

**U.S. Wheat Farming and the Value of the Dollar
Part 1 – The Importance of Exchange Rates**

By

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Summary and Conclusions

The period from 1998 to 2002 was not a good time for U.S. wheat growers. Both the average price received by U.S. wheat farmers and the Portland price of white wheat were lower during this period than during any other five-year period since the Russian Wheat Deal in the early 1970's. U.S. wheat production and exports declined during most years of the period.

An important explanation of the U.S. wheat industry's problems is the rapid rise in the value of the U.S. dollar in the late 1990's. Relative to a weighted average of the currencies of our competitors, the U.S. dollar rose in value by 53% between January of 1996 and December of 2002. The rise in the value of the dollar meant that our competitors could convert the U.S. dollars they earned from export sales into 53% more of their local currencies. This increased the profitability of foreign wheat farming and was an incentive to expand foreign production and exports.

The effects of an appreciation of the dollar are illustrated by examining the relative performance of wheat farming in the U.S. and Australia. Due to the rising value of the U.S. dollar, the price of Australian wheat in Australian dollars was insulated from the sharp decline in world wheat prices in the late 1990's. Australian wheat production and exports rose, while production and exports in the U.S. fell.

The paper briefly examines the early 1980's, when the dollar also appreciated sharply. It concludes by noting that the value of U.S. dollar has recently declined dramatically against the currencies of most of our competitors and that this may bode well for U.S. wheat prices and exports in the coming decade.

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Part 1 – The Importance of Exchange Rates

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Wheat farming has been less profitable in recent years than it was in the early 1990's. During the period from 1998-2002, average U.S. wheat prices were 15% lower than they had been in 1990-94. U.S. wheat exports averaged 17% less and exports declined every year between 1998 and 2002. Farm-gate wheat prices were below \$3/bushel during much of the late 1990's. Why?

I believe an important part of the answer is the rapid appreciation in the value of the U.S. dollar between 1996 and 2002. Exchange rates are a critical factor in determining the cost and revenue from sales in the world wheat markets. Because approximately 50% of U.S. wheat and 80% of PNW soft white wheat is exported, the price received by U.S. farmers depends on world market prices. The USDA publishes an index showing how the value of the U.S. dollar has changed relative to a weighted average of our competitors' currencies (see Figure 1). It also publishes an index that shows how the U.S. dollar's value has changed relative to our customers' currencies (see Figure 2). Both indices show a dramatic rise in the late 1990's.¹

