

Table I
Description of Futures Data from AFET

Commodity Description	NOBS	Period of study (Year.Month.Date)	StopTrading Date (Year.Month.Date)	Number contracts	Delivery Month	
Ribbed Smoked Sheet no.3	RSS3	5,315	2004.05.28-2007.12.28	Present	47	1,2,3,4,5,6,7,8,9,10,11,12
White Rice 5%	WR5	5,219	2004.08.26-2007.12.28	Present	54	1,2,3,4,5,6,7,8,9,10,11,12
Tapioca Starch premium grade	TS	3,854	2005.03.25-2007.12.28	Present	34	1,2,3,4,5,6,7,8,9,10,11,12
Standard Thai Rubber 20	STR20	2,534	2005.09.27-2007.09.03	2007.09.03	26	1,2,3,4,5,6,7,8,9,10,11,12
Concentrated Latex	LATEX	2,019	2006.03.31-2007.09.03	2007.09.03	20	1,2,3,4,5,6,7,8,9,10,11,12
Tapioca Chip	TC	1,982	2006.08.18-2007.12.28	Present	20	1,2,3,4,5,6,7,8,9,10,11,12

Table II: The thick and thin of each futures contract's trading volume classified by the trading frequency

During the period of study, there are six products available to trade. Two out of them, STR20 and LATEX, have been delisted from the market. This table shows the number of futures contract of particular product classified by the total trading volume of each contract. For example, there are *four* out of forty seven contracts of RSS3 product that contain the total trading volume fall in the range of four to five thousand contracts.

Products	Total contract	Trading Volume									
		0	1-500	501-1000	1001-1500	1501-2000	2001-2500	2501-3000	3001-3500		
Ribbed Smoked Sheet no.3	47	0		2	1	2	3	3	3		
White Rice 5%	54	13	21	3	4	3	1	3	2		
				3501-4000	4001-5000	5001-6000	6001-7000	7001-8000			
Ribbed Smoked Sheet no.3				3	4	8	11	7			
White Rice 5%				1	1	1		1			
				0	1-50	51-100	101-150	151-200	201-250	251-300	351-400
Tapioca Starch premium grade	34	21	3	8		1				1	
Standard Thai Rubber 20	26	17	4		1		1			3	
				0	1-500	501-1000	1001-1500	1501-2000	2001-2500	3001-3500	3501-4000
Concentrated Latex	20	9		1	5	2	3				
Tapioca Chip	20	8	6	2		1	1	1	1	1	

Table III: Summary statistics of futures price and volume series of Agricultural Futures Exchange of Thailand

The table reports the summary statistics of futures price and volume series during the period of study starting from May 2004 to December 2007. First column shows the statistics of the futures price series while second column shows the statistics of futures return series. Futures return series is generated by applying the natural logarithm on future contract price series. The statistics of volume are reported on third and fourth column. The difference of the last two volume columns is due to the unit. The third column is reported in unit of contract whereas the fourth is in kilogram. Due to AFET market specification, each contract contains 5,000 kilograms.

Data type :	Daily data				
Market :	Agricultural Futures Exchange of Thailand (AFET)				Spot
Series	Price	Return	Volume	Volume	Price
Unit	THB	(%)	Contract	Kilogram	THB
Mean	68.730	0.001	135.390	676952.100	65.220
Median	69.700	0.000	117.000	585000.000	66.380
Maximum	104.400	0.055	551.000	2755000.000	103.900
Minimum	45.900	-0.047	0.000	0.000	40.4100
Std. Dev.	14.515	0.016	104.412	522057.300	14.1264
Skewness	0.130	-0.085	0.866	0.866	0.23251
Kurtosis	2.073	3.883	3.258	3.258	2.54191
Jarque-Bera	33.835	29.544	111.923	111.923	15.534
Probability	0.000	0.000	0.000	0.000	0.0004
Observations	876	876	876	876	876

Each contract contains 5,000 kilograms.

