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Rice Trade Liberalization and Rice Price Volatility

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Prior to 1998 the Indonesian government maintained a monopoly over international trade in rice, with exports and imports controlled by the national logistics agency (Bulog). In 1998 the government agreed to liberalize rice trade, allowing private importers to compete with Bulog. This policy became effective in late 1998 and the first significant private sector rice imports began in early 1999.

Following liberalization, concerns were raised that the government had lost the ability to stabilize the domestic price of rice. It was feared that changes in the world market would dictate the movement of domestic rice prices. A significant drop in the farmgate price of unhusked rice (*gabah*) during the main harvest in 2000 was blamed on a flood of rice imports, seeming to confirm these fears. More recently, a sharp surge in rice prices in January 2002, with the average retail price rising by up to 30% in just two weeks in several major cities, was blamed on rising prices in the world market.

These experiences have rekindled a debate on the wisdom of opening up the domestic rice market to international trade. The main fear is that rice prices will become excessively volatile, rising or falling with a world rice market commonly viewed as thin and unstable. Policymakers have therefore discussed the possibility of restoring some degree of direct government control over rice trade. While details have not been discussed publicly, such controls would presumably go well beyond the protection offered by the current rice import tariff of Rp 430 per kilogram.

Although it is widely assumed that rice prices are more volatile under a liberalized trading environment, an empirical analysis of the pre-liberalization and post-liberalization volatility has not yet been conducted. However, as there have now been three full years of experience with rice trade liberalization, it is statistically possible to compare volatility before and after liberalization. This short note presents a first pass at such a comparison, using urban retail milled rice (*beras*) price data and rural farmgate unhusked rice (*gabah*) price data over the period 1980 to 2001.

Volatility of urban *beras* prices

Data on the urban price of rice are available in index form from the national statistics agency (BPS) for the period April 1990 to the present (January 2002).1 Prior to April 1990, data on

1 The rice price index is a component of the urban CPI. From April 1990 to December 1996, the urban CPI covered all 27 provincial capital cities. Beginning in January 1997, 17 new cities were added.

the average price of medium quality rice are available from Bulog. These two data sources have been combined to create a monthly rice price index from January 1980 to January 2002 (see Appendix 1).

To compare pre-liberalization and post-liberalization volatility, a statistical measure of volatility was constructed over sequential three year time periods. This time horizon was chosen because three years of domestic price data are now available for the post-liberalization period. The statistic used to measure volatility is the coefficient of variation, calculated as the standard deviation divided by the mean. This statistic is invariant to units of measure.

Table 1 shows the coefficient of variation for urban rice (*beras*) prices from 1981 to 2001, calculated from the monthly data in Appendix 1. The table shows that the three year period with the most stable rice prices was from 1984 to 1986, while the period with the most unstable rice prices was from 1996 to 1998. (The last half of this second period, from July 1997 to December 1998, was dominated by the economic crisis, which saw a tripling of urban rice prices).

Table 1. Volatility of urban beras prices, before and after rice trade liberalization.

Time Period	Coefficient of Variation* (%)
January 1981 - December 1983	12.8%
January 1984 - December 1986	4.9%
January 1987 - December 1989	11.7%
January 1990 - December 1992	6.8%
January 1993 - December 1995	14.2%
January 1996 - December 1998	49.3%
January 1999 - December 2001	6.4%
Average pre-crisis (1981-1995)	10.1%
Average post-crisis (1999-2001)	6.4%

*The coefficient of variation is calculated as the standard deviation divided by the mean.

Source: See Appendix 1.

Excluding the crisis period, the average coefficient of variation prior to rice market liberalization (1981-1995) was 10.1%. By contrast, the average coefficient of variation in the post-liberalization period (1999-2001) was 6.4%. Evidently, urban rice prices have been

