

# Supply Chain Management in Thailand

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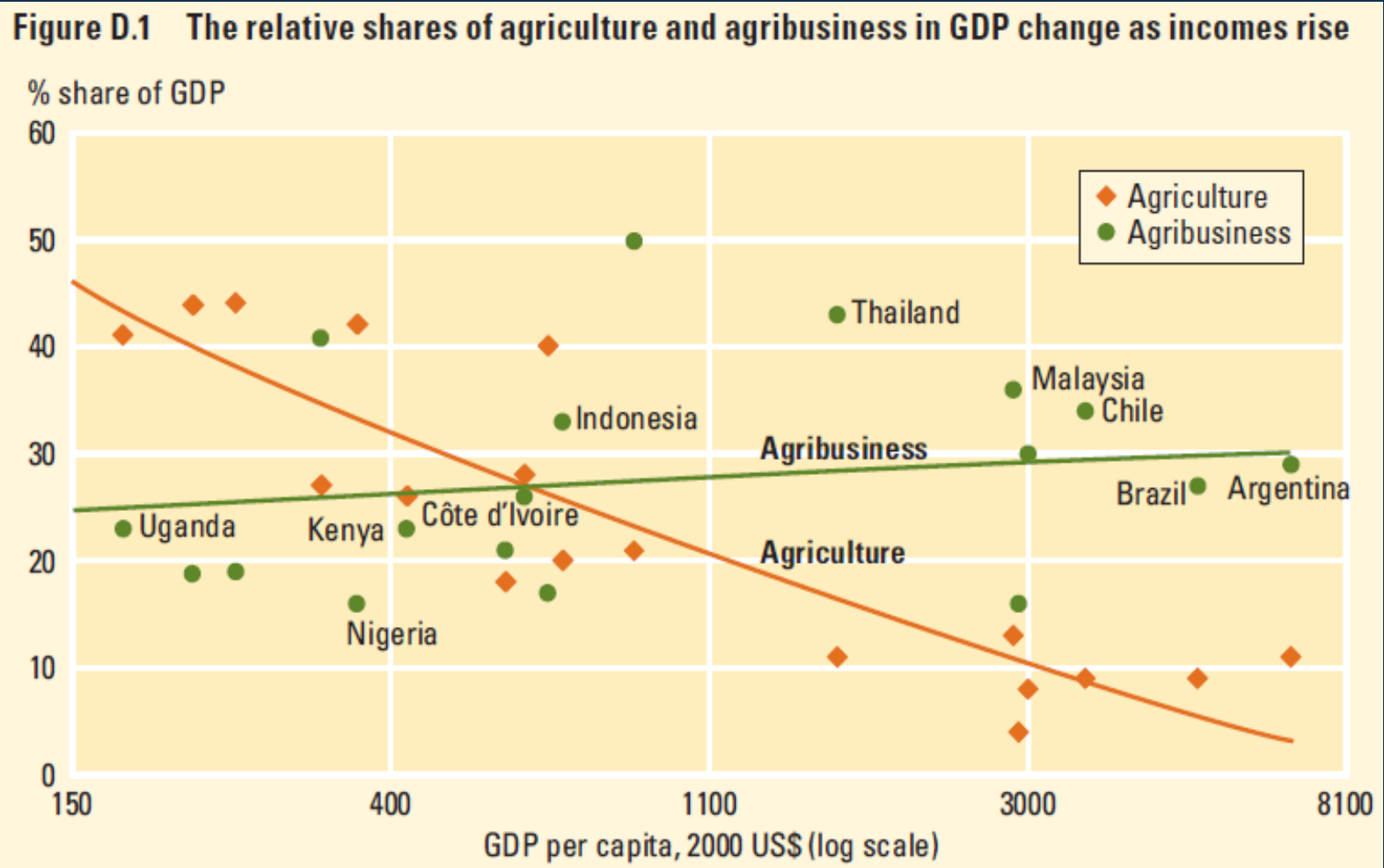
**A seminar on “Reducing Friction : Towards Inclusive and  
Efficient Agriculture Supply Chains” Organized by LIRNEasia.**

**Siam City Hotel,**

**2 April 2012**



### 3. ประสิทธิภาพของภาคเกษตร



ที่มา : World Bank 2008



# Issues

- **What drives the modern supply chain management (SCM) in Thai agriculture ?**
- **Do agents under the modern SCM have higher capability than those in the traditional SCM ?**
- **Are farmers under the modern supply chain better off ?**



# 1. Characteristics and drivers of modern SCM in Thai agriculture ?

- **Definition**

- **Supply chain management is the management of a network of interconnected business involved in the ultimate provision of product and service packages required by and customers.**
- **It spans all movement and storage of raw materials, work-in-process inventory, finished goods as well as flow of information and cash flows from point of origin is point of consumption.**
- **Its objectives are to create net value (e.g., quality & safe food), reducing cost & waste and introduce innovation**



- **Note that the traditional supply chain management in Thai agriculture has been quite efficient because most markets at all levels of the chain are competitive, with few exceptions.**
- **The markets are highly integrated, thanks to the infrastructural investment and large number of traders at all levels of supply chain**



