

Foreign Direct Investment, Technology Transfer and Development: The Role of Vertical Coordination in Supply Chains

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Globalization and transition dramatically change supply chains

- TRANSITION :
disruption of supply chains
- GLOBAL FORCES
rapidly change the environment of farmers and agri-food companies worldwide
 - ◆ foreign investment in agri-food sector
 - ◆ spread of global standards on food safety and quality

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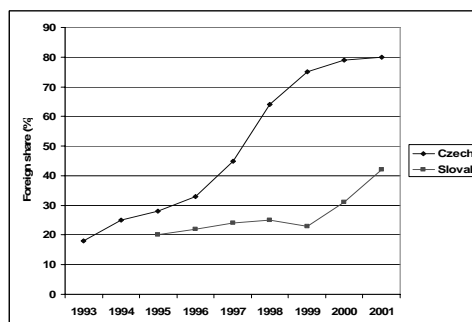
FDI in ECA agri-food sector

- Sugar and brewery sectors are mostly foreign owned
- Major investments in confectionary, oilseeds, dairy, etc
-
- Most recently, major investments in food retail sector

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"The Supermarket Revolution"

Share of foreign retailers in top 50 retail in Czech and Slovak



2004 Top FDI Destinations of Global Retail Chains

1. Russia
 2. India
 3. China
 4. Slovenia
 5. Latvia
 6. Croatia
- Central Europe is "already mature"
 - Food retail is top investment area

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Rise of Global and Private Safety and Quality Standards

- Rich country quality and safety standards have rapidly increasing impact on transition and developing countries through trade and investment
- Trade agreements (WTO, etc) – public standards
- Increasingly, private standards of investors play an important role, both for international (exports) and domestic markets (regional sourcing, import competition)

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Impact on Technology and Development

- The demand for quality supplies has major impacts on
 - ◆ Structure of the supply system (which farms, which products, under which conditions, ...)
 - ◆ Technology adoption (need for investments to enhance quality and safety)
 - ◆ Vertical integration in the chain

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Vertical Coordination in Supply Chains

- Rapidly growing in transition (and emerging/developing) countries
- Contracting and vertical coordination to overcome obstacles that suppliers and processors face in producing high quality products
- Processes have been an engine of growth in most countries.

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The Basic Problem

- Processors face lack of supplies, because suppliers
 - ◆ Do not want to supply (no trust in payment)
 - ◆ Are not able to supply (inputs, working capital, ...)
 - ◆ Are not able to supply quality (quality inputs, technology, management, ...)
- Solution requires some form of contracting :
 - ◆ Contract with on-time payments
 - ◆ Input assistance
 - ◆ Technology and management assistance

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Supplier assistance by agribusiness companies – Examples :

- Input supply programs
- Trade credit
- Investment assistance program
- Bank loan guarantee programs
- Extension services (technology and management)
-

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Key Issues / Questions

- How important / general is this process ?
- Which models ?
- Which conditions are required ?
- Effects ?
- Who gets the benefits ? (What about small farmers ?)
- Which role does FDI play ?
- Implications for government policy and international organizations ?

Methodology

- Series of (multi-level) surveys, case studies, and interviews
- Different sectors (dairy, cotton, fruits & vegetables, ...)
- Different countries across ECA

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Farms selling on contract in Central Europe (% of all)

		Farm Comp	Family Farms
Hungary	1997	94	17
Czech	1999	98	46
Slovak	1999	96	35

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Use of contract relationships to source raw materials

Armenia, Georgia, Moldova, Russia, & Ukraine

Contract Relationship	% in 1997	% in 2003
With all farmers	41	77
With small farmers	36	49
With larger farmers	37	74
Own farms	6	26
Other agents	17	49

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Agri-business Motivations for Vertical Integration

- Early stage : Securing basic supplies (ex: pre-finance, inputs, ...)
- Advanced : Upgrading quality of supplies (ex: technical and management assistance, investment loans, loan guarantees, ...)

