Relative Profitability from Production and Trade

A Study of Selected Potato Markets in West Bengal

Based on the results of a two-year market survey, this paper studies the phenomenon of low prices received by potato farmers in West Bengal even as traders make huge profits. The paper argues that the differential profit earned by producers and traders, especially large traders, is due to the informational advantage enjoyed by the latter and suggests the formation of small sellers' cooperatives to ensure proper flow of information.

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I
Introduction

A well known problem faced by Indian farmers is that they often do not get a fair price for their produce. A disproportionately large fraction of the price consumers pay does not go to farmers but is appropriated by middlemen and traders. This problem arises mainly because farmers cannot directly reach consumers. They have to depend on middlemen or traders to market their products.

By definition, traders are agents who buy in one market and sell in another. The markets where they buy and those where they sell are separated either spatially or inter-temporally, or both. An incident of spatial trade takes place when the trader buys from a producer at the local village market and sells to a wholesaler in a distant city market. Again, inter-temporal trade takes place when the trader buys at one point in time, say, in the post-harvest period, and sells at another point in time, say, in the pre-harvest period. In the first case, the farmer cannot reach the distant city market because of the lack of an appropriate network. In the second case, he cannot hold his stocks from the busy post-harvest season to the lean pre-harvest season due to immediate cash requirements and lack of credit. So, in both instances he has to depend on the trader, who in turn makes full use of this dependence to reap supernormal profits. Of course, such supernormal profits would not be possible if there were sufficient competition among traders. Unfortunately, in many Indian agricultural markets such competition is absent, and markets are controlled by a small number of traders who manage to earn oligopolistic profits.

The present paper attempts to demonstrate this phenomenon, namely, the one of low prices received by farmers coexisting with high profits made by traders. It does so by reporting the results obtained from a two-year survey conducted on potato markets in West Bengal for the production years 1999 and 2000. Our survey results show that: (1) potato farmers in West Bengal survive on very small nominal profits; (2) profits become negative when we impute for factors of production, like family labour, which are owned (and not bought from the market) by the farmers; (3) on average larger farmers get a better price for their output than smaller farmers; and (4) profits from pure inter-temporal trade are exorbitantly high. Finally, we indicate the main reason why traders are making huge profits while farmers are making losses.

The paper is organised as follows. In Section II, we give a brief description of the potato market in West Bengal. In Section III, we report the estimates of costs, revenues and profits of potato producers belonging to different size classes. In particular, we present alternative estimates of costs based on different layers of imputations. It is shown that if own factors of production are imputed, profits of producers become negative. In Section IV, we try to get an estimate of pure inter-temporal trade from our survey data and show that it is very high. Section V puts forward a possible reason for why traders are making so much more profits than the producers. Section VI concludes the paper.

II
Potato Markets in West Bengal

West Bengal is a major potato producing state, accounting for about 33 per cent of the national output. Within the state, potato is the most important subsidiary crop, the main crop being rice. Sowing of potato takes place in late November or early December and the crop is harvested in late January or early February. Thus there is roughly a three-month production lag.

After harvest, a small part of the produce goes directly to the market through various layers of middlemen. Another part, also quite small, is stored in the producers' households. This latter bit cannot be stored for more than three months. The remaining output, which is the bulk of the produce, is taken for cold storage. The cold stores open for loading in March and close, for technical reasons, in April to reopen again in May. From May, potato is continuously taken out from the stores for the next nine months, to meet constant demand.

Potato has to go through a number of intermediate markets to travel from the producer to the consumer. But apart from the wholesale markets at various stages and the final retail market, there is an active *bond market* for potato. It is necessary to explain, at the outset, what the potato bond market is all about. When a producer or anyone else keeps a bag of potatoes in a cold store, he gets a receipt from the storeowner. This receipt, when produced at the store at a later stage, entitles the receipt holder to get a bag of potatoes. Now, this receipt, which is transferable and is freely bought and sold in an open market, is called a potato bond. The market where it is transacted is called the bond market for potato.