- **Examples of traditional SCM in Thai agriculture**
  - **Commodity : rice, rubber, cassava, corn**
  - **Fruits and vegetables in the wet market**
  - **Fishery, except shrimp**
  - **Cattle**



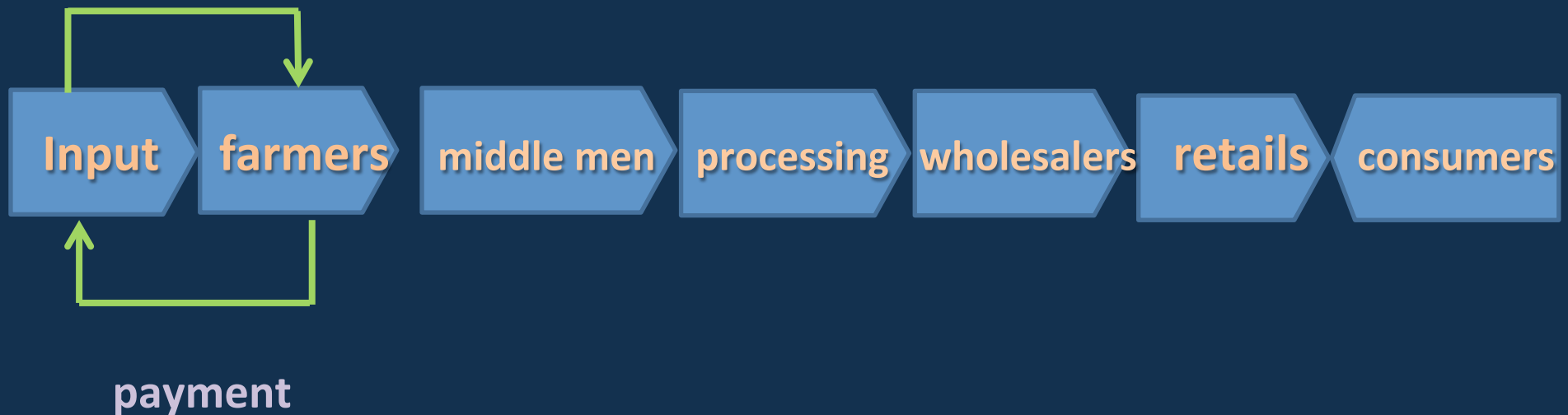
- **Modern SCM in agriculture**
  - **Contract farm : chicken, sugar cane, pig fattening safe vegetables**
  - **Corporate farms : shrimps, chicken, oil palm, eggs**
  - **Farmer groups : organic rice, fruits for export (e.g., mango, banana)**
  - **Super market chain : safe vegetables and fruits, safe meat,**



