

# **Wheat-Importing State Trading Enterprises: Impacts on the World Wheat Market**

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### **Introduction**

State trading emerged as one of the more contentious issues at the end of the Uruguay Round negotiations under the General Agreement on Tariffs and Trade (GATT). Nevertheless, state trading was permitted to continue, and the only change in the 1994 agreement was that countries became subject to stricter reporting requirements on the existence of state trading enterprises (STEs). The World Trade Organization (WTO) is in the process of establishing a formal definition of state trading and has new notification requirements, including information on the operation of these entities. The requirement remains from previous agreements that state traders must abide by the same disciplines that apply to trade by private firms under GATT.

As the new GATT agreement is being implemented under the auspices of the WTO, concern over the behavior of state trading enterprises has increased, especially in the United States. Government officials and industry associations in the United States are concerned that state traders may be able to increase protection of domestic agricultural producers beyond GATT commitments in a disguised manner and to subsidize exports or price-discriminate among trading partners, and so may not abide by the requirements of GATT (Dixit and Josling). The current U.S. position is that state trading is an important issue for further negotiation in the agricultural mini-round scheduled to begin in 1999 (Ackerman, Dixit and Simone).

State trading enterprises are one common institutional mechanism through which trade is regulated in order to achieve domestic agricultural policy objectives of price stability, low prices for consumers and high prices for producers. State trading enterprises may be reformed without a fundamental change in the objectives of a nation's agricultural policy. Hence, it may well be the case that many aspects of trading behavior would not change after reform or elimination of a state trading enterprise.

There are two prominent concerns over importing STEs. One concern is that importing STEs may restrict wheat imports, negating the potential liberalization brought about by the conversion of nontariff trade barriers to tariffs (Dixit and Josling). A primary reason to restrict imports is to subsidize domestic production by increasing prices above world market levels, frustrating the intent of limitations in the Uruguay Round Agreement on Agriculture which restricts those subsidies. Another concern is that decisions regarding the source of the purchases of wheat may not be made on a commercial basis, for political or other reasons (Blandford).

Wheat state trading enterprises were chosen as a focus in this paper due to the importance of wheat as a food grain and the prevalence over time of STEs in the world wheat market. A list of wheat importers and their current and past use of STEs for importing wheat is provided in Table 1. The fifty-three importers listed accounted for 73 percent of the wheat imported in 1996. Around 40 million metric tons (mmt) (approximately 40 percent of total wheat trade) of wheat was imported by countries that are identified here as having either STEs with a monopoly on imports or STEs that heavily influence the domestic market. This is a marked decline from the 91.3 percent share of imports by countries using STEs in the period 1973–77 that was estimated by Schmitz et al. (1981).

The primary objective of this paper is to assess the behavior of importing STEs in the world wheat market compared to trade by private firms, either coexisting with an STE or replacing an STE as the entity physically handling wheat trade. Our goal is to determine whether elimination or alteration of remaining STEs, or regulations that may be placed on STEs in future negotiations under the World Trade Organization, will substantively change trade behavior in world wheat markets.

Three hypotheses are investigated: (1) that operation of an STE is associated with a higher level of protection than with private traders, (2) that countries where STEs handle trade are less responsive to world market prices in the determination of import levels, and (3) that countries where STEs handle trade

may be less responsive to prices differences between exporters and more likely to rigidly depend on historical shares of import sources.

Differences are examined at various points in time, between countries with STEs and those with solely private trade, to ascertain differences between the two and how they have evolved over various market conditions. Countries that have eliminated STEs are also examined over time to try to identify any differences in behavior.

## **Empirical Tests**

### **Level of Protection**

Whether STEs lead to a greater level of protection for wheat producers is investigated by calculating effective tariffs over time for wheat for twenty-two countries from 1980 to 1995, except when limited by data. An effective tariff is estimated as:

$$(1) T_{\text{eff}} = P_d / P_w - 1$$

where  $P_d$  is the domestic producer price of wheat, and  $P_w$  is the world price of wheat. For a detailed discussion of the data see Abbott and Young (1997), and data sources are listed after the references.

Table 2 reports the average and standard deviation of effective tariffs for 1980 through 1994, along with averages for each country when its trade regime was an STE with monopoly power to import (Monopolist), an STE coexisting with private firms that also handled imports (Coexist), and when private firms handled all imports (Private). In countries where there was only one regime, the average for that regime equals the overall average. When institutions changed, an average under each regime is reported, permitting comparison of protection before and after reforms.