Figure 1: Index of Stockholding and Average Price Received by Producers (1999)
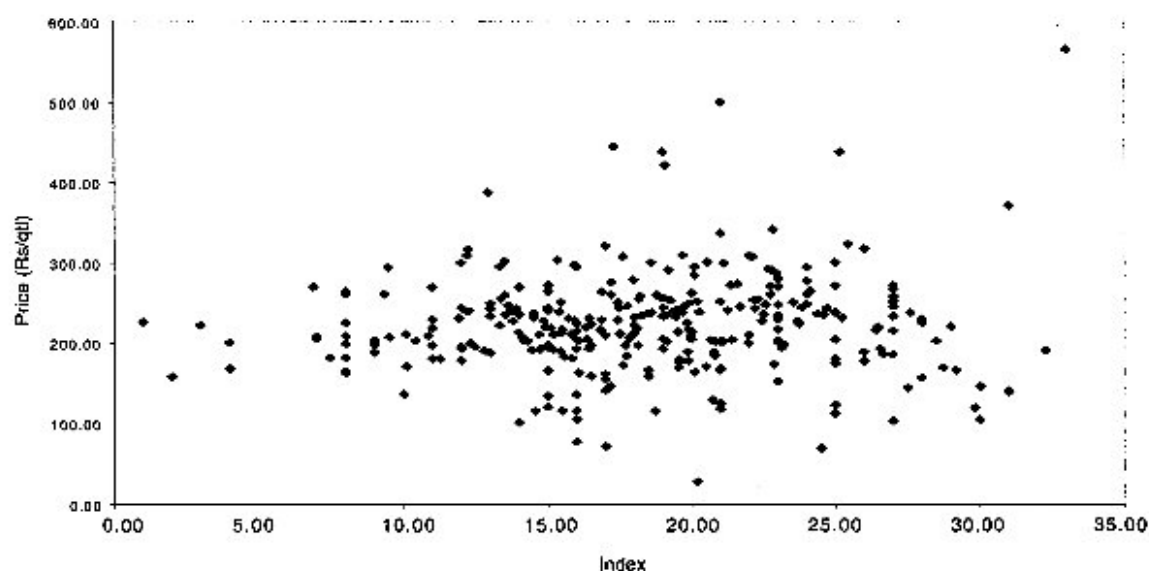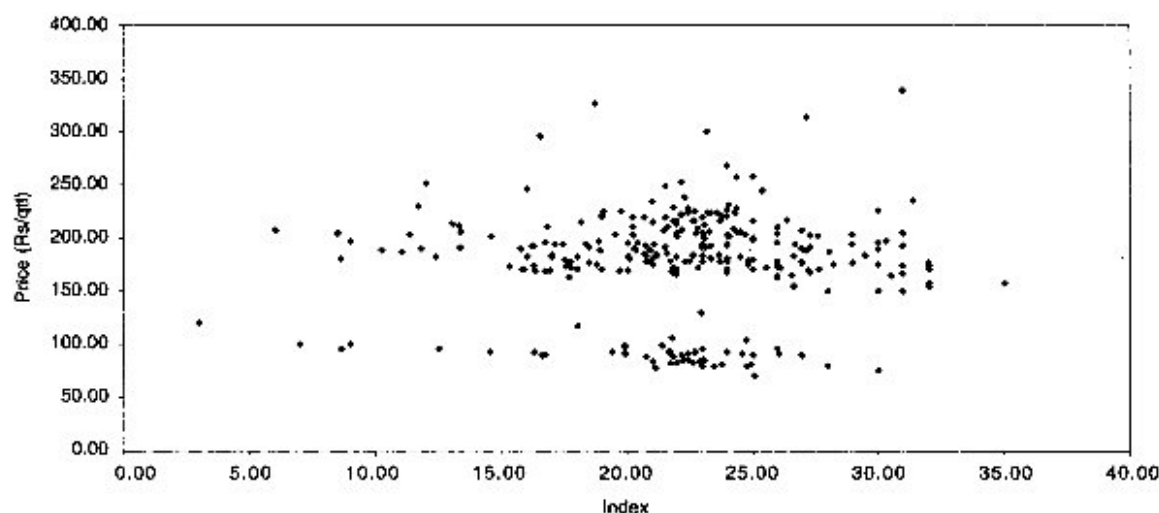

Figure 2: Index of Stockholding and Average Bond Price Received by Producers (2000)

Usually, a producer who has kept his potatoes in the cold store, does not release them himself. Instead, he sells the bonds to another person at an opportune moment. The person who buys these bonds may, in turn, sell them to a third party and in this way bonds may change hands several times before they are finally produced at the cold store and the potato is released. Evidently, there are agents operating in the bond market who are pure speculators. They buy bonds at some point in time with the expectation of selling them at a future date at a higher price. Typically, there is a whole range of speculators operating in the bond market depending on their scale of operation.

Three comments may be made in the context of speculation in the bond market. First, at any point of time there is normally a constant difference between the bond price of potato and the wholesale price. This constant difference is due to the storage cost. When potato is released from the store, a constant storage fee per bag is to be paid. This fee is independent of the number of weeks the bag of potato has been kept in the cold store. The reason is that when a bag is withdrawn from the store in the middle

of the year, the empty space cannot be used till the next production period. Hence a storage fee is charged as if the bag has been kept in the store for the entire year. Due to this constant difference, the time series of bond prices is an excellent representation of the time series of wholesale potato prices.