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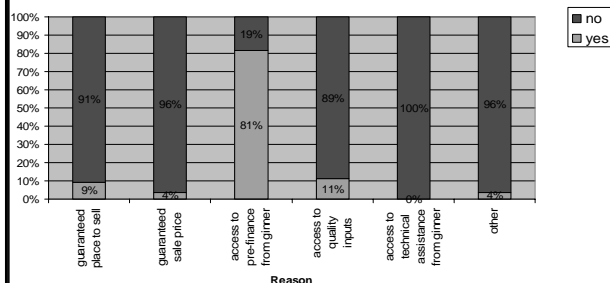
Farms' Reasons for Contracting : Central Europe

	Czech	Slovak	Hung
Contract price higher	12	10	10
Avoid price uncertainty	6	21	33
Guaranteed sales	60	50	43
Immediate payment	7	11	3
Easier to get credit	0	0	9
Contract - inputs or TA	10	6	2
Other	4	2	0

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Farms' Reasons for Contracting : Kazak Cotton Farmers

Q36: If you sign a contract, why do you do it? What is the benefit of having such contract?



Types of Contract / VC : Dairy in North Poland

- ALL dairy companies assist suppliers (farms) through :
 - ◆ Input supply programs
 - ◆ Credit programs
 - ◆ Extension services
- SEVERAL :
 - ◆ Bank loan guarantee programs
 - ◆ Investment loans
- Programs for SMALL and LARGE suppliers

Dairy in Bulgaria, Slovakia, Poland

		Credit	Inputs	Extension	Vet.	Bank	Total
1994	PL	50	67	50	0	50	43
	SK	0	0	83	17	17	23
	BG	9	18	9	0	0	7
1998	PL	83	100	83	17	83	73
	SK	17	17	83	17	33	33
	BG	45	64	18	18	18	33
2002	PL	83	100	83	17	83	73
	SK	100	33	83	17	50	57
	BG	82	81	73	18	36	60

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Elements of Farm Assistance Programs to Romanian Dairies

Type of support	Danone	Friesland	Promilch	Raraul
Extension services	X	X	X	X
Quality inputs	X	X	X	X
Input Pre-finance	X	X		
Investment loans	X	X	X	
Bank loan guarantees	X	X	X	

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Contracted Farm Support Measures in CIS-5

	% of firms	% of farms
Credit	43	51
Prompt payments	42	87
Physical inputs	36	53
Quality control	34	78
Agronomic Support	21	81
Farm loan guarantees	21	15
Investment loans	6	0

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Supermarket Assistance to farms

Available evidence indicates that

- Some modern retailers introduce similar packages to secure quality supplies. E.g.
 - ◆ Central America (Hortifruti)
 - ◆ Croatia (Konzum, Metro) – loan guarantees for dairy farms / greenhouse investments
 - ◆ Serbia-M. (Maxi) – inputs
- Some not:
 - ◆ Czech Republic

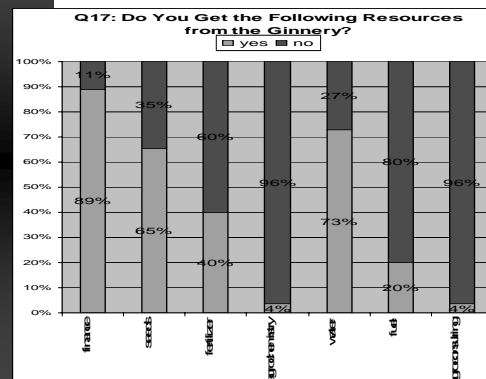
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Cotton

- Vertical coordination is important in all Central Asia
- Kazakhstan survey : 71% of cotton farmers contracts with ginner, with assistance packages

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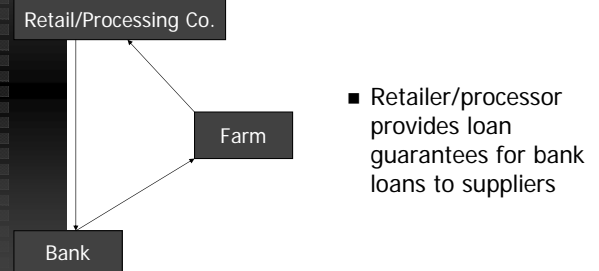
VC in Kazak cotton



Some Examples of Contracting Models

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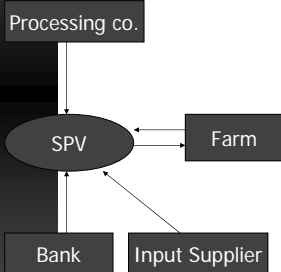
Proces./Retail – guaranteed supplier loans: JUHOSUKOR in Slovakia & KONZUM in Croatia