Table IV: Summary statistics of futures price series of Agricultural Futures Exchange of Thailand (AFET) and Tokyo commodity exchange (TOCOM)

The table reports the summary statistics of futures price and exchange rate during the period of study starting from May 2004 to December 2007. The futures price series derived from TOCOM is converted into Baht currency by using the average exchange rate form BOT. The table reports future price series derived from both in Japanese yen and baht currency.

Data type : Daily data
 Source : Agricultural Futures Exchange of Thailand (AFET), Tokyo Commodity Exchange (TOCOM) and Bank of Thailand (BOT)

Market Item Unit	AFET Closing Price THB	TOCOM Closing Price THB	TOCOM Closing Price JPY	BOT Ex rate THB:100JPY	TOCOM Volume Contract	TOCOM Volume Kilogram
Mean	68.94	71.23	215.30	33.87	19679.67	98,398,367
Median	69.70	71.93	223.30	33.67	19348.00	96,740,000
Maximum	104.40	108.71	321.10	38.94	70004.00	3.50E+08
Minimum	45.90	46.19	119.00	27.38	1159.00	5,795,000
Std. Dev.	14.61	14.75	58.68	3.39	12351.11	61,755,562
Skewness	0.13	0.12	-0.12	-0.13	0.55	0.546622
Kurtosis	2.07	2.11	1.54	1.56	3.25	3.248992
Jarque-Bera	34.47	31.25	79.73	78.23	46.04	46.04426
Probability	0.00	0.00	0.00	0.00	0.00	0.00
Observations	879	879	879	879	879	879

Each contract contains 5,000 kilogram.

Table V: The unit root test of price and volume series

The table shows the result of Augmented Dickey Fuller (ADF) unit root test of price, return and volume series. Based on intercept with trend, the table provides the result of the unit root test for both level and first different. The t-statistics are reported on the first line and probability on the second line.

Series		Intercept with trend	
		--Level--	--First difference--
AFET Price	t-Statistic	-1.820347	-27.7075
	Prob.*	0.69420	0.0000 ***
Volume	t-Statistic	-8.827725	
	Prob.*	0.00000 ***	
Spot price	t-Statistic	-2.130242	-17.42456
		0.5276	0.0000 ***
TOCOM Price	t-Statistic	-1.890564	-28.6689
	Prob.*	0.658500	0.0000 ***
Volume	t-Statistic	-3.268756	
	Prob.*	0.072200 *	

The unit test with intercept yield similar result

* Statistical significance at the 10% level.

** Statistical significance at the 5% level.

*** Statistical significance at the 1% level.

The table VI: Lag length selection for granger causality analysis

The table reports the Schwarz information criterion (SIC) of lag length selection for return-volume analysis based on vector autoregressive (VAR). According to SIC, the appropriated lag length is three in AFET and four in TOCOM.

Market	AFET	TOCOM
Lag	SIC	SIC
0	6.737012	16.43772
1	6.285948	15.45082
2	6.256090	15.40209
3	6.222264*	15.35209
4	6.224941	15.34334*
5	6.249148	15.34912
6	6.251741	15.37157
7	6.272805	15.38655
8	6.286180	15.41260

* indicates lag order selected by the criterion
SC: Schwarz information criterion

Table VII.I: The result of granger causality test on return and volume

The table reports the granger causality analysis between return and volume. The analysis bases on vector autoregressive (VAR). The test is implemented on the data that obtained from Agricultural Futures Exchange of Thailand (AFET). RET or return is generated by applying the natural logarithm on future contract price series while VOL denotes the trading volume. First and second column report the result of estimated parameters, the reported number on the first line of equation one and two. The t-statistics are reported in parentheses on the second line.

