>t</i> -ratio	Coef.	<i>t</i> -ratio	Coef.	<i>t</i> -ratio	Coef.	<i>t</i> -ratio
BTA	-0.004	-0.849	-0.003	-0.055	-0.009	-0.044	0.041	0.106
TAX	0.007*	1.727	-0.023	-0.553	0.032	0.195	-0.074	-0.238
LABEL	0.001	0.184	0.017	0.325	-0.091	-0.434	0.118	0.295
US Income	0.171	0.990	0.479	0.232	0.834	0.134	-10.767	-0.901
Poultry price	-0.131	-1.141	1.385	1.041	-6.683	-1.454	-2.819	-0.324
Salmon price	0.001	0.060	-0.230	-0.747	-0.994	-1.180	1.245	0.770
Atlantic freight	-0.041	-0.514	0.115	0.122	1.932	0.603	-1.194	-0.197
Pacific freight	0.115	1.617	-0.005	-0.006	3.317	1.127	-2.034	-0.366
Catfish feed price	0.106**	2.043	-0.167	-0.262	-5.573***	-2.931	2.122	0.595
Lag of dependents	0.121	1.026	-0.233**	-2.183	-0.204*	-1.730	-0.308***	-2.785
First quarter	0.014***	3.174	0.088*	1.770	-0.069	-0.387	-0.642*	-1.892
Second quarter	-0.004	-0.698	0.061	1.084	0.355*	1.686	-0.396	-0.988
Third quarter	0.000	-0.067	0.090*	1.827	0.009	0.053	-0.728**	-2.158
Constant	-0.005	-1.379	-0.069*	-1.680	0.015	0.092	0.446	1.481
R2	0.29		0.36		0.27		0.20	
D.W.	2.16		2.19		2.16		2.13	

All continuous variables in the first difference of logarithms; \*, \*\*, \*\*\*: significant at 90%, 95% and 99% levels; autocorrelations are corrected by Prats and Winsten method.

Error Correction Models								
	US Price		VN Price		US Import		VN Export	
	Coef.	t-ratio	Coef.	t-ratio	Coef.	t-ratio	Coef.	t-ratio
BTA	-0.006	-1.122	-0.001	-0.019	0.315	1.633	0.044	0.140
TAX	0.008*	1.677	0.003	0.063	0.115	0.759	-0.109	-0.427
LABEL	0.002	0.291	-0.020	-0.309	-0.367*	-1.861	0.165	0.507
US Income (1)	-0.014	-0.083	1.430	0.761	8.121	1.403	-10.309	-1.111
Poultry price (1)	-0.279**	-2.221	-1.677	-1.200	-9.648**	-2.365	-2.782	-0.396
Salmon price (1)	-0.008	-0.356	-0.074	-0.291	2.149***	2.873	-0.620	-0.493
Atlantic freight (1)	0.033	0.379	0.485	0.499	-5.743*	-1.972	-0.657	-0.137
Pacific freight (1)	0.031	0.417	0.750	0.886	-0.733	-0.298	1.196	0.288
Catfish feed price (1)	0.045	0.848	-0.173	-0.282	-0.584	-0.334	2.497	0.827
Error correction term	-0.196**	-2.152	-0.914***	-7.072	-0.468***	-4.133	-0.920***	-6.845
First quarter	0.015***	3.358	0.092*	1.768	0.007	0.044	-0.276	-1.077
Second quarter	0.004	0.734	0.076	1.404	0.348**	2.210	-0.157	-0.581
Third quarter	0.004	0.716	0.090	1.602	0.056	0.345	-0.135	-0.469
Constant	-0.008*	-1.781	-0.061	-1.229	-0.106	-0.735	0.093	0.382
R <sup>2</sup>	0.15		0.49		0.38		0.47	
D.W.	2.06		2.20		2.11		2.25	

Long run model derived from ECM				
	US Price	VN Price	US Import	VN Export
BTA	-0.014		0.674	
TAX	-0.004	-0.237	-0.460	
LABEL	-0.014	-0.221	-0.367	3.100
US Income				-22.104
Poultry price	0.058		1.668	7.395
Salmon price	0.017			
Atlantic freight		-1.047	1.773	
Pacific freight	0.022		1.827	
Catfish feed price		0.691	-3.776	
First quarter	0.024	0.092	-0.151	-0.500
Second quarter	0.009		0.348	
Third quarter		0.095		-0.477
Constant	-0.008			193.395
lag of dependent variable	0.804	0.086	0.532	0.080

*All continuous variables in logarithms;*

## CONCLUSION

- The US catfish import has increased since the BTA between the US and Vietnam was signed in Dec 2001.
- Contrast to the positive effect on US domestic price in short run, the antidumping measurement lowers the price in long run although with a very small incidence.
- The punishment effect of the US antidumping on rival import is large when it lowers both its catfish import and Vietnamese export price.
- Price effect of the labeling law on US catfish is negative in contrast to expectations from the US catfish producers.

## CONCLUSION

Based on international economics,  
import is the good, export is the bad (Thompson, 2005)

- the BTA benefits the US consumers with lower prices and more import
- the antidumping tariff is futile
- the labeling law lowers prices and also imports while helps VN producers to boost their exports.

**THANK YOU!**

Comments, please!