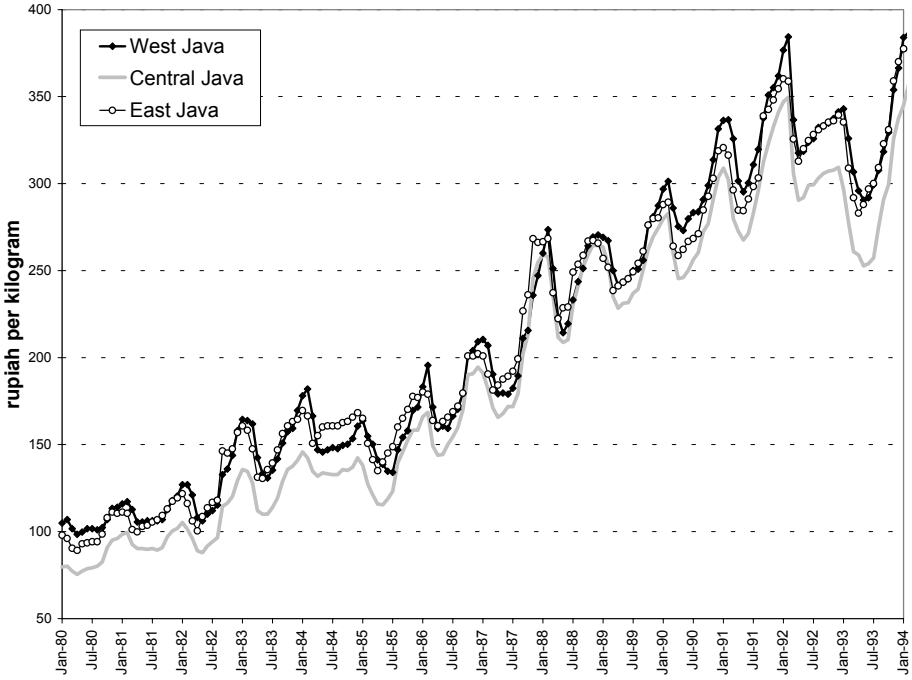
more stable, on average, since the liberalization of rice trade than they were during the period when Bulog held a trade monopoly.2

Volatility of farmgate *gabah* prices

Prior to rice market liberalization, Bulog was expected to stabilize not only urban rice prices but also farmgate prices, by purchasing rice during the harvest season and selling it back during the lean season (*paceklik*). Liberalization might therefore be expected to cause the farmgate price of *gabah* to become more volatile. This is investigated using the farmgate price of *gabah* in West, Central and East Java (the three largest producing provinces) as published by BPS, for the period 1980 to 2001 (see Appendix 2).

Figures 1 and 2 show the farmgate price of *gabah* by month in these three provinces from 1980 to 2001. The salient feature obvious in these figures is the strong seasonality of *gabah* prices, with the price of *gabah* falling each year between January/February and April/May, and subsequently rising. This seasonality corresponds to the main rice harvest that occurs in March and April.

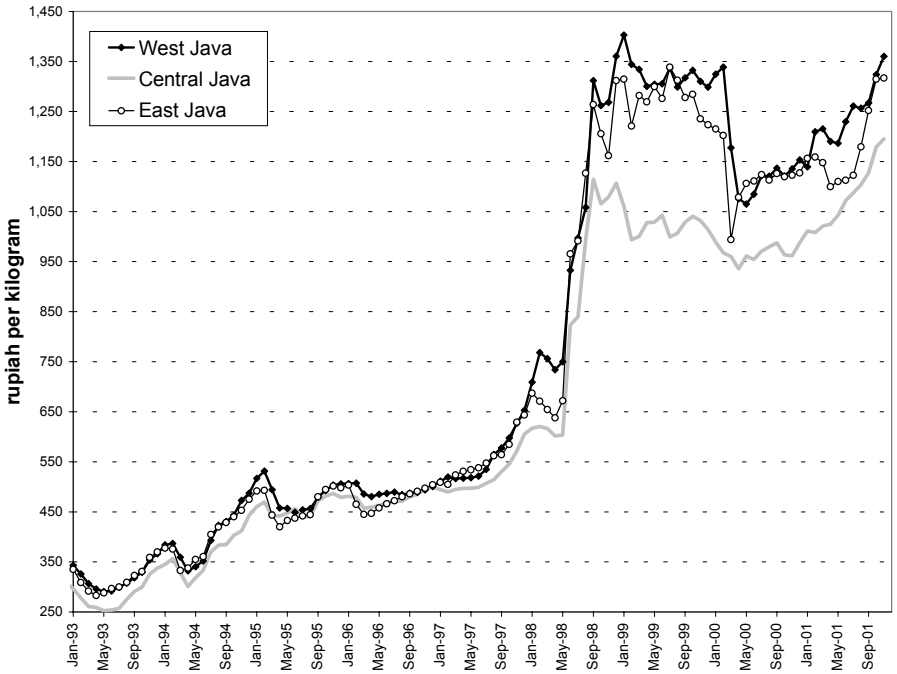
Figure 1. Seasonality in the farmgate price of gabah, 1980-1993.