Equation 1: $RET_t = \alpha_0 + \sum_{i=1}^3 \alpha_{1,i} RET_{t-i} + \sum_{i=1}^3 \alpha_{2,i} VOL_{t-i}$ Equation 2: $VOL_t = \beta_0 + \sum_{i=1}^3 \beta_{1,i} VOL_{t-i} + \sum_{i=1}^3 \beta_{2,i} RET_{t-i}$

Panel A: AFET

	<i>RET</i> _{<i>t</i>}		<i>VOL</i> _{<i>t</i>}	
α_0	-0.00025 [-0.25000]		β_0	30.38432 *** [6.36676]
$\alpha_{1,1}$	0.060578 * [1.78205]		$\beta_{1,1}$	-56.87338 [-0.35007]
$\alpha_{1,2}$	0.040254 [1.18276]		$\beta_{1,2}$	-64.43946 [-0.39617]
$\alpha_{1,3}$	-0.006514 [-0.19192]		$\beta_{1,3}$	-368.0744 ** [-2.26921]
$\alpha_{2,1}$	8.19E-06 [1.18869]		$\beta_{2,1}$	0.410249 *** [12.4626]
$\alpha_{2,2}$	-3.32E-06 [-0.44673]		$\beta_{2,2}$	0.128547 *** [3.62051]
$\alpha_{2,3}$	8.53E-07 [0.12376]		$\beta_{2,3}$	0.240316 *** [7.29888]
Adj. R-squared	0.000668			0.451424
F-statistic	1.097137			120.5952 ***

* Statistical significance at the 10% level.
 ** Statistical significance at the 5% level.
 *** Statistical significance at the 1% level.

Table VIII: The unit root test of AFET and TOCOM futures price series and AFET spot price

The table shows the result of Augmented Dickey Fuller (ADF) unit root test of futures price series.

Based on intercept with trend, the table provides the result of the unit root test for both level and first different. The t-statistics are reported on the first line and probability on the second line.

Series	Intercept with trend		
		---Level---	---First difference---
AFET price	t-Statistic	-1.77944	-27.95960
	Prob.*	0.71410	0.00000 ***
TOCOM price	t-Statistic	-1.89056	-28.66893
	Prob.*	0.65850	0.00000 ***

The unit test with intercept yield similar result

** Statistical significance at the 5% level.

*** Statistical significance at the 1% level.

Equation 3:

$$RET_t = \alpha_0 + \sum_{i=1}^4 \alpha_{1,i} RET_{t-i} + \sum_{i=1}^4 \alpha_{2,i} VOL_{t-i}$$

Equation 4:

$$VOL_t = \beta_0 + \sum_{i=1}^4 \beta_{1,i} VOL_{t-i} + \sum_{i=1}^4 \beta_{2,i} RET_{t-i}$$

Panel B: TOCOM

	<i>RET_t</i>		<i>VOL_t</i>	
α_0	0.001079 [0.89452]	β_0	1666.92 [3.60664]	***
$\alpha_{1,1}$	0.025261 [0.74181]	$\beta_{1,1}$	11969.32 [0.91768]	
$\alpha_{1,2}$	-0.008074 [-0.23708]	$\beta_{1,2}$	-465.094 [-0.03566]	
$\alpha_{1,3}$	0.033773 [0.99198]	$\beta_{1,3}$	10323.75 [0.79167]	
$\alpha_{1,4}$	0.021968 [0.64584]	$\beta_{1,4}$	21885.07 [1.67980]	*
$\alpha_{2,1}$	1.00E-07 [1.14544]	$\beta_{2,1}$	0.447027 [13.3446]	***
$\alpha_{2,2}$	-8.90E-08 [-0.93713]	$\beta_{2,2}$	0.095924 [2.63842]	***
$\alpha_{2,3}$	5.54E-08 [0.58348]	$\beta_{2,3}$	0.179994 [4.94904]	***
$\alpha_{2,4}$	-9.34E-08 [-1.06901]	$\beta_{2,4}$	0.192111 [5.73771]	***
Adj. R-squared	-0.004118		0.701247	
F-statistic	0.552005		257.4363	***

- * Statistical significance at the 10% level.
- ** Statistical significance at the 5% level.
- *** Statistical significance at the 1% level.

The table IX: Lag length selection for error correction model analysis

The table reports the Schwarz information criterion (SIC) of lag length selection for analysis based on error correction model (ECM). The SIC shows the appropriated length of lag is one.

