PRIVATIZATION, YARDSTICK COMPETITION AND EMPLOYMENT DYNAMICS:

EVIDENCE FROM BANGLADESH

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Abstract

We analyze the dynamics of public and private sector employment, using the natural experiment provided by the partial privatization of the Bangladeshi jute industry. A differences-in-differences approach allows us to infer ownership effects. Although the public sector had substantial excess employment of workers initially, this excess was substantially eroded by the end of the period we study. This finding is consistent with the idea that the central authorities, which were increasingly financially constrained, used yardstick competition to reduce public sector managerial rents. The extent of such erosion differs between white-collar and manual worker categories, with excess employment persisting only in the former.

Keywords: privatization, yardstick competition, excess employment.

JEL Classification Nos: L32 (Public Enterprises), L33 (Privatization).

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1. Introduction

This paper uses firm level data from the jute industry in Bangladesh over the 1983-1994 in order to analyze the effects of ownership upon employment in a dynamic setting. In 1982 the military regime in Bangladesh privatized 31 of the 62 mills in the jute industry, while retaining the remainder in the public sector. This natural experiment provides a unique opportunity to study the effects of ownership structure on economic performance.

Our main findings are presented in terms of measures of public sector "excess employment". We have two alternative measures, depending on whether it adjusts for output or not. The adjusted measure shows excess employment in all categories in 1988, but this excess is eliminated in the manual worker category by the end of the period. For white-collar workers, excess employment is reduced, but continues to be significant. We argue that this dynamic pattern is consistent with changes in the macroeconomic environment and with the notion of yardstick competition, where central authorities use information on private sector behavior to constrain public sector managers. Our second substantive finding, that white-collar workers are the main beneficiaries of public sector employment generation demands a fuller explanation.

2. