Analysis of Wheat Price Changes in Afghanistan:

Stress of Price Level, Price Variation and Price Seasonality 1987-92

Afghanistan Agricultural Sector Support Project/
Private Sector Agribusiness

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Development Alternatives, Inc.

ANALYSIS OF WHEAT PRICE CHANGES IN AFGHANISTAN:

STRESS OF PRICE LEVEL, PRICE VARIATION AND PRICE SEASONALITY 1987-1992

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EXECUTIVE SUMMARY

Agricultural input and output prices are a basic instrument for development planning and policy in many developing countries. This is true of Afghanistan as well. For planning future food production and supply stabilization in Afghanistan, wheat is considered a strategic crop and the status of wheat, including changes in annual, seasonal and regional wheat prices is crucial information.

Both current and past information on wheat prices for Afghanistan is limited and incomplete. Price reporting based on monthly bazaar surveys was initiated in Afghanistan between 1967-1970 but did not continue as a regular activity. In recent years, the USAID-financed Afghanistan Agricultural Sector Support Project implemented by Development Alternatives, Inc., has collected monthly price data for some agricultural inputs and outputs. Monthly wheat prices covering the period 1987-92 are an important component of this data.

The current study has utilized this data for measuring the impact of political and economical uncertainty on wheat price movements in Afghanistan. More specifically, the focus of the study has been to examine the annual, seasonal and regional changes in wheat prices in Afghanistan in order to evaluate the level of price stress on consumers at both the national and provincial levels.

The frequency distribution of prices by province was used to examine the shift over time in the national annual wheat price level and its variation. Spatial statistical indices were also constructed to measure the "stress" caused by wheat price increases and variability. These indices were used to compare the level of "stress" by province both annually and for the entire period 1987-92. Provinces were ranked on the basis of price level and price instability and the consistency of ranks over the period tested statistically.

The "average percentage method" was used to compute seasonal wheat price indices for the pre-war period 1967-1970 and for the war years 1987-1992. These indices were compared to identify any changes in the seasonality of wheat prices. The seasonal index for 1987-1992 was disaggregated at the regional level and the regions compared. Regions were ranked on the basis of the price index in each month, and the consistency of ranks over the calendar year tested statistically.

The results of the study are summarized as follows:

1. The annual national wheat price increased almost seven-fold, from 34 Afs/kg in 1987 to 225 Afs/kg in 1992 in nominal terms.

2. Annual wheat price variability as measured by the standard deviation increased eight times, from 5 Afs/kg in 1987 to 42 Afs/kg in 1992.

3. A price level index based on the highest price province is used to measure the absolute "price level stress" on consumers for each province. The analysis indicates that, all other things being equal, the price stress over the period 1987-92 was higher in certain regions than in others. In particular, Kabul, the largest population center,

was the most stressed and Kunar, the province with easy access to Pakistan for supplies, the least stressed.

4. A price variability index based on the province with the highest standard deviation was used to measure the "price instability stress" on consumers. The analysis of this index indicates that "stress" due to price variability was higher in certain regions than in others. Kabul, Wardak, Oruzgan and Zabul Provinces exhibited the most variability in wheat prices during the period 1987-92 and Nimroze, Farah and Herat, the provinces bordering Iran, the least.

5. Provincial ranks based on the price level index did not remain consistent over the period 1987-92. This inconsistency reflects the overall instability in the wheat market during this period due to the isolation of provinces from the national economy and their fragmentation.

6. Provincial ranks based on the annual price variation index did not remain statistically consistent either over the study period, reflecting the volatile behavior of wheat prices caused by changing conditions in Afghanistan.

7. The wheat price seasonal index for the conflict period (1987-1992) changed compared to that for the pre-war period (1967-1970). During the years of conflict the wheat price seasonal index was at its lowest in June, two months earlier than the typical pre-war period minimum which occurred in August. This seems to be mainly due to the impact of imports from Pakistan where the wheat harvest takes place two months earlier. After June, the seasonal index for the wartime period rose until the end of the calendar year, while the pre-war period index showed only a slight rise but remained below the average wheat price for the year.

8. During the years of conflict the wheat price seasonal index, disaggregated by region, showed some variation in the regional behavior of prices, but on the whole the regions followed the national pattern.

9. The ranking of the eight regions in each month of the season was tested for stability. The test indicated that regions were unstable in their price ranking throughout the twelve months. This test implies that each region's price formation mechanism was affected by abnormal factors attributable to the war.

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I. INTRODUCTION

1.1 Background

Wheat is the most important crop grown in Afghanistan. Bread, or "nan" made from wheat flour is a significant item in the Afghan diet. In the West, "bread and butter" is a staple food. In Afghanistan, "bread and mutton" is a highly desirable combination and a source of great satisfaction.

Apart from "nan," many other items in the Afghan diet are made from wheat and wheat flour. According to one estimate, an Afghan consumes, on the average, half a kilogram of wheat per day. This is said to be the highest rate of consumption of wheat in the world, providing Afghans 80% of their total calorie intake[1].

Afghans' strong dietary reliance on wheat has made the price of wheat in Afghanistan not only an indicator of wheat availability but also of the relative status and price levels of other cereals. Food grains which are close substitutes generally follow the price trend set by wheat.

A small-household survey conducted in 1967 shows that 45% of the household expenditure for food and fuel was spent on wheat[2]. A 1964 survey of Kochi (nomads) in Helmand valley shows that fully 75% of total family expenditure was on wheat alone[3]. It is conceivable that this figure will be much higher for recent years, if reliable estimates are obtained. High inflation, the decline in the purchasing power of Afghan currency and shortage of wheat during these years of turmoil all contributed to high expenditures on this basic food item.

Retail wheat prices, over time and cross-sectional, are valuable bases for analyzing the food situation in Afghanistan and in planning food production. It is also important in evaluating total grain production, distribution and consumption in the country. Unfortunately, data on prices of food grains in Afghanistan has been largely incomplete.

In November 1966, the Agriculture Division of the United States Agency for International

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[1] Azam Gul, "Afghanistan Agricultural Still Needs Help", Agricultural Developments in Afghanistan, Development Alternatives Inc., p. 6, March 1992.

[2] G.P. Owens, "Price Data Book", USAID/Agricultural Division, University of Wyoming Contract, Kabul, Afghanistan, February 1971. p. 29.

[3] Stevens, R.M., "Kochi Livestock Operation in Helmand Valley Afghanistan", May 1964.

Development (USAID) and the Robert Nathan contract team at the Afghanistan Ministry of Planning cooperated in the initiation of a crop and price reporting service for Afghanistan. Prior to this, the Ministry of Planning and *Da Afghanistan Bank* were the only sources of price data. Because of the efforts of USAID and Robert Nathan, price reporting became a regular activity from January 1967 to December 1970. During this period, prices of main consumer goods were obtained, mainly through bazaar surveys.

After 1970, reports on prices were published by the Afghanistan Central Statistics Office annually or occasionally, until the mid 1980s. These publications were characterized by limited time and area coverage and unspecified methods of processing and analysis. In the last 5-6 years, from 1987-92, Afghanistan experienced the breakdown of public administration, economic disintegration, and balkanization. During this period, the Government was unable to collect and publish reliable food price information.

In 1987, the Agricultural Sector Support Project for Afghanistan (ASSP)[4], funded by USAID and based in Pakistan, started a cross border program which included agricultural input and output price data collection. Monthly wheat prices for the years 1987-1992 are an important component of this data series.

1.2 The Problem

Agricultural input and output prices are basic policy instruments for development planning in most developing countries. In Afghanistan, information on prices and their socio-economic implications have always remained limited and incomplete.

When planning for future food production and supply stabilization in Afghanistan, wheat is considered a strategic crop. The supply and demand for wheat as reflected in price changes (annual, seasonal, regional) are forces that must be balanced if food security and economic viability are to be achieved.

This study analyzes wheat price changes for the years 1987-1992. The results are expected to provide a basis for planning and policy formulation related to agricultural rehabilitation, particularly with respect to wheat production, marketing, and price stabilization in Afghanistan.

1.3 The Objective

The overall objective of this study is to examine the annual, seasonal and regional wheat price changes in Afghanistan during the years 1987-1992.

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[4] Originally implemented by Volunteers in Technical Assistance (VITA), ASSP was later jointly implemented by VITA and Development Alternatives, Inc., or DAI.

The specific objectives of the study are:

i) To measure, over time, the pattern of changes in wheat price levels and price variation between 1987-1992;

ii) To measure change due to non-seasonal factors in the annual ranking of provinces with respect to "wheat price level" and "price variation" during 1987-1992;

iii) To measure "price stress" at the provincial level resulting from increases in "annual price level" and "price variation" for each year and for the entire period 1987-1992;

iv) To measure the seasonal movement of wheat prices for the years 1987-1992, both at the national and regional level, and test for changes in the relative status or "ranking" of regions during each twelve-month period;

v) To compare the seasonal movement of wheat prices during the turbulent years (1987-1992) with their seasonal movement during the more settled pre-war period (1967-1970).

Related to the objectives ii) and iv), the following hypotheses are to be tested:

1. Ranking of provinces with regard to wheat price level changed from year to year;

2. Ranking of provinces with regard to wheat price variation changed from year to year;

3. Ranking of regions with regard to seasonal prices is not similar each month.

1.4 Sources and Specification of Data

All prices used in this analysis are in nominal terms. They were collected from various sources by ASSP/PSA staff based in Pakistan and Afghanistan. The sources have mainly been project extension agents working in Afghanistan, occasional surveys of Afghan bazaars, and travellers from Afghanistan. Travellers were interviewed upon their arrival in catchment towns along the borders of Afghanistan. They were asked to identify specific places referred to and dates of departure from these places.

Complete twelve-month prices for each province were not available for computing annual prices for each province, each year. For 1987, for example, only the price for the last four months of the year for all the provinces were available; and for 1992, prices for the last 4

months were not available. The number of months used for computing annual prices for 1988, 1989, 1990 and 1991 also varied according to province. These limitations resulted from various difficulties encountered during the survey work.

Despite the fact that the data was not obtained through conventional statistical enumeration procedures, and that the data is based on an incomplete number of observations (especially for 1987 and for 1992), the data obtained and the results of the analysis show the spatial and temporal variation to be expected in a situation of war and national economic disintegration in Afghanistan.

1.5 Methodology

The methods employed as part of this analysis are as follows:

a) Measurement of the shifts or changes in annual national wheat prices ($\bar{X}$) and national wheat price variation (S) for each year, through the application of a frequency distribution table and frequency distribution curves of wheat prices by province for respective years;

b) Use of the standard deviation of monthly prices for each year (1987-1992) to compare annual price instability among the provinces.

c) Use of provincial wheat price level and price variability index for each year (province with highest price = 100) to measure degrees of "wheat price stress" in different provinces and according to this, finding the "stress rank" of each province, each year.

d) Use of the Kendall Coefficient of Concordance Test to test for changes in the "price level" and "price variability" ranks of provinces during the years 1987-1992. The same test is also used for any monthly changes in the regional ranking of seasonal prices.

The formula for the coefficient is as follows:

$$W = \frac{S}{1/12\ K^2\ (N^3 - N)}$$

where:

W = the coefficient of concordance
K = the number of sets ranked (in the provincial ranking, a year is one set; in the regional ranking, a month is one set)
N = the number of provinces or regions (entities) to be ranked

S = the sum of the observed deviation of the rank sums from the mean of those sums, squared

$$S = \Sigma(R_j - \frac{\Sigma R_j}{N})^2$$

Rj = the sum of ranks of provinces or regions given in each (jth) year or (jth) month

The test coefficient based on the values of (W), (K) and (N) is χ^2 computed as follows:

$$\chi^2 = K(N-1)W$$

If the ranking of provinces each year is unchanged, then the (Rj)s' will have more variation, so (S) and consequently (W) would be large and χ^2 significant.

On the other hand, if the yearly ranking of provinces or the monthly ranking of regions is inconsistent, then (R_j) will have less variation; (S) and consequently (W) will be small and χ^2 not significant. The null hypothesis would be: "ranks of provinces are not similar each year" or "ranks of regions are not similar each month." A small χ^2 coefficient and rejection of the null hypothesis would imply that provincial or regional wheat price status was unstable during the time period involved and the economic links between provinces or regions changed due to the deterioration and fragmentation of the national economy.

e) Use of monthly data on wheat prices for the six years (1987-1992) to identify seasonal movement of wheat prices in Afghanistan. To compute movement, a simple average percentage method is applied. Thus:

- Monthly prices for each year are converted to percentages of respective annual average prices;

- Averages of the percentage value each month, each year, for six years are used to yield a seasonal movement index.

- If the 12-month seasonal index does not add up to 1200 due to rounding errors, it is adjusted accordingly.

- To identify regional variation in seasonal behavior of wheat prices in Afghanistan, seasonal indexes are computed for eight separate regions.

II. ANALYSIS AND RESULTS

Available time series data on wheat prices has provided a base for the analysis of the following issues:

- The annual pattern of wheat prices
- The provincial pattern of wheat prices
- The seasonal movement of wheat prices

2.1 Annual Pattern of Wheat Prices

2.1.1 Limitations In Estimating Trends

Prices collected over time are a useful base for estimating trends and making predictions. If a fairly long period of time is represented - say, ten years or more, and if there are no dramatic occurrences or disturbances during that time period, the period may be considered "normal" and forecasting about the future is all the more possible.

The existing wheat price data for Afghanistan covers a shorter period of time (about six years). This period was characterized by a highly abnormal economic situation as a result of the occupation of Afghanistan by Soviet troops, their withdrawal, and the eventual fall of the Soviet-supported regime. Because of these major disruptions, trend estimation is not considered reliable.

During the six year period under consideration, the average annual wheat price increased from 34 Afs/kg in 1987 to 225 Afs/kg in 1992. This represented a change of 102% per year, a highly dramatic annual increase. For an overall view of monthly price fluctuations, the movement of monthly wheat prices for the time period (1987-1992) is presented in *Figure 1*.

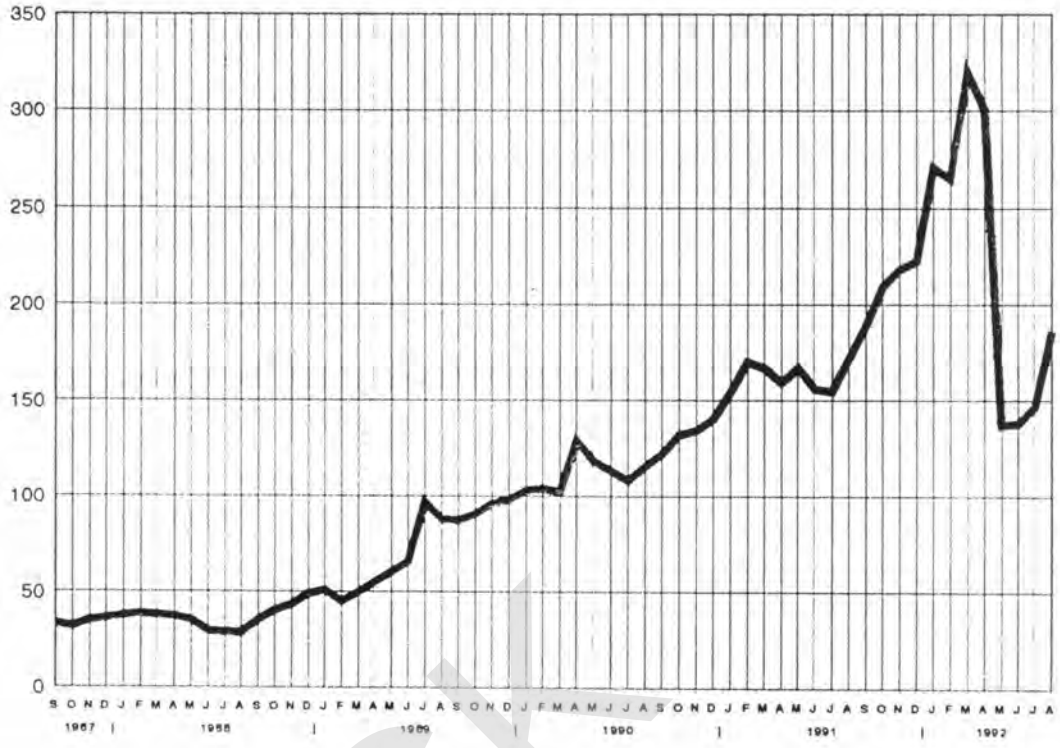
Figure 1 shows a steady increase of wheat prices from mid-1988 to March 1992. This period witnessed various impediments to local production. Eventually the Soviets, realizing the impossibility of complete victory in Afghanistan, pulled out their troops, gradually reducing the flow of food items, including wheat, to the country.

Figure 1 also displays regular drops in prices at harvest time or immediately after the harvest months. This is a general indication that, despite all the negative impacts of war on grain production, the seasonality impulse remained in the annual pattern of wheat prices. This seasonal behavior is discussed in section 2.3 in more detail.

Figure 1:

Afghanistan Wheat Prices, 1987-1992

afghanis per kilogram



2.1.2 Changes Over Time in Wheat Prices

Two economic impacts of this period of turbulence in Afghanistan are notable:

i) A persistent rise over time of the general price level, particularly of wheat, a basic food item;

ii) An expanding provincial dispersion of wheat prices arising from geographic fragmentation and regional isolation from national economic links and markets.

Table 1 and *Figure 2* show these two impacts through the frequency distribution curves of the annual wheat prices by province for the years 1987-1992.

In *Figure 2* (please turn to page 9), the changes in shape of the price distribution curves from year to year and their downward shift also reflect changes in the annual national

average wheat price ($\bar{X}$) and the annual national standard deviation of wheat prices (S)[5]. This curve changed from a highly concentrated distribution in 1988 to a more widely dispersed distribution in 1992. The shifts in and dispersion of prices year after year reflect the deterioration of the national price mechanism and the isolation of regions due to the disruption of transportation, communication and trade links.