*Changes in effective tariffs over time.* There are several cases in which effective tariffs were lower when private firms handled trade compared to when STE monopolies existed — Brazil, Colombia, Egypt, Israel, and Poland. At the same time the opposite result is also evident; protection was lower under a

monopolist STE in Korea, Mexico, and Pakistan. In Peru little change in the effective tariff is evident, and in most cases, the differences in the effective tariff by regime are small compared to its standard deviation, making it impossible to find statistically significant differences in any case.

*Comparisons across countries.* Comparisons across countries using the effective tariffs in Table 2 indicate substantial variation among countries with similar institutional arrangements. Over the period 1980-1994 very high producer protection persisted in Algeria, Japan, Tunisia, and Saudi Arabia, while negative rates of protection existed for producers in China and India, and all of these countries had STEs.

For countries with private trade the average effective rate of protection varied from -13 percent to 260 percent, while for countries with monopolists, i.e. STEs, the average effective rate of protection varied from -35 percent to 500 percent. Even if STEs are eliminated, or their market power is diminished, high (and variable) rates of consumer or producer protection may persist, depending on the domestic agricultural policy goals, and internal market conditions, of the country in question. If STEs are eliminated, countries can find other means to divorce domestic prices from world prices and continue the desired level of support for producers and consumers.

### **Determinants of Import Demand**

A net import demand model is used to test the hypothesis that countries with state trading are less sensitive to world price signals than private traders. The model is specified here as follows:

$$(2) M = C_0 + C_1 (Q + S_{t-1}) + C_2 Pw + C_3 Y + C_4 \text{Pop.}$$

The role of state trading enterprises in controlling import levels is assessed by comparing the effect of supply ( $C_1$ ) and world price ( $C_2$ ) on imports across countries and institutions. For a state trader stabilizing the domestic market  $C_1$  is expected to be negative, significant and close to one. Under free trade, the magnitude of  $C_1$  would be determined by short-run domestic supply and demand elasticities.

Interaction dummy variables are used to test if responsiveness of import levels to world price change after reforms occur.

Results are reported in Table 3. The coefficient on world price is converted to be a net import demand elasticity to facilitate interpretation. These elasticities show that supply is very important in determining imports, since its coefficient is significantly less than zero in fifteen cases. Often values between zero and -1 are found, reflecting only partial adjustment to production shortfalls via trade. Most countries also stabilize domestic markets using stocks, and some variation in consumption levels to market conditions is evident.

Statistically significant coefficients on world price were found in seven out of twenty-seven countries. Two of these countries, China and India, were always state traders, and one, Nigeria, was private over the time span. A very low elasticity was found in India's case due to the large local market. In several cases where state trading has applied, very small or incorrectly signed coefficients are found, including Algeria, Indonesia, Iran, Japan, Morocco, and Sri Lanka. These results support the notion that state traders isolate their domestic markets from world prices. In another set of countries, Brazil, Costa Rica, Israel, Malaysia, and Mexico, reasonably large coefficients with large standard errors were estimated. Three of these countries experienced rapid inflation and reform at some point in time. Chile and Malaysia are also two countries where private firms handled trade and yet domestic markets appeared isolated from world markets.

In four countries, the interaction dummy variables were significant. In each case, the coefficient was positive, indicating reduced price responsiveness, and small relative to the overall influence of world price. In general, these interaction dummies failed to demonstrate increased price responsiveness after institutional reform. They may indicate an upward shift in the level of demand after reform, although such effects are also small.

In many cases these results support the notion that state traders often isolate their markets from world market conditions and base import decisions on domestic needs. There are also several cases of private traders that were responsive to world price, but there is little evidence that institutional reform increased price responsiveness. While mixed, these results support the hypothesis, subject to the caveats stated above, that there are ways without state trading to isolate markets, and significant changes in import behavior do not necessarily coincide with institutional reform. Further evidence related to this hypotheses is presented in Abbott and Young (1997). In that paper a price transmission model is used to investigate the transmission of world prices into domestic markets.

### **Exporter Market Share**

The next hypothesis was that countries who engage in state trading may not treat all exporters equally, favoring some suppliers for political or other reasons. A variation on an Armington market share model was used to test this hypothesis:

$$(3) \text{ Log}(\text{Mus}/M) = C_0 + C_1 \text{ Log}(\text{Mus}/M)_{t-1} + C_2 \text{ Log}(P_{us}/P_w)$$

where Mus equals imports from the United States, so that Mus/M is U.S. market share in the import market being modeled. Table 4 reports results for this model, along with a variant on it that included an interaction dummy to identify the effects of institutional reform.