- Retailer/processor provides loan guarantees for bank loans to suppliers

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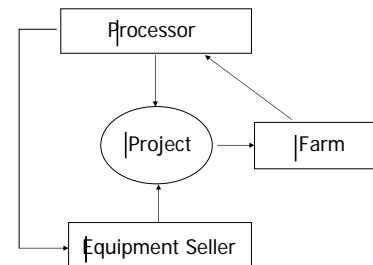
Lending with distributed risk: RABOBANK - SPVs



- Financial institution is foreign investor
- Special purpose vehicle (SPV) to distribute risk equally among partners
- Ex. where group of small farmers formed cooperative to participate in SPV

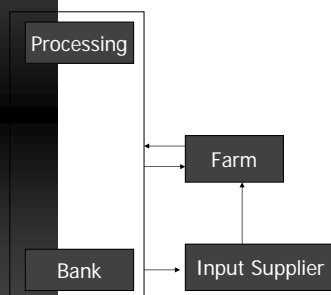
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Leasing dairy equipment by joint project Wimm Bill Dann -- De Laval in Russia



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Dairy Processor Becomes Financial Institution: DANONE in Romania



- Processor takes on banking function:
 - ◆ provides loans to farms
 - ◆ based on business plans
 - ◆ takes collateral
- Provides payment guarantee for input suppliers

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Integrating Multiple Stages : Brewing / Malting Companies



- Core business = brewing
- Forced to vertically integrate all the way to seed supply to ensure quality malt-barley-seed
- General strategy applied differently in countries b/c of local conditions
- Bring in co-foreign investors to assist with non-core activities and set up farm assistance programs
- Programs interlink markets

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Contract Enforcement is essential for ANY model

- Crucial to make VC sustainable
- Not obvious: Many cases and stories where contract enforcement problems undermines VC
- Private enforcement mechanisms can be more important than public institutions

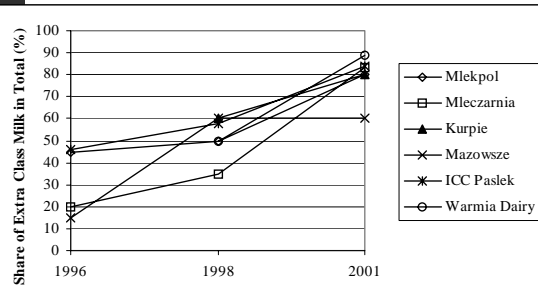
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Impact

- Important **Direct** Effects :
 - ◆ Enhanced **QUALITY** (& higher prices)
 - ◆ Increased **PRODUCTIVITY**
 - ◆ (eg CIS study)
 - ◆ Increased **INVESTMENTS**
- Important **Indirect** Effects: **Spillovers**
 - ◆ Contract replication by other companies
 - ◆ Farm assistance replication
 - ◆ Household level spillovers

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Change in Quality Dairy in North Poland 1996-2001



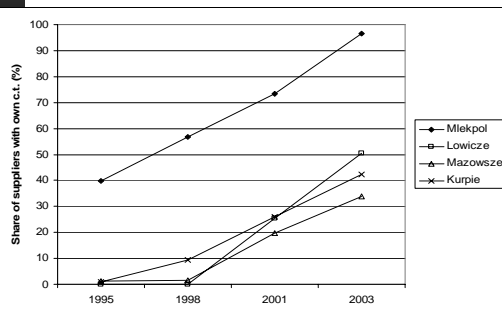
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Impact on LOANS and Investment Small farms in Polish Dairy sector

Size (# of cows)	Invests (% of total)	Uses loan to invest (% of A)	Uses dairy loan (% of B)	Uses bank loan (% of B)
	A	B	C	D
1-5	52	54	41	50
6-10	78	51	43	70
>10	92	74	43	75
ALL	76	58	43	69

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Effect on INVESTMENT : On farm cooling equipment in Poland 1995-2003



Indicators of Impacts of Juhocukor Contract Innovations (Average annual changes, in %)

	1990-1991	1993-1997	1993-1995	1995-1997
Sugar Production	-8.8	33.4	30.1	36.7
Yield	4.1	5.7	3.7	7.7
Sugar Content	1.2	3.6	3.0	4.2
Contract Hectares	-6.6	25.3	1.7	48.8
Input prices / Output prices	-11.5	0.0	-1.9	4.7

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Household Spillover Effects

- Reduced risk (guaranteed price for contracted crop) in absence of insurance markets
- Improved access to credit (cash for contracted crop) with imperfect capital markets
- Increased productivity of non-contracted activities, through improved management and better input use