Figure 1

**Value of the US Dollar versus US Wheat Competitors' Currencies
(Inflation adjusted index)**

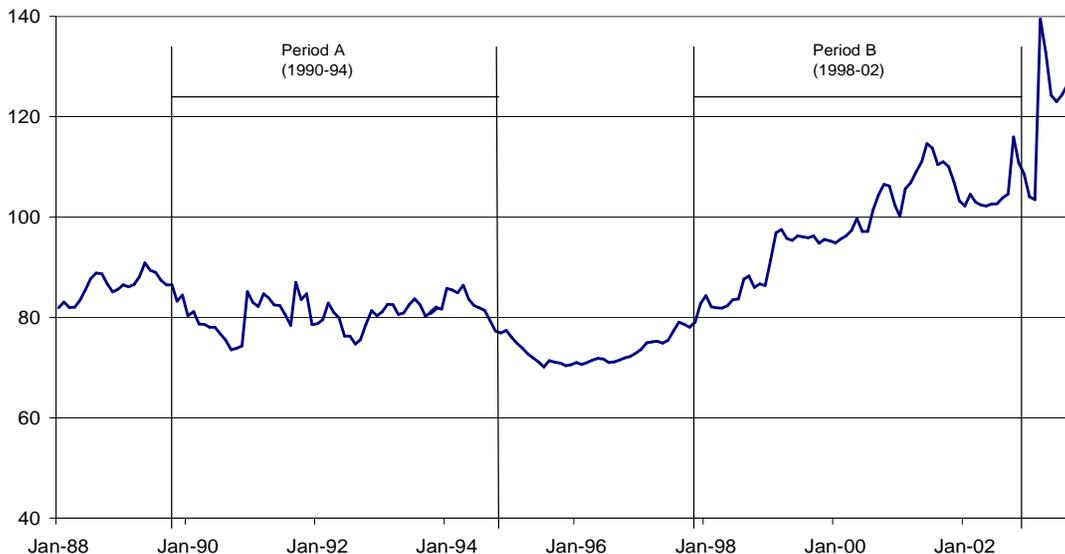
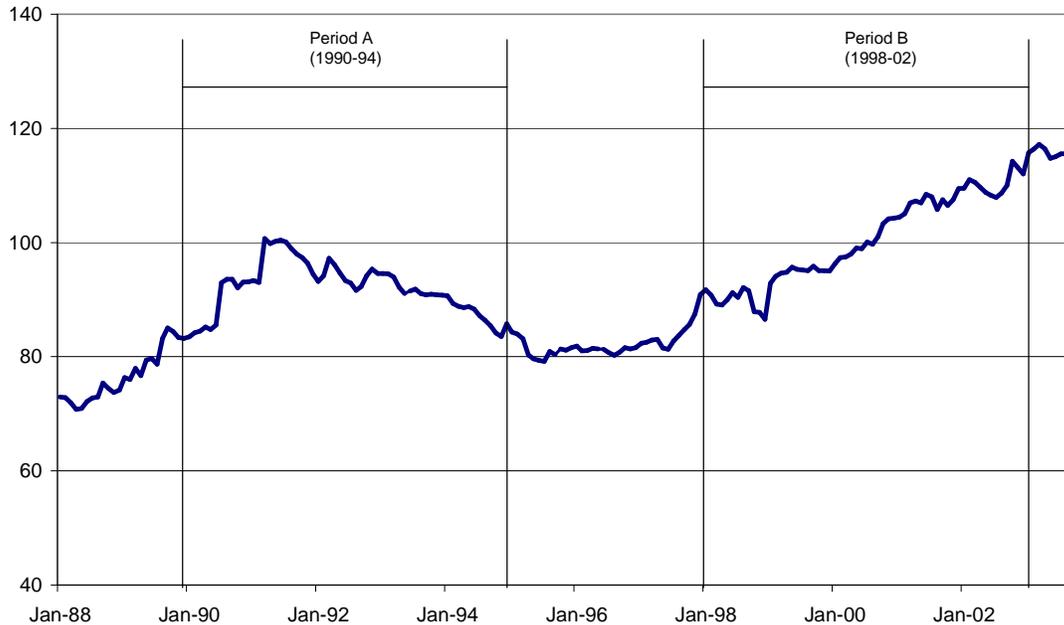


Figure 2

**Value of US Dollar versus US Wheat Customers' Currencies
(Inflation adjusted index)**



Relative to a weighted average of the currencies of our wheat competitors, the average value of the U.S. dollar was 32% higher during the period from 1998 to 2002 (Period B) than it was during the first five years of the 1990's (Period A). Relative to our customers' currencies, the average value of the U.S. dollar was 9% higher during the recent period.

The Effect of a Dollar Appreciation on U.S. Wheat Exports

Most wheat sales around the world are priced in U.S. dollars. This means our customers must buy dollars with their local currency in order to purchase our wheat. An increase in the cost of dollars (an "appreciation of the dollar") raises the cost of our wheat in their local currency. Since our wheat is more expensive, our customers will tend to buy less.

Even more important, an appreciation of the U.S. dollar increases the value of export sales by our foreign competitors. The U.S. dollars earned from wheat sales by our competitors can be exchanged for more of their local currency. This makes growing wheat more profitable abroad and provides an incentive to increase foreign wheat production.