Source: See Appendix 2.

2 Note that if the January 2002 surge in rice prices is included (by measuring the coefficient of variation from February 1999 to January 2002) the coefficient of variation rises to 7.0%, which is still substantially less than the coefficient of variation in the pre-liberalization period.

Figure 2. Seasonality in the farmgate price of gabah, 1993-2001.



Source: See Appendix 2.

Table 2 shows the coefficient of variation over three year periods from 1980 to 2001. The average coefficient of variation during the pre-liberalization period (1980 to 1995) ranges from 13.1% in East Java to 14.6% in Central Java. During the post-liberalization period (1999-2001) the coefficient of variation averages between 5.9% and 7.7%. The decline in volatility following rice trade liberalization is even more pronounced for farmgate *gabah* prices than for urban *beras* prices.

Table 2. Volatility of rural gabah prices before and after rice trade liberalization.

	Coefficient of Variation (%)		
Time Period	Jawa Barat	Jawa Tengah	Jawa Timur
Dec 1980-Nov 1983	15.4%	15.1%	16.6%
Dec 1983-Nov 1986	10.8%	12.6%	8.6%
Dec 1986-Nov 1989	13.2%	14.7%	12.7%
Dec 1989-Nov 1992	8.8%	9.3%	9.6%
Dec 1992-Nov 1995	19.0%	21.4%	17.8%
Dec 1995-Nov 1998	37.0%	32.0%	36.6%
Dec 1998-Nov 2001	7.7%	5.9%	7.5%
Average Dec 1980-Nov 1995	13.4%	14.6%	13.1%
Average Dec 1998-Nov 2001	7.7%	5.9%	7.5%

Source: See Appendix 2.

Figure 2 indicates that there was a large drop in the price of *gabah* during the 2000 harvest season in both East Java and West Java. However, analysis of the annual peak-to-trough movement in rice prices indicates that this drop was by no means unusual. During the period 1980 to 1996, the average decrease in the farmgate price of gabah during the harvest period amounted to 15.0% in West Java, 13.9% in Central Java and 13.4% in East Java. The drop in

2000 in West Java (20.4%) and East Java (17.3%) was greater than this historical average, but it was less than the historical average in Central Java (see Table 3). Moreover, although the 20.4% drop in West Java *gabah* prices in 2000 was large, it was not unprecedented, as similar declines had been recorded in 1983, 1985, 1988, and 1992. Based on this analysis, it appears that the decline in *gabah* prices in 2000 was exactly what would have been expected in response to an excellent rice harvest during the period when Bulog monopolized international rice trade. Normal seasonality, rather than a flood of rice imports, is a sufficient explanation for the drop in the price of *gabah* between February and April 2000.

Conclusion

This brief analysis reveals that rice prices were more volatile during the period when Bulog held a monopoly over rice imports than they have been since rice trade was liberalized in late 1998. This finding is not surprising, because imports and exports are the most effective way to stabilize domestic prices given unstable domestic production. Controls over rice trade, such as those exercised by Bulog prior to 1999, increase domestic price stability only if the primary source of instability is from the world market.3 The finding that stability has increased since liberalization suggests that the primary source of rice price instability in Indonesia is the volatility of domestic production.

The fact that rice prices have been relatively stable over the past three years, following rice trade liberalization, does not ensure that prices will remain stable in the future. It is possible that world prices could rise sharply if simultaneous crop failures occurred in several major producing countries. With relatively open borders this would push up domestic prices. However, the volume of rice traded on the world market has more than doubled over the past two decades and major new exporters, such as Vietnam and India, have emerged, creating a more competitive market. This has resulted in world rice prices being much more stable in the 1990s than they were in the 1970s or 1980s. For example, in response to the 1997/98 El Niño drought, the average price of Thai 25% brokens rose by only 3%, despite a surge in Indonesian rice imports.4 Because the world market is so much more stable than it used to be, allowing free trade in rice is likely to lead to greater price stability for Indonesia then would a return to the New Order model of state-managed trade under the control of a rice monopolist.

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3 World prices can be volatile either because world prices in dollars are volatile or because the exchange rate is volatile.