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Role of Foreign investment

- Conceptually, no need for FDI
- Empirically:
 - ◆ FDI is driving force for contract innovations
 - ◆ Domestic spillovers are important
- Several exceptions: FIG investments (Russia, Kaz), Cotton Kazakhstan
- Crucial factor appears access to outside finance (and management strategy)

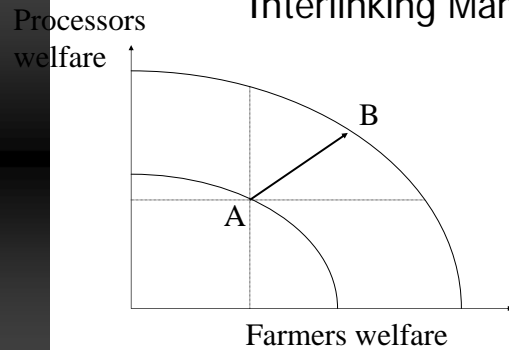
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The Equity Issue

- **Rent distribution :**
who benefits from the efficiency gains ?
- **Exclusion ?**
What will happen to poor and small farmers in this VC process ?

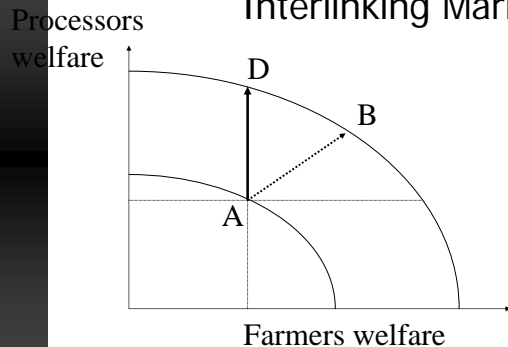
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Rent distribution & Efficiency of Interlinking Markets



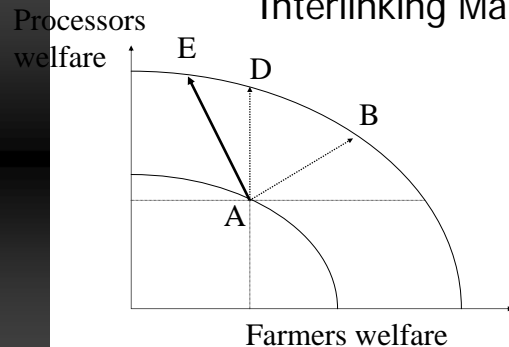
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Rent distribution & Efficiency of Interlinking Markets



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Rent distribution & Efficiency of Interlinking Markets



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Rent Distribution

- For now :
 - ◆ ECA is a “suppliers market”
 - ◆ Shortage of quality supplies strengthens bargaining position of farms
 - ◆ Upgrading reinforces this
- Future ?
 - ◆ Pressure on farms likely to increase

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Equity II: The Exclusion Issue

Key Concern:

- Modern supply chains will push a large share of farmers, in particular small farmers, out of the market as they fail to meet the requirements to sell to these chains

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The Exclusion Concern

Small farmers may ‘fail to make the grade’ because :

1. Fixed component in transaction costs makes it more costly to deal with many small farmers than with a few large farms
2. Small farms are constrained financially (internally and/or externally) for making necessary investments

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Evidence ?

- Many stories but little ‘hard evidence’
- What exists suggest that
 - ◆ We should take this concern seriously
 - ◆ But the **reality** is much more **complex and nuanced** than assumptions

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Evidence – 1

- Interviews with agri-food companies confirms preference for larger suppliers
- Specialized wholesalers and supermarkets prefer to work with (relatively) large FFV producers in Croatia (Reardon et al 2003)
- Danone and Megle in Bulgaria and Romania have strategy focused on >20 cow farms
- CIS study finds 60% of processors have minimum size for some of its farm assistance programs

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Evidence – 2

Empirics show that

- VC with small farmers is widespread
- CIS: vast majority of firms has not reduced number of suppliers over past 6 years
- Sometimes VC with remarkable number and small size suppliers
 - ◆ Eg Friesland Romania contracts with 40,000 small farms through 1,000 collection centers;

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Evidence – part 3

- CIS study finds that processors do not discriminate on size for providing basic programs (agronomic support, physical inputs, prompt payments, ...)
- Examples of company programs to small farmers being quite successful. Eg.
 - ◆ Croatian F&V suppliers to supermarkets
 - ◆ Kazak cotton
 - ◆ Polish dairy