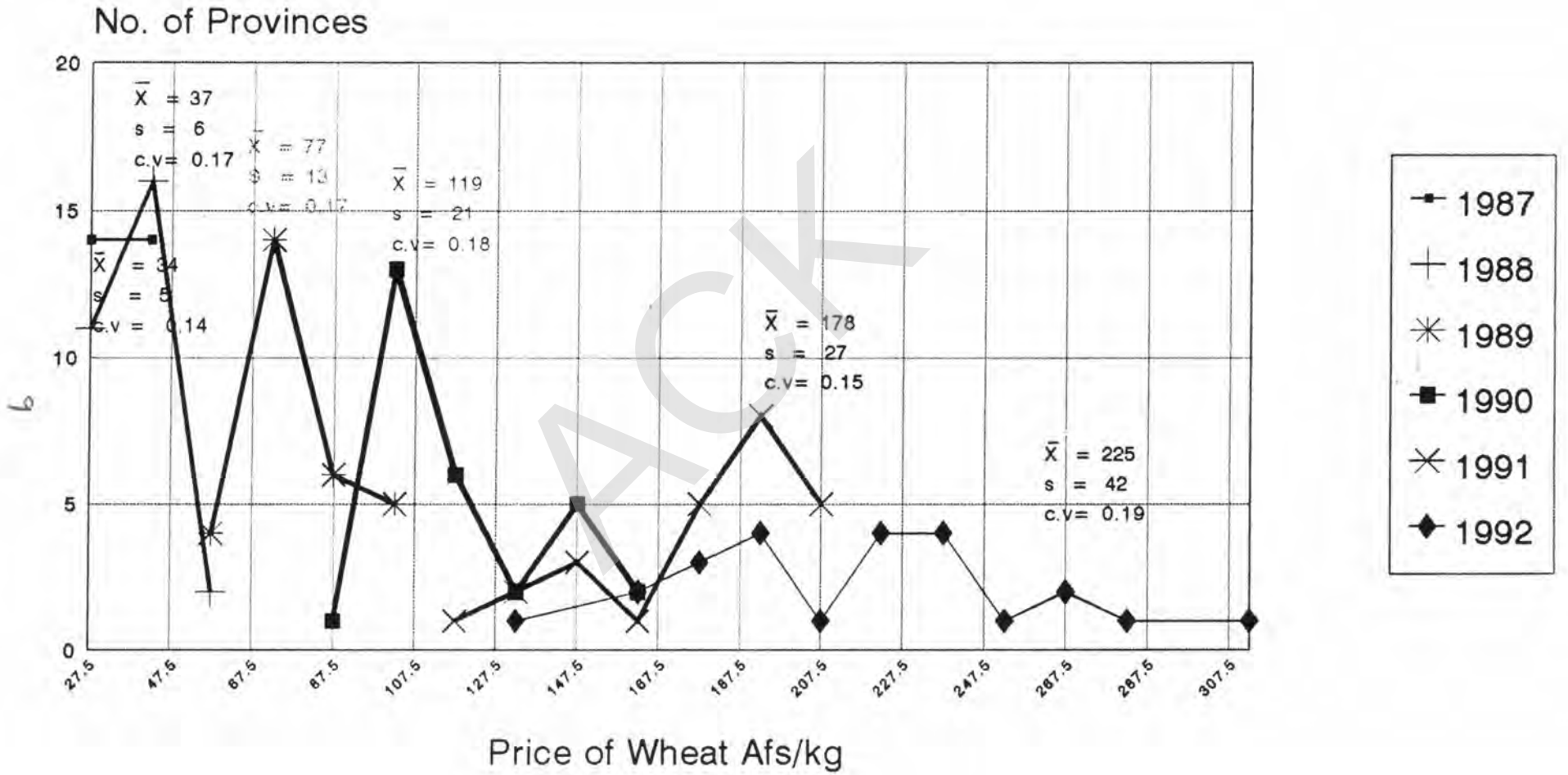
Table 1: Distribution of annual wheat prices by provinces in Afghanistan for the year 1987-1992

Price Classes [Afs/Kg]	Provincial Frequencies					
	1987	1988	1989	1990	1991	1992
20-34.9	14	11				
35-49.9	14	16				
50-64.9		2	4			
65-79.9			14			
80-94.9			6	1		
95-109.9			5	13		
110-124.9				6	1	
125-139.9				2	2	1
140-154.9				5	3	
155-169.9				2	1	2
170-184.9					5	3
185-199.9					8	4
200-214.9					5	1
215-229.9						4
230-244.9						4
245-259.9						1
260-274.9						2
275-299.9						1
300-314.9						1
TOTAL Prov.	28	29	29	29	25	24
($\bar{X}$) Nat.av.price	34	37	77	119	178	225
(S) Nat.st.dev.	5	6	13	21	27	42
(c.v.)= $\frac{S}{\bar{X}}$	0.14	0.17	0.17	0.18	0.15	0.19

[5] The close proportional change of (X) and (S) is confirmed by the value of coefficient of variation (c.v) which is a ratio S/X and almost constant throughout the years.

Figure 2: Distribution of Annual Wheat Price by Province in Afghanistan

During the year 1987-92



2.2 The Provincial Pattern of Wheat Prices

Historically, the mountainous terrain of Afghanistan has made transportation assume crucial importance in realizing the development potential of the country. Improvements in the transportation system, which started in the mid 1950's up to the beginning of 1970's, bridged the fragmented, semi-autonomous geographical regions of the nation.

The economic impacts of this improvement can be easily seen by comparing over time the differential between wheat prices in the most expensive and least expensive towns of Afghanistan.

In 1924, before road building activities commenced, wheat price in the most expensive town of the country was 166% higher than the least expensive town. This indicates the concentration of wheat supplies in certain areas and shortage of supply in others. In 1964, the differential had been reduced to 56%. In 1970 the price differential fell to 18% and in 1972 it was 20%. This decrease in price differential indicates greater regional economic integration, which happened during a period of broad-based roadbuilding activities. It is widely believed that the construction of about 2500 km of paved road between 1956 and 1972 had the greatest effect on the promotion of national integration[6].

The last six years (1987-1992) saw the recurrence of high price differentials between locations, despite the existence of road networks. In 1987, the wheat price in the most expensive province was 73% higher than in the least expensive province. Between 1988-92 the differential varied from 57-98%.

The price differentials during this period can be attributed to socio-economic stresses which were deep and pervasive all across Afghanistan. During this time, several forces were at work:

i) decreased production and importation of wheat;

ii) the malfunctioning of marketing channels for distribution of wheat;

iii) hoarding of commodities and speculation for profit by traders and dealers;

iv) excessive demand from consumers due to loss of reliance on and confidence in market mechanisms and sources of supply;

v) breakdown of local systems of transportation and communication and the

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6 The figures in this paragraph are from Fry J. Maxwell **"The Afghan Economy"**, Leiden, E. J. Brill, 1974 Leiden Netherlands P. (56-59).

consequent lack of market information, and

vi) the pressure of internal migration from rural to urban areas and vice versa.

These factors pushed the general level of wheat prices up and brought renewed price instability all across the nation. They affected consumers in two ways:

i) The purchasing power of consumer incomes was reduced when income levels could not keep up with rising prices;

ii) Consumers were compelled by continuous price instability to rely less on the market as a consistent source of supply, and to obtain their needs in quantities and at prices that were generally not favorable.

Both of these impacts caused stress on consumers' budgets and usual patterns of expenditure. These impacts are referred to, respectively, as "price level stress" and "price instability stress."

Spatial statistical indices based on provincial wheat price patterns in Afghanistan are computed to measure the degrees of price stress in relative terms for each province, each year. In the indices, provinces are ranked according to (a) level of price stress, and (b) stress associated with price instability.

2.2.1 Stress Ranking Based on Level of Prices

Annual wheat prices for the years 1987-1992 have been computed from ASSP/PSA's monthly prices for all the provinces and are shown on Table 2. The provinces are ranked each year according to the magnitude of an index computed from these prices. These indices and ranks are presented in Table 3.

The ranking in Table 3 allows us to compare wheat "price level stress" in different provinces and to check if the ranking of provinces remained stable during the six-year period.

To compute the price level stress index in Table 3, the province with the highest price (or rank number one) is designated as a base (100%). The rest of the provinces have been categorized into the following price level stress groups:

Price Level Stress Group	Price Stress Index (%)[7]
1 - Most stress	100 - 90
2 - High stress	89.9 - 80
3 - Medium stress	79.9 - 70
4 - Low stress	69.9 - 60
5 - Least stress	59.9 - 50

The provincial categorization is done for each year from 1987-1992. The results are shown in *Figures B-1* through *B-6*, (Appendix B). The average price level stress index for all the years combined is then computed from the average of annual prices and according to their average values. Provincial rankings are shown in the last column of *Table 3*, and also *in Figure 3*.

We can see from the distribution of provinces into various price stress groups each year that generally, the annual wheat price status of the provinces remained unstable from year to year. Kabul, however, the largest population center in the country, consistently remained in the most stressed or highly stressed category throughout the six-year period.

The instability in annual provincial wheat price levels during these years, can be tested through the application of the "Kendall Coefficient of Concordance." This is done to see if the changes in annual ranks of provinces (according to price level stress) are statistically significant.

The result of the test (please see *Appendix A, Table 1-A*) is as follows:

$$S = \Sigma\left(R_j - \frac{\Sigma R_j}{N}\right)^2 = 13729$$

$$W = \frac{S}{1/12\ K^2(N^3 - N)} = \frac{13729}{1/12(36)\ (29^3 - 29)} = 0.19$$

$$\chi^2 = K(N-1)W = 6(29-1)\ (0.19) = 31.9$$

As the results suggest, the χ^2 coefficient at (29-1) degrees of freedom, is not significant at 5% level, indicating that the null hypothesis, "Ranks of provinces are not similar each year", is not rejected. This implies unstable annual wheat price status in general throughout these years.

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[7] Five equal interval classes are used in order to cover all of the provinces within the limit of five ordinal classes of stress.

The average price level stress in the provinces for the whole period combined (1987-1992), shown in Figure 3, confirms the status of Kabul as the most stressed area. It also indicates that high price stress areas have mostly been the central, north west, east and south east regions of Afghanistan. The least stressed provinces have been the north central wheat producing area.

Medium stress provinces are the wheat producing areas of Jawzjan and Samangan in the north, or southern, south-western and western provinces with certain geographic advantages, such as accessibility and proximity to outside supply sources. (See Map A).

TABLE 2: Afghanistan's Annual Wheat Prices by Province; 1987–1992

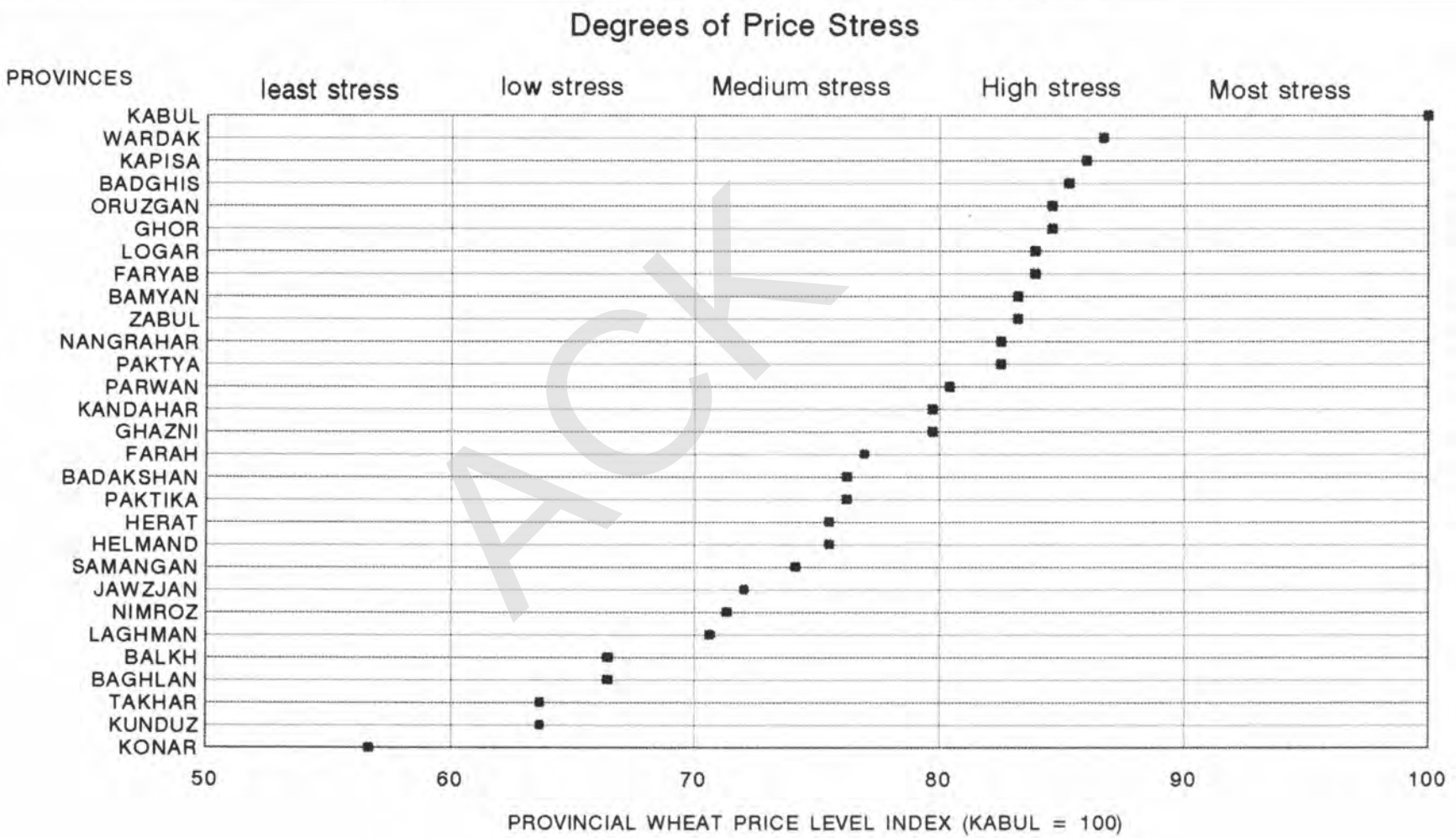
PROVINCES	ANNUAL PRICES (AFS/KG)						1987-92 Avg Price Afs/kg.
	1987	1988	1989	1990	1991	1992	
BADAKSHAN	36	45	105	146	195	129	109
BADGHIS	31	32	101	167	178	225	122
BAGHLAN	31	32	76	104	147	179	95
BALKH	33	31	61	108	146	193	95
BAMYAN	38	40	76	130	207	224	119
FARAH	29	32	93	106	178	225	110
FARYAB	35	41	94	178	188	186	120
GHAZNI	39	44	78	103	183	235	114
GHOR	39	37	97	149	178	225	121
HELMAND	31	33	71	98	191	227	108
HERAT	35	40	75	98	178	225	108
JAWZJAN	29	30	65	140	176	176	103
KABUL	45	54	108	128	213	312	143
KANDAHAR	38	41	85	113	189	218	114
KAPISA	34	54	86	122	175	264	123
KONAR	33	35	59	90	111	157	81
KUNDUZ	29	31	61	104	141	180	91
LAGHMAN	27	32	65	115	169	199	101
LOGAR	43	40	77	121	200	239	120
NANGARHAR	26	32	95	145	197	216	118
NIMROZ	29	31	86	104	136	225	102
ORUZGAN	39	39	78	105	197	267	121
PAKTYA	35	37	81	109	213	236	118
PAKTEKA	36	36	77	108	192	203	109
PARWAN	39	40	77	118	176	241	115
SAMANGAN	28	31	63	144	174	195	106
TAKHAR	32	35	68	109	137	166	91
WARDAK	39	39	71	114	200	280	124
ZABUL	34	37	78	107	199	258	119
N.AVG.	34	37	77	119	178	225	112

TABLE 3: AFGHANISTAN'S PROVINCES RANKED ON THE BASIS OF ANNUAL WHEAT PRICE LEVEL INDEX 1987–1992.

PROVINCES	1987 INDEX	RANK	1988 INDEX	RANK	1989 INDEX	RANK	1990 INDEX	RANK	1991 INDEX	RANK	1992 INDEX	RANK	AVG. INDEX	RANK
KABUL	100	1	100	1	100	1	72	9	100	1	100	1	100.00	1
LOGAR	94	2	74	5	72	12	68	11	94	3	76	7	83.92	6
WARDAK	87	3	72	6	65	15	64	14	94	3	90	2	86.71	2
ORUZGAN	87	3	73	6	72	11	59	20	93	5	86	3	84.62	5
GHAZNI	87	3	81	3	72	11	58	22	86	11	75	9	79.72	10
GHOR	87	3	69	7	90	4	84	3					84.62	5
PARWAN	86	3	74	5	71	12	66	12	82	12	77	6	80.42	9
BAMYAN	84	4	74	5	71	13	73	8	97	2	72	11	83.22	7
KANDAHAR	83	4	76	4	79	9	64	15	89	9	70	12	79.72	10
BADAKSHAN	80	5	83	2	97	2	82	4	92	6	41	24	76.22	12
PAKTEKA	80	5	67	8	71	12	61	17	90	7	65	14	76.22	12
HERAT	77	6	74	5	69	14	55	23					75.52	13
PAKTYA	77	6	69	7	75	10	61	16	100	1	76	8	82.52	8
FARYAB	77	6	76	4	87	6	100	1	88	10	60	18	83.92	6
ZABUL	76	7	69	7	72	11	60	18	93	4	83	5	83.22	7
BALKH	74	8	57	12	56	19	61	17	68	17	62	17	66.43	18
KONAR	73	8	65	9	55	20	51	24	52	21	50	23	56.64	20
TAKHAR	71	9	65	9	63	16	61	16	64	19	53	22	63.64	19
BADGHIS	69	10	59	11	94	3	94	2					85.31	4
BAGHLAN	69	10	59	11	70	13	58	21	69	16	57	20	66.43	18
HELMAND	68	10	61	10	66	15	55	23	90	8	73	10	75.52	13
JAWZJAN	65	11	56	13	60	17	79	7	83	12	56	21	72.03	15
KUNDUZ	64	11	57	12	56	19	58	21	66	18	58	19	63.64	19
NIMROZ	64	11	57	12	79	8	59	21	64	20			71.33	16
FARAH	64	11	59	11	86	7	59	19					76.92	11
SAMANGAN	63	12	57	12	59	18	81	6	82	14	62	16	74.13	14
LAGHMAN	59	13	59	11	60	17	65	13	79	15	64	15	70.63	17
NANGARHAR	57	14	59	11	88	5	82	5	93	5	69	13	82.52	8
KAPISA			100	1	80	8	69	10	82	13	85	4	86.01	3

Ranks based on 1 being the highest price and 29 the lowest.

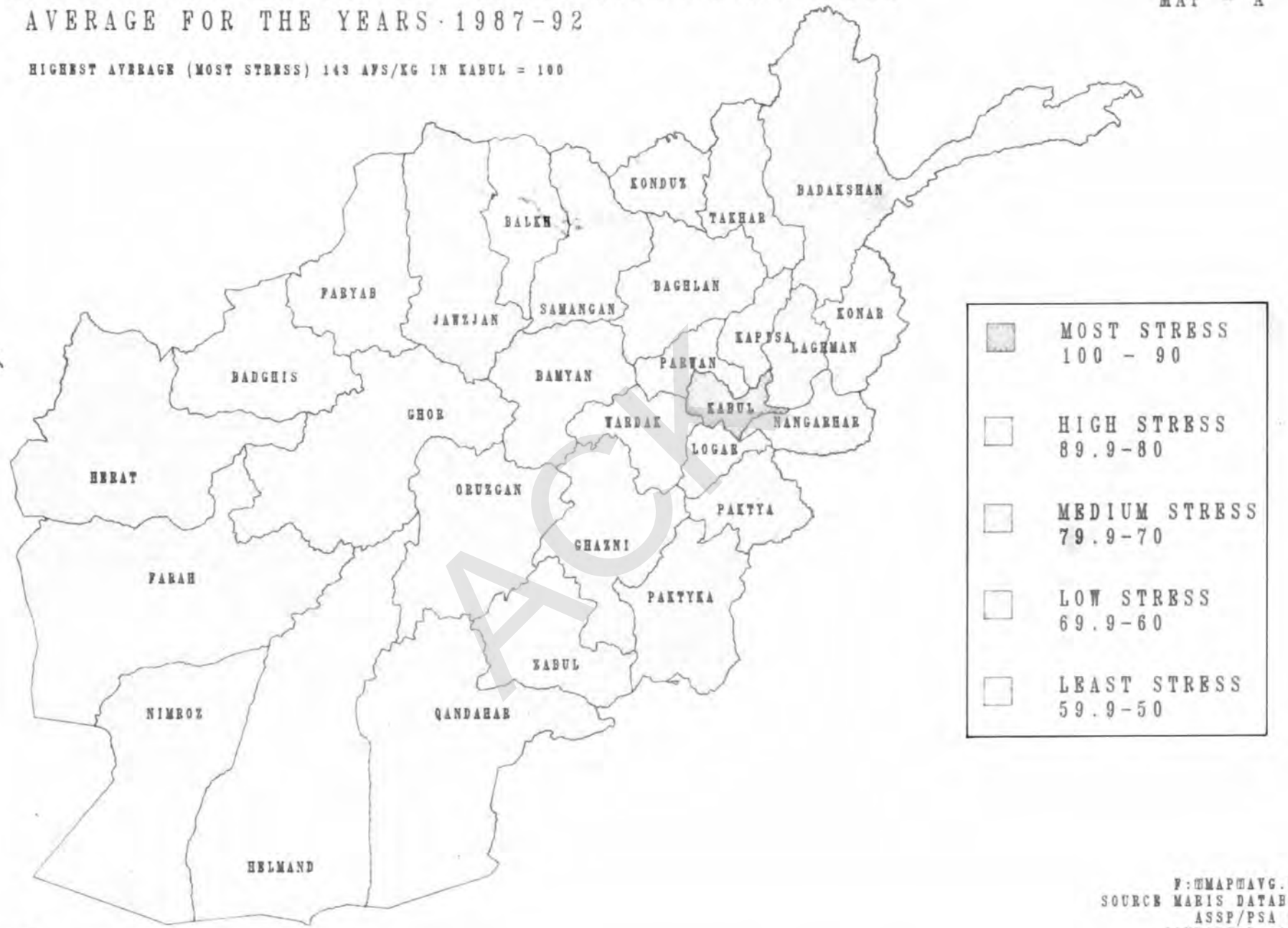
Figure 3: AFGHANISTAN'S PROVINCIAL ANNUAL WHEAT PRICE LEVEL INDEX
AVERAGE FOR THE YEARS 1987 - 92
HIGHEST AVERAGE PRICE (143 AFS/KG) IN KABUL = 100



AFGHANISTAN PROVINCIAL WHEAT PRICE LEVEL INDEX
AVERAGE FOR THE YEARS 1987-92

MAP - A

HIGHEST AVERAGE (MOST STRESS) 143 AFS/KG IN KABUL = 100



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SOURCE MARIS DATABASE
ASSP/PSA PPA
JANUARY 5, 1993

DAI ASSP/PSA Information Unit

2.2.2 Stress Ranking Based on Provincial Monthly Wheat Price Variability

Except for seasonal movements, other observed variations in monthly wheat prices within the span of each year, are mainly short run price fluctuations which may be attributed to turmoil in each province of Afghanistan. The standard deviation of monthly prices of each year is used to show the extent of these fluctuations.