Second, any agent who buys bonds at one point in time and sells in another may be called an inter-temporal trader. In other words, we are not making any distinction between speculators and inter-temporal traders.

Third, in order that there is speculation in the market, inter-temporal prices should not exhibit any *predictable* trend, for any such trend would be arbitraged away by the speculators if it were present. This is exactly what we find when we look at the weekly

Table 1: Sample Distribution across Size Classes (all Villages)

Size Class	0-2	2-4	4-6	6-10	10 and Above	Total
Sample size	107	95	47	93	43	385

Note: 1 bigha = 0.331 acre.

movement of bond prices over the year (Figures 1 and 2). In particular, the figures reveal that bond prices do not exhibit any upward rising seasonal trend.

This, in turn, has an important implication. A standard explanation as to why small producers on average get a lower price than large producers and traders is provided in terms of 'distress sales' [Bhaduri 1983] for a detailed exposition of this idea). It is argued that the producers, especially the smaller ones, need cash just after the harvest to repay their old loans. Therefore, they are compelled to sell their output just after the harvest. These distress sales, in turn, increase supply and depress prices in the post-harvest period. The traders buy part of the output that is sold by the producers at the low post-harvest price to sell them later at a high pre-harvest price.

The observed time series of potato bond prices rejects the 'distress sales' explanation. If the 'distress sales' explanation is correct, then one should observe a clear trend of increasing prices over the year starting from the post-harvest period and going to the pre-harvest period. Since potato prices exhibit no such trend, one has to look for an alternative explanation for why traders get higher prices. We attempt to provide such an alternative explanation in terms of *differential information* between small and large sellers. This is done in Section V.

III
Costs, Revenues and Profits

We have divided the cost of production of potato into labour cost, material cost, land rent and the cost of credit. We have confined ourselves to the most common variety of potato, called the 'jyoti' variety. We have collected information on these costs for two successive years, 1998-99 (first round) and 1999-2000 (second round), for 385 households. The households are classified into five groups according to the size of land under potato cultivation. The distribution of households across the five groups is given in Table 1.

In Table 2, the first two rows refer to the actual cost, i e, the cost actually incurred to produce a quintal of potato by an average household in a particular group. The third row reports the average actual cost over the two years. It should be noted that the costs are consistently lower in the second round compared with the

Table 2: Cost of Production (Rs/Quintal) across Size Classes (All Villages)

Size Class (Bighas) Cost	Round	0-2	2-4	4-6	6-10	10 and Above
Cost (Actual): C_1	1st Round	195.55	191.55	216.04	218.89	190.53
	2nd Round	149.01	138.12	145.08	153.82	145.91
	Average	172.28	164.84	180.56	186.36	168.22
Cost (C_1+Imp Labour): C_2	1st Round	231.12	208.14	229.41	228.27	199.91
	2nd Round	178.26	153.69	158.42	162.99	154.57
	Average	204.69	180.92	193.92	195.63	177.24
Cost (C_2+Imp Material): C_3	1st Round	245.90	217.55	233.19	231.89	201.64
	2nd Round	190.71	172.26	179.88	186.03	164.77
	Average	218.31	184.91	206.54	208.96	193.21
Cost (C_3+Imp Land Land Rent+Imp Credit): C_4	1st Round	282.68	253.74	272.62	273.47	240.71
	2nd Round	209.50	189.82	198.89	205.06	202.68
	Average	246.09	221.78	235.76	239.27	221.70

Note: Imp: Imputed; Mat: Material, 1 bigha = 0.331 acre.

first. While part of this difference may be attributed to a tendency of farmers to over-report costs which they cannot perfectly recall (when the first round of survey was conducted, production was actually over), the major part is explained by higher yields per unit of land in the second period compared with the first. However,

Table 3: Distribution of Costs (Rs/Quintal) across Size Classes (All Villages)