In ten cases, significant coefficients on lagged market share  $C_1$  were found and in another four cases, intermediate values for  $C_1$  that were not significant were also found. These cases show considerable persistence in market share, supporting the hypothesis that products are differentiated by source and that factors including politics could be determining the source of supply. Factors such as long-term supply contracts, and transactions cost due to switching suppliers could be equally important in accounting for these results (Kallio). Six of these cases were always state traders, lending strong support to the notion that

these institutions can add rigidity to exporter choice. One case, Malaysia, was always a private trader, however, suggesting that inertia in market share is not confined to state traders.

In five cases, the price ratio was significant and larger than one, which is still a low degree of substitution by source. Four of those were countries undergoing reform, and one was a state trader. In five cases where institutional reform occurred, a significant interaction dummy variable was found, suggesting changes in market share determination after reform. In three of these cases, coefficients were positive, however, indicating a shift in market share toward the United States, but not increased price responsiveness.

The empirical test of this hypothesis provides the strongest evidence of all the tests supporting differences in behavior between state and private traders. Many state traders appear to rely on the same source of supply over time. Although private traders and reforming countries generally showed more price responsiveness, some private traders also were found to rely on the same exporter, demonstrating insensitivity to price differences between exporters.

## **Conclusions**

The strength of the empirical tests presented in this paper are limited by the small number of countries that have never had a wheat-importing STE to compare with those who have, and by the limited number of years since reform for countries that have changed their institutional arrangements. However, several conclusions can be drawn from the results. First, there is no clear correlation between the existence of an STE and the level of protection in a country. This result can be explained by the fact that other policies and institutions can be used to accomplish these same goals. Being open to world markets is most effectively accomplished by domestic policy reform, not by simply eliminating certain border institutions. Results from the import demand equations indicate that many, but not all, state traders tend to isolate



domestic markets from world market conditions and that institutional reform has not necessarily led to an increase in the role of price in making import decisions.

Investigation of the relationship between institutional structure and the importance of lagged market share and price ratios gives some evidence that STEs may be less responsive to changes in market conditions in choosing their sources of supply. However, it should be realized that the elimination of STEs could result in both negative as well as positive changes for the United States, and the balance of these two deserves further consideration. It appears that these institutional features, rather than the level of protection, deserve attention in the future.

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Variable	Data Sources
Producer wheat price (Pd), World Wheat Price(Pw)	Agrostat Database, Food and Agriculture Organization of the United Nations
Imports(M), Production(Q), Stocks(S), Imports from the U.S.(Mus)	Production, Supply and Demand Database, Economic Research Service, U.S. Department of Agriculture
Population (Pop). Gross National Product(Y), Exchanges Rates, U.S. Gulf Wheat Price (Pus)	International Financial Statistics, International Monetary Fund

**Table 1. Institutions Involved in Wheat Imports**

<i>Country</i>	<i>STE name (in the past if reformed)</i>	<i>Monopolist in 1997</i>	<i>Date of reform</i>	<i>Country</i>	<i>STE name (in the past if reformed)</i>	<i>Monopolist in 1997</i>	<i>Date of reform</i>
Algeria	OIAC	Yes	---	Nigeria	unknown (eliminated)	No	1996
Bangladesh	FCM	No	1992	North Korea	unknown	Yes	---
Bulgaria	Zareni Chrani	Yes	expected 1997	Norway	Statkorn (privatized)	No	1995
Bolivia	P.L. 480 Executive Secretariate (coexist)	No	---	Pakistan	MFAC (coexists)	No	1991
Brazil	CTRIN (eliminated)	No	1991	Peru	ENCISA (coexists)	No	March 1991
Chile	none	No	---	Philippines	National Food Authority	No	1986
China	COFCO	Yes	---	Poland	Agencja Rynku Rolnego (coexist)	No	June 1990
Colombia	IDEMA (eliminated)	No	1992	Romania	Romecereal (eliminated)	No	June 1995
Costa Rica	none	No	---	Russian Federation	Roskhleboproduct (privatized)	No	1991
Cuba	unknown	Yes	---	Saudi Arabia	GSFMO	Yes	---
Cyprus	Cyprus Grain Commission	Yes	---	Singapore	none	No	---
Ecuador	Ministry of Industry	No	1991	Slovakia	KOOSPOL (coexist)	No	1990
Egypt	GASC (coexist)	No	1992	South Africa	Wheat Board	Yes	Oct. 1997
Ghana	1992 National Procurement Agency (eliminated)	No	1992	South Korea	KOFMIA	No	1983
Hong Kong	none	No	---	Sri Lanka	Cooperative Wholesale Establishment	Yes	---
India	Food Corporation of India	Yes	---	Sudan	unknown	Yes	---
Indonesia	BULOG	Yes	---	Taiwan	TFMA	No	Jan. 1994
Iran	unknown	Yes	---	Tajikistan	Ministry of Grain Products	Yes	---
Israel	Government Trade Administration (eliminated)	No	1989	Thailand	none	No	---
Japan	MAFF	Yes	---	Tunisia	Office des Cereales	Yes	---
Jordan	Ministry of Supply (coexist)	No	1996	Turkey	Turkish Grain Board (coexist)	No	---
Kenya	none	No	---	Uruguay	none	No	---
Libya	unknown	Yes	---	Uzbekistan	Uzmarkazimpex for Uzkhleboproduct	Yes	---
Malaysia	none	No	---	Venezuela	CORPOMERCADEO	No	1989
Mauritius	none	No	---	Yemen	Ministry of Trade and Supply (coexists)	No	---
Mexico	CONASUPO	No	1992	Zimbabwe	Grain Marketing Board	No	1996
Morocco	ONICL	No	1997				