Standard deviation of monthly prices is computed for each province, each year (1987-1992) and illustrated in Table 4. Here, the size or the magnitude of the standard deviation of monthly prices, reflects the extent of price instability stress on consumers for the months of each year in each province.

For comparison, a spatial index of price instability is computed and provinces are ranked on the basis of this index. The province with the highest standard deviation - indicating highly unstable monthly prices - is used as a base (100%), and the rest of the provinces categorized into the following price instability stress groups:

Price instability stress groups	Price instability index
1. Most unstable	100 -- 80
2. Highly unstable	79.9 -- 60
3. Unstable	59.9 -- 40
4. Less unstable	39.9 -- 20
5. Least unstable	20.0 -- 0

This provincial categorization is done for each of the six years (1987-1992). An average provincial price instability index for the six-year period is computed using the provincial standard deviation for each of the six years. Results are shown in the last column of *Table 4* and illustrated in *Figure 4*.

Results for each of the six years are separately shown in Figures C-1 to C-6 in Appendix C.

The charts included in Appendix C show that the provinces changed their positions in terms of price instability every year. Because of the time period during which this price instability existed, it is possible to infer that the monthly wheat price instability in Afghanistan resulted from conflict and uncertain political situation rather than from less volatile traditional economic forces functioning before the war.

To see if changes in annual ranks of provinces according to price instability are statistically significant, the Kendall Coefficient of Concordance is used. Results of the test - computations for which are shown in Table A-2, Appendix A - is as follows:

TABLE 4: Afghanistan's Provinces Ranked On The Basis Of Annual Standard Deviation Of Wheat Price in Each Province 1987–1992.

PROVINCES	ST. DEV	1987 INDEX	RANKS	ST. DEV	1988 INDEX	RANK	ST. DEV	1989 INDEX	RANK	ST. DEV	1990 INDEX	RANK	ST. DEV	1991 INDEX	RANK	ST. DEV	1992 INDEX	RANK	AVERAGE FOR ALL YEARS ST. DEV	INDEX	RANK
HERAT	8.50	100	1	6.69	25	10	17.31	34	23	11.78	26	21							32.27	29	22
KANDAHAR	5.07	60	2	6.50	24	12	23.19	46	11	8.75	19	25	53.74	77	4	87.78	50	11	74.37	67	9
PAKTYA	4.80	56	3	6.79	25	9	22.63	45	14	11.70	26	22	29.57	43	14	55.56	32	16	81.36	74	6
PAKTEKA	4.08	48	4	6.27	23	14	17.77	35	22	18.35	40	12	38.20	55	8	55.03	31	17	72.34	66	10
KABUL	3.65	43	5	26.90	100	1	38.06	75	2	28.11	62	6	59.22	85	3	175.42	100	1	110.29	100	1
BADAKSHAN	3.16	37	6	12.96	48	2	50.67	100	1	19.68	43	11	16.85	24	23				64.01	58	14
KONAR	2.75	32	7	4.39	16	23	14.06	28	24	7.11	16	28	18.87	27	22	42.02	24	22	49.13	45	19
PARWAN	2.38	28	8	7.61	28	8	17.79	35	21	16.22	36	16	33.78	49	12	94.65	54	7	78.83	71	8
GHAZNI	2.36	28	9	8.51	32	5	17.83	35	20	13.08	29	19	42.46	61	7	90.66	52	8	78.45	71	8
SAMANGAN	2.22	26	10	2.91	11	26	20.39	40	16	40.27	89	2	24.07	35	16	52.76	30	18	70.52	64	12
BAGHLAN	2.16	25	11	2.64	10	28	33.78	67	4	15.22	33	17	18.95	27	21	47.27	27	20	57.82	52	17
LAGHMAN	2.08	24	12	5.22	19	19	18.02	36	19	19.76	43	10	31.80	46	13	74.16	42	15	72.11	65	11
NIMROZ	2.06	24	13	4.05	15	24	12.56	25	26	14.27	31	18							37.88	34	21
BAMYAN	1.83	21	14	5.48	20	18	31.38	62	6	12.36	27	20	36.41	52	10	88.89	51	10	80.05	73	7
LOGAR	1.73	20	15	8.04	30	6	19.55	39	18	23.88	53	7	37.21	54	9	113.79	65	4	84.09	76	5
ORUZGAN	1.71	20	16	5.65	21	15	26.87	53	7	7.75	17	27	49.69	71	5	113.68	65	5	94.88	86	3
GHOR	1.71	20	16	6.56	24	11	35.66	71	3	23.82	52	8							48.91	44	20
HELMAND	1.71	20	16	5.62	21	16	22.19	44	15	6.52	14	29	69.52	100	1	86.14	49	13	81.83	74	6
BADGHIS	1.71	20	16	4.70	17	21	3.13	6	28	45.46	100	1							60.90	55	15
BALKH	1.71	20	16	4.56	17	22	20.38	40	17	17.40	38	13	21.69	31	18	39.68	23	23	59.30	54	16
KUNDUZ	1.41	17	17	2.75	10	27	24.53	49	9	17.23	38	14	20.51	30	19	44.60	25	21	57.37	52	17
FARYAB	1.29	15	18	11.41	42	3	22.85	45	13	30.49	67	4	19.09	27	20	75.22	43	14	71.85	65	11
FARAH	1.26	15	19	4.94	18	20				9.81	22	24							37.03	34	21
NANGARHAR	1.26	15	19	7.65	28	7	33.38	66	5	30.20	66	5	24.46	35	15	97.04	55	6	81.50	74	6
ZABUL	1.26	15	19	6.42	24	13	25.82	51	8	10.75	24	23	100.58	145	1	116.45	66	3	93.59	85	4
JAWZJAN	0.96	11	20	3.12	12	25	23.83	47	10	35.00	77	3	35.81	52	11	48.37	28	19	68.48	62	13
TAKHAR	0.96	11	20	5.53	21	17	12.57	25	25	8.57	19	26	7.38	11	24	86.63	49	12	50.63	46	18
WARDAK	0.96	11	20	8.97	33	4	23.05	46	12	20.01	44	9	42.72	61	6	142.09	81	2	98.44	89	2
KAPISA							4.43	9	27	16.85	37	15	21.74	31	17	90.64	52	9	70.82	64	12

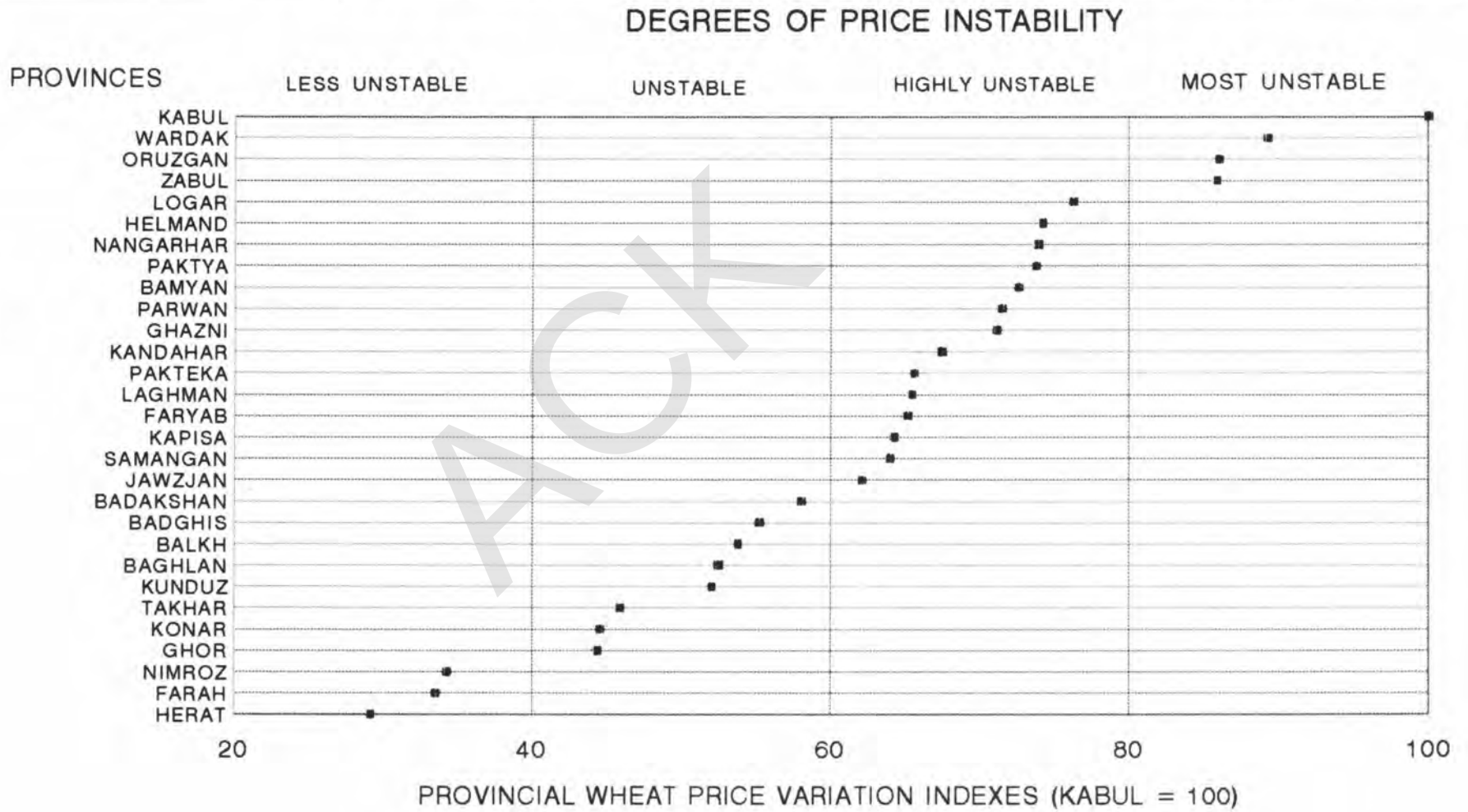
Ranks based on 1 being the highest standard deviation (100%) and 29 the lowest.

Figure 4:

AFGHANISTAN'S PROVINCIAL ANNUAL WHEAT PRICE VARIATION INDEX

PROVINCIAL STANDARD DEVIATION FOR THE YEARS 1987-1992.

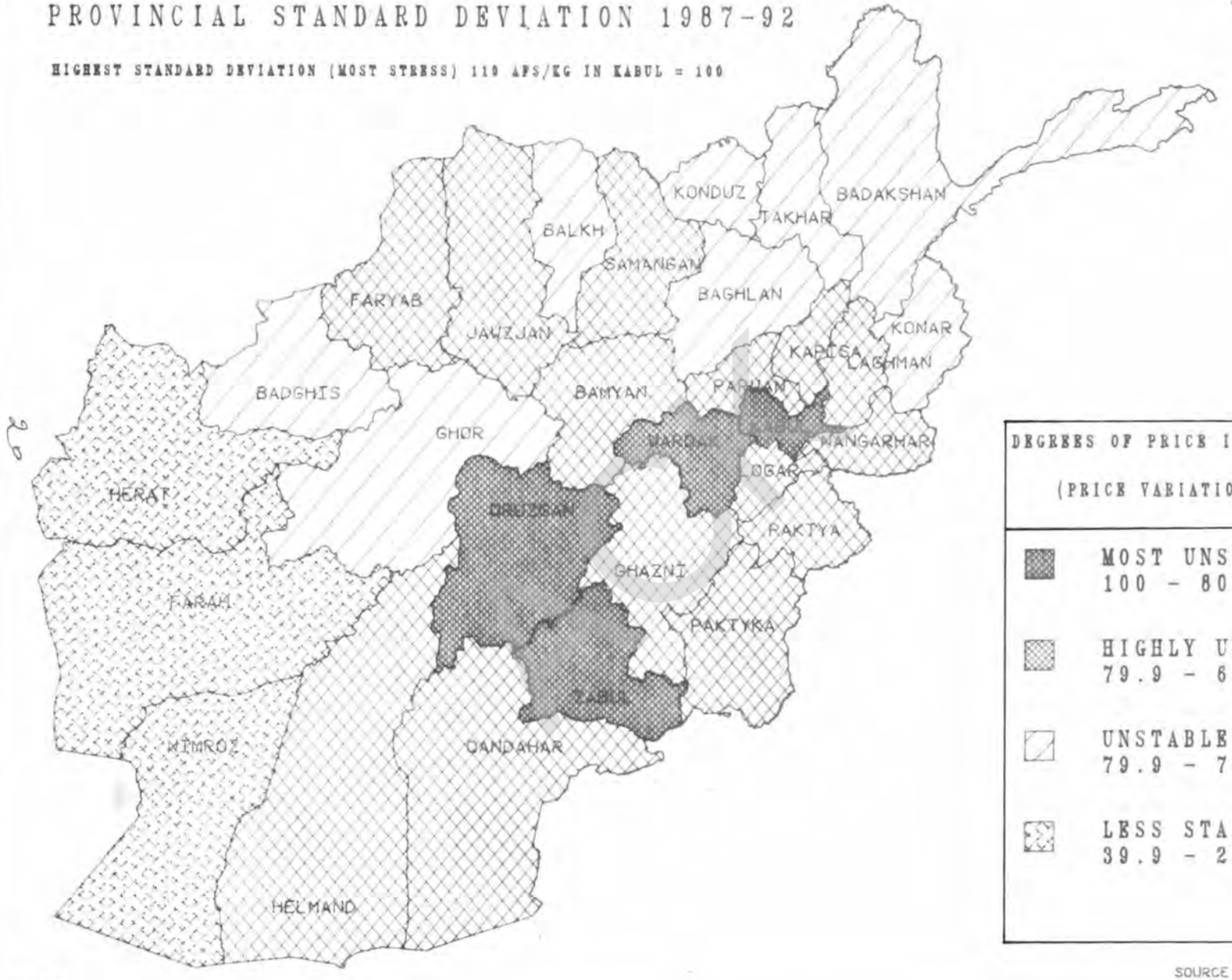
HIGHEST STANDARD DEVIATION (110.29 AFS/KG) IN KABUL = 100



AFGHANISTAN WHEAT PRICE VARIATION INDEX
PROVINCIAL STANDARD DEVIATION 1987-92

MAP - B

HIGHEST STANDARD DEVIATION (MOST STRESS) 110 AFS/KG IN KABUL = 100



DEGREES OF PRICE INSTABILITY (PRICE VARIATION INDEX)	
MOST UNSTABLE	100 - 80
HIGHLY UNSTABLE	79.9 - 60
UNSTABLE	79.9 - 70
LESS STABLE	39.9 - 20

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SOURCE MARIS DATABASE
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JANUARY 5, 1993

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$$S = \Sigma(R_j - \frac{\Sigma R_j}{N})^2 = 14560$$

$$W = \frac{S}{1/12\ K^2(N^3 - N)} = \frac{14560}{1/12\ 6^2(29^3 - 29)} = 0.199$$

$$\chi^2 = K(N-1)W = 6(29-1)\ (0.199) = 33.47$$

Results of the computation show that the χ^2 coefficient is not significant at 5% level, indicating that the null hypothesis "Ranks of provinces are not similar each year" is not rejected, indicating a changing price "instability ranking" for each province, each year, throughout the six year period.

The average "price instability stress" for the period (1987-1992), illustrated in *Figure 4,* shows that Kabul, Wardak, Oruzgan and Zabul were the most unstable in terms of wheat prices. Nimroze, Farah and Herat experienced the least instability. The locations of these provinces and their relative stress levels according to price instability are shown on *Map B.*

2.3 The Seasonal Movements of Wheat Prices

2.3.1 Seasonal Pattern of Wheat Prices Before the War

Before the war, seasonal fluctuation in foodgrain prices were a response to the availability of supplies associated with crops' normal production patterns. Prices were lowest after the harvest because of increased availability of a crop, increasing gradually during the marketing year and peaking immediately before the following year's harvest when stocks were at a minimum. This price pattern was also a reflection of the country's limited storage and transportation facilities and the subsistence nature of its farming system. Supply shortages due to regional transportation problems and bad weather caused temporary localized price changes. Price fluctuations due to bad weather usually occur from December through April.

Many Afghan farmers have the practice of selling their crops immediately after harvest because of financial need, underestimation of household requirements for particular crops, or lack of on-farm storage facilities. The same farmers buy foodgrains later in the year in order to meet household consumption requirements. This creates a "demand pull" effect on prices before the harvest, in addition to the "push" effect during the same period caused by

shortage of supplies as stocks are drawn down.[8]

To highlight the seasonal movement of wheat prices during the prewar years, monthly wheat prices for the years 1967-70 are taken from G.P Owens Price Data Book. This data, which represents eight major cities of Afghanistan, is used to compute a national seasonal wheat price index, shown in Table 5.

For this computation, nominal monthly wheat prices for every month of the four year period, 1967-1970, in *afghanis per seer*, are presented at the top section of the table. These monthly prices are used to calculate the annual average wheat prices for each year, shown at the extreme right hand column.

The bottom half of the table shows monthly wheat prices expressed as percentages of annual average prices. The bottom row of Table 5 shows the monthly averages of the percentage values. These averages comprise the national *seasonal index* of wheat prices for the period under review.

Although based on a relatively short period of only four years, which include some atypical years for prices and production, this index reflects the seasonal pattern of wheat price movements in prewar Afghanistan.[9]

The wheat harvest period in Afghanistan falls between mid June and late August. The seasonal index throughout the twelve-month period as shown on Table 5 clearly illustrates the sequence of pre-harvest rise, harvest season drop and post harvest increase of wheat prices. For the seasonal index curve of this period, see *Figure 5.*

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8 G.P. Owens Price Data book, Ibid.

9 There was a large but relatively short-term price aberration in 1967 primarily due to psychological factors. In 1970 and 1971 there was a shortfall in food grain production due to low rainfall.

Table 5: Computation of Wheat Price Seasonal Index for Afghanistan based on (1967 - 1970) Monthly National Prices

Wheat Prices in Afs/seers

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
1967	52.2	55.4	62.4	84.8	72.8	64.6	56.7	54.2	53.9	55.9	56.3	58.5	60.6
1968	57.6	56.9	55.2	51.4	52.8	47.2	41.7	39.8	40.4	38.5	37.6	37.8	46.4
1969	38.8	37.6	38.1	38.5	39.3	39.4	37.4	37.2	35.9	36.8	37.1	36.1	37.7
1970	37.0	38.0	40.9	44.9	49.4	47.5	51.2	52.3	57.3	60.8	62.5	62.9	50.4

Percentage Values Based on Averages

1967	86	91	103	140	120	107	94	89	89	92	92	93	
1968	124	123	119	111	114	102	90	86	87	83	81	81	
1969	103	100	101	102	104	105	99	99	95	98	98	96	
1970	73	75	81	89	98	94	102	104	114	121	124	125	
S.Index	97	97	101	110	109	102	96	94	96	98	99	100	1200

2.3.2 Seasonal Fluctuation of Wheat Prices During the War

Monthly wheat price data for 1987-92 was utilized to measure the seasonal behavior of wheat prices in Afghanistan during the war.