Cost	Size Class (Bighas)	Round	0-2	2-4	4-6	6-10	10 and Above
Total cost:	A:	1st Round	195.55	191.55	216.04	218.89	190.53
	A:	2nd Round	149.01	138.12	145.08	153.82	145.91
	A:	Average	172.28	164.84	180.56	186.36	168.22
	A+Imp	1st Round	282.68	253.74	272.62	273.47	240.71
	A+Imb	2nd Round	209.50	189.82	198.89	205.06	202.68
	A+Imp	Average	246.09	221.78	235.76	239.27	221.70
Labour cost:	A:	1st Round	36.83	42.04	49.65	54.85	48.68
	A:	2nd Round	33.56	34.78	38.37	39.87	39.37
	A:	Average	35.20	38.41	44.01	47.36	44.03
	A+Imp	1st Round	72.39	58.63	63.03	64.21	58.05
	A+Imp	2nd Round	62.82	50.35	51.71	49.04	48.03
	A+Imp	Average	67.61	54.49	57.37	56.63	53.04
Material cost:	A:	1st Round	155.11	145.35	162.05	160.26	137.96
	A:	2nd Round	112.17	100.53	106.08	112.74	105.27
	A:	Average	133.68	122.94	134.07	136.50	121.62
	A+Imp	1st Round	169.96	154.76	165.83	163.87	139.69
	A+Imp	2nd Round	124.62	119.1	127.54	135.78	135.47
	A+Imp	Average	147.29	136.93	146.685	149.825	137.58
Interest cost:	A:	1st Round	2.63	2.68	2.91	2.93	2.99
	A:	2nd Round	2.64	1.83	0.52	0.47	0.49
	A:	Average	2.635	2.355	1.715	1.7	1.74
	A+Imp	1st Round	10.67	10.73	11.79	11.95	10.79
	A+Imp	2nd Round	5.1	4.33	3.61	3.81	3.75
	A+Imp	Average	7.885	7.53	7.7	7.88	7.27
Land rent:	A:	1st Round	0.90	1.26	1.42	0.86	0.90
	A:	2nd Round	0.64	0.99	0.11	0.74	0.78
	A:	Average	0.77	1.13	0.77	0.80	0.84
	A+Imp	1st Round	29.65	29.61	31.97	33.43	32.16
	A+Imp	2nd Round	16.97	16.04	16.04	16.43	15.42
	A+Imp	Average	23.31	22.825	24.005	24.93	23.79

Table 4: Distribution of Costs Per Quintal across Size Classes *(as percentage of total)*

Cost	Size Class (Bighas)	Round	0-2	2-4	4-6	6-10	10 and Above
Labour cost:	A:	1st Round	18.83	21.95	22.98	25.06	25.55
	A:	2nd Round	22.52	25.18	26.45	25.92	26.98
	A:	Average	20.68	23.56	24.71	25.49	26.27
	A+Imp	1st Round	25.61	23.11	23.12	23.48	24.12
	A+Imp	2nd Round	29.99	26.53	26.00	23.91	23.70
	A+Imp	Average	27.80	24.82	24.56	23.70	23.91
Material cost:	A:	1st Round	79.36	75.88	75.01	73.21	72.41
	A:	2nd Round	75.28	72.78	73.12	73.29	72.15
	A:	Average	77.32	74.33	74.06	73.25	72.28
	A+Imp	1st Round	60.12	60.99	60.83	59.92	58.03
	A+Imp	2nd Round	59.49	62.74	64.13	66.21	66.84
	A+Imp	Average	59.80	61.87	62.48	63.07	62.44
Interest cost:	A:	1st Round	1.34	1.50	1.35	1.34	1.57
	A:	2nd Round	1.77	1.32	0.36	0.31	0.34
	A:	Average	1.56	1.41	0.85	0.82	0.95
	A+Imp	1st Round	3.77	4.23	4.32	4.37	4.48
	A+Imp	2nd Round	2.43	2.28	1.82	1.86	1.85
	A+Imp	Average	3.10	3.25	3.07	3.11	3.17
Land rent:	A:	1st Round	0.46	0.66	0.66	0.39	0.47
	A:	2nd Round	0.43	0.72	0.08	0.48	0.53
	A:	Average	0.44	0.69	0.37	0.44	0.50
	A+Imp	1st Round	10.49	11.67	11.73	12.22	13.36
	A+Imp	2nd Round	8.10	8.45	8.06	8.01	7.61
	A+Imp	Average	8.29	10.06	9.90	10.12	10.48

the comparative costs over the different size classes have remained roughly the same over the two rounds. Thus the actual costs are lowest for the lowest size class and highest for the second highest size class for both rounds.

The other rows of Table 2 refer to imputed costs. When own or domestic labour costs are imputed, not surprisingly, the lowest size class exhibits the highest cost. This inefficiency of production is retained when we account for imputed material costs (mainly the cost of potato seeds owned by the households) as well as for imputed land rent and imputed interest costs for own funds. Thus, once we impute for various inputs owned by the household, the lowest size class turns out to be the most efficient and the highest size class the most inefficient. It, therefore, seems that there are economies of scale in potato production.

Table 3 breaks down total cost into its major components: labour cost, material cost, interest cost and land rent. Clearly, material cost, which includes cost of seeds, fertilisers, water, tractor and the like, is the most important component in total cost. Quite expectedly, labour cost assumes second place in terms of importance. The percentage distribution of costs over different items is given in Table 4. We may conclude from the figures that factor intensities, as measured by the relative percentages of total costs, do not significantly vary across different size classes. The other thing worth noting is that for all size classes, interest cost, as a fraction of total cost, is negligible. This is precisely the reason why holding of stocks for a longer time has no relationship with higher profits.