Lag	Spot-Futures	AFET-TOCOM
	SC	SC
0	-11.05737	5.547621
1	-11.26771	5.510801*
2	-11.33069*	5.530437
3	-11.32807	5.545215
4	-11.30159	5.570636
5	-11.27713	5.574797
6	-11.26209	5.601083
7	-11.24778	5.616358
8	-11.21761	5.643036

* Indicates lag order selected by the criterion
SC: Schwarz information criterion

Table X: The Johanson test of co-integration

Panel A: Spot-Futures price relationship

Hypothesized No. of CE(s)	Trace Statistic	0.05 Critical Value	Prob.
$r = 0$	13.20568	15.49471	0.1075
$r \leq 1$	1.798074	3.841466	0.1799

Panel B: AFET – TOCOM price relationship

Hypothesized No. of CE(s)	Trace Statistic	0.05 Critical Value	Prob.
$r = 0$	75.62536	15.49471	0.0000
$r \leq 1$	1.314193	3.841466	0.2516

Table XI: Panel A The result of Futures and spot relationship

The table shows the result of VAR analysis of relationship between spot and futures.

$$\text{Equation 1: } SRET_t = \delta_s + \sum_{i=1}^l \beta_{si} FRET_{t-i} + \sum_{i=1}^l \gamma_{si} SRET_{t-i}$$

$$\text{Equation 2: } FRET_t = \delta_f + \sum_{i=1}^l \beta_{fi} SRET_{t-i} + \sum_{i=1}^l \gamma_{fi} FRET_{t-i}$$

Panel A: AFET

	<i>Change in spot at time t</i>		<i>Change in futures at time t</i>		
δ_s	0.000128 [0.27384]		δ_f	0.000504 [0.92427]	
$\beta_{s,1}$	0.480999 [14.5732]	***	$\beta_{f,1}$	0.016142 [0.42059]	
$\beta_{s,2}$	0.239059 [0.03614]		$\beta_{f,2}$	-0.048023 [-1.14277]	
$\gamma_{s,1}$	-0.190274 [-5.0873]	***	$\gamma_{f,1}$	0.087607 [2.01438]	**
$\gamma_{s,1}$	0.009481 [0.28225]		$\gamma_{f,1}$	0.126220 [3.23151]	***
Adj. R-squared	0.231078			0.015925	
F-statistic	66.28833	***		4.515743	***

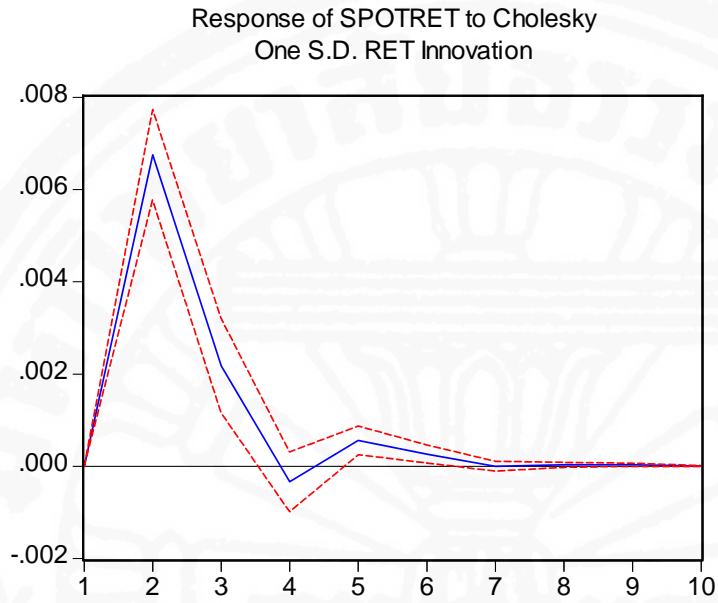
* Statistical significance at the 10% level.

** Statistical significance at the 5% level.

*** Statistical significance at the 1% level.

Table XI: Panel B Graph of the impulse response analysis

Panel B.A: The response of spot price (SPOTRET) to one standard deviation innovation on futures price (RET).