For this measurement, provincial prices are aggregated at two levels:

(1) At the national level for ease of presentation and comparison with pre-war (1967-70) national seasonal indexes;

(ii) At the regional level, to identify differences in seasonality according to geographic location.

Each level is discussed separately below.

Seasonal Movement of Wheat Price at the National Level

The national seasonal wheat price index based on 1987-92 price data is shown in *Table 6* and graphically compared with the wheat price index of the pre-war period (1964-1970) in *Figure 5*.

National seasonal variation of wheat prices in Afghanistan during the war years can be attributed to those forces normal to the typical seasonality of wheat production and marketing as well as abnormal forces imposed by the war. Both "normal" and "abnormal" seasonal factors are reflected in the 1987-92 index.

To examine the effects of war on the seasonal movement of wheat prices, a comparison is made of the war period index with that of the pre-war period. When comparing the pre-war and war indices, the following points need to be kept in mind:

(i) The pre-war (1964-1970) and wartime (1987-1992) seasonal indices are for periods twenty years apart and are based on samples of durations shorter than are usually used for seasonal analysis (only 4 years and 6 years respectively).

(ii) In the pre-war sample period, the years 1967, 1970 and 1971 were atypical due to drought and local economic factors and in the wartime sample, all of the six years were abnormal because of the impact of war.

(iii) During the pre-war period (late sixties up to 1970) newly established nationwide systems of transportation and communication were beginning to have a positive impact on the trade and production system in Afghanistan. In the wartime period, the transportation and communications systems of the country were damaged, and the free movement of commodities for trading was disrupted.

With these caveats in mind, comparing the behavior of the national wheat price indices related to the two time periods reveals both similarities and differences. Both indices are similar (see Figure 5) in that wheat prices rose during the first three months of the year and reached a maximum in April, although the April maximum is higher for the war period than the pre-war period.

The similarity of prices rising to reach a peak in April in both periods is mainly an indication of the effect of bad weather on transportation, occurring in winter and spring, and the impact on wheat prices of an "end of the year" shortage of supply all over the country, when stocks are at their lowest.

After the April maximum, the pre-war seasonal index gradually declines to its minimum level in August reflecting the increased availability of wheat as the harvested crop reaches the market. Following this, the index rises steadily but remains below the annual average index of 100 until the end of the year.

The pre-war behavior of the wheat price seasonal index differs from the wartime index in two ways. First, the "wartime" index falls more sharply after April and reaches its minimum in June, two months earlier than the pre-war minimum in August. Second, the wartime index rises much faster after its minimum level in June and remains at a much higher level until the end of the year compared to the pre-war index. After September, the "wartime" index exceeds the annual average index.

The main factors causing the sharp pre-harvest increase in wheat prices during the war years can be explained by: (a) reduced overall wheat supplies due to the depletion of stocks; (b) the negative impact of weather and fighting on the movement of imported wheat and other goods; (c) stockpiling of wheat by consumers due to a fear of shortages; and (d) hoarding by traders and speculators which reduced the supply of wheat on the open market.

The steep decline in the wheat price level in June during the war years appears to be due to: (a) the opening of supply routes after the end of the bad weather; (b) release of stocks by hoarders before the arrival of the harvested crop in the market; and (c) imports from neighboring countries. The fact that the minimum wheat price is experienced two months earlier than the pre-war period may be related to the fact that the wheat harvest in neighboring Pakistan, a major source of imports, begins two months earlier than in Afghanistan and probably reflects the increased importance of imports in the Afghan market in recent years.

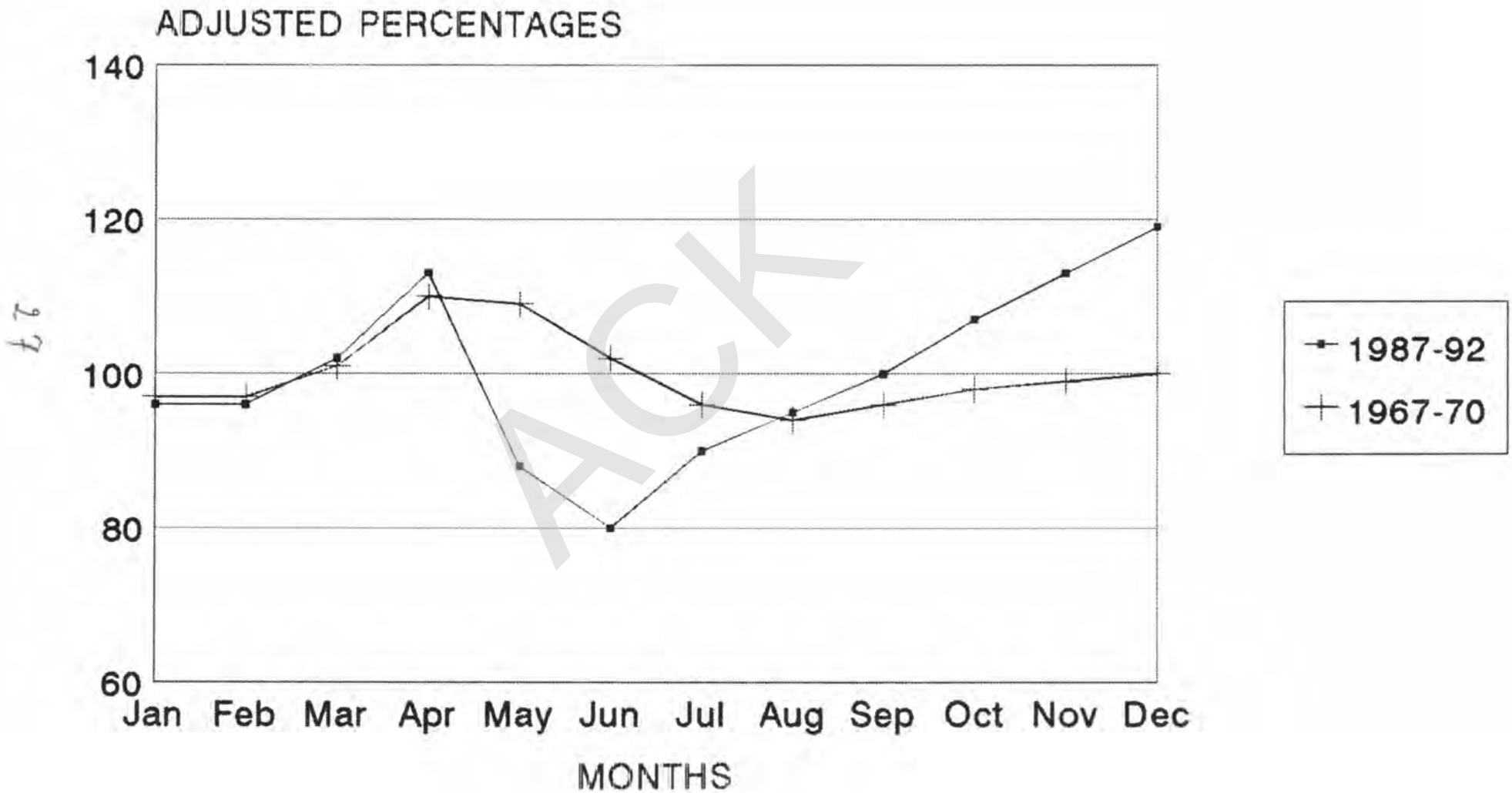
The rapid increase in "wartime" wheat prices from June onward are harder to explain but may reflect the procurement of wheat by government agencies and early stockpiling by hoarders and consumers for the approaching winter months.

In general, the range of variation of wheat prices during the year is much bigger for the "war" (40%) than for the pre-war (15%) years.

Table 6 : Computation of Wheat Price Seasonal Index for Afghanistan Based on 1987–1992 Monthly Wheat Prices

	YEAR	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	AVERAGES
	1987									33	32	35	36	34
	1988	38	38	38	37	35	30	29	29	35	40	44	49	37
	1989	51	45	50			66	97	88	87	91	96	98	77
	1990	103	104	102	129	118		108	115	122	132	134	140	119
	1991	154	170	167	159	167	156	155	172	189	209	218	222	178
	1992	270	265	320	301	133	138	147	186	176	198			213
PERCENTAGE	1987									98	93	103	106	
	1988	102	104	103	101	96	80	79	78	96	110	118	133	
	1989	66	59	65			85	126	114	114	118	125	128	
	1990	87	87	86	108	99		91	97	103	111	113	118	
	1991	86	95	94	89	94	87	87	96	106	118	122	125	
	1992	152	149	180	169	75	77	83	104	99	111			
Average Percentages		99	99	105	117	91	83	93	98	102	110	116	122	1235
Adjusted Percentages		96	96	102	113	88	80	90	95	100	107	113	119	1200

Figure 5: SEASONAL INDEX OF WHEAT PRICES FOR TWO TIME PERIODS: (1967-1970) AND (1987-1992)



Seasonal Movement of Wheat Prices by Region

In the discussion on the provincial pattern of wheat prices, evidence was presented that prices of agricultural products have a history of regional variation in Afghanistan. Apart from the normal geographic and transportation impacts on regional price differentials, the effects of war have also tended to increase regional price variation in the country. It seems appropriate, therefore, to disaggregate the national "seasonal index" of wheat prices for the years 1987-1992 by region and identify any regional differences in seasonal behavior during this period.

For this purpose, the provinces have been divided into eight regions. The divisions which are mainly based on geographic proximity and access to external supply sources are shown in Map C. The provinces in each region are as follows:

i) The central eastern region: Kabul, Logar, Wardak, Parwan, Kapisa.

ii) The central western region: Bamyan, Oruzgan, Ghor.

iii) The Eastern region: Nangarhar, Laghman, Kunar.

iv) The South Eastern region: Ghazni, Paktya, Paktika.

v) The South western region: Zabul, Kandahar, Helmand, Nimroze

vi) The western region: Herat, Farah, Badghis.

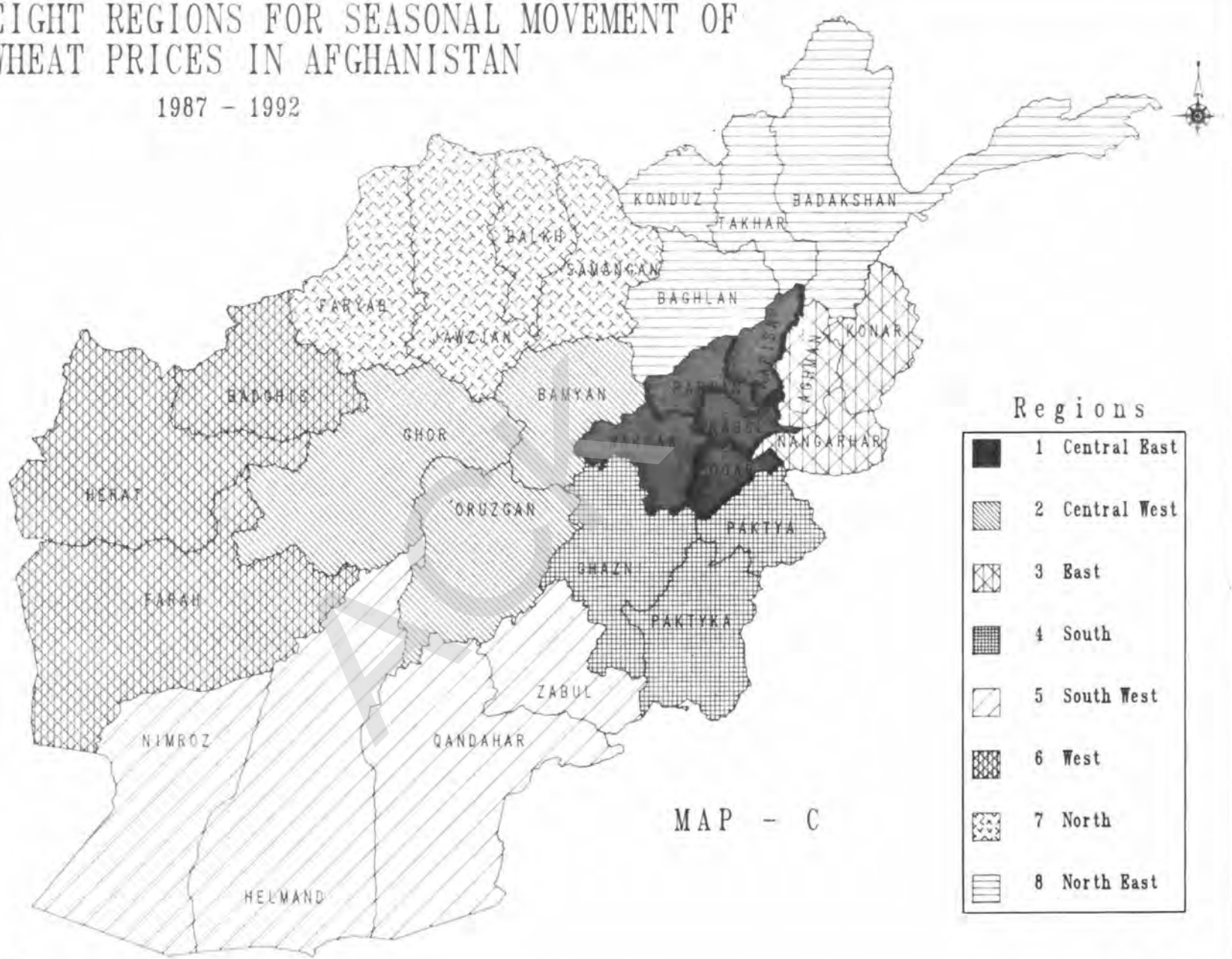
vii) The north central region: Faryab, Balkh, Samangan, Jawzjan.

viii) The north eastern region: Baghlan, Kunduz, Takhar, Badakshan.

Seasonal indexes are computed for each region in *Table 1*, *Appendix D*, and illustrated in *Figure 6* in the following pages. It appears that the seasonal behavior of wheat prices in nearly all eight regions generally follows the same pattern: a maximum pre-harvest price level in April, and a minimum in June. After June, the regional index indicates a steady post-harvest rise in wheat prices which reaches its highest peak in December.

EIGHT REGIONS FOR SEASONAL MOVEMENT OF WHEAT PRICES IN AFGHANISTAN

1987 - 1992



There were some regional differences in seasonal wheat price movement during these years. The dissimilarities basically relate to the maximum pre-harvest price level, the minimum harvest time price level, the highest post-harvest price jump, the number of months the index is below the annual average price, and the range of price fluctuations over the year. *Table 7* presents a comparison of regional differences based on these indicators. The table reflects differences in the seasonal indexes of the regions shown in *Figure 6.*

The last two rows of *Table 7* make it possible to compare national and regional perspectives for both the war and prewar periods.

Table 7: Specific Values of Afghanistan's Wheat Price Seasonal Index for Eight Regions and For National Level At Two Time Periods (1987-1992) and (1967-1970)

Seasonal Index Values

	Regions	Pre-harvest Maximum (%)	Harvesting Time Minimum (%)	Post Harvest Maximum (%)	Months Below Annual Average (No.)	Range Of Fluctuations (%)
1	Central East	108	77	130	7	53
2	Central West	116	79	119	7	40
3	East	112	75	130	6	55
4	South	100	84	125	7	41
5	South West	101	78	118	6	40
6	West	114	81	117	4	36
7	North	100	75	129	7	54
8	North East	108	80	115	6	35
	National (1987-1992)	113	80	119	6	39
	National (1967-1970)	110	94	99	8	15

The results of the seasonal analysis indicate that in all regions wheat prices reach their highest level in December. The pre-harvest maximum wheat price is in April and is less than the post-harvest December maximum in every region.

The June harvest season minimum wheat price level is fairly uniform in all regions. In every region, except Region 6, wheat prices are below the annual average for six to seven months. In Region 6 (which incudes Badghis, a very isolated province), wheat prices are below the annual average for only four months. The range of price fluctuation between the highest and the lowest level is greatest in Region 3 and Region 1. These regions have large populations and are trading centers where hoarding for speculative gain is likely to be widespread.

The impact of the wheat harvest and imports from external sources is not observed in the national seasonal wheat price movement after June. However, at the regional level, wheat prices in some regions appear to be more stable during the summer. For example in Regions 2, 4, 5, and 7, prices were relatively stable in the summer months of July and August. In Region 8, this impact is reflected in the decline in August wheat prices followed by a gradual increase. In Region 3, wheat prices fall in September, perhaps due to the influence of imports from Pakistan.

The stabilizing influence of the harvest and imports on wheat price is not noticeable in Region 1. This is because of the inclusion in this region of Kabul, a large population center and a trading hub for dealers, speculators and hoarders.

In the west, because Region 6 includes Herat, a population center and a large city of traders and dealers; and Badghis, a wheat deficient area, the price stabilizing impact of the summer harvest or of imports is only noticeable in June-July.

The seasonal wheat price indices of the eight regions are compared in Table 8. In each region the price level stress varies according to the month of the year. In January for example, Region 1 appears to have been the most price stressed area while in February the north, south west and west regions exhibited the greatest stress. The regions were ranked according to each month's seasonal index value, and the "Kendall Coefficient of Concordance" statistical test applied to see if the ranking of the regions remained consistent over the year. The result of the ranking test computed in Table 3, Appendix A, is

$$S = \Sigma (R_j - \frac{\Sigma R_j}{N})^2 = 175.87$$

$$W = \frac{S}{1/12\ K^2(N^3 - N)} = \frac{175.87}{1/12\ 12^2(8^3 - 8)} = .029$$

$$\chi^2 = K(N-1)\ W = 12\ (8-1)\ 0.029 = 2.44$$

The result shows that the χ^2 coefficient is not significant at the 5% level. This suggests that the null hypothesis, "Ranks of regions are not consistent each month" is not rejected. That the regional ranking of seasonal price indices has varied over time reflects the wheat price instability that has characterized Afghanistan in recent years.

Table 8: Seasonal Wheat Price Index for Eight Regions of Afghanistan 1987-1992.