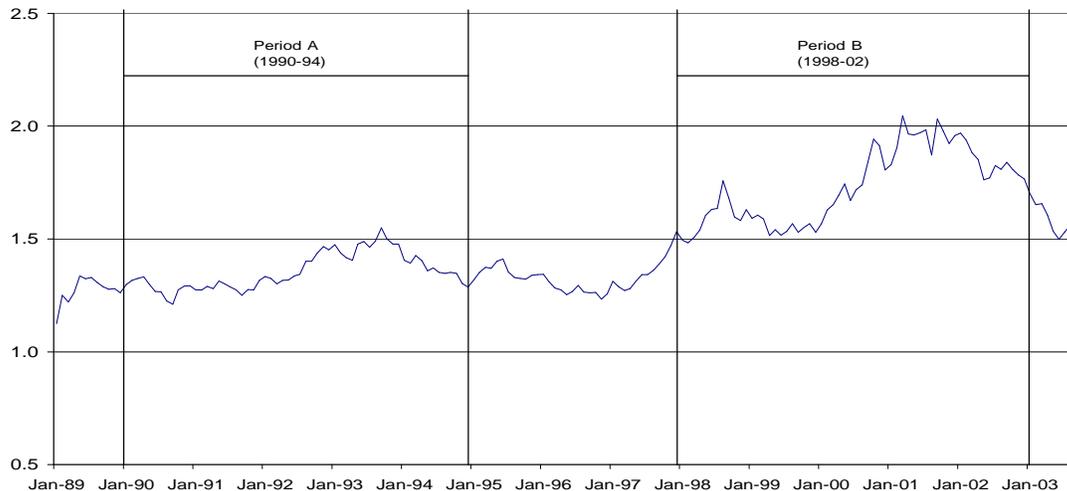
A dollar appreciation has two adverse effects on U.S. wheat producers: it increases the foreign supply of wheat and reduces foreign demand for our wheat. These effects may take a year or more to manifest themselves. However, the long-run effect of an appreciation of the dollar will be to reduce the price received by U.S. wheat farmers.

An Example of a Competitor – Australia

In January of 1990, one U.S. dollar would buy 1.30 Australian dollars. When the U.S. dollar peaked in value in March of 2001, one U.S. dollar was worth 2.05 Australian dollars (see Figure 3).

Figure 3

Value of one US Dollar in Australian Dollars



The importance of exchange rates can be seen by comparing the very different experience of wheat producers in Australia and in the U.S. during the last decade. I compare production and exports in Australia with production and exports in the U.S. during two periods. The first period (Period A) is from 1990 to 1994; the second (Period B) is from 1998 to 2002. I exclude the middle period from 1995 to 1997 because it featured abnormal weather and low world stocks, resulting in unusual price volatility. To minimize the effects of year-to-year fluctuations in weather, I calculate five-year averages of each of the variables for Period A and Period B. I then examine how these averages change between the two periods (see Table 1).²

Adjusted for inflation, the average value of the U.S. dollar was 31% higher relative to the Australian dollar in Period B than it was in Period A. This means Australian wheat farmers received an average of 31% more Australian dollars for every U.S. dollar earned from wheat sales by the Australian Wheat Board. U.S. white wheat sold for an average of 13% less in Period B than it sold for in Period A. Australian wheat (in Australian dollars) sold for an average of 34% more (an average of A\$7.32 per bushel in 1998-2002 compared to A\$5.47 per bushel in 1990-1994).³ Most of the increase in average Australian wheat prices in the late 1990's was due to favorable movements in exchange rates (see Table 1).

Comparing Period B to Period A, average production in Australia increased by 53%, while U.S. production declined by 10%. During the same periods, Australian exports increased by 54%, while U.S. exports declined by 22%. Largely because of exchange

rate changes, Australian wheat farmers were seeing rising prices and were encouraged to expand wheat production. Partly as a result of rising Australian exports, U.S. wheat prices and U.S. exports were declining.