Panel B.B: The response of futures price (RET) to one standard deviation innovation on futures price (RET).

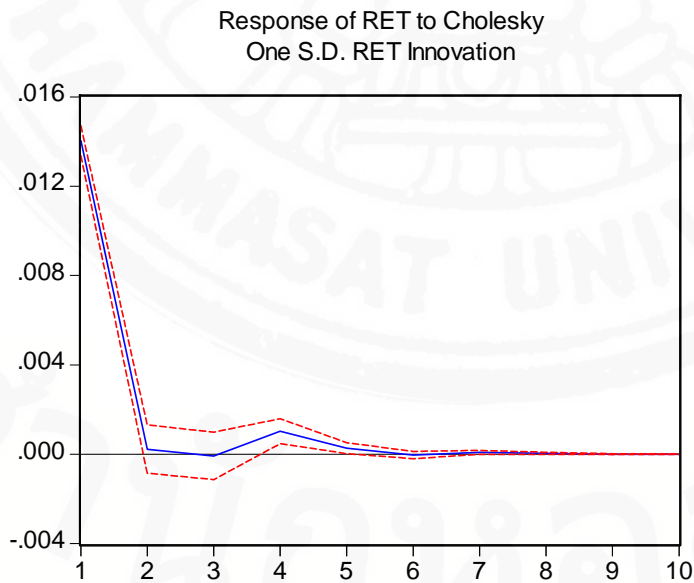


Table XII: The result of the error correction model

The estimated parameters and t-statistics are reported on the first and second line respectively.

Equation 1:
$$\hat{u}_{t-1} = (FAFET_{t-1} - \delta FTOCOM_{t-1} - \alpha)$$

Equation 2:

$$FAFET_t = \hat{\partial}_1 + \tau_2 \hat{u}_{t-1} + \sum_{i=1}^m \alpha_i FAFET_{t-i} + \sum_{i=1}^m \delta_i FTOCOM_{t-i} + \varepsilon_t$$

Equation 3:

$$FTOCOM_t = a_1 + b_2 \hat{u}_{t-1} + \sum_{i=1}^m \beta_i FTOCOM_{t-i} + \sum_{i=1}^m \nu_i FAFET_{t-i} + \varepsilon_t$$

Co-integrating equation							
First equation							
	Coefficient		t-statistics				
$FAFET_{t-1}$		1					
α		1.765894					
δ		-0.992561	***	[-108.486]			
Error correction model							
L.H.S Variable →	Second equation				Third equation		
	$\Delta FAFET_t$				$\Delta FTOCOM_t$		
	Coefficient		t-statistics		Coefficient		t-statistics
τ_2	-0.114854	***	[-3.38705]	b_2	0.065739	*	[1.79087]
$\hat{\partial}_1$	0.038572		[0.96145]	a_1	0.035744		[0.82304]
α_1	0.181154	***	[3.06920]	β_1	0.347714	***	[5.44210]
δ_1	-0.138192	**	[-2.53620]	ν_1	-0.214394	***	[-3.63479]
Adj. R-squared	0.015314				0.042709		
F-statistic	5.541329		***		14.02747 ***		

* Statistical significance at the 10% level.

** Statistical significance at the 5% level.

*** Statistical significance at the 1% level.

L.H.S. stands for left hand side.