Regions	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Avg.
1. Central east	99	97	108	106	83	77	85	90	99	106	120	130	100
2.Central west	92	91	95	116	96	79	91	91	103	108	118	119	100
3. East	94	95	97	112	80	75	86	106	99	109	117	130	100
4. South	95	96	98	100	85	84	93	93	103	109	119	125	100
5. South west	93	98	99	101	85	78	94	97	106	116	114	118	100
6. West	97	98	92	114	111	82	94	81	100	104	111	117	100
7. North	97	100	97	95	77	25	96	98	101	115	120	129	100
8. North east	91	92	93	108	93	80	115	96	101	107	115	109	100

FIGURE 6: SEASONAL WHEAT PRICE INDEX LINES FOR EIGHT REGIONS OF AFGHANISTAN, 1987-92

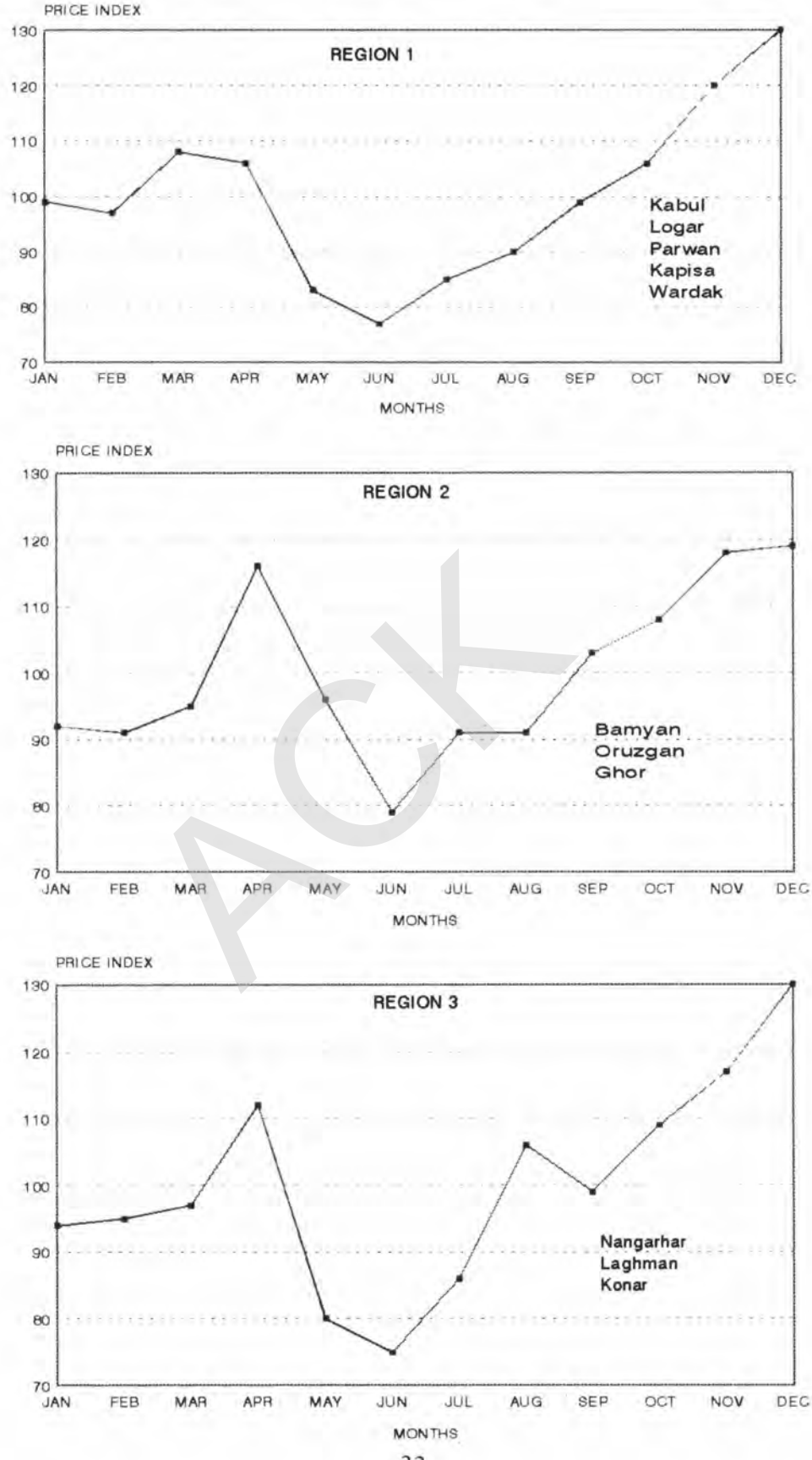
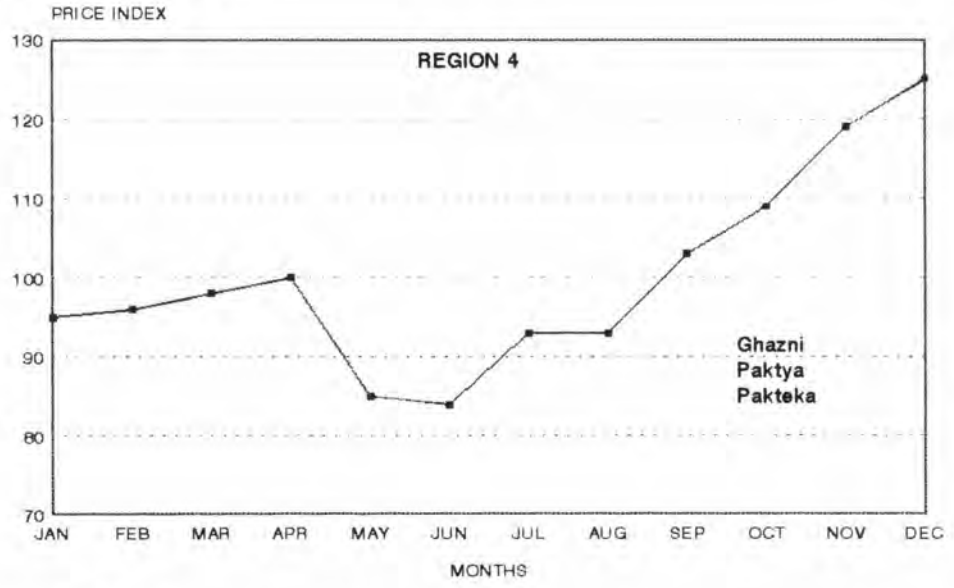
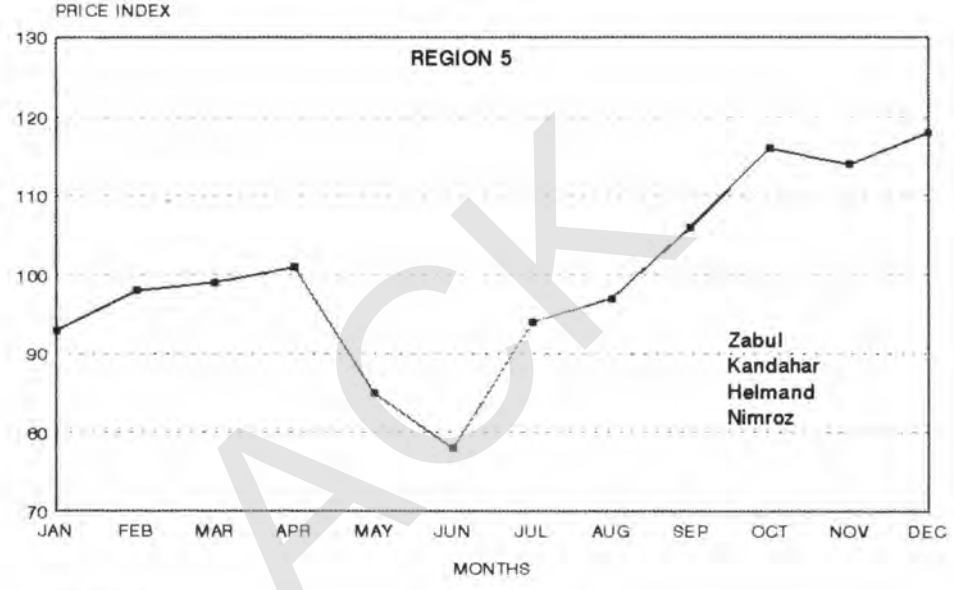


Figure 6 Continued...





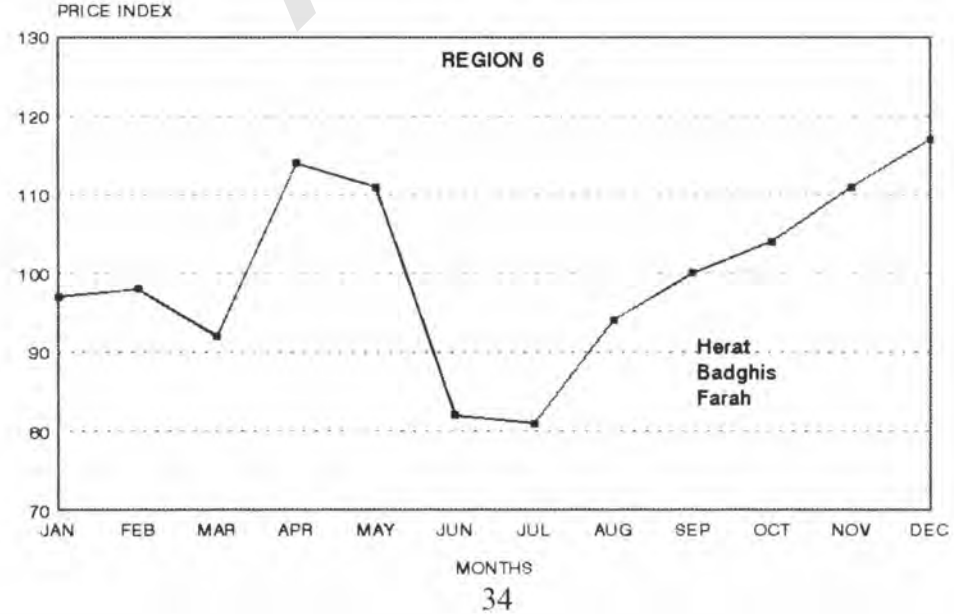
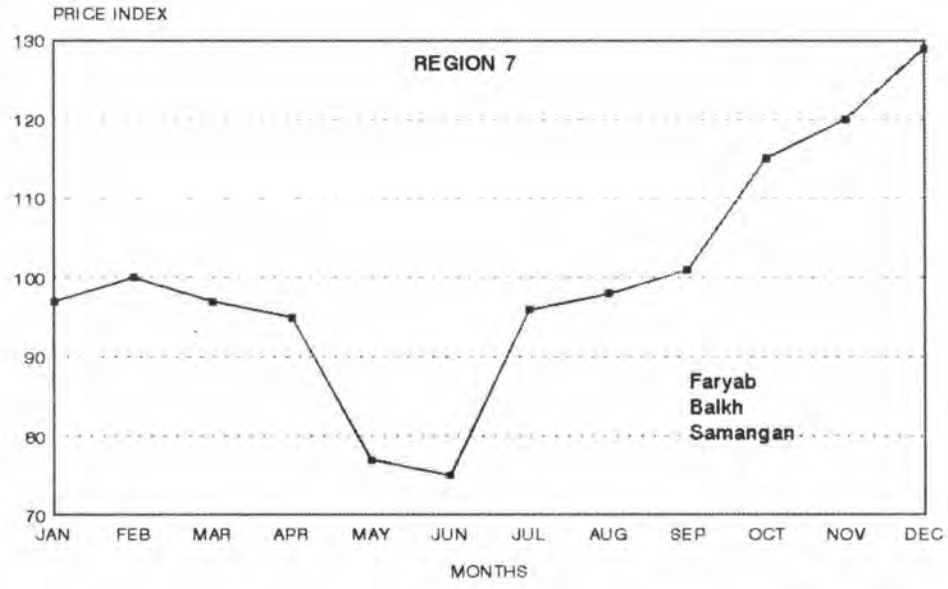
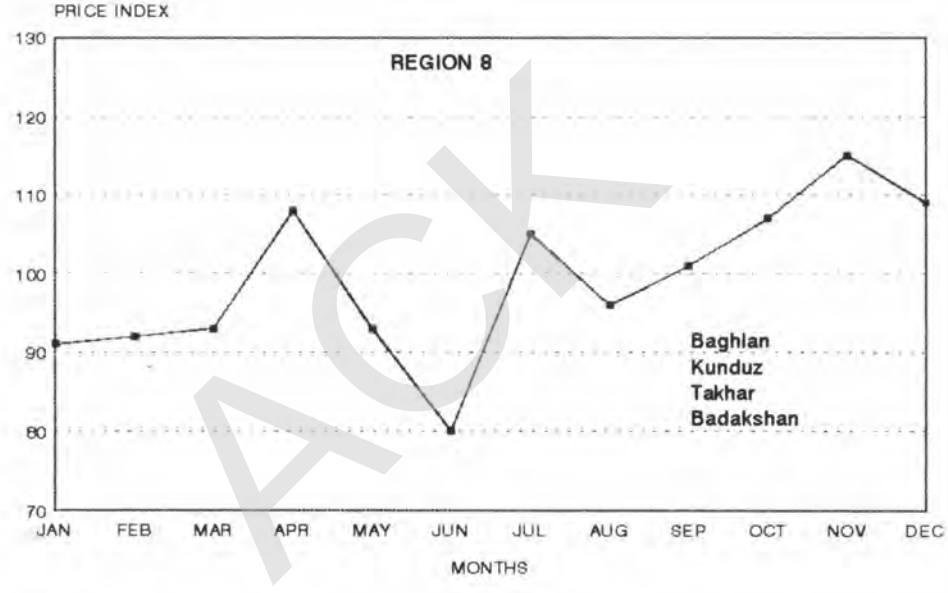


Figure 6 Continued..





III. CONCLUSION

3.1 Conclusion and Implications for Planning and Policy

The changes in wheat prices during 1987-1992 and the reasons for these changes provide some lessons to be learned. Knowing the forces that can cause prices of basic food items like wheat to fluctuate assist in developing proposals for some short and long term measures to bring about price stabilization in Afghanistan.

3.1.1 Short Term Measures

1. Peace is a pre-condition for assuring wheat availability to consumers at reasonable prices and for the rehabilitation of the agricultural economy of Afghanistan. With the continuation of fighting, the whole economic network related to production, distribution and consumption will further break apart and prices will not stabilize.

2. Afghanistan cannot immediately produce all of its food needs. At this stage agricultural infrastructure, land, and labor resources have to be rehabilitated. For immediate food needs, Afghanistan will continue to depend on outside sources of supply. The more important steps which need to be taken in this regard are:

   - Establish a clear food grain import policy through which unregulated traffic of food items and the impacts of profiteering middlemen dealers on food grain prices are avoided.

   - Clear avenues for international assistance in food grains. International food assistance could directly contribute to price stabilization if it is distributed as "wages in kind" for agricultural rehabilitation work in Afghanistan.

3. Hoarding for speculative purposes has distorted normal market forces in alleviating price stress faced by consumers due to war. Laws to eliminate this practice are needed to stabilize food grain prices in Afghanistan.

4. The Government-subsidized coupon system through which thousands of civil servants and military personal regularly received a monthly ration of wheat or wheat flour, was disrupted or completely stopped during the last six years of war. For the short run, reinstating of this system, even with minimum level of subsidy, would reduce the pressure of prices in the market and discourage hoarding and other undesirable trade practices.

5. Modern grain storage and transportation facilities in grain producing areas serve to stabilize supplies and prices. The present silo capacity in Kabul, Balkh and Baghlan province is limited and needs to be increased.

6. The rising cost of liquid fuel and firewood for local bakeries and their inefficient traditional scale and method of operation has created a large impact on prices of bread in urban centers. Policies in the form of incentives are required to renovate the private bakeries and standardize bread and bread prices.

3.1.2 Long Term Measures

1. The agricultural production system deteriorated during the last six years of war. According to a ministry of agriculture estimate, land under wheat declined by 29% and wheat production by 39% from 1987 to 1991. The following measures are needed to restore agricultural production to its prewar level:

   - Rehabilitation and repair of irrigation infrastructure including canals, karezes, local diversion systems from the rivers, and tube wells.

   - Strengthening of the services related to input distribution (improved seeds, fertilizer, pesticides and farm machinery) through the private sector with credit and administrative assistance from the government. Handling of input distribution through government channels in the past have proved inefficient.

2. Roads are an important infrastructure component for agricultural development, particularly for the price stabilization of agricultural products in the mountainous situation of Afghanistan. At the present time, about 2,500 km of paved roads, and a large number of unpaved roads require rehabilitation or complete reconstruction.

3. A regular price reporting service, based on bazaar surveys, is required to monitor food prices in Afghanistan. Without reliable and consistent information on prices, planning for the stabilization of food price is difficult.

APPENDIX - A

Kendall Coefficient of Concordance Test

TABLE A-1: Afghanistan's Provinces Ranked on the Basis of Annual Average Wheat Prices (1987-92) and Computation of Kendall Coefficient of Concordance for Testing Instability Of Ranks

PROVINCES	1987 RANK	1988 RANK	1989 RANK	1990 RANK	1991 RANK	1992 RANK	Rj	(Rj − ΣRj/N)	(Rj − ΣRj/N)²
KABUL	1	1	1	9	1	1	14	-48.00	2304
LOGAR	2	5	12	11	3	7	40	-22.00	484
WARDAK	3	6	15	14	3	2	43	-19.00	361
ORUZGAN	3	6	11	20	5	3	48	-14.00	196
GHAZNI	3	3	11	22	11	9	59	-3.00	9
GHOR	3	7	4	3	10	13	40	-22.00	484
PARWAN	3	5	12	12	12	6	50	-12.00	144
BAMYAN	4	5	13	8	2	11	43	-19.00	361
KANDAHAR	4	4	9	15	9	12	53	-9.00	81
BADAKSHAN	5	2	2	4	6	24	43	-19.00	361
PAKTEKA	5	8	12	17	7	14	63	1.00	1
HERAT	6	5	14	23	10	13	71	9.00	81
PAKTYA	6	7	10	16	1	8	48	-14.00	196
FARYAB	6	4	6	1	10	18	45	-17.00	289
ZABUL	7	7	11	18	4	5	52	-10.00	100
BALKH	8	12	19	17	17	17	90	28.00	784
KONAR	8	9	20	24	21	23	105	43.00	1849
TAKHAR	9	9	16	16	19	22	91	29.00	841
BADGHIS	10	11	3	2	10	13	49	-13.00	169
BAGHLAN	10	11	13	21	16	20	91	29.00	841
HELMAND	10	10	15	23	8	10	76	14.00	196
JAWZJAN	11	13	17	7	12	21	81	19.00	361
KUNDUZ	11	12	19	21	18	19	100	38.00	1444
NIMROZ	11	12	8	21	20	13	85	23.00	529
FARAH	11	11	7	19	10	13	71	9.00	81
SAMANGAN	12	12	18	6	14	16	78	16.00	256
LAGHMAN	13	11	17	13	15	15	84	22.00	484
NANGARHAR	14	11	5	5	5	13	53	-9.00	81
KAPISA	7	1	8	10	13	4	43	-19.00	361
							ΣRj = 1809		13729
							ΣRj/N = 62		

$$S = \sum (R_j - \frac{\Sigma R_j}{N})^2 = 13729$$

$$W = \frac{S}{\frac{1}{12} K^2 (N^3 - N)} = \frac{13639}{\frac{1}{12} .6^2 (29^3 - 29)} = 0.19$$

$$\chi^2 = K(N-1) W = 6(29-1)0.19 = 31.92$$

$$\chi^2_\alpha = 41.34$$

N = 29 (Number of Provinces)
K = 6 (Number of Years)
Rj = Sum of Ranks of Each Province
W = Kendall Coefficient of Concordance
χ^2 = Chi-Square Statistic computed
χ^2_α = Chi-Square critical value at (α = 0.05) and (29 - 1) d.f.

TABLE A–2 : Afghanistan's Provinces Ranked On The Basis Of Annual Standard Deviation Of Wheat Prices (1987–1992) and Computation of Kendall Coefficient of Concordance for Testing Instability Of Ranks

PROVINCES	1987 RANKS	1988 RANKS	1989 RANKS	1990 RANKS	1991 RANKS	1992 RANK	Rj	$(Rj - \sum Rj/N)$	$(Rj - \sum Rj/N)^2$
HERAT	1	10	23	21	12	12	79	-2	4
KANDAHAR	2	12	11	25	4	11	65	-16	256
PAKTYA	3	9	14	22	14	16	78	-3	9
PAKTEKA	4	14	22	12	8	17	77	-4	16
KABUL	5	1	2	6	3	1	18	-63	3969
BADAKSHAN	6	2	1	11	23	12	55	-26	676
KONAR	7	23	24	28	22	22	126	45	2025
PARWAN	8	8	21	16	12	7	72	-9	81
GHAZNI	9	5	20	19	7	8	68	-13	169
SAMANGAN	10	26	16	2	16	18	88	7	49
BAGHLAN	11	28	4	17	21	20	101	20	400
LAGHMAN	12	19	19	10	13	15	88	7	49
NIMROZ	13	24	26	18		12	93	12	144
BAMYAN	14	18	6	20	10	10	78	-3	9
LOGAR	15	6	18	7	9	4	59	-22	484
ORUZGAN	16	15	7	27	5	5	75	-6	36
GHOR	16	11	3	8	12	12	62	-19	361
HELMAND	16	16	15	29	1	13	90	9	81
BADGHIS	16	21	28	1	12	12	90	9	81
BALKH	16	22	17	13	18	23	109	28	784
KUNDUZ	17	27	9	14	19	21	107	26	676
FARYAB	18	3	13	4	20	14	72	-9	81
FARAH	19	20	15	24	12	12	102	21	441
NANGARHAR	19	7	5	5	15	6	57	-24	576
ZABUL	19	13	8	23	1	3	67	-14	196
JAWZJAN	20	25	10	3	11	19	88	7	49
TAKHAR	20	17	25	26	24	12	124	43	1849
WARDAK	20	4	12	9	6	2	53	-28	784
KAPISA	13	15	27	15	17	9	96	15	225
						$\sum Rj$ =	2337		14560
						$\sum \frac{Rj}{N}$ =	81		

$$S = \sum (R_j - \frac{\sum R_j}{N})^2 = 14560$$

$$W = \frac{S}{\frac{1}{12} K^2 (N^3 - N)} = \frac{14560}{\frac{1}{12} .6^2 (29^3 - 29)} = 0.199$$

$$\chi^2 = K(N-1) W = 6 (29-1) 0.199 = 33.47$$

$$\chi^2_\alpha = 41.34$$

N = 29 (Number of Provinces)
K = 6 (Number of Years)
Rj = Sum of Ranks of Each Province
W = Kendall Coefficient of Concordance
χ^2 = Chi-Square Statistic computed
χ^2_α = Chi-Square critical value at ($\alpha = 0.05$) and (29 - 1) d.f.