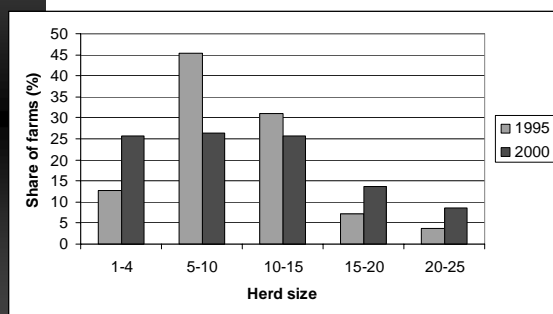
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Impact on small farms – Poland dairy



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More importantly

- Modern dairy companies focusing on high-quality market (incl retail sector) tend to assist small farms; compared to market channels targeted to informal and low quality sales which do not
- In Lithuania, all credit which small dairy farms get is through the dairy companies (cannot get access to bank loans or public assistance, incl SAPARD)

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Why work with small suppliers ?

- In some cases processors have no choice : small farms represent most supply (eg Poland, many Balkan countries, Transcaucasus, Kyrgyz, ...)
- ◆ Eg. Romania: 95% of dairy farms have 1-2 cows.
- Enforcement costs may be lower

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Why work with small suppliers ?

- "processing companies stressed that willingness to learn, take on board advice, and a professional attitude were more important than size in establishing fruitful farm-processor relationship" (CIS study)
- Cost advantages (eg labor intensive products)
- Processors may prefer mix of suppliers to spread risk
- Exogenous differences in company strategies

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Retailers and vertical coordination may play positive role for key weaknesses

- Key weaknesses of small farms :
 - ◆ Shortage of finance for investments
 - ◆ Quality
 - ◆ Access to high value markets
- Retail investments and coordination within supply chains may assist farms in these areas

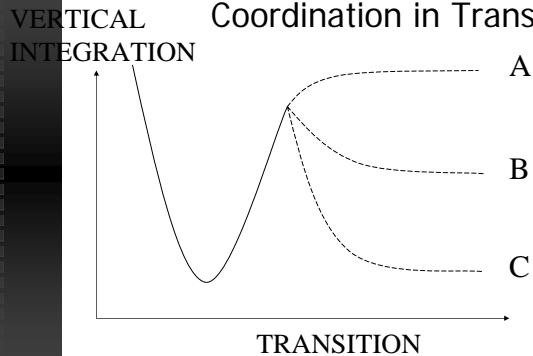
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The problem of small farms

- THE main problem in countries where small farms dominate is usually labor market
- Farm fragmentation is often caused by labor pressure (eg Romania, Georgia, Armenia, Azerbaijan, Kyrgyz, Tajikistan, ...)
- While improvements in agri-finance can certainly help, they are unlikely to solve "the problem" in these countries by themselves

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Decline and Rise of Vertical Coordination in Transition



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Implications for public policy

- Important
- Require major re-thinking of public policy in transition/developing countries
- What role in this new environment for traditional public investments in research, extension, standards, etc. ?

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Implications for Government Policy and World Bank Operations

- No.1: Realizing the importance of VC
- Then :
 - ◆ Enabling and stimulating vertical coordination
 - ◆ Improving efficiency, transparency, and equity in vertical coordination
 - ◆ Rethinking the role of the government and policy-making

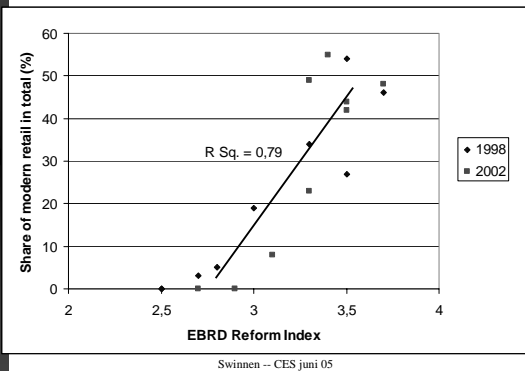
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Implications I: Enabling and stimulating vertical coordination

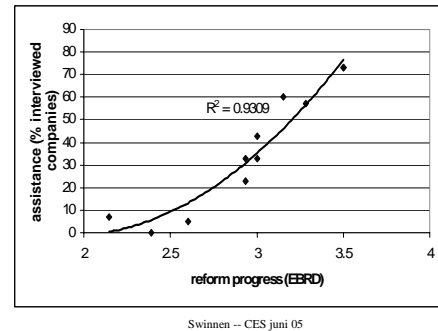
- Create the right conditions for stimulating investment.
- Ensure macro-economic stability.
- Refrain from direct intervention: "Bad policies are worse than bad weather."