# • Conceptualization of traditional and modern supply chain

Traditional chain : disconnected flows

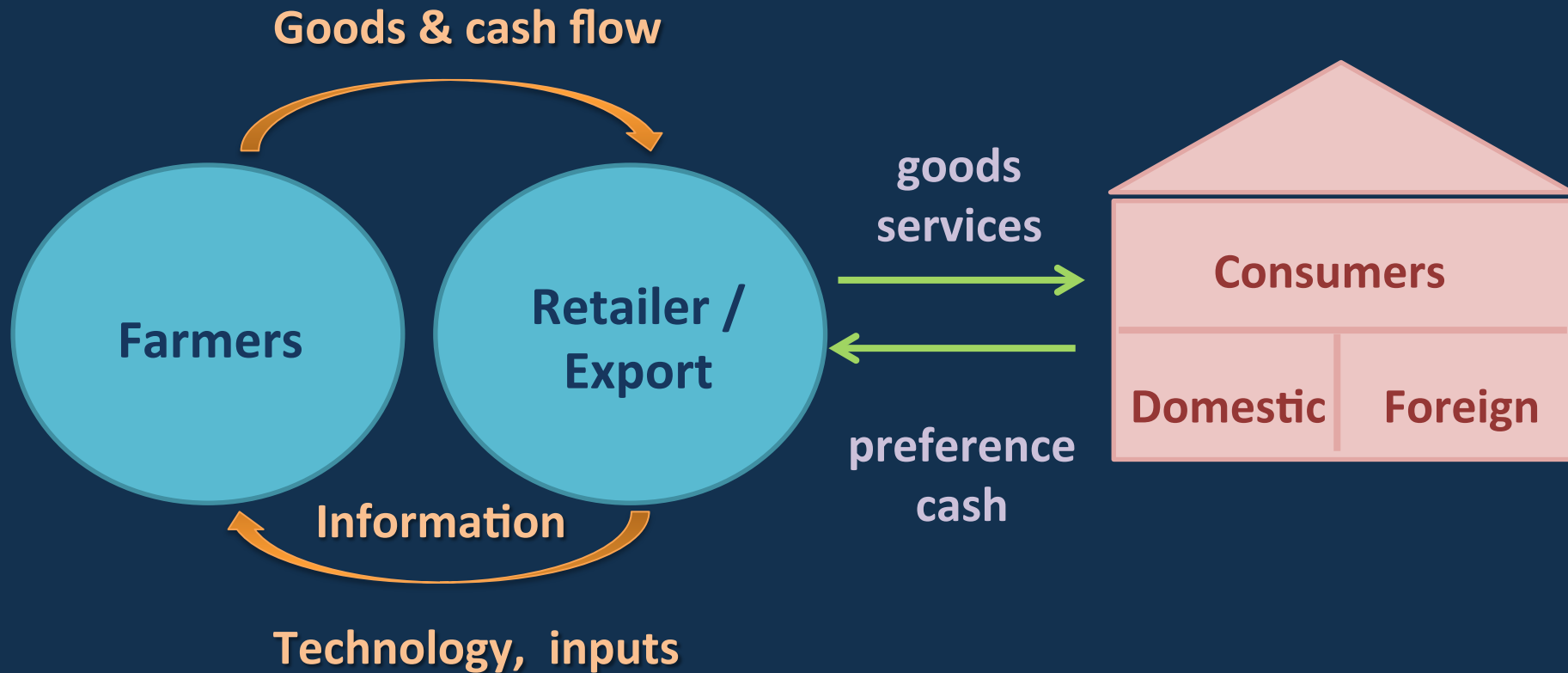
Goods & information





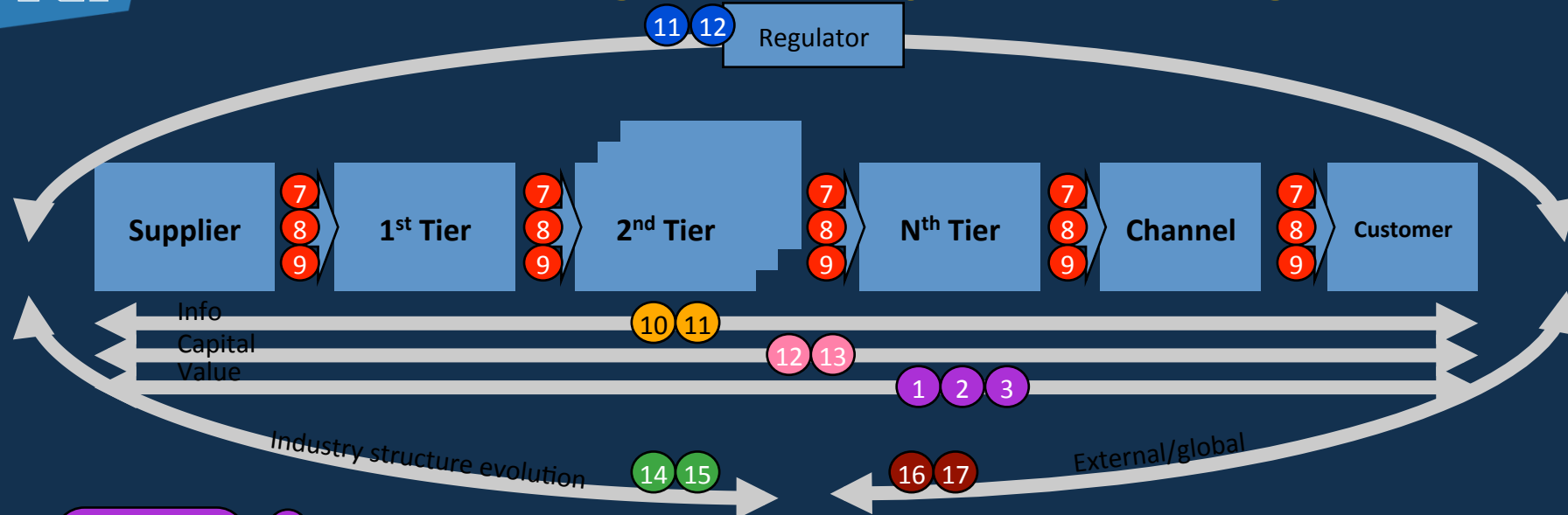


# Modern SCM





# Factors affecting the supply chain management.



Flow of value add

- 1 Significant value loss along supply chain due to inefficiency
- 2 Difficult to introduce value added products and services
- 3 Value is not well distributed across supply chain

Flow of information

- 4 Insufficient communication and information sharing
- 5 Ineffective communication channels

Flow of capital and risk sharing

- 6 Ineffective use of supply contracts and risk sharing
- 7 Unavailable sources of capitals causing imperfect environment

Flow of products (logistics)

- 8 Inadequate central logistics infrastructure
- 9 Low quality and high cost modes
- 10 Insufficient technology investment

Government policy

- 11 Ineffective management of trade barriers and quotas
- 12 Ineffective/inadequate/unfair government subsidy & support
- 13 Inefficient/ineffective government required processes

Industry structure and evolution

- 14 Industry structure leading to fierce competition or collusion
- 15 Evolution of industry structure causing paradigm change

External/global environment & competition

- 16 Global competition landscape causing ineffective supply chain
- 17 Requirements from other countries causing supply chain ineffectiveness