Another way to view the effects of exchange rate changes is to compare how the prices of Australian and U.S. wheat have changed over the 1990's. The USDA publishes monthly data on the price of Australian standard white wheat (f.o.b. in Australia) in U.S. dollars. Figure 4 graphs this series and the price of U.S. soft white wheat in Portland (also in U.S. dollars). Although the U.S. dollar price of Australian wheat appears to be increasing slightly relative to the price of U.S. wheat, the two price series move in a similar way. This is what would be expected since the Australian standard white and U.S. soft white wheat have similar end-uses and are competitors in many export sales. The slightly higher price of Australian wheat may be due to Australia's freight advantage in the main Asian markets.

Figure 5 graphs the same two series, only this time the price of the Australian standard white is converted into the Australian dollars that Australian wheat farmers actually receive. Because of the appreciation of the U.S. dollar, the gap between the two price series widens markedly during the 1990's. Although the U.S. dollar price of both Australian and U.S. white wheat declined sharply after 1996, the price of Australian wheat in Australian dollars declined much less and spent much of the late 1990's at or near its 1996 peak.

Other Competitors

Australian wheat producers were not alone in experiencing favorable exchange rate changes during the 1990's. Similar changes occurred in the value of the currencies of our other competitors.

Table 2

Percent Change in Average Values
from Period A (90-94) to Period B (98-02)

	US Dollar Exchange Rate (inflation adjusted)	Wheat Production
EU-12	34%	14%
Canada	31%	-21%
Australia	31%	53%
Argentina	15%	43%
US wheat Competitors	32%	13%
U.S.		-10%

The small increase in production in the European Union (EU-12) is not surprising since the EU farm program shields EU farmers from changes in world wheat prices. The fall in Canadian production is surprising and may be due to abnormal weather.⁴ Overall,

Table 1

	Real Exchange Rate ^a (Aust\$/US\$)	Australian Production ^b (mmt)	Australian Net Exports ^b (mmt)	Australian Price ^c (US\$/bushel)	Australian Price ^d (Aust\$/bushel)	US Production ^b (mmt)	US Exports ^b (mmt)	Portland Price ^b US \$	
Period A {	1990	1.214	15.1	11.7	3.92	4.76	74.3	27.6	3.16
	1991	1.227	10.6	8.3	3.73	4.57	53.9	34.1	4.11
	1992	1.334	16.2	9.5	4.49	5.99	67.1	35.4	4.11
	1993	1.450	16.5	12.7	4.19	6.08	65.2	29.9	3.53
	1994	1.351	8.9	7.7	4.41	5.96	63.2	30.1	4.16
	Average 90-94	1.315	13.5	10.0	4.15	5.47	64.7	31.4	3.81
Period B {	1998	1.603	21.5	16.0	4.19	6.72	69.3	26.2	3.02
	1999	1.572	24.8	17.1	3.89	6.12	62.6	26.9	3.02
	2000	1.742	22.1	16.6	3.95	6.87	60.8	25.6	2.99
	2001	1.910	24.9	16.4	4.34	8.29	53.3	23.3	3.56
	2002	1.784	9.4	10.7	4.83	8.62	44.0	21.0	3.95
	Average 98-02	1.722	20.5	15.4	4.24	7.32	58.0	24.6	3.31
Percent Change (Av 98-02 / Av 90-94)	31%	53%	54%	2%	34%	-10%	-22%	-13%	

Source:

^a USDA Exchange Rate Web Site (<http://www.ers.usda.gov/Data/exchangerates/>)

^b Tierney [2003]

^c USDA [2003]

^d Price series from USDA [2003]. Converted to Australian dollars using data from USDA Exchange Rate Web Site.