4 The average price of Thai 25% brokens rose from $236 per ton during the second half of 1997 to $243 per ton during the first half of 1998. Thai 15% brokens rose by 10% over this period. Indonesian rice imports reached 6 million tons in 1998.

Table 3. Seasonal change in *gabah* prices (annual trough to annual peak**)**

Season	Trough or Peak	Price of Gabah (Rp/kg)			Percentage Change		
		Jawa Barat	Jawa Tengah	Jawa Timur	Jawa Barat	Jawa Tengah	Jawa Timur
musim panen	Apr-80	98	75	89			
paceklik	Feb-81	117	99	111	19.4%	32.0%	24.7%
musim panen	Apr-81	106	90	100	-9.4%	-9.1%	-9.9%
paceklik	Jan-82	127	105	122	19.8%	16.7%	22.0%
musim panen	Apr-82	106	88	100	-16.5%	-16.2%	-18.0%
paceklik	Jan-83	164	135	161	54.7%	53.4%	61.0%
musim panen	May/Jun 83	131	110	131	-20.1%	-18.5%	-18.6%
paceklik	Jan-84	182	145	170	38.9%	31.8%	29.8%
musim panen	Apr/May 84	146	132	151	-19.8%	-9.0%	-11.2%
paceklik	Dec/Jan 85	168	142	165	15.1%	7.6%	9.3%
musim panen	Apr-85	134	116	135	-20.2%	-18.3%	-18.2%
paceklik	Jan-86	196	168	180	46.3%	44.8%	33.3%
musim panen	Apr-86	161	144	161	-17.9%	-14.3%	-10.6%
paceklik	Jan-87	211	195	202	30.7%	35.4%	25.5%
musim panen	Apr-87	179	166	181	-14.9%	-15.0%	-10.2%
paceklik	Feb-88	274	259	268	52.7%	56.4%	48.0%
musim panen	Apr/May 88	214	210	222	-21.7%	-19.0%	-17.1%
paceklik	Nov/Dec 88	271	265	267	26.3%	26.0%	20.2%
musim panen	Apr-89	242	228	239	-10.7%	-13.7%	-10.8%
paceklik	Feb-90	301	283	289	24.7%	23.8%	21.3%
musim panen	May-90	273	246	259	-9.4%	-13.0%	-10.6%
paceklik	Feb-91	337	309	321	23.3%	25.6%	24.0%
musim panen	May-91	295	268	285	-12.4%	-13.4%	-11.3%
paceklik	Feb-92	384	350	360	30.3%	30.7%	26.6%
musim panen	Apr-92	318	291	313	-17.4%	-16.9%	-13.2%
paceklik	Jan-93	343	309	340	8.0%	6.5%	8.5%
musim panen	May-93	291	253	283	-15.3%	-18.3%	-16.6%
paceklik	Feb-94	387	357	378	33.2%	41.3%	33.3%
musim panen	Apr-94	332	301	333	-14.2%	-15.7%	-11.8%
paceklik	Feb-95	531	470	493	60.0%	56.1%	48.2%
musim panen	Apr-95	449	442	420	-15.5%	-6.0%	-14.8%
paceklik	Jan-96	508	487	504	13.1%	10.1%	19.9%
musim panen	Apr-96	481	457	445	-5.3%	-6.1%	-11.7%
paceklik	Feb-97	520	500	509	8.2%	9.4%	14.4%
musim panen	Apr-97	518	497	531	-0.4%	-0.6%	4.4%
paceklik	Feb-98	768	621	687	48.4%	24.9%	29.4%
musim panen	Apr-98	734	602	638	-4.5%	-3.1%	-7.2%
paceklik	Jan-99	1,400	1,107	1,315	90.8%	84.0%	106.1%
musim panen	Apr-99	1,300	1,028	1,270	-7.1%	-7.2%	-3.4%
paceklik	Feb-00	1,339	968	1,202	3.0%	-5.9%	-5.3%
musim panen	Mar/May 00	1,065	936	994	-20.4%	-3.3%	-17.3%
paceklik	Jan/Mar 01	1,215	1,011	1,159	14.1%	8.1%	16.6%
musim panen	Apr/May 01	1,187	1,100	1,025	-2.3%	8.8%	-11.6%
Average increase from trough to peak, 1980-1996:					**31.0%**	**31.1%**	**28.5%**
Average decrease from peak to trough, 1980-1996:					**-15.0%**	**-13.9%**	**-13.4%**