# • Salient characteristics of agric SCM

	<b>Traditional SCM</b>	<b>Modern SCM</b>
<b>1. Market structure</b>	<ul style="list-style-type: none"><li>- Spot market</li><li>- Competitive,</li><li>- Small holders, small traders</li></ul>	<ul style="list-style-type: none"><li>- Vertical integration</li><li>- Oligopoly</li><li>- Farmer groups, large firms</li></ul>
<b>2. Exchange relations</b>	<ul style="list-style-type: none"><li>- Arms' length</li><li>- Dependent on middle men</li></ul>	<ul style="list-style-type: none"><li>- Long-term contract</li><li>- Direct sale to retailers/exporters</li></ul>
<b>3. Production process &amp; technology</b>	<ul style="list-style-type: none"><li>- Commodity</li><li>- Public R&amp;D</li></ul>	<ul style="list-style-type: none"><li>- Diffracted products</li><li>- R&amp;D by private sector</li></ul>



## • Salient characteristics (cont.)

	<b>Traditional SCM</b>	<b>Modern SCM</b>
<b>4. Information flow</b>	<ul style="list-style-type: none"><li>- Market price</li><li>- Advertising, salesmen and extension officers</li></ul>	<ul style="list-style-type: none"><li>- Guarantee price</li><li>- Two ways flow of information between firms and farmers</li></ul>
<b>5. Logistics</b>	<ul style="list-style-type: none"><li>- Handled by small traders</li></ul>	<ul style="list-style-type: none"><li>- Dedicated logistics handled by retailers</li></ul>
<b>6. Credit and risks</b>	<ul style="list-style-type: none"><li>- Volatile prices</li><li>- Price &amp; output risks</li><li>- Credit provided by SFI (BAAC)</li></ul>	<ul style="list-style-type: none"><li>- Guarantee prices</li><li>- Price risk sharing</li><li>- Credit provided by commercial banks</li></ul>



- **Four drivers of modern SCM**

- **1) Foreign market : chicken , vegetables**

- **Demand from the high income countries**
    - **High income elasticity of demand for quality & safe food : health conscious**
    - **NTBs**



## Four drivers of modern SCM (cont.)

### –2) Domestic market

- Rise of middle class : income elasticity for safe food
- Rise of modern supermarkets
- TDRI study (2009) finds that factors affecting consumers' decision to buy safe food include education, income, age, employment status (especially government employees)
- Consumers are also willing to pay higher prices for safe foods. The price premium is about 42 %.

# Types of food that Bangkok consumers have tendency to buy in the future

Types	Consumers	%
Safe food	68	35.23
Health food	102	52.85
Food as the medicine	2	1.04
Climate change concern, e.g., using less plastic bags	10	5.18
Environmental concern	2	1.04
Animal Welfare concern	5	2.59
Other concerns, i.e., child labor, prisoner utilization	4	2.07
Total	193	100.00



### **– 3) Technology**

- **Contract farming in chicken & vegetables were successfully introduced by the private sector in the early 1970s and 1980s, thanks to technology and demand in the developed economies**
- **Hard-ware : hybrid seeds, evaporative housing, better feeds**
- **Software : contract farming, GAP, HACCP, GMP, private standards, private labels, central procurement, distribution centers, information technology (bar code, POS,DC), etc.**

### **– 4) Foreign direct investment : foreign supermarkets**





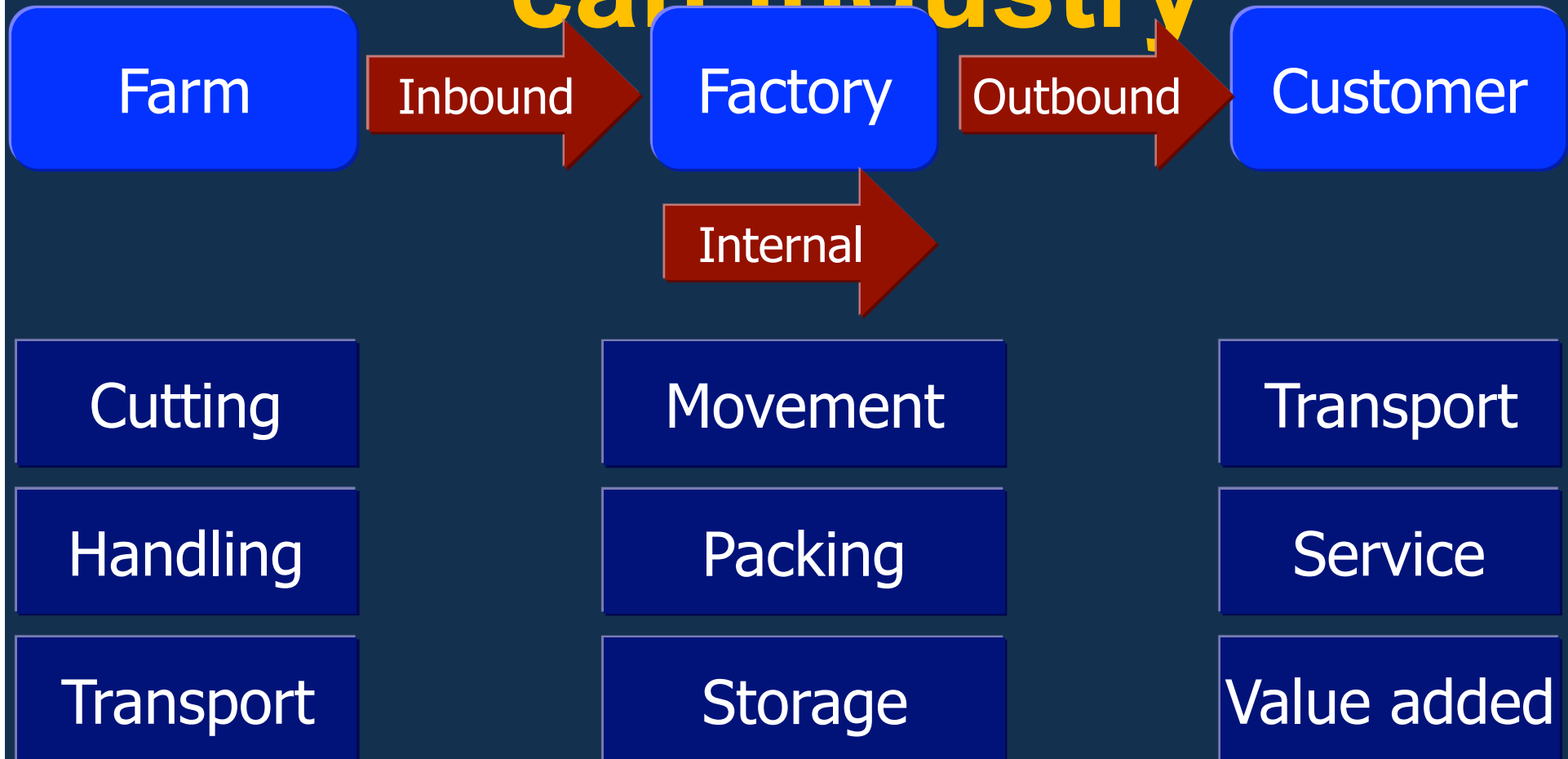
# ***Supply chain management and logistics of the sugarcane and sugar industry***