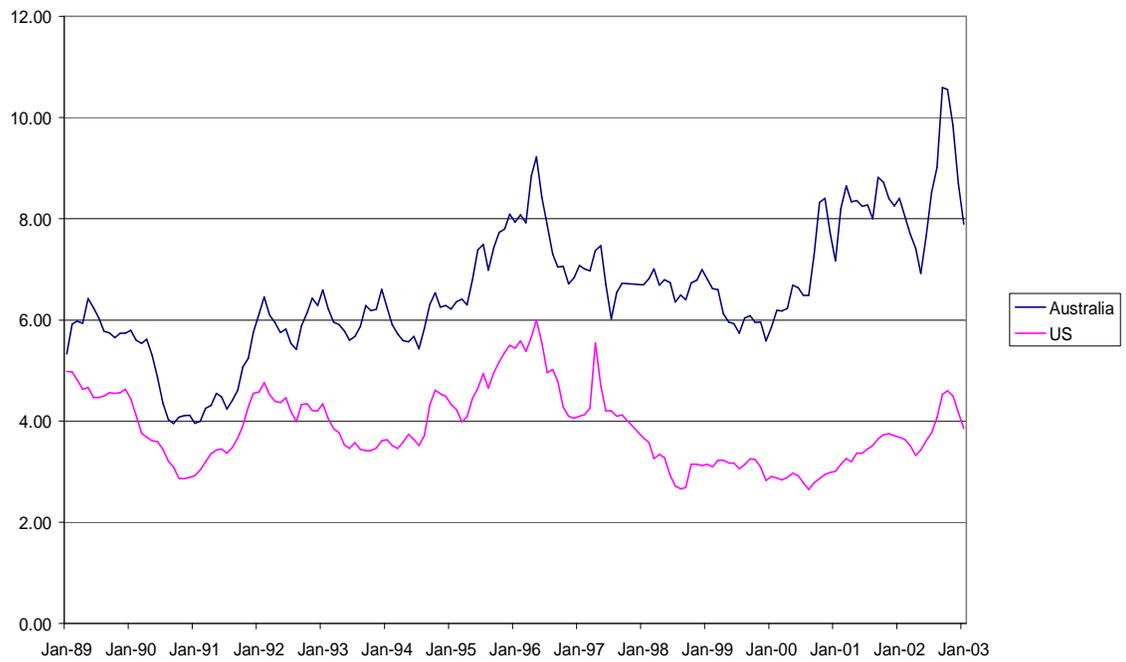
Figure 4

**Price of Australian Standard White and US Portland SW
Both in US Dollars**



Figure 5

**Price of Australian Standard White in Australian Dollars and
Portland SW in US Dollars**



changes in the value of the dollar made wheat farming more profitable in foreign countries, causing foreign production to expand and U.S. exports and wheat prices to fall.

The First Half of the 1980's

There was one other period when the U.S. dollar appreciated rapidly – the first half of the 1980's.

Figure 6

**Value of US Dollar versus US Wheat Competitors' Currencies
(Inflation adjusted Index)**



Between 1980 and 1985, the value of the U.S. dollar increased over 100% versus the currencies of our wheat competitors. As a result, U.S. wheat exports fell by 45% between 1981 and 1986. U.S. exports were cut almost in half. A big difference between the early 1980's and the late 1990's was in the level of the price support provided by the U.S. government farm program. Under the 1980 Farm Bill, the U.S. reserve loan rate (price support) was raised to \$4.00 per bushel in 1982 (equivalent to over \$7.00 per bushel in 2003 prices).⁵ As the U.S. dollar appreciated, the world wheat prices quickly fell below the U.S. price supports. Rather than exporting, the most profitable way for U.S. farmers to market wheat in the early 1980's was to forfeit it to the U.S. government. This caused the collapse in exports and a dramatic increase in foreign production.

The 1986 Farm Bill recognized the failure of this policy and drastically lowered U.S. price supports. Lower price supports plus the LDP program have meant U.S. wheat prices can decline when the U.S. dollar appreciates. Lower prices have kept U.S. exports competitive. An appreciation of the dollar still affects exports, but it is now through its effect on production. By changing the profitability of wheat production, exchange rates have a big effect on the incentives to produce wheat in different parts of the world. When the dollar appreciates, the U.S. farmers produce less wheat and U.S. exports decline.

Conclusion

The rapid appreciation of the U.S. dollar between 1996 and 2002 is an important cause of the low wheat prices and depressed U.S. farm economy that plagued U.S. wheat producers during much of that period. Exchange rate changes also have had an important role in explaining changes in the distribution of wheat production around the world.