**Table 2. Effective Tariffs, Overall Average and by Trading Institution, 1980-1994 (percent)<sup>a</sup>**

<i>Country</i>	<i>1980-94</i>	<i>Standard Deviation</i>	<i>Private</i>	<i>Coexists</i>	<i>Monopolist</i>
Algeria	139.037	(81.18)			139.037
Bolivia	13.375	(16.75)		13.375	
Brazil	150.660	(115.35)	50.502		207.893
Chile	15.082	(18.51)	15.083		
China	-5.394	(12.27)			-5.394
Colombia	54.707	(26.73)	38.803		58.683
Egypt	45.926	(74.01)		32.376	48.010
India	-30.657	(15.53)			-30.657
Iran	499.486	(473.23)			499.486
Israel	37.078	(16.87)	29.380		48.624
Japan	491.554	(162.72)			491.554
Kenya	8.264	(27.01)		8.264	
Korea	189.974	(66.11)	259.908	182.345	117.073
Mexico	16.552	(35.31)	48.750		11.599
Morocco	110.417	(46.76)			110.417
Nigeria	175.065	(120.71)	175.065		
Pakistan	-30.251	(12.36)		-17.898	-35.866
Peru	66.943	(53.32)	69.015		66.001
Poland	19.472	(41.54)		-15.196	40.273
Saudi Arabia	115.307	(30.71)			115.307
Tunisia	58.422	(49.43)			58.422
Turkey	-6.553	(25.32)		-6.553	
Venezuela	7.714	(26.61)	-13.493		21.852
<b>AVERAGE</b>	<b>93.138</b>		<b>74.779</b>	<b>28.102</b>	<b>109.017</b>

<sup>a</sup>Based on import unit values.

**Table 3. Net Import Demand**

<i>Country</i>	<i>Supply</i>	<i>(t-statistics)</i>	<i>Pw</i>	<i>(t-statistics)</i>	<i>Interaction</i>		<i>Institution</i>	<i>R<sup>2</sup></i>
					<i>Dummy</i>	<i>(t-statistics)</i>		
Algeria	-0.726	(6.19)**	-0.075	(-0.94)			M	0.98
Bolivia	-0.404	(-0.37)	0.808	(1.02)			C	0.53
Brazil	-0.798	(-4.66)**	-0.565	(-1.35)	0.071	(2.26)*	M+P	0.97
Chile	-0.931	(-7.07)**	-0.075	(-1.25)			P	0.97
Colombia	-0.026	(-0.19)	-0.072	(-0.59)	0.065	(4.22)**	M+P	0.95
Costa Rica			-0.561	(-1.76)			P	0.65
China	-0.381	(-5.37)**	-0.958	(-2.92)**			M	0.81
Egypt	0.055	(0.22)	-0.336	(-2.60)**	-0.018	(-1.01)	M+C	0.84
India	-0.138	(-2.19)*	-0.003	(-2.02)*			M	0.68
Indonesia			-0.115	(-0.58)			M	0.97
Iran	-0.803	(-2.81)**	0.325	(1.15)			M	0.70
Israel	-2.680	(-2.38)*	-1.404	(-1.64)	-0.018	(-0.38)	M+P	0.83
Japan	-0.892	(-2.82)**	0.005	(0.08)			M	0.79
Kenya	-1.083	(-3.02)**	-1.019	(-1.50)			C	0.82
Korea	0.089	(0.09)	-1.733	(-3.69)**	0.01 0.02	(0.16) (0.46)	M+C+P	0.86
Malaysia			-0.535	(-1.75)			P	0.90
Mexico	-0.616	(-3.25)**	-1.818	(-1.72)	0.304	(4.19)**	M+P	0.86
Morocco	-0.710	(-3.85)**	0.003	(0.01)			M	0.74
Nigeria			-0.755	(-5.32)**			P	0.89
Pakistan	-0.365	(-2.36)**	1.121	(1.20)	0.066	(0.97)	M+C	0.79
Peru	0.537	(0.68)	-0.925	(-3.30)**	0.082	(1.82)*	M+P	0.79
Philippines			0.188	(0.48)	0.015	(0.39)	M+P	0.94
Poland	0.030	(0.12)	-0.340	(-2.91)**	-0.008	(-0.14)	M+C	0.89
Sri Lanka			-0.135	(-0.48)			M	0.77
Saudi Arabia	-0.520	(-2.64)*	1.525	(1.32)			M	0.91
Tunisia	-0.227	(-1.98)*	-0.341	(-0.76)			M	0.47
Turkey	-0.965	(-2.47)*	1.151	(0.56)			C	0.73