We next come to revenues and profits. These are represented in Table 5. Now, typically, a producer distributes his total sales over the harvesting year and gets different prices at different points in time. The total revenue he gets is the sum of the prices he gets at different points in time multiplied by the corresponding quantities he sells. The average price is simply the total revenue divided by the total quantity he sells for the entire year. The average of these average prices, for each size class, is represented in the first row of Table 5.

The second to the fifth rows reveal the profitability of the different classes. The second row records actual profits, the third to the fifth row give profits when imputed labour, material costs, and interest costs are imputed respectively. Two points are worth noting.

First, profits per quintal are the highest for the largest size class. This is true for actual as well as imputed profits, i e, when profits are calculated by subtracting imputed costs from average revenue. Average revenues, on the other hand, are highest for the highest size classes. Thus, large farmers receive, on average, better price for their output. Secondly, as we keep on imputing for own inputs, profits become negative.

Tables 6–9 report total costs, distribution of total costs between components, revenues and profits per bigha rather than per quintal. In Table 8, actual labour costs, material costs, land rent and credit costs are expressed as percentages of actual total costs. Once more we notice that labour costs and material costs together comprise almost all of the total costs. The other components are negligible. From Table 8 it might appear that for the smallest size class, labour cost is less important than material cost than in the larger size classes. This would be a wrong conclusion to draw. Since Table 8 considers only *actual costs*, labour costs for the smallest size class are under-represented. The farmers belonging to the smallest class use a lot of own and family labour which is not included in the labour cost in Table 8. If labour

Table 5: Average Price Received and Profit Accrued (Rs/Quintal) across Size Classes (All Villages)

Profit	Size Class (Bighas)	Round	0-2	2-4	4-6	6-10	10 and Above
Price (per quinal): P		1st Round	211.09	207.50	209.41	226.64	227.70
		2nd Round	162.98	180.75	182.18	179.24	175.41
		Average	187.04	194.13	195.80	202.94	201.56
Profit actual: X_1		1st Round	15.54	15.95	-6.63	7.74	37.17
		2nd Round	18.61	25.33	22.63	19.35	22.37
		Average	17.08	20.64	8.00	13.55	29.77
Profit (X1+Imp Labour): X_2		1st Round	-20.03	-0.64	-20.00	-1.63	27.79
		2nd Round	-10.65	9.76	9.39	10.18	13.71
		Average	-15.34	4.56	-5.36	4.28	20.75
Profit (X2+Imp Mat): X_3		1st Round	-34.80	-10.04	-23.79	-5.24	26.06
		2nd Round	-23.09	-8.81	-12.17	-12.86	-16.50
		Average	-28.95	-9.43	-17.98	-9.05	4.78
Profit (X3+Imp Land+Imp Credit): X_4		1st Round	-61.82	-36.77	-52.85	-35.74	-9.10
		2nd Round	-41.88	-26.37	-31.18	-31.89	-34.40
		Average	-51.85	-31.57	-42.02	-33.82	-18.75

Notes: Imp: Imputed, Mat: Material, 1 bigha = 0.331 acre.

Table 6: Cost of Cultivation (Rs/Bigha) across Size Classes (All Villages)

Cost	Size Class (Bighas)	Round	0-2	2-4	4-6	6-10	10 and Above
Cost (actual): Z_1		1st Round	5266.83	5396.43	5742.75	6203.94	5641.76
		2nd Round	4510.10	4382.71	4526.68	4755.76	4727.50
		Average	4889.47	4889.57	5134.72	5479.85	5184.63
Cost (Z1+Imp Labour): Z_2		1st Round	6103.88	5867.16	6107.34	6471.65	5893.22
		2nd Round	5326.82	4838.64	4927.82	5028.40	4991.41
		Average	5715.35	5352.90	5517.58	5750.03	5442.32
Cost (Z2+Imp Material): Z_3		1st Round	6512.25	6099.56	6231.13	6581.14	5942.75
		2nd Round	5708.45	5445.37	5576.91	5738.86	5969.24
		Average	6110.35	5772.47	5904.02	6160.00	5956.00
Cost (Z3+Imp Land Rent + Imp Credit): Z_4		1st Round	7223.93	6836.42	7022.28	7445.86	6798.03
		2nd Round	6259.44	5990.82	6162.67	6314.53	6552.11
		Average	6741.69	6413.62	6592.48	6880.20	6675.07

Notes: Imp: Imputed, 1 bigha = 0.331 acre.

