



Assessing Impacts of the Korea-US Free Trade Agreement on South Korean Dairy Product Imports

Don Blayney and Keithly Jones

USDA-Economic Research Service, USDA

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Overview

- Objective: Assess impacts of the KORUS FTA on dairy product trade.
- Estimate the South Korean short-run and long-run import demand parameters for source-based dairy products.
- Given the estimated own- and cross-price effects between all import countries, impact of the free trade agreement on 3 dairy products is assessed.
- In particular, we examine possible increased opportunities for U.S. dairy product exports from the United States.

South Korea Dairy Industry Background

– Early commercialization efforts

- Rapid expansion in milk production
 - Increase in both cow numbers and productivity
 - Output per cow, 18,500 pounds

– Milk enters two use “channels”

- drinking milk ($\approx 73\%$)
- Processing milk (fresh and fermented milk, cheese, and dry milk powders)

– Processing sector has seen slow growth



South Korea Dairy Industry Background, continued

- Industry has received significant government support
 - The 1967 Dairy Promotion Law established a pricing program for fresh milk
 - Formal marketing quotas, and adjustments to the two-tier pricing system were established in the late 1990s
- Trade policy instruments of choice-- Applied tariffs and tariff rate quotas (TRQs)
- Has not pursued multi-and bilateral trade agreements as actively as many other countries
 - EU/Korea FTA signed in October 2010 and went into effect on July 1, 2011.
 - KORUS FTA signed into law later that same year (October, 21) by President Obama. The KORUS FTA went into effect on March 15, 2012.

South Korea Dairy Industry Background, continued

– Prior to KORUS FTA signing:

- **global imports of 54,223 tons of whey at maximum bound tariff rate of 20 % (WTO TRQ)**
 - Feed whey entered under 35,000-tons TRQ with tariff rate of 4 %
 - Food whey entered under 19,233-tons TRQ with tariff rate of 20 %
 - Out-of-quota tariff rate is 49.5 %
- **global imports of 420 tons of butter and butter fat with in-quota tariff rate of 40 % and out-of-quota rate of 89 % (WTO TRQ)**
- **applied tariff on cheese at the WTO-bound rate of 36 %**



Dynamic CBS Model

- How do we make our assessment?
 - Use the Central Bureau of Statistics model of Keller and Van Driel
 - Combines nonlinear expenditure effects of AIDS model and price effects of the Rotterdam model
 - A set of partial differential equations

Dynamic CBS Model

$$w_{it} \cdot \left[\partial \text{Ln}q_i - \sum_j w_j \partial \text{Ln}q_j \right] = a_i + \sum c_{ij} \partial \text{Ln}p_{jt} + \sum d_{ij} \partial \text{Ln}p_{j,t-1} + b_{i1} dBQ_t + b_{i2} dBQ_{t-1} + e_{it}$$

where w_{it} is the expenditure share of dairy product consumed from the i^{th} source country, p_j is the differential price based on the unit value of imports and the domestic wholesale price, and a , c_{ij} , d_{ij} , b_1 , and b_2 are parameters to be estimated and e_{ij} is the disturbance term.

Dynamic CBS Model

$$\sum_i c_{i,j} = \sum_j c_{i,j} = \sum_i b_i = 0, \quad (\text{Homogeneity})$$

$$c_{ij} = c_{ji}, \quad \forall i, j \quad (\text{Symmetry})$$

Demand elasticities are derived from model coefficients and the budget shares

$$\varepsilon_{i,j} = \frac{c_{i,j} - b_{i1}w_j - w_iw_j}{w_i} \quad (\text{short run price elasticities})$$

$$\varepsilon^L_{ij} = \frac{d_{i,j} - b_{i2}w_j - w_iw_j}{w_i} \quad (\text{long run price elasticities})$$

Deriving the Impact of tariff reductions associated with the FTAs

Elasticity matrix

$$\varepsilon_{ij} = \begin{pmatrix} a_{11} & \dots & a_{1n} \\ \vdots & \ddots & \vdots \\ a_{m1} & \dots & a_{mn} \end{pmatrix}$$

Tariff reduction

$$t = \begin{pmatrix} t_1 \\ \vdots \\ t_n \end{pmatrix}$$

Country impact

$$\zeta = \begin{pmatrix} a_{11} & \dots & a_{1n} \\ \vdots & \ddots & \vdots \\ a_{m1} & \dots & a_{mn} \end{pmatrix} \begin{pmatrix} t_1 \\ \vdots \\ t_n \end{pmatrix}$$



Data

- **Products:** whey, butter, cheese,
- Global Trade Atlas database (CIF Import Values)
- Quarterly times series: January 2000 to December 2011
- Suppliers: (1) South Korea, (2) Australia, (3) New Zealand, (4) United States, (5) European Union, (6) ROW
- South Korea's total consumption and price data were obtained from South Korea's Livestock Policy Bureau
- Per-unit import values are used as proxies for import prices.