Note:

Interaction dummy sign for private trade regime only.

M = monopoly

C = coexists

P = private

Two and one asterisks (\*\* and \*) denote significance at the five and ten percent levels, respectively.

**Table 4. U.S. Market Share**

Country	Lagged Import		Interactio				Institution	R <sup>2</sup>
	Share	(t-statistics)	Price Ratio <sup>a</sup>	(t-statistics)	n Dummy	(t-statistics)		
Algeria	0.500	(1.74)	-0.910	(-1.42)			M	0.30
Bolivia	0.242	(0.88)	-1.252	(-1.19)			C	0.14
Brazil			-9.711	(-1.95)*	-2.956	(-1.86)	M+P	0.28
Chile	0.590	(3.22)**	4.830	(2.97) <sup>u</sup>			P	0.71
Colombia			-1.998	(-2.40)**	-0.990	(-3.99)**	M+P	0.67
Costa Rica	-0.200	(-0.76)	-0.581	(-2.02)*			P	0.27
China	0.580	(2.50)**	2.520	(1.89)			M	0.42
Egypt			0.630	(0.71)	1.128	(2.68)**	M+C	0.59
India	0.308	(2.23)**	-4.376	(-5.65)**			M	0.81
Indonesia	0.795	(5.14)**	1.075	(1.24)			M	0.75
Israel	-0.715	(-2.21) <sup>b</sup>	-1.416	(-3.01)**	-0.138	(-0.97)	M+P	0.45
Japan	0.698	(2.78)**	0.279	(0.91)			M	0.45
Kenya	-0.431	(-1.58)	-11.360	(-0.39)			C	0.26
Korea			-0.580	(-0.64)	-0.570	(-2.85)**	M+C+P	0.60
Malaysia	0.656	(3.38)**	-0.300	(-0.10)			P	0.51
Mexico	0.280	(1.83)*	-2.950	(-3.34)**	-0.001	(-0.00)	M+P	0.85
Morocco	0.359	(1.13)	-1.379	(-0.81)			M	0.16
Nigeria	-0.126	(-0.31)	-2.455	(-1.64)			P	0.43
Pakistan	-0.127	(-0.36)	0.971	(1.09)	0.259	(0.79)	M+C	0.31
Peru	0.511	(2.31)**	-0.720	(-0.58)	-0.220	(-0.73)	M+P	0.50
Philippines			-0.154	(-0.39)	-0.157	(-2.05)*	M+P	0.42
Poland			-0.800	(-0.53)	1.465	(1.94)*	M+C	0.37
Sri Lanka	0.517	(1.85)*	0.040	(0.06)			M	0.24
Saudi Arabia	0.881	(2.27)*	0.160	(0.08)			M	0.43
Tunisia			-0.390	(-0.34)			M	0.01
Turkey	0.279	(1.44)	0.020	(0.00)			C	0.54
Venezuela	0.459	(1.06)	0.890	(0.50)	-0.177	(-0.61)	M+P	0.19

Note:

Interaction dummy sign for private trade regime only.

M = monopoly

C = coexists

P = private

Two and one asterisks (\*\* and \*) denote significance at the five and ten percent levels, respectively.

<sup>a</sup>The coefficient on world price has been converted to a net import demand elasticity.

<sup>b</sup>Incorrectly signed.