Table XIII: The Market specification

Item	AFET	TOCOM
Date of Listing	May 28, 2004	December 12, 1952
Underlying Product	Natural Rubber Ribbed Smoked Sheet No.3 (RSS No.3)	Ribbed Smoked Sheet (RSS) No.3
Deliverable Grade	<p><u>For contract month before February 2008</u></p> <p>RSS No.3 as per the International Rubber Quality and Packing Conference or "The Green Book"</p> <p><u>For contract month since February 2008</u></p> <p>RSS No.3 as per the International Rubber Quality and Packing Conference or "The Green Book". The buyer may specify deliverable grade in accordance with the house term from major tyre manufacturers and the deliverable products must be produced or delivered from factories as approved by the exchange.</p>	RSS No.3 or 4 of International Standard Specifications, deliverable within a year of date of customs clearance
Trading Unit	5,000 Kg. or 5 metric tonnes / one trading unit.	5,000 Kg. or 5 metric tonnes / one trading unit.
Delivery Unit	20,000 Kg. or 20 metric tonnes / one delivery unit.	10,000 kg
Trading Method	Computerized continuous trading	Computerized continuous trading
Quotation	THB/Kg.	JPY/Kg.
Initial Customer Margin	Available on web site	Available on web site
Delivery Deposit	Available on web site	Available on web site
Trading Hours	10.00 to 15.45	9:00 a.m. to 11:00 a.m. , 12:30 p.m. to 5:30 p.m.
Contract Months	Nine consecutive months from the nearest contract month	Six consecutive months from the current month
Last Trading Day	The third business day prior to the first business day of the delivery month	The fourth business day prior to the Delivery Day
Last Delivery Day	The last business day of the delivery month	The last business day of each month except December (the 28th for December)
Minimum price Fluctuation	0.05 THB/Kg.	JPY 0.1 per kg

Item	AFET	TOCOM
Daily Price Fluctuation Limit	2.80 THB/Kg.- (The AFET may change the amount of price limit according to the range of Reference Notional Value)	<p>* Daily Price Fluctuation Limits are determined every month based on the market price movement within a recent period of time. See Margin and Price Limit for the price limit currently imposed.</p> <p>* When final contract prices for three or more contract months have reached the price limit in the same direction, the Daily Price Fluctuation Limit for all contract months except the current contract month shall be expanded by 50% from the following business day, and shall remain in effect until the final contract prices for three or more months stop reaching the ordinary price limit. However, when the final contract prices for three or more contract months have reached the applicable Price Limit in the same direction for two consecutive business days, the Exceptional Measures for Price Limits will be maintained until the last contract price for all contract months (in this case, "all contract months" doesn't include the first contract month) stop reaching the ordinary Price Limits for three consecutive business days.</p>
Speculative Position Limit (for all long/short position combined)	<p><u>For contract month before February 2008</u></p> <p>Not greater than 100 contracts in delivery month Not greater than 500 contracts in all contract months combined (A hedger may ask for permission to hold more than this limit)</p> <p><u>For contract month since February 2008</u></p> <p>1st contract month : Not greater than 200 contracts 2nd contract month : Not greater than 600 contracts all contract months combined : Not greater than 3000 contracts</p>	<p>Current contract month: 200 contracts</p> <p>2nd contract month: 600 contracts</p> <p>3rd contract month: 1,600 contracts</p> <p>Other contract months: 3,000 contracts for each month</p> <p>Total: 10,000 contracts</p>

Item	AFET	TOCOM
	Hedger limit is set at 500 contracts for 1st contract month. An extension of the limit may be granted by the exchange upon request.	
Initial Customer Margin	Available on web site	Available on web site
Delivery Deposit	Available on web site	Available on web site
Trading Hours	10.00 to 15.45	9:00 a.m. to 11:00 a.m. , 12:30 p.m. to 5:30 p.m.
Contract Months	Nine consecutive months from the nearest contract month	Six consecutive months from the current month
Last Trading Day	The third business day prior to the first business day of the delivery month	The fourth business day prior to the Delivery Day
Last Delivery Day	The last business day of the delivery month	The last business day of each month except December (the 28th for December)
Delivery Terms and Conditions	<p><u>For contract month before February 2008</u></p> <p>FOB Bangkok or Leam Chabang</p> <p><u>For contract month since February 2008</u></p> <p>Buyer's choice of delivery location including only;</p> <p>1) FOB (PAR)</p> <ul style="list-style-type: none"> - Bangkok Port - Leam Chabang Port <p>2) Local delivery (Discount)</p> <ul style="list-style-type: none"> - Designated warehouses or factories. 	<p>Specified warehouses</p> <p>Physical delivery (not cash settlement)</p>