Table (A – 3) : Afghanistan's Eight Regions Ranked on Bases Of monthly Index Value of Wheat Prices For The Year 1987–1992 and Computation of Kendall Coefficient of Concordance For Testing Instability of Ranks

REGIONS	RANKS														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Rj	$(Rj-\Sigma Rj/N)$	$(Rj-\Sigma Rj/N)^2$
1. Central East	1	3	1	5	5	6	7	8	5	6	1	1	49	1.375	1.9
2. Central West	6	7	5	1	2	4	5	7	2	4	3	4	50	2.375	5.6
3. East	4	5	4	3	6	7	6	1	5	3	4	1	49	1.375	1.9
4. South	3	4	3	7	4	1	4	6	2	3	2	3	42	-5.625	31.6
5. South West	5	2	2	6	4	5	3	3	1	1	6	5	43	-4.625	21.4
6. West	2	2	7	2	1	2	8	5	4	7	7	6	53	5.375	28.9
7. North	2	1	4	8	7	7	2	2	3	2	1	2	41	-6.625	43.9
8. North East	7	6	6	4	3	3	1	4	3	5	5	7	54	6.375	40.6
												Σ Rj =	381		175.87
												Σ Rj / N =	47.625		

$$S = \sum (R_j - \frac{\Sigma R_j}{N})^2 = 175.87$$

$$W = \frac{S}{\frac{1}{12}K^2(N^3-N)} = \frac{17587}{\frac{1}{12}12^2(8^3-8)} = 0.029$$

$$\chi^2 = K\,(N-1)\;W = 12\;(8-1)\;0.029 = 2.44$$

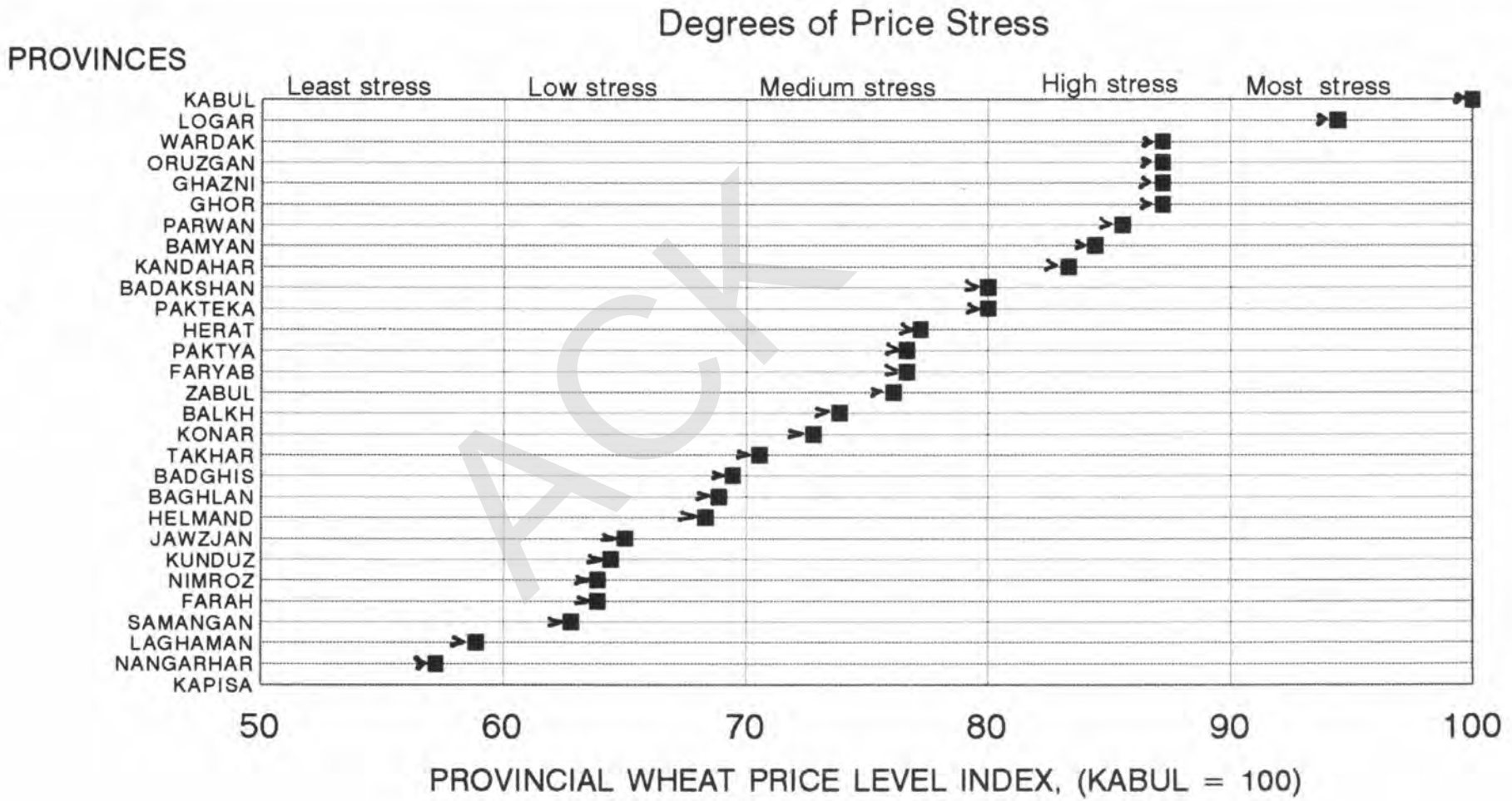
$\chi^2_\alpha = 14.07$ *at* ($\alpha = 0.05$) 8-1 *degrees of freedom.*

N = Number of Regions (8).
K = Number of Months (12).
Rj= Sum of Ranks of Each Region.
W = Kendall Coefficient of Concordance
χ^2 = Chi-Square Statistic computed.
χ^2_α = Chi-square critical value at ($\alpha = 0.05$) and (8-1) d.f.

APPENDIX - B

Wheat Price Level Index

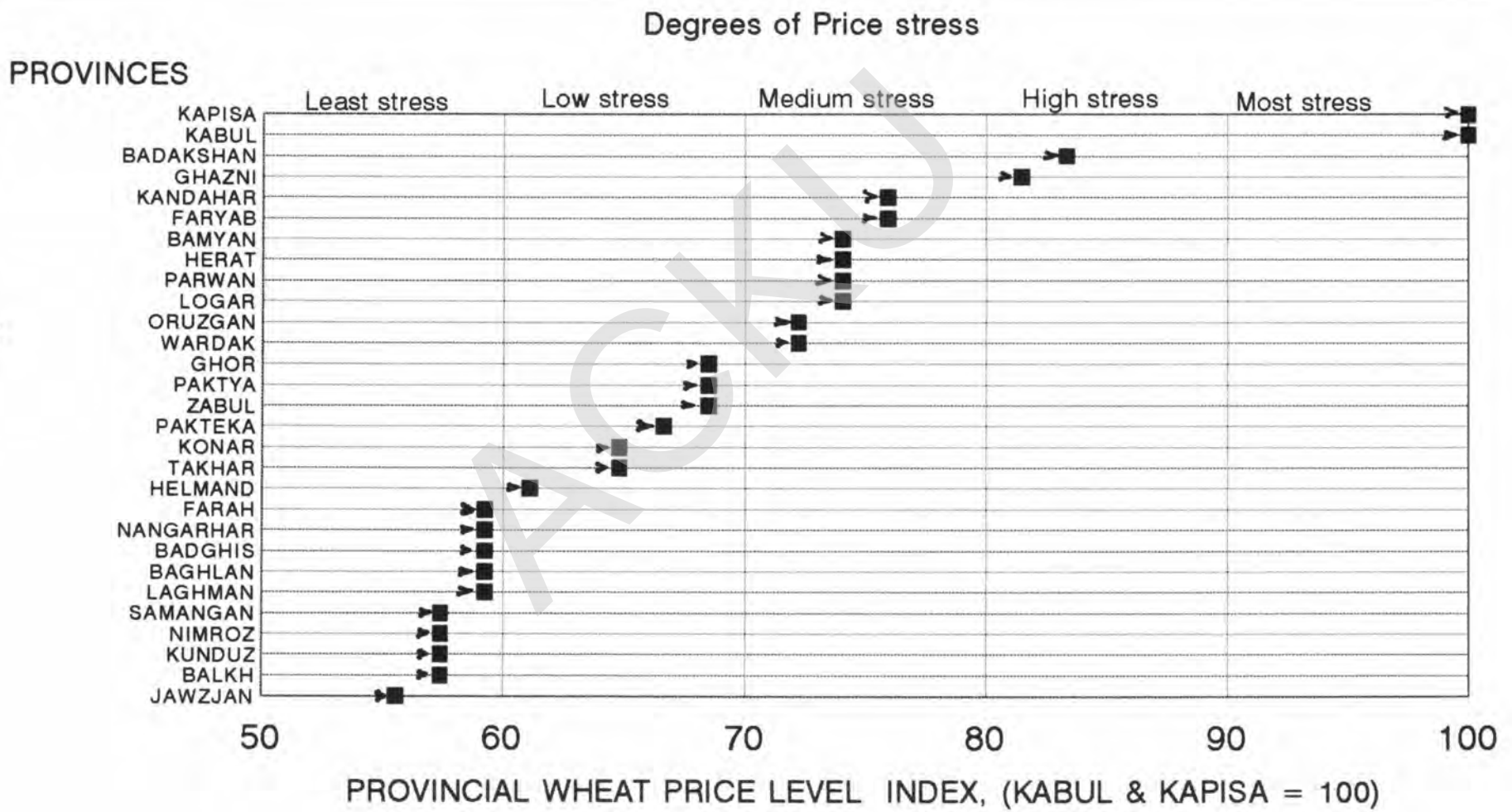
Figure(B-1) AFGHANISTAN'S PROVINCIAL ANNUAL WHEAT PRICE LEVEL INDEXES
AVERAGE FOR THE YEAR 1987
HIGHEST AVERAGE PRICE (45 AFS/KG) IN KABUL = 100



Figure(B-2): AFGHANISTAN'S PROVINCIAL ANNUAL WHEAT PRICE LEVEL INDEXES

AVERAGE FOR THE YEAR 1988

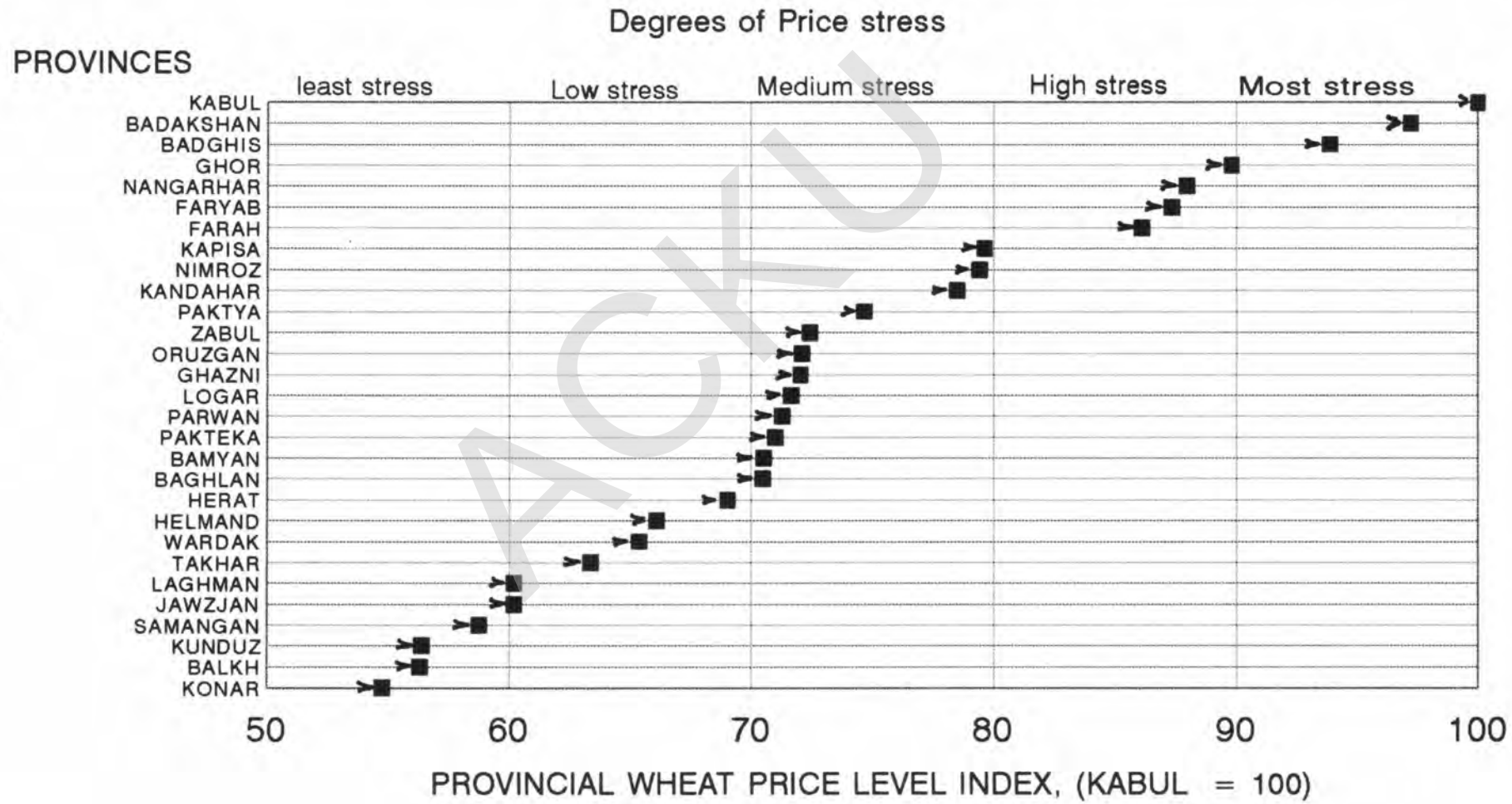
HIGHEST AVERAGE PRICE (54 AFS/KG) IN KABUL & KAPISA = 100



Figure(B-3) AFGHANISTAN'S PROVINCIAL ANNUAL WHEAT PRICE LEVEL INDEXES

AVERAGE FOR THE YEAR 1989

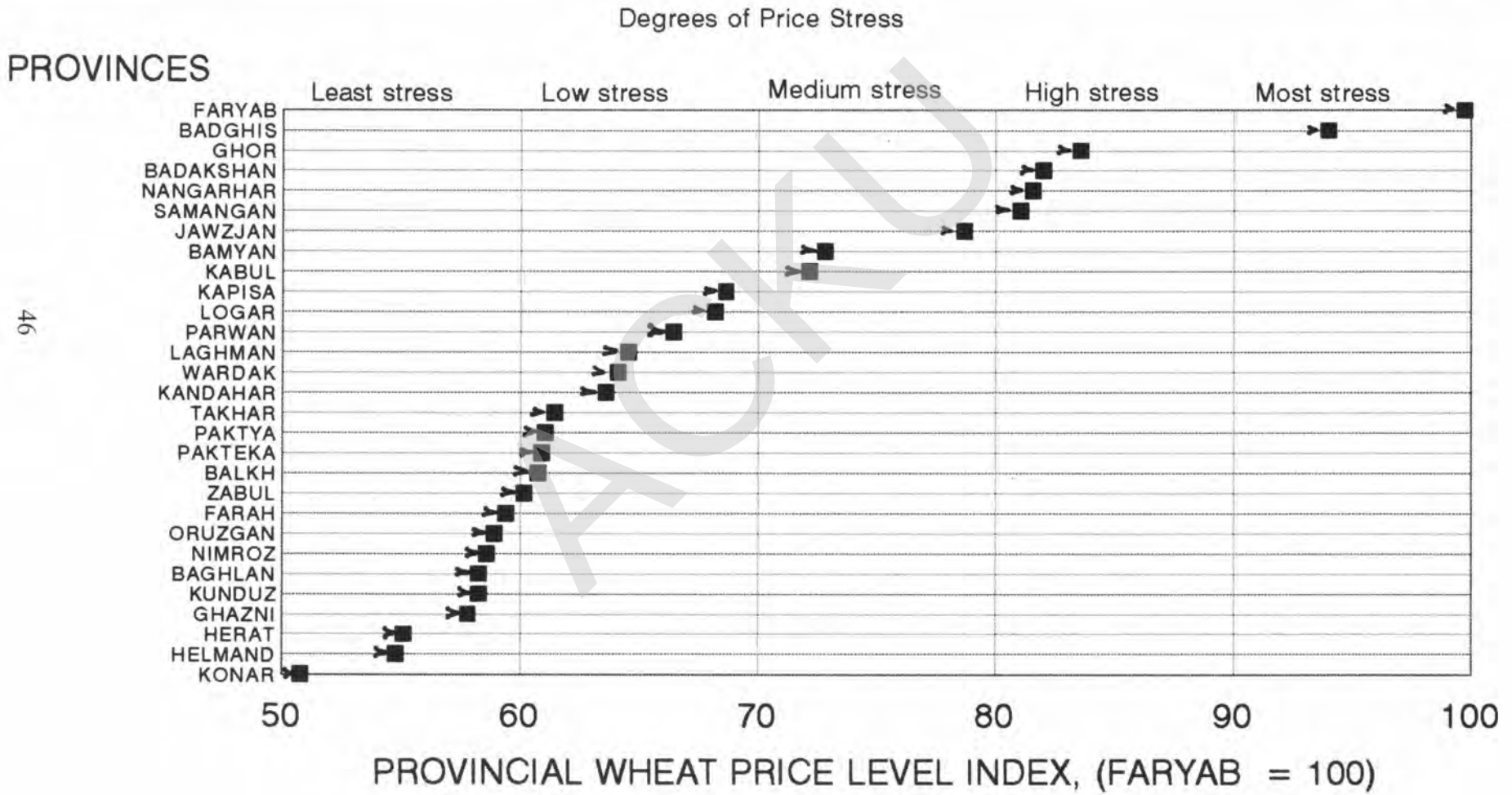
HIGHEST AVERAGE PRICE (109 AFS/KG) IN KABUL = 100