Results

- Estimates of both short run and long run elasticities generated for each of the three commodity groupings
- Three scenarios were considered:
 - EU FTA implemented without KORUS FTA put in place
 - KORUS FTA implemented without EU FTA in place
 - Both EU and KORUS FTAs in place
- It is the last scenario that is most relevant (it is the situation currently in place)

Estimated Short- and Long-run Own-Price Elasticities for South Korean Source Country Demand for Dairy Products

	Whey		Butter		Cheese	
	Short-run	Long-run	Short-run	Long-run	Short-run	Long-run
South Korea	-0.922***	-1.516**	-1.079***	-0.938	-0.388***	-0.158
	(0.106)	(0.254)	(0.263)	(0.730)	(0.055)	(0.828)
Australia	-0.011***	-0.902**	-0.335***	-1.656	-0.128	-0.680
	(0.003)	(0.341)	(0.101)	(0.997)	(0.087)	(0.752)
New Zealand	-0.024	0.251	-0.780	-0.492	-0.644	-0.898
	(0.234)	(0.243)	(0.717)	(0.999)	(0.555)	(0.770)
United States	-0.678*	-0.324	-0.750	-0.473	-0.743***	-1.012*
	(0.365)	(0.540)	(0.458)	(0.808)	(0.259)	(0.539)
European Union	-0.845***	-0.854**	-1.610***	-1.571*	-1.125***	-0.895**
	(0.259)	(0.374)	(0.576)	(0.878)	(0.218)	(0.360)
ROW	-0.409**	-0.528**	-0.140	-0.107	-0.385	-0.536*
	(0.159)	(0.228)	(0.367)	(0.552)	(0.242)	(0.277)

Derived changes in South Korean imports with EU and KORUS FTAs in place

Changes derived from estimates of elasticities						
	Whey		Butter		Cheese	
	Short-Run	Long-Run	Short-Run	Long-Run	Short-Run	Long-Run
South Korea	-17.3%	-29.6%	-21.0%	11.4%	12.4%	26.0%
Australia	142.6%	205.2%	36.0%	31.8%	-24.6%	-26.8%
New Zealand	-48.5%	-32.5%	13.0%	-121.7%	6.5%	-3.2%
United States	98.0%	89.0%	97.8%	59.9%	36.3%	36.8%
European Union	118.7%	137.0%	337.8%	336.6%	55.8%	21.6%
ROW	55.5%	130.0%	-109.6%	426.6%	-15.5%	-12.9%

Estimated short run import changes into South Korea

EU/KORUS short run relative to 2010 import levels						
	Whey		Butter		Cheese	
	2010	Projected	2010	Projected	2010	Projected
	-----Quantity (metric tons)-----					
Australia	984	2,387	1,725	2,346	8,636	9,707
New Zealand	67	35	3,305	3,733	19,306	14,556
United States	20,135	39,861	139	275	18,518	19,722
European Union	2,716	5,940	1,142	5,000	6,056	8,253
ROW	16,727	26,013	85	0	8,455	13,172
	40,629	74,236	6,396	11,354	62,981	65,410
Total change		82.7%		77.5%		3.9%

Estimated long run import changes into South Korea

EU/KORUS long run relative to 2010 import levels						
	Whey		Butter		Cheese	
	2010	Projected	2010	Projected	2010	Projected
-----Quantity (metric tons)-----						
Australia	984	3,003	1,725	2,273	8,636	6,320
New Zealand	67	45	3,305	0	19,306	18,692
United States	20,135	38,054	139	222	18,518	25,335
European Union	2,716	6,437	1,142	4,986	6,056	7,367
ROW	16,727	38,478	85	448	8,455	7,360
	40,629	86,017	6,396	7,929	60,971	65,074
Total change		111.7%		24.0%		6.7%



Summary and Conclusions

- Reducing import product prices via FTAs results in both substitution and expenditure effects
- Overall, the FTAs appear to open South Korean dairy product markets primarily by reducing prices that in turn increases competition among possible suppliers and increases dairy product imports overall
- The U.S. and the E.U. stand to be the biggest gainers, **but**
- Further expansion of U.S. and E.U dairy product trade with South Korea not guaranteed in the long run
- The price sensitivity of South Korean importers suggests if many suppliers of a particular product exist, those with the “best” price into the country will garner the larger shares of the imports.



Contacts:

Don Blayney dblayne@ers.usda.gov

Keithly Jones kjones@ers.usda.gov

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