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Reforms and Retail Investments



Reforms and Vertical Coordination (% farm assistance programs in dairy)



Implications II: Improving efficiency, transparency, and equity in VC

- Reduce **transaction costs**
- Enforce **competition**
- Invest in higher **quality**
- **Empower** farmers

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Implications II: Improving efficiency, transparency, and equity in VC

- Reduce transaction costs :
 - ◆ Lower transport costs through improvements of rural infrastructure.
 - ◆ Reduce the number of transactions by investing in intermediary institutions.
 - ◆ Investment in farmers associations
 - ◆ (also enhances suppliers bargaining position vis-à-vis processors and governments, and improves information distribution.)

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Implications II: Improving efficiency, transparency, and equity in VC

- Enforce **competition**.
 - ◆ domestic policies (e.g., competition policies, lower barriers of entry)
 - ◆ external policies (e.g., liberal trade policies).

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Competition is VERY Important

- Induces horizontal spillovers and the spread of farm assistance packages
- Constrains (potential) rent extraction in chain
- E.g. Central Asian cotton story: competition among processors for suppliers induces assistance programs, collection center investments, etc.

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Cotton Central Asia Annual Growth Rate (%)

	Kazakh	Kyrgyz	Uzbek	Tajik
Harvested Area (Ha)				
1993 – 1998	12.3	6.0	-1.7	3.7
1993 - 2003	5.8	7.6	-1.7	-0.1
Baled Cotton Production (1000 MTs)				
1993 – 1998	12.6	20.4	-2.7	0.4
1993 - 2003	5.4	25.9	-2.6	-3.5
Cotton Price	\$550	\$450	\$200	\$165

Implications II: Improving efficiency, transparency, and equity in VC

Invest in Quality :

- ◆ Stimulate and certify quality and safety standards
- ◆ Invest in projects, institutions, and technical assistance stimulating higher quality.

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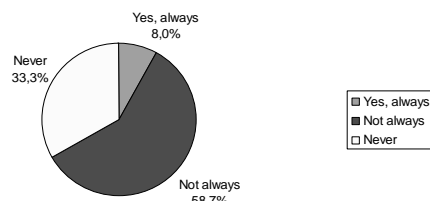
Quality Control and Rents in Kazak Cotton Chain

- Extra payments for clean cotton ? NO (99%)
- Fines for 'dirty' cotton ? YES (100%)
- Is your cotton mixed with that of other farmers ? YES (100%)
- Can you inspect quality of processed cotton from your seed cotton ? NO (97%)
- Who assesses the quality of your cotton ? GINNER's LAB (100%)

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Quality Control and Rents in Kazak Cotton

Q45: Do you trust the quality assessment as fair and honest?



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Implications II: Improving efficiency, transparency, and equity in VC

- **Empowering** farmers to strengthen their position :
 - ◆ stimulating farmers associations,
 - ◆ investing in quality control institutions,
 - ◆ competition and trade policy, etc.
 - ◆ invest in institutions to assist farms with contract negotiations and dispute settlements,
 - ◆ invest in institutions for (independent) quality and safety control and certification,
 - ◆ encourage alternatives in input and output markets.

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Implications III : Rethinking the role of the government and policy-making

- **Policy analysis and information gathering.**
 - ◆ Policy analysis and traditional instruments of information do not include VC.
- **Rethinking traditional public investments.**
 - ◆ VC in traditional areas of public investment (research & extension, market info systems, veterinary services and animal surveillance programs, ...)
- **Public-private partnerships: consider supply chains part of the solution, not the problem.**
 - ◆ Focus on collaborations between public authorities, NGOs, and private companies.

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Implications III : Rethinking the role of the government and policy-making

- **Innovative finance instruments.**
 - ◆ Focus on innovations which use the supply chain as a structural aspect of the financing problem, while being critical on which role international organizations and the government should play.
- **Supply-chain development as part of a wider rural development strategy.**
 - ◆ Integration of the farms in modern supply chains cannot solve all structural problems. Supply chain development models, even inclusive ones, can be only one part of a broader development strategy.

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