Table 7: Distribution of Costs of Cultivation (Rs/Bigha) across Size Classes (All Villages)

Cost	Size Class (Bighas)	Round	0-2	2-4	4-6	6-10	10 and Above
Labour:	A:	1st Round	1019.16	1153.27	1332.68	1543.95	1425.46
	A:	2nd Round	1043.19	1114.25	1193.08	1250.47	1282.90
	A:	Average	1031.18	1133.76	1262.88	1397.21	1354.18
	A+Imp	1st Round	1854.31	1624.00	1697.26	1811.65	1876.92
	A+Imp	2nd Round	1859.90	1570.18	1594.21	1523.11	1546.62
	A+Imp	Average	1857.06	1597.09	1645.74	1667.38	1611.67
Material:	A:	1st Round	4139.76	4126.20	4285.69	4555.76	4105.86
	A:	2nd Round	3969.35	3175.83	3314.12	3470.33	3412.67
	A:	Average	3754.56	3651.02	3799.91	4013.05	3759.27
	A+Imp	1st Round	4548.13	4358.60	4409.47	4665.26	4155.38
	A+Imp	2nd Round	3750.98	3782.56	3963.22	4180.78	4390.49
	A+Imp	Average	4149.56	4070.58	4166.35	4423.02	4272.94
Land rent:	A:	1st Round	31.45	36.77	42.00	23.58	25.47
	A:	2nd Round	23.14	34.29	3.17	22.95	16.67
	A:	Average	27.30	35.53	22.59	23.27	21.07
	A+Imp	1st Round	790.14	817.06	872.79	945.97	940.26
	A+Imp	2nd Round	497.35	498.44	492.70	495.76	493.97
	A+Imp	Average	649.75	657.75	682.75	720.57	717.12
Credit:	A:	1st Round	76.46	80.19	81.63	80.65	84.97
	A:	2nd Round	74.43	58.34	16.91	10.01	15.27
	A:	Average	75.45	69.27	48.97	48.33	50.12
	A+Imp	1st Round	294.38	301.16	316.95	336.46	316.44
	A+Imp	2nd Round	151.2	139.65	112.54	114.87	120.84
	A+Imp	Average	222.79	220.41	214.75	225.67	218.64
Total:	A:	1st Round	5266.83	5396.43	5742.75	6203.94	5641.76
	A:	2nd Round	4510.10	4382.71	4526.68	4755.76	4727.50
	A:	Average	4889.47	4889.57	5134.72	5479.85	5184.63
	A+Imp	1st Round	7223.93	6836.42	7022.28	6314.53	6798.03
	A+Imp	2nd Round	6259.44	5990.82	6162.67	6314.53	6552.11
	A+Imp	Average	6741.69	6413.62	6592.48	6880.20	6675.07

costs were imputed, one would have observed that they are no less important for the smallest size class than for the others.

Table 10 represents the per bigha total revenue, actual total cost, actual total profit and the rate of profit for different size classes. Note that the actual rate of profit is highest for the two smallest size classes. This is partly due to the fact that here labour and material costs are not imputed. If costs were imputed the picture would have changed. Table 10 also reports average yield (in quintals) per bigha. Though the yield in the smallest size class is the lowest and that in the largest size class is the highest, the difference is not significant. However, we observe that yields for all size classes were higher in the second round than in the first. This explains why costs per quintal were reported to be lower in the second round.

IV
Profits from Pure Inter-Temporal Trade

We have shown above that large farmers tend to get a better price on average than small farmers. However, our empirical results suggest that once we impute for various types of inputs, even for large sellers profit becomes negative. Who then is making profits in the potato market? We have so far not said anything about pure traders, who buy bonds from the market at some point in time and sell them at some other point in time. We call them pure traders because their activities are not related to production and many of them are not farmers, though some may be both farmers and traders. In this section, we try to get an estimate of profits from pure trade.

An inter-temporal trader, by definition, is one who buys at one point and sells at another. Who does he buy from? Obviously he buys from farmers. Who does he sell to? Usually he sells to retailers. Thus, if we look at the selling behaviour of the farmers, we can get a fairly good idea of the buying behaviour of the traders. Moreover, note that potato is a highly storage-dependent commodity. So, once it comes out of the cold store it has to be taken to the retail market quickly. Therefore, the pattern of release from the cold stores should give us a clear picture of the pattern of sale of bonds by the traders.