**How a sugar company, the Mitrphol Group, has successfully introduced the efficient SCM to reduce cost and increase value of their sugar products.**

**July 22, 2010**



# Supply chain of Sugar can industry





# Mitrphol's Supply chain

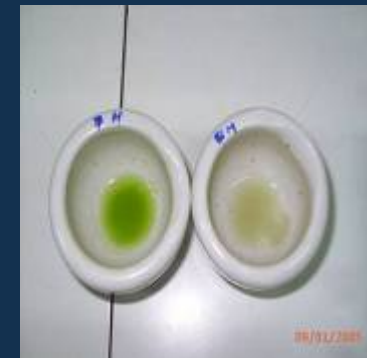


Source: Mitrphol 2010.

# Research and Development



Biology control



Test kit (white leaf disease)



Breeding



Water drop system



# Research generates value added

List	10 CCS.	12 CCS.	14 CCS.
Sugar prices (USD / ton)	965	1,085	1,205
Sugar prices per truck (15 tons)	14,475	16,275	18,075
Cost of cutting, handling (300 * Baht / ton)	4,500	4,500	4,500
Proportion of transport costs on the price of sugar cane	31.09%	27.65%	24.90%

\* = (300 Baht/Ton @ 15 Ton/Trip)

The value of the goods increases, while the logistics cost remains constant, farmers will have more revenue.



# Loading stations reduce the transport cost

ESCAP: Use the Loading Station reduce the transport of small farmers over 50%

Cost item	Traditional system (baht/ton)	Through loading station	
		Hired labour (baht/ton)	Own labour (baht/ton)
<b>Cutting and loading</b>	85	85	-
<b>Cost of transportation from farm to station</b>	-	45	45
<b>Cost of Transportation from station to mill (charged by the mill)</b>	-	85	85
<b>Cost of Transportation from farm to mill</b>	180-220	-	-
<b>Total costs</b>	265-305	215	130