Recently, the value of the U.S. dollar has declined dramatically, especially against the currencies of our main competitors. Since January of 2002, the dollar has depreciated 30% against the Euro, 19% against the Canadian dollar and 34% against the Australian dollar. Among our competitors, the only exception to the general depreciation in the U.S. dollar is the Argentine peso. If the decline in the U.S. dollar continues, wheat farmers in the U.S. should be more prosperous during the next decade.

References:

Tierney, William I, Jr. 2003. *Quarterly Wheat Outlook*, Kansas State University Extension Service, September 4, 2003 edition.

USDA/ERS. 2003a. *Wheat Situation and Outlook Yearbook*, WHS-2003, March 2003. (downloaded from ERS website at www.ers.usda.gov)

USDA/ERS. 2003b. *Agricultural Exchange Rate Database*, November 20, 2003 update. (downloaded from ERS website at <http://www.ers.usda/Data/exchangerates/>)

Endnotes:

¹ See (USDA/ERS, 2003b). Almost all the exchange rate data used in this paper come from the ERS website. The ERS exchange rate website is an important resource and presents data on exchange rates in a way that is particularly useful for wheat farmers. Mathew Shane, who updates the ERS website, was very helpful in discussing exchange rate issues and answering my questions when I met with him several years ago.

Most of the exchange rate data used in this article have been adjusted to account for the effects of different rates of price inflation between the countries. Inflation-adjusted exchange rates are called “real” exchange rates. Exchange rates that aren’t adjusted for inflation are called “nominal” exchange rates. Since a focus of this article is on how exchange rate changes affect the incentives to grow wheat in different parts of the world, adjusting for inflation can be important. For example, a 20% appreciation of the nominal value of the U.S. dollar relative to the Australian dollar during a year would increase by 20% the amount of Australian dollars received by Australian farmers when they sell wheat. The higher price in the local currency would tend to cause Australian farmers to expand production. However, if inflation was 20% higher in Australia than it was in the U.S., higher costs would offset the higher wheat price in Australian dollars and the relative profitability of wheat production in the U.S. and Australia would be unaffected. For more information on how “real” exchange rates are calculated, see (USDA/ERS 2003b).

² All the data on exports and production for the different countries mentioned in this article are taken from (Tierney 2003). Data on wheat prices in the U.S. also come from (Tierney 2003).

³ Data on the U.S. dollar price of Australian standard white wheat came from (USDA/ERS 2003a) pp.75-79. The price of Australian standard white wheat in Australian dollars was calculated by using this price series and converting to Australian dollars using data from (USDA/ERS 2003b). These two series are graphed along with U.S. white wheat on page 6.

⁴ I graphed Canadian wheat production since 1970 and inserted a linear trend line. For Period A, production in both 1990 and 1991 is much above the trend line and only production in 1994 is below the trend line. For Period B, all the years are at or below the trend line and production in 2002 is the lowest since the mid 1970’s.

⁵ Price supports during the early 1980’s:

	1980	1981	1982	1983	1984	1985
Regular loan rate	3.00	3.20	3.55	3.65	3.30	3.30
Reserve loan rate	3.30	3.50	4.00	3.65	3.30	3.30

When wheat entered into the Reserve program, farmers lost the right to sell it for 3 years. However, since (1) a farmer did not pay handling and transportation costs if wheat in either loan program was forfeited and (2) the government paid storage costs for wheat in the reserve program, the effective price support provided by both the regular and reserve loan programs was higher than the announced loan rate.

There are two periods when the U.S. dollar appreciated rapidly – the early 1980’s and the late 1990’s. In studying the effects of exchange rates on wheat prices, it would be helpful to be able to use both. However, U.S. price supports prevented U.S. wheat prices from falling as the dollar appreciated in the early 1980’s. This shielded U.S. farmers from the adverse effects of the U.S. dollar’s rise and caused a much greater fall in U.S. exports. When studying the effects of a sharp appreciation of the U.S. dollar on wheat prices, we are left with only one post-WWII period to study – the late 1990’s.