Let x_{it} be the amount of bonds sold by the ith producer at week t, let $x_t = \sum_i x_{it}$ be the total bonds sold at week t by all farmers and let $x = \sum_t x_t$ be the total bonds sold over the entire time horizon. Finally, define $\alpha_t = \frac{x_t}{x}$ as the proportion of total bonds sold by the farmers at any week t. Let y_t be the total amount of potato released from the cold stores at time t, $y_t = \sum_t y_t$ be the total release over the time horizon and $\beta_t = \frac{y_t}{y}$ be the proportion of release at week t. Then α_t, β_t denote the proportion of purchase and sales of bonds by the traders at week t to total purchase and sales over the entire time horizon. Let p_t be the price of bonds at week t. Then, the present value of total profits of traders over the entire time horizon per unit of output is given by

$$\Pi = \sum_t \frac{(\beta_t - \alpha_t)p_t}{(1+r)^t} \qquad ...(1)$$

where r is the rate of interest used as the rate of discount.

To get an estimate of Π, we have calculated α_t from the data on the time profile of bond sales of the sample of farmers we have drawn for our survey. Again, we have calculated β_t from the data we have collected on the time profile of release from the cold stores. Finally, we have taken r = 2 per cent per month, which is the interest rate in the informal credit market. Our calculated value of Π is Rs 7.68 for 1999 and Rs 4.53 for 2000. This means that even at the very high rate of discount that we have chosen, the traders, on average, have made a profit of Rs 7.68 per quintal of potatoes in 1999 and Rs 4.53 per quintal of potatoes in 2000. It may be mentioned once again that this profit is earned through pure inter-temporal trade. Thus it may be concluded that while the farmers are making losses (after we appropriately impute various costs), the traders are making huge profits. Since the rate of discount we have chosen is 2 per cent per month, the gross rate of profit is greater than 2 per cent per month.

V
Profits and Information Asymmetry

What is the basis of differential profits earned by producers and traders? We strongly believe that the traders earn exorbitant profits because of their informational advantage. This is supported by the qualitative data we have gathered about traders through our survey. Table 11 summarises the data.

Table 8: Distribution of Cost (Rs/Bigha) as Percentage of Total Cost across Size Classes (All Villages)

Cost	Size Class (Bighas)	Round	0-2	2-4	4-6	6-10	10 and Above
Labour:	A:	1st Round	18.09	21.76	23.42	25.14	25.91
	A:	2nd Round	20.99	25.03	25.88	26.27	27.74
	A:	Average	19.54	23.40	24.65	25.71	26.83
Material:	A:	1st Round	80.06	76.21	74.55	73.21	72.19
	A:	2nd Round	77.05	72.56	73.68	72.96	71.54
	A:	Average	78.57	74.58	74.12	73.09	71.87
Land rent:	A:	1st Round	1.32	1.39	1.22	1.30	1.49
	A:	2nd Round	1.57	1.26	0.37	0.33	0.33
	A:	Average	1.45	1.33	0.80	0.82	0.91
Credit:	A:	1st Round	0.59	0.64	0.81	0.35	0.41
	A:	2nd Round	0.39	0.76	0.08	0.44	0.39
	A:	Average	0.49	0.70	0.45	0.40	0.40

Notes: A: Actual, 1 bigha = 0.331 acre.

Table 9: Total Revenue and Profit Accrued (Rs/Bigha) across Size Classes (All Villages)

Items	Size Class (Bighas)	Round	0-2	2-4	4-6	6-10	10 and Above
Revenue		1st Round	6220.85	6135.14	5993.80	6650.03	6947.08
		2nd Round	5152.67	5315.38	5314.58	5420.95	5538.61
		Average	5686.76	5725.26	5654.19	6035.49	6242.85
Profit (actual):	y_1	1st Round	952.01	738.72	251.05	446.08	1305.28
		2nd Round	642.57	932.67	787.90	665.19	811.11
		Average	797.29	835.69	519.47	555.64	1058.19
Profit (y_1+Imp Labour):	y_2	1st Round	116.96	267.98	-113.54	178.38	1053.82
		2nd Round	-174.14	476.74	386.76	392.55	547.19
		Average	-28.59	372.36	136.61	285.47	800.51
Profit (y_1+Imp Material):	X_3	1st Round	-291.41	35.58	-237.32	68.88	1004.26
		2nd Round	-555.78	-129.99	-262.33	-317.91	-430.63
		Average	-423.60	-47.21	-249.83	-124.52	286.83
Profit (X_1+Imp Credit+Land):	X_4	1st Round	-1003.08	-701.28	-1028.47	-795.83	149.00
		2nd Round	-1106.76	-675.45	-848.09	-893.58	-1013.51
		Average	-1054.92	-688.36	-938.28	-844.71	-432.26

Notes: Imp: Imputed, 1 bigha = 0.331 acre.