*"ASSESSING THE TRANSPORTATION PROBLEMS OF THE SUGAR CANE INDUSTRY IN THAILAND"*

of Bureau of Agricultural Economic Research, Escape

Published on Transport and Communications Bulletin for Asia and the Pacific

No.70, 2001





# Loading Station

Household Labor



Reduce Transportation Cost



Transport to Factory



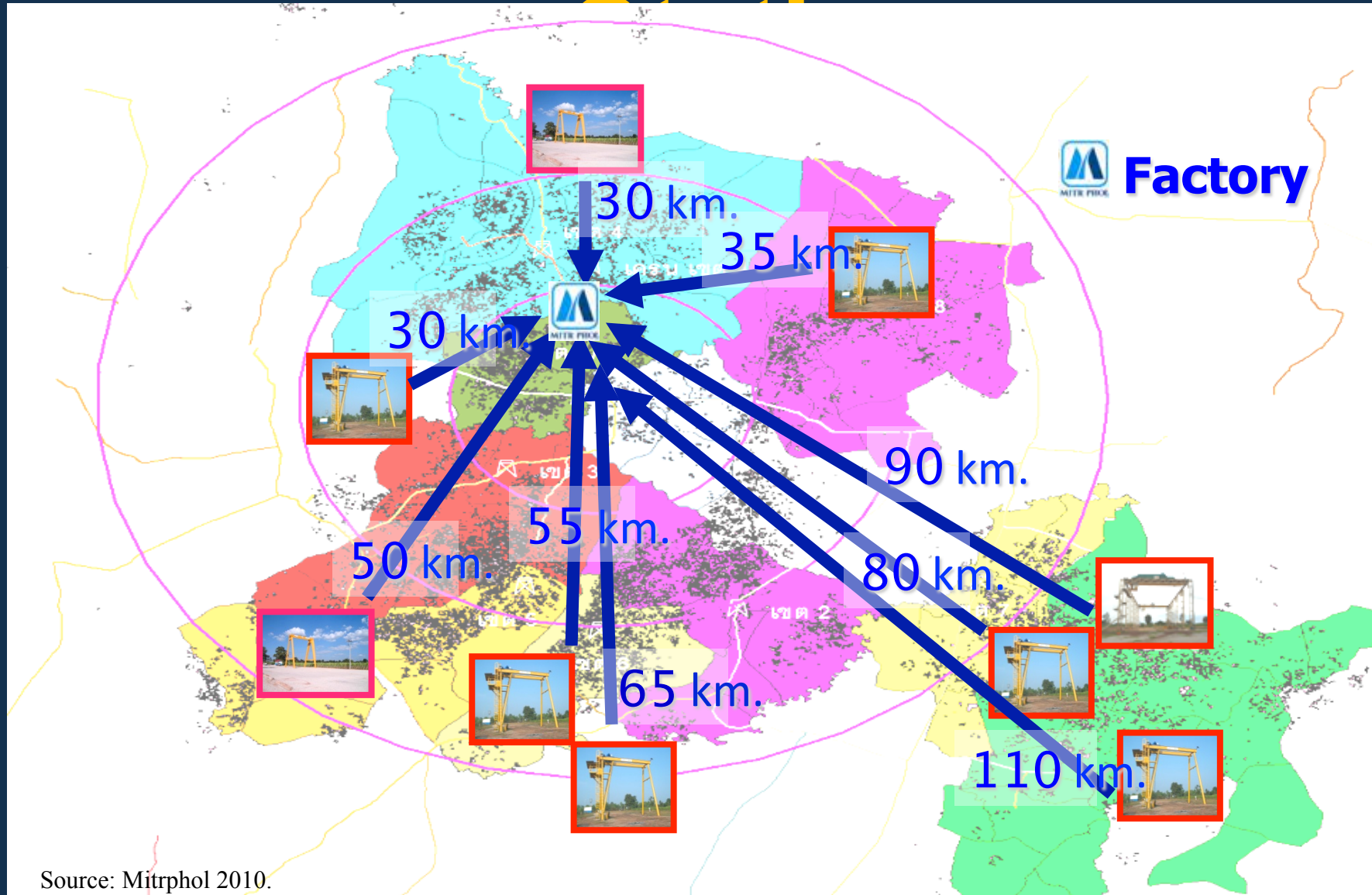
Light Truck to Large Truck



Source: Mitrphol 2010.



# Location of Loading



Source: Mitrphol 2010.





# Reducing queuing time between cutting milling

Queuing System

UF-PM-2000-004/1

บริษัท รวมเกษตรกรอุตสาหกรรม จำกัด  
แบบฟอร์มการจัดสรรโควต้าตัดซื้อของชาวไร่แต่ละรอบ

คิวที่ 64

หมายเลขประจำตัว 8989 จำนวน 1900 ตัน หมายเลขประจำตัว..... จำนวน..... ตัน  
 หมายเลขประจำตัว..... จำนวน..... ตัน หมายเลขประจำตัว..... จำนวน..... ตัน  
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รวม 1900 ตัน

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130

Queue Schedule



**MITR PHOL** บัตรประจำรถ 24/11/2547

ทะเบียน ไร่ 80-1254

ประเภทรถ สีล้อ เล็ก

สังกัด มีตรภู เบียว

12128C79A1 ออกบัตรครั้งที่ 1

Truck Card

Source: Mitrphol 2010.



# Transferring Management

1.

Cut & Handing 8-10 hrs.



Wait time 1.5 hrs.

4.



Time limit 24 hrs.



2.

Transfer from light truck to truck 3 hrs.



3.

Transfer to the factory in 3 hrs.



Source: Mitrphol 2010.



# Packaging machine





# Transfer

Past



Now



Source: Mitrphol 2010.



# Transfer

Past



Now



Source: Mitrphol 2010.



# Storage



P-Sling



Stacktainer



Jumbo Bag

Source: Mitrphol 2010.



Pallet



# Delivery



Truck



Container Truck



Tank Car

Source: Mitrphol 2010.