Figure(B-4) AFGHANISTAN'S PROVINCIAL ANNUAL WHEAT PRICE LEVEL INDEXES

AVERAGE FOR THE YEAR 1990

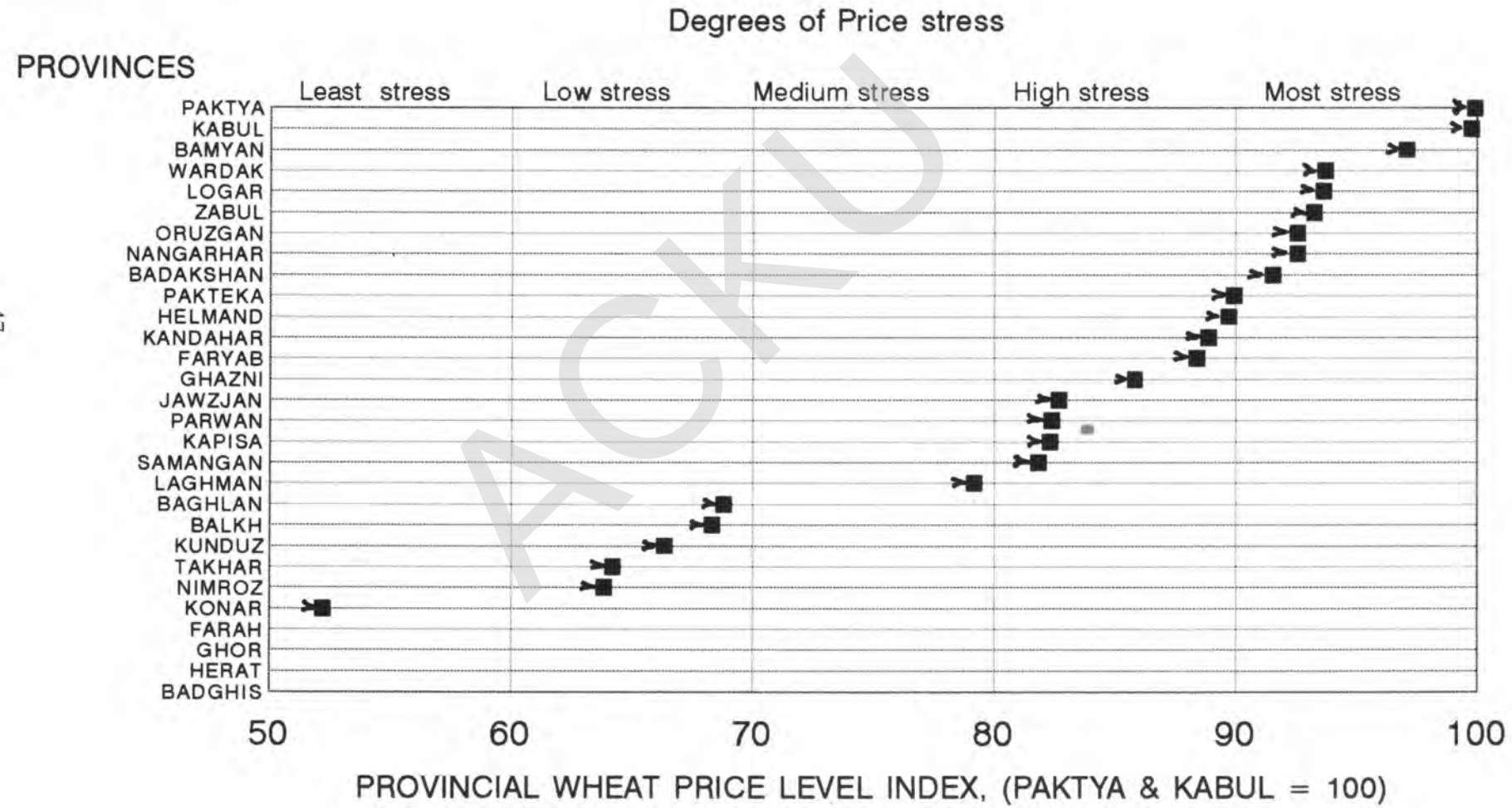
HIGHEST AVERAGE PRICE (179 AFS/KG) IN FARYAB = 100



Figure(B-5) AFGHANISTAN'S PROVINCIAL ANNUAL WHEAT PRICE LEVEL INDEXES

AVERAGE FOR THE YEAR 1991

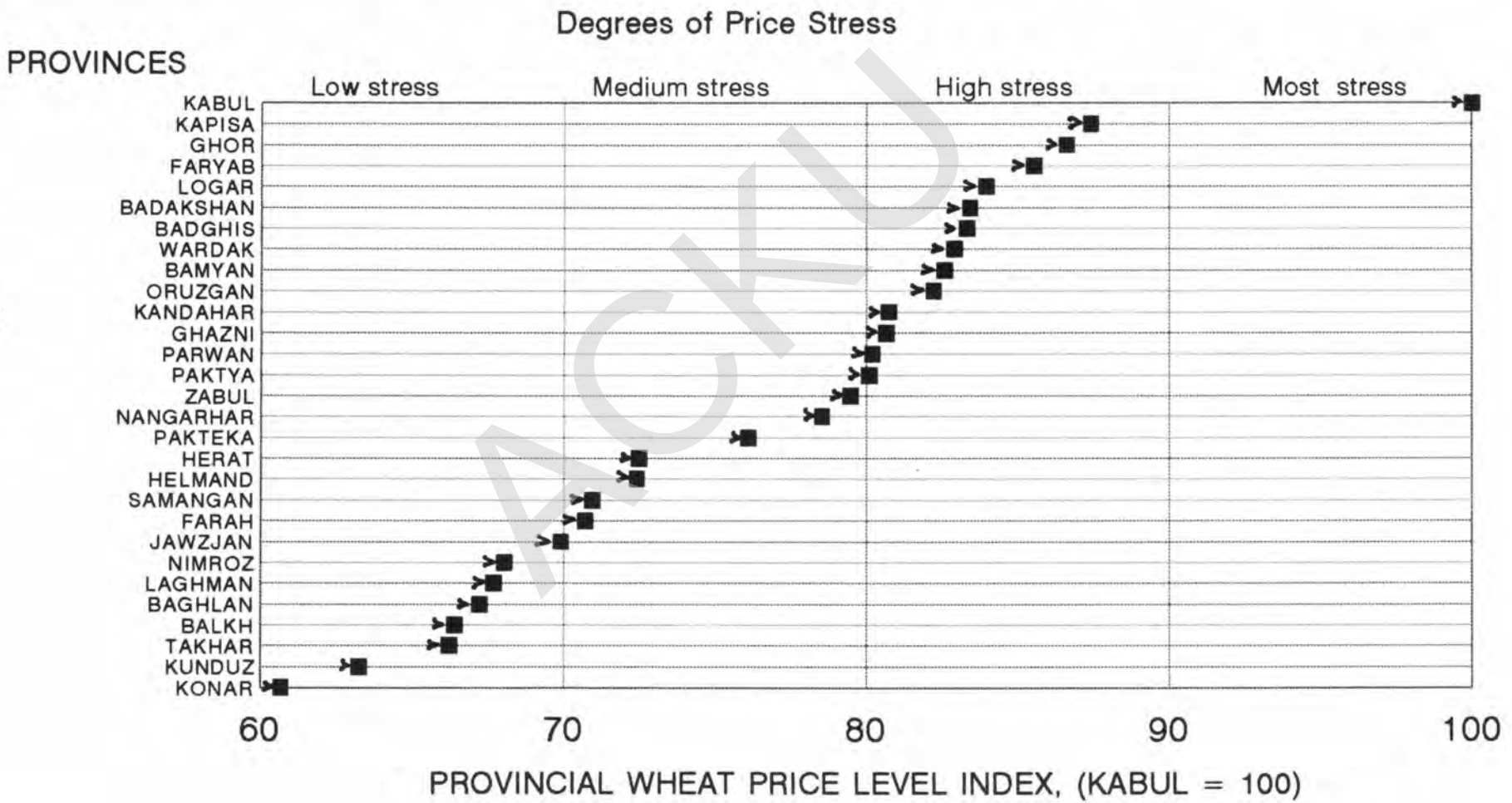
HIGHEST AVERAGE PRICE (213 AFS/KG) IN KABUL & PAKTYA = 100