As the table indicates, we have surveyed 10 large and 15 small traders. All large traders gather information about local as well as global markets. Small traders, on the other hand, collect information only about the local market. Secondly, the source

Table 10: Profit, Yield, Revenue, Cost (Rs/Bigha) across Size Classes (All Villages)

Items	Size Class (Bighas)	Round	0-2	2-4	4-6	6-10	10 and Above
Total revenue		1st Round	6220.85	6135.15	5993.81	6650.03	6947.04
		2nd Round	5152.67	5315.38	5314.58	5420.95	5538.61
		Average	5686.76	5725.27	5654.20	6035.49	6242.83
Total cost	(A)	1st Round	5268.83	5396.43	5742.75	6203.94	5641.76
		2nd Round	4510.10	4382.71	4526.68	4755.76	4727.50
		Average	4889.46	4889.57	5134.72	5479.85	5184.63
Profit	(A)	1st Round	952.01	738.72	251.05	446.08	1305.28
		2nd Round	642.57	932.67	787.90	665.19	811.11
		Average	797.29	835.70	519.48	555.64	1058.20
Rate of profit	(A)	1st Round	29.12	21.82	10.44	13.78	28.95
(TP/TCx100)		2nd Round	26.91	28.38	23.28	18.38	20.51
		Average	28.02	25.10	16.88	16.08	24.73
Yield	(Quintal)	1st Round	28.44	29.13	28.21	29.68	30.04
		2nd Round	31.24	32.71	32.04	31.32	32.71
		Average	29.84	30.92	30.13	30.49	31.38

Notes: TP - Total profit (A)   1 bigha= 0.331 acre.
TC - Total cost (A)
A - Actual

Table 11: Informational Advantage of Traders

Factor	Traders Large	Small
(1) Total number of traders	10	15
(2) Average duration of business (no of years)	18	3
(3) Av size of own investment (no of times of current business)	6	0.25
(4) No of traders making profit or loss in last 10 years (1990-99)		
Profit	8	2
Undisclosed	2	0
Loss	0	1
Uncertain	0	12
(5) Type of trade (numbers)		
Spatial	0	12
Inter-temporal/speculation	0	0
Mixed	10	5
(6) Type of information collected		
(a) Prodn local market	10	15
outside market	10	3
(b) Arrival local market	10	15
outside market	10	3
(c) Prices local market	10	15
outside market	10	3
(d) Release from stores		
local market	10	15
outside market	10	0
(e) Govt policy	10	0
(f) New markets	10	0
(g) Share prices	8	0
(7) Sources of information		
Panchayat	0	8
Government	2	3
Media	3	1
Private	10	0
Large traders	0	12
(8) Problems		
Excess supply	10	15
Increasing storage facility	10	15
Absence of govt procurement	10	15
Absence of export market	10	0
Entry of small producers in trade	8	0

of information of large sellers is mainly private. In contrast, small traders gather information mainly through large traders. It is reasonable to assume that large traders do not reveal valuable information to their smaller counterparts in general. Therefore, while most large traders are making positive profits on average, most small traders are uncertain about their profits. Finally, while most large traders are engaged in both spatial and inter-temporal trade, small traders are mostly engaged only in spatial trade. Our analysis, therefore, suggests that on the whole it is the large traders who are reaping profits in the potato market because of their informational advantage, while farmers and small traders face uncertain prospects due to their informational disadvantage.

In fact, the lack of information among small sellers directly helps large sellers to earn more profits. Small sellers do not know exactly when to sell their bonds. As a result, they often sell their bonds randomly, their decisions being based on rumours and incorrect information. This adds to fluctuations in bond sales and bond prices. These fluctuations, in turn, benefit informed traders. They buy when the price is low and sell when it is high.

We have calculated the coefficients of variation of market sale of bonds by farmers for the two years under study. The calculated values of coefficients of variations are 1.62 for 1999-2000 and 0.67 for 2000-01. It may be mentioned that the traders' profits per quintal of potato for these two years were Rs 7.68 and Rs 4.53, respectively. Thus the year with a higher variance in market sales by farmers saw higher profits for traders. In other words, our survey data supports the theoretical argument that traders' profits go up with an increase in the variance of market sales by farmers.

VI
Concluding Remarks

The paper demonstrates, in terms of a two-year survey of potato markets in West Bengal conducted by the authors, that producers make much lower profits than traders. In fact, the survey data indicate that while producers actually make losses when imputed costs of own inputs are taken into consideration, the traders, in particular the large ones, earn an exorbitant 2 per cent profit per month on their investment. We explain this asymmetry in terms of asymmetric information. The question, of course, that arises is why the producers try to acquire the information which is acquired by large traders. The answer probably lies in the lumpiness of the cost of acquiring information. For large traders, it is worthwhile to invest in the cost of acquiring information because of their large volume of sales. For an individual small seller, this huge investment is never worthwhile. A possible way out, therefore, is to form small sellers' cooperatives to acquire important information. Another possibility is to provide this information through appropriate government agencies or local public bodies. [EPW]

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