## **2. Do agents have higher capability in the modern SCM than those in the traditional SCM ?**

- **Agents' capability under the modern SCM relative to that under the traditional SCM**
  - **Technical: value added , quality & cost reduction**
  - **Marketing**
  - **Access to credit**
  - **Technology and innovation**



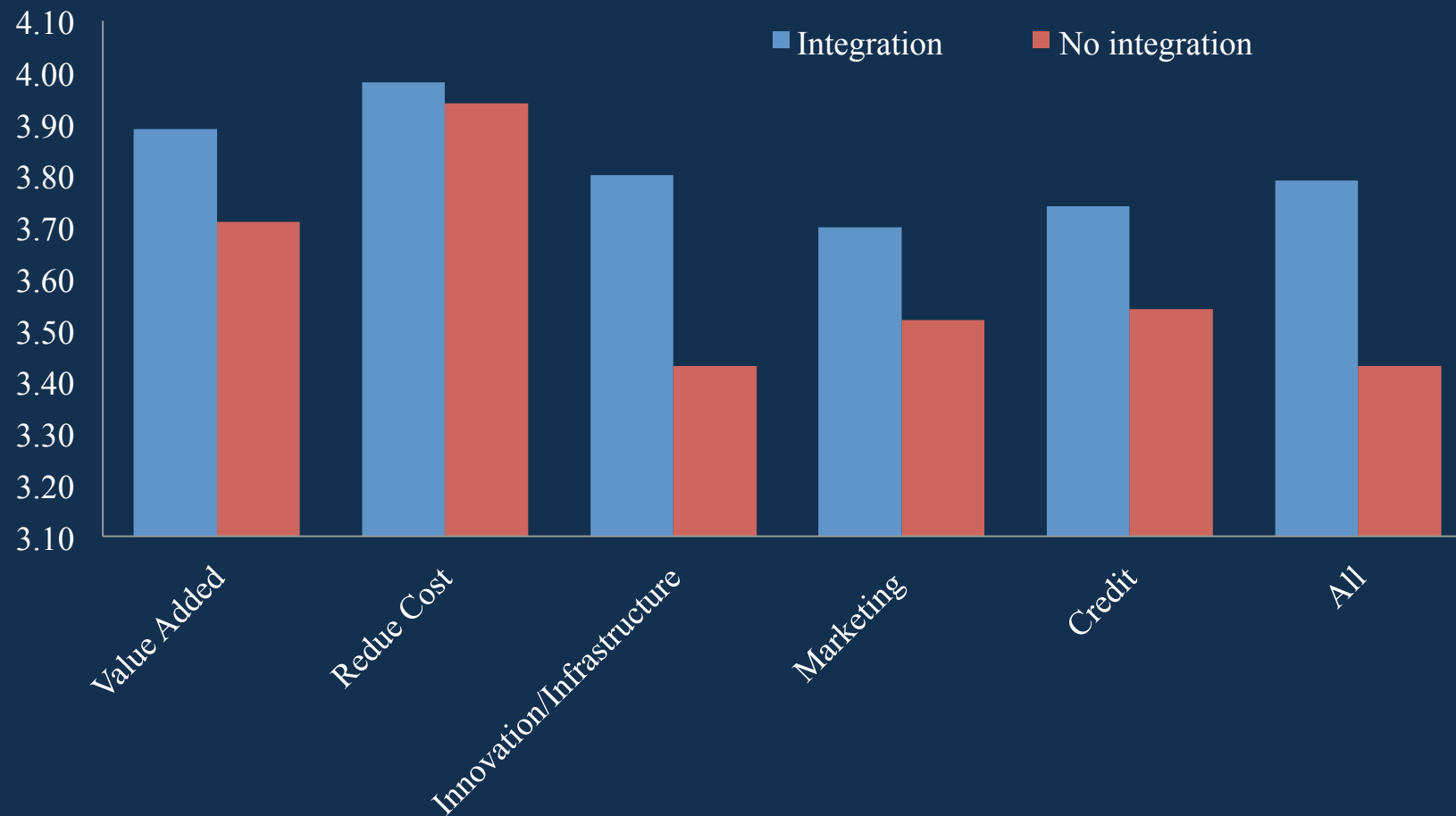


## 2. Do agents under the modern SCM have higher capability than those in the traditional SCM ?

- **Agents' capability under the modern SCM**
  - **Using the Likert scale, 1-5 to measure relative capability of agents under modern SCM and traditional SCM**
  - **A survey of 350 agents in four major stages of supply chain, i.e., inputs suppliers, farmers, food processors, middle men and wholesalers, retailers and exporters**



## Potential capability of enterprises under integration and no integration



Source: TDRI 2010.