Figure(B-6) AFGHANISTAN'S PROVINCIAL ANNUAL WHEAT PRICE LEVEL INDEXES

AVERAGE FOR THE YEAR 1992

HIGHEST AVERAGE PRICE (312 AFS/KG) IN KABUL = 100



APPENDIX - C

Wheat Price Variation Index

Figure: C - 1

AFGHANISTAN'S PROVINCIAL ANNUAL WHEAT PRICE VARIATION INDEX

PROVINCIAL STANDARD DEVIATION FOR THE YEAR 1987

HIGHEST STANDARD DEVIATION (8.50 AFS/KG) IN HERAT = 100

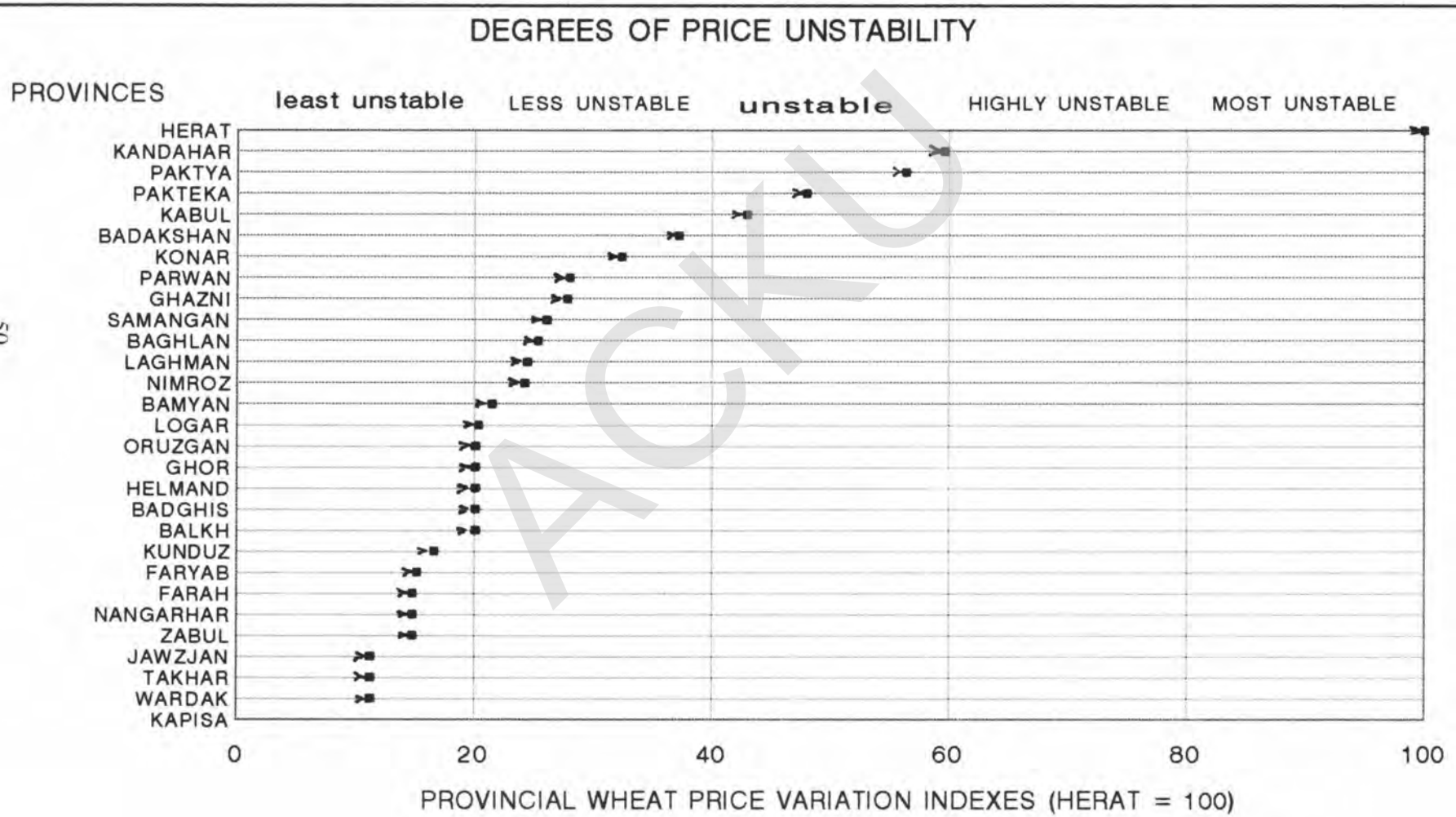


Figure: C - 2

AFGHANISTAN'S PROVINCIAL ANNUAL WHEAT PRICE VARIATION INDEX

PROVINCIAL STANDARD DEVIATION FOR THE YEAR 1988

HIGHEST STANDARD DEVIATION (26.90 AFS/KG) IN KABUL = 100

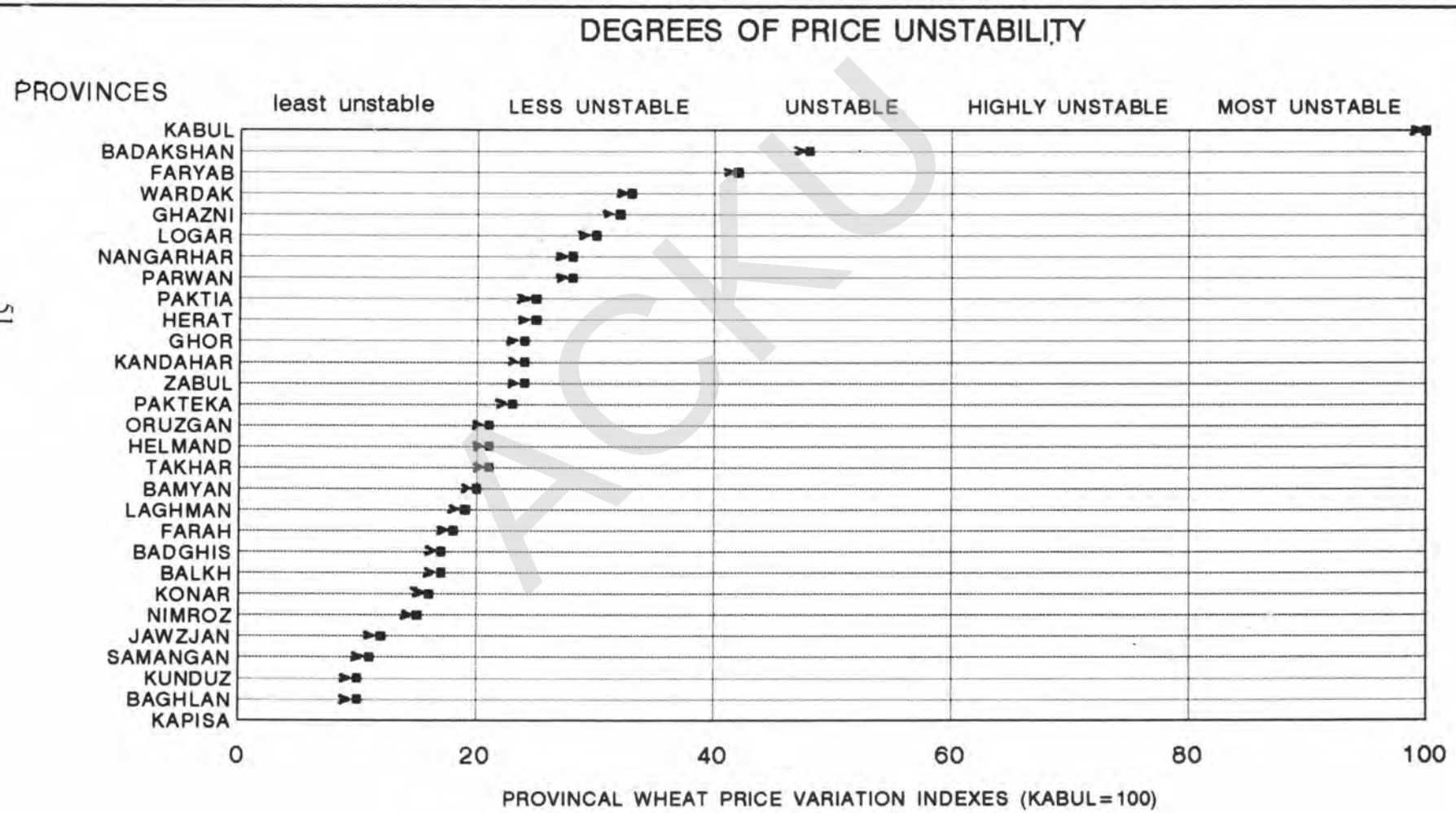


Figure: C - 3

AFGHANISTAN'S PROVINCIAL ANNUAL WHEAT PRICE VARIATION INDEX

PROVINCIAL STANDARD DEVIATION FOR THE YEAR 1989

HIGHEST STANDARD DEVIATION (50.67 AFS/KG)IN BADAKSHAN=100

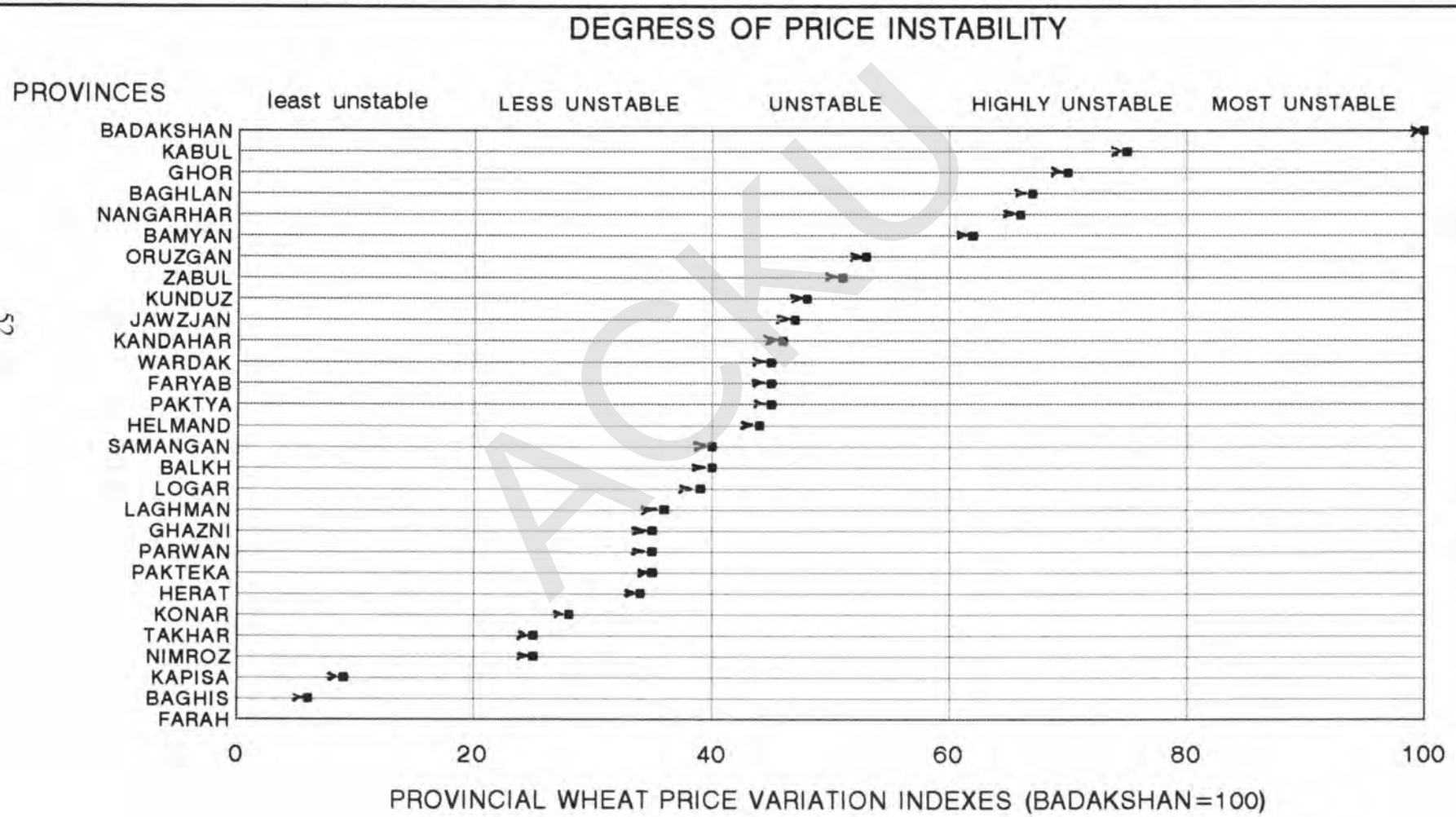


Figure: C-4

AFGHANISTAN'S PROVINCIAL ANNUAL WHEAT PRICE VARIATIONN INDEX

PROVINCIAL STANDARD DEVIATION FOR THE YEAR 1990

HIGHEST STANDARD DEVIATION (45.46 AFS/KG) IN BADGHIS=100

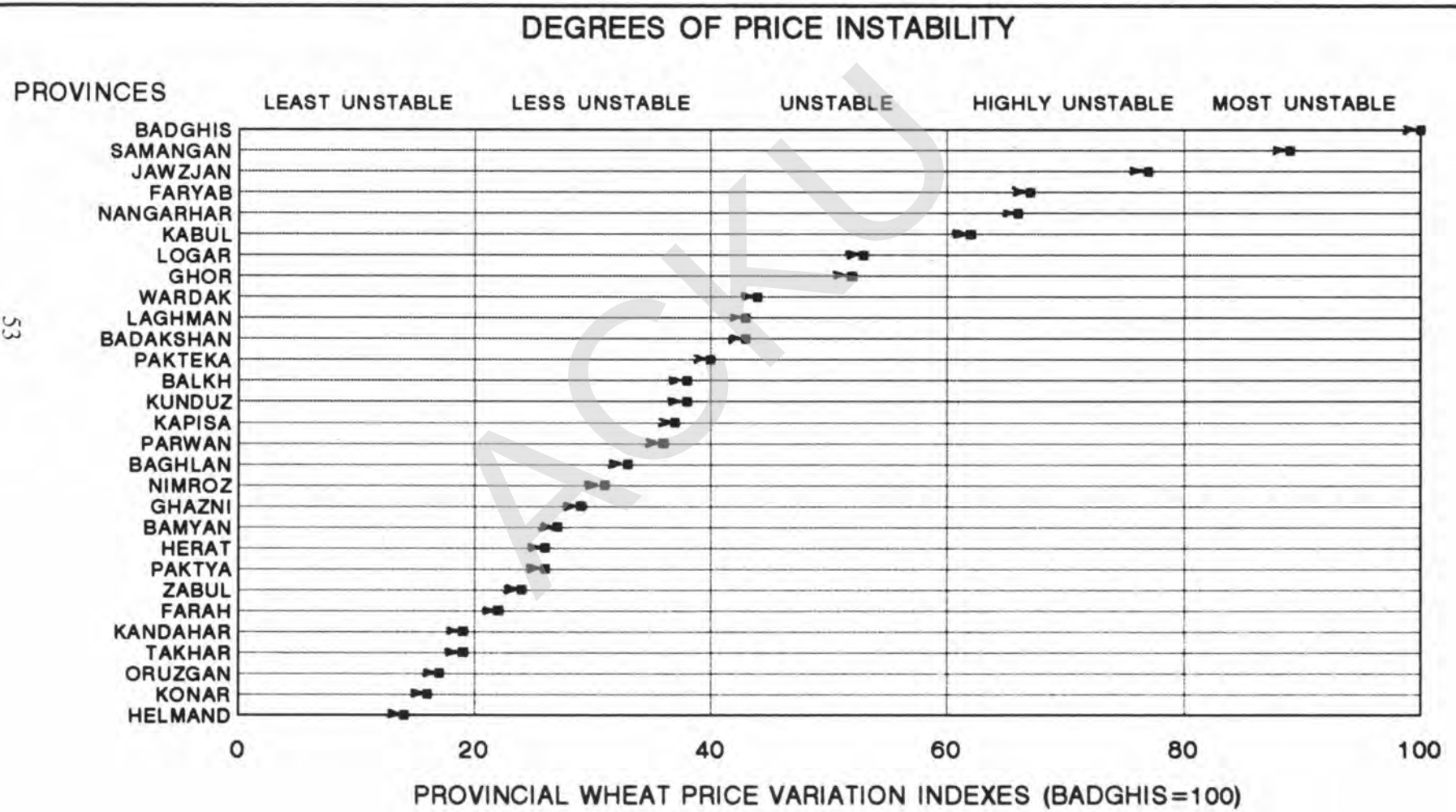


Figure: C - 5

AFGHANISTAN'S PROVINCIAL ANNUAL WHEAT PRICE VARIATION INDEX

PROVINCIAL STANDARD DEVIATION FOR THE YEAR 1991

HIGHEST STANDARD DEVIATION (100.58 AFS/KG) IN ZABUL = 100

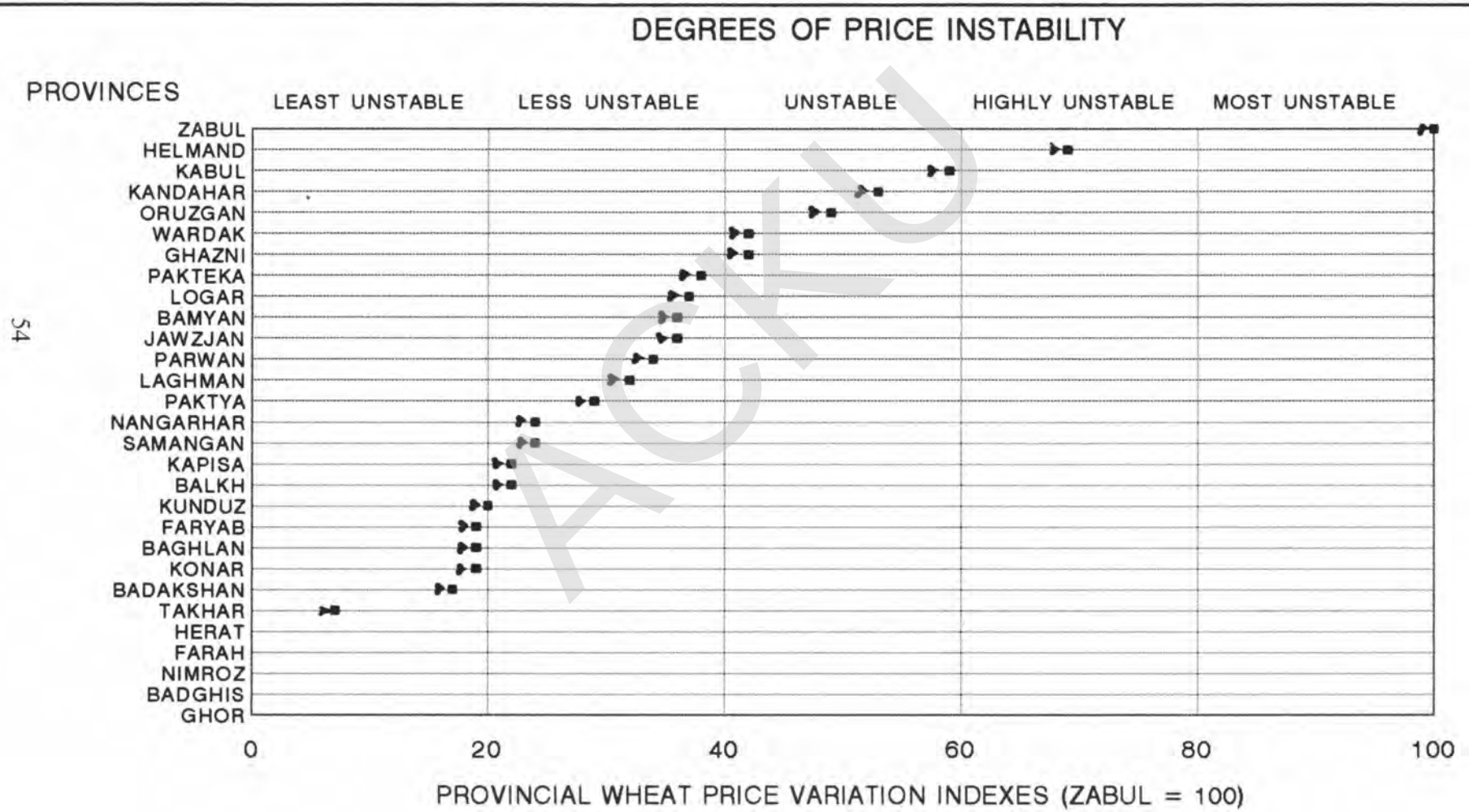
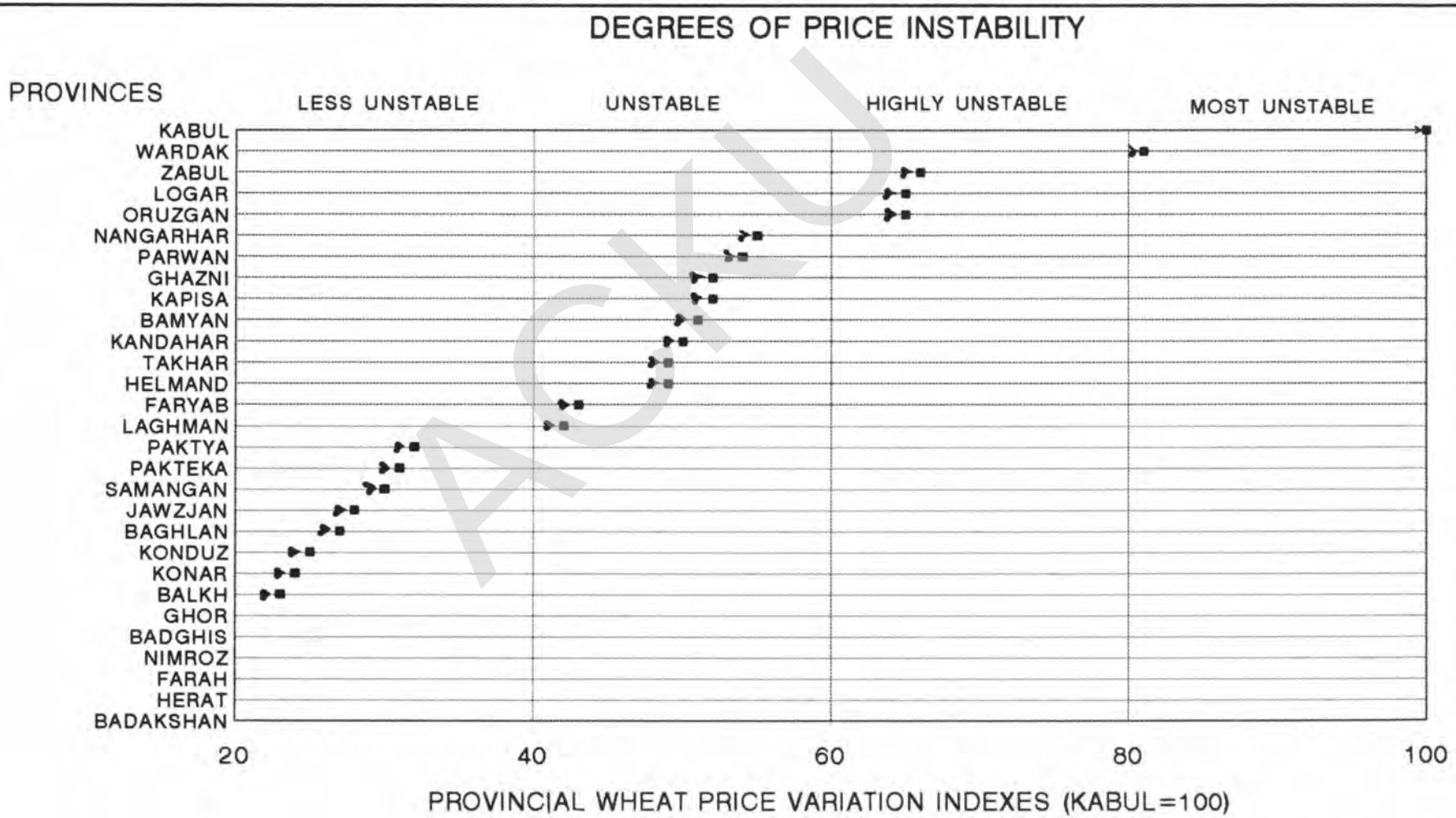


Figure : C - 6

AFGHANISTAN'S PROVINCIAL ANNUAL WHEAT PRICE VARIATION INDEX

PROVINCIAL STANDARD DEVIATION FOR THE YEAR 1992

HIGHEST STANDARD DEVIATION (175.42 AFS/KG)IN KABUL = 100



APPENDIX - D

Wheat Price Seasonal Index.

Table D–1 : Computation of Seasonal Wheat Price Index for Eight Geographical Regions Of Afghanistan. Monthly Wheat Price Data 1987–1992

REGION 1	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	AVG
	1987									41	39	42	44	42
	1988	45	49	44	42	40	29	28	30	39	48	52	67	43
(CENTRAL EAST)	1989	70	52	66			78	105	93	87	84	102	104	84
	1990	111	109	96	121	113		106	117	130	139	140	149	121
	1991	160	184	183	164	171	168	161	175	206	225	268	263	194
	1992	320	300	449	343	135	149	151	201	201	237			249
	1987									98	93	100	105	
	1988	105	113	101	98	93	67	65	69	90	112	122	156	
% values	1989	83	62	79			92	125	111	104	100	121	124	
	1990	92	90	79	100	93		87	97	108	115	116	123	
	1991	82	95	94	85	88	87	83	90	106	116	138	136	
	1992	129	121	180	138	54	60	61	81	81	95			
Seasonal Index		98	96	107	105	82	76	84	89	98	105	119	129	1189
Seasonal Index Adjusted		99	97	108	106	83	77	85	90	99	106	120	130	1200

REGION 2:	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	AVG
	1987									37	38	40	41	39
	1988	42	42	41	40	39	31	30	30	35	41	44	49	39
(CENTRAL WEST)	1989	50	44	46				114	102	100	110	109	111	87
	1990	107	100	100	116	145		119	119	126	157	129		122
	1991	157		186	200	184	173	171	190	236	246	286		203
	1992	306	290	347	404	177	173	158	164	226	172			242
	1987									95	97	102	104	
	1988	108	109	105	103	101	79	76	78	91	104	114	124	
% values	1989	57	51	52				131	118	115	126	126	127	
	1990	88	82	82	95	119		98	98	104	129	106		
	1991	77		92	99	90	85	84	94	116	121	141		
	1992	126	120	143	167	73	71	65	68	93	71			
Seasonal Index		91	90	95	116	96	79	91	91	102	108	118	119	1195
Seasonal Index Adjusted		92	91	95	116	96	79	91	91	103	108	118	119	1200

REGION 3:	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	AVG
	1987									27	27	30	30	28
	1988	31	32	33	32	30	29	29	28	31	37	44	50	34
(EAST)	1989	53	50	52			50	74	86	83	86	96	100	73
	1990	105	105	107	158			105	117	110	107	112	143	117
	1991	152	157	155	141	157	138	129	190	160	167	183	206	161
	1992	235	243	251	251	101	114	140	215	195	261			201
	1987									95	96	106	107	
	1988	92	93	96	94	88	86	84	83	90	108	130	147	
% values	1989	73	68	71			68	101	117	114	117	132	137	
	1990	90	90	92	135			90	100	94	91	96	122	
	1991	95	98	96	87	97	86	80	118	99	104	114	128	
	1992	117	121	125	125	50	57	70	107	97	130			
Seasonal Index		93	94	96	110	79	74	85	105	98	108	115	128	1186
Seasonal Index Adjusted		94	95	97	112	80	75	86	106	99	109	117	130	1200

Table D– 1 Continued .....

REGION 4:	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	AVG
	1987									36	33	38	40	37
	1988	42	42	41	40	38	31	29	29	37	45	47	48	39
(SOUTH)	**1989**	50	54	49			68	93	79	88	88	95	95	76
	1990	100	95	102	86	90		100	107	102	117	119	134	105
	1991	147	159	169	160	183	181	192	188	214	219	252	262	194
	1992	266	262	278	274	133	146	151	182	211	221			212
	1987									97	89	103	108	
	1988	107	108	105	103	97	79	74	74	94	115	121	123	
	1989	66	70	64			90	122	103	116	116	125	125	
% values	**1990**	95	91	97	82	85		95	102	97	111	113	127	
	1991	76	82	87	82	95	93	99	97	110	113	130	135	
	1992	126	124	131	129	63	69	71	86	99	104			
Seasonal Index		94	95	97	99	85	83	92	92	102	108	118	124	1190
Seasonal Index Adjusted		95	96	98	100	85	84	93	93	103	109	119	125	1200

REGION 5:	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	AVG
	1987									33	31	35	37	34
	1988	38	38	37	37	36	28	30	30	36	42	45	48	37
(SOUTHWEST)	**1989**	49	46	46			74	102	93	95	91	97	93	79
	1990	95	100	98	106	109		100	105	109	111	114	122	106
	1991	120			121	145	153	171	177	237	304			178
	1992	316	303	318	304	131	120	148	192	177	214			222
	1987									97	91	103	109	
	1988	103	103	101	99	96	76	80	82	98	114	122	131	
	1989	62	58	58			94	130	118	121	115	123	118	
% values	**1990**	90	94	92	100	103		94	99	103	104	108	115	
	1991	67			68	81	86	96	99	133	171			
	1992	142	136	143	137	59	54	67	86	80	96			
Seasonal Index		93	98	99	101	85	77	93	97	105	115	114	118	1195
Seasonal Index Adjusted		93	98	99	101	85	78	94	97	106	116	114	118	1200

REGION 6:	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	AVG
	1987									29	28	33	34	31
	1988	36	36	36	36	35	28	27	27	30	37	39	43	34
(WEST)	**1989**			51			64	57	86	88	98	93	93	79
	1990	100	100	114	150	132		100	107	95	112	114	121	113
	1991				136									136
	1992								150	200	155			168
	1987									92	90	106	110	
	1988	104	106	107	106	103	81	79	78	89	108	115	126	
	1989			65			81	72	108	111	124	118	118	
% values	**1990**	88	88	101	133	117		89	95	84	99	101	107	
	1991				100									
	1992								89	119	92			
Seasonal Index		96	97	91	113	110	81	80	93	99	103	110	116	1188
Seasonal Index Adjusted		97	98	92	114	111	82	81	94	100	104	111	117	1200

Table D–1 Continued .....

REGION 7:	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	AVG
	1987									32	30	31	32	31
	1988	34	34	35	35	33	35	32	26	30	32	35	41	33
(NORTH)	**1989**	36	45	45			59	71	82	75	93	83	97	69
	1990	105	107	100	150	122		127	136	161	171	177	176	139
	1991	186	186	136	181	169	145	142	152	156	168	195	200	168
	1992	224	223	257	243	142	148	152	150	122	193			185
	1987									104	96	100	104	
	1988	102	102	105	105	99	105	96	80	91	98	105	123	
	1989	52	65	65	0	0	86	103	119	109	135	120	140	
% values	**1990**	75	77	72	108	87	0	91	98	116	123	127	127	
	1991	111	111	81	108	101	86	85	90	93	100	116	119	
	1992	121	121	139	131	77	80	82	81	66	105			
Seasonal Index		92	95	92	90	73	71	92	94	96	109	114	123	1141
Seasonal Index Adjusted		97	100	97	95	77	75	96	98	101	115	120	129	1200

REGION 8:	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	AVG
	1987									32	30	32	34	32
	1988	35	36	37	36	33	27	29	30	42	43	43	35	35
(NORTH EAST)	**1989**	38	37	45			57	179	81	82	82	88	93	78
	1990	98	107	97	107	109		107	111	120	128	138	129	114
	1991	129	136	129	143	159	140	137	154	156	168	175	162	149
	1992	217	207	219	229	123	126	127	146	117	154			166
	1987									101	95	99	105	
	1988	101	101	105	101	94	77	81	86	121	122	124	99	
	1989	49	47	57			73	229	103	105	105	113	119	
% values	**1990**	86	94	85	94	96		94	97	105	113	121	113	
	1991	87	91	87	96	107	94	92	103	104	113	117	109	
	1992	131	125	132	138	74	76	77	88	70	92			
Seasonal Index		91	92	93	107	93	80	115	96	101	107	115	109	1197
Seasonal Index Adjusted		91	92	93	108	93	80	115	96	101	107	115	109	1200

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