# Factors affecting agents' overall capability

	(1)	(2)	(3)	(4)	(5)
<b>Higher education dummy</b>	0.176*	0.167*	0.145	0.152 <sup>a</sup>	0.163*
	(1.820)	(1.750)	(1.350)	(1.610)	(1.800)
Role of government in production & testing		0.088	0.056	0.007	0.003
		(0.900)	(0.590)	(0.080)	(0.040)
Regulation			0.292		
			(0.650)		
Government intervention	-0.070	-0.073	-0.058	-0.026	-0.036
	(-1.100)	(-1.130)	(-0.870)	(-0.380)	(-0.540)
Have business in more than one stages of supply chain	0.047	0.054	-0.045	0.050	0.019
	(0.260)	(0.300)	(-0.270)	(0.310)	(0.130)
<b>Infrastructure problems</b>	-0.003**	-0.004**	-0.004***	-0.003**	-0.003**
	(-2.250)	(-2.310)	(-2.680)	(-2.410)	(-2.460)
<b>Other bottleneck</b>	-0.302***	-0.311***	-0.270***	-0.221***	-0.226***
	(-3.520)	(-3.700)	(-3.480)	(-3.050)	(-3.070)
<b>Contract farming dummy</b>	0.139**	0.145**	0.083		
	(2.190)	(2.310)	(1.280)		
				0.152**	
				(2.560)	
<b>Contract with supermarket/ exporters</b>					0.289**
					(2.350)
<b>Farmer groups</b>					0.165**
					(2.220)
Constant	3.136***	3.125***	3.188***	3.121***	3.130***
	(67.250)	(69.600)	(63.450)	(57.180)	(63.880)
Commodity dummy	none	none	yes	yes	η
F-statistic	3.040	2.910	2.920	2.88	2.9
R-squared	0.128	0.133	0.2245	0.230	0.253

\*\*\*, \*\*, \* denote significance at 0.01, 0.05, and 0.10 level, respectively



# Factors affecting the agents' access to credit.

	(1)	(2)
Bachelor's degree or higher.	0.594 <sup>b</sup>	0.873 <sup>**</sup>
	(1.480)	(2.060)
The role of the government.	-0.034	0.006
	(-0.120)	(0.020)
The price of government intervention.	-0.636 <sup>**</sup>	-0.369
	(-2.080)	(-1.100)
Poor infrastructure.	-0.002	-0.003
	(-0.250)	(-0.520)
Bottlenecks.	-0.500 <sup>b</sup>	-0.461
	(-1.530)	(-1.400)
Business model and commitment.	0.672 <sup>**</sup>	0.706 <sup>**</sup>
	(2.210)	(2.240)
Market environment.	0.079	0.003
	(0.010)	(0.020)
Dummy variable (Category).	No	Yes

\*\*\*, \*\*, \*, b represent statistical significance at 1%, 5%, 10% and 15% respectively.



# Results of Econometric test

- Factors that positively affect the agents' capability
  - 1) Contract farm or contract to buy / sell
  - 2) Forming group purchasing/ selling
  - 3) Ability of the operators
- Factors that have negative impact on the agents' capability
  - 1) Government intervention in the market.
  - 2) Bottlenecks to do business
  - 3) Quality of infrastructure, information technology and public utility.
- Policy implications: though the private sector can efficiently manage the SCM in agriculture, there are needs for some govt intervention, i.e., public research, reducing logistics costs, and streamlining regulations



### 3. Are farmers under the modern supply chain management better off ?

- TDRI study (2009) finds that farmers who produce safe foods are able to receive at least 10-20 % higher price than that for regular food
- Using cooling station and refrigerated trucks in the modern logistics will result in savings of 100-200 billion bath from reduction in waste.
  - Part of the savings will benefit the farmers in term of higher farm-gate prices









### 3. Are farmers under the modern supply chain better off ?

- Yet there are still some concerns, i.e., unfair risk sharing of contract farming and trust in safe foods
  - **Farmers have to invest heavily when they participate in the contract farm system and when firm introduces new technology. But they have to bear all the output risks, including the unexpected disasters which bankrupt them financially.**
  - **Some the farmers' contracts were illegally kept by the company**
  - **Some contractors use marketing strategy to attract farmers to participate in the contract program without carefully screening the farmers, thus resulting in large number of failure**



### 3. Are farmers under the modern supply chain better off ?

- Yet there are still some concerns: trust in safe foods
  - More than 32 % of consumers in Bangkok do not have trust in safe food
  - Though the brand name and company's reputation are the major sources of consumers' trust in food safety, 15 % of consumers still make their decision to buy safe food based on the government standards
  - Many small & medium traders still mix safe vegetables with unsafe products
- So there is a need for an establishment of public-private-farmer-consumer participation in the development of modern supply chain in agriculture

# Consumers' confidence in safe food: how much confidence about food safety you have when you buy the following foods?

<b>Foods</b>	<b>No trust</b>	<b>Not so confident</b>	<b>No difference</b>	<b>Some confidence</b>	<b>Very confident</b>	<b>Can't assess</b>	<b>Total</b>
Vegetables	6.52	25.65	24.35	30.87	8.70	3.91	100.00
Fruits	5.24	27.51	27.95	30.57	5.24	3.49	100.00
Meat	6.09	26.96	26.52	29.57	5.65	5.22	100.00
Rice	3.04	20.87	20.43	40.00	9.13	6.52	100.00

# Factors affecting decision to buy safe foods

Factors	Percent	
	1 st choice	2 <sup>nd</sup> choice
Brand name	24.09	17.91
Company's reputation	13.14	19.40
Appearance & look of packages	15.33	17.91
Private labels of domestic firms	15.33	14.93
Private labels of foreign firms	2.92	4.48
Government's standards	14.60	9.70
Reputation of retailers	7.30	5.97
Personal trust in sellers	4.38	5.22
Trust in farmers groups	2.92	4.48
Total	100.00	100.00



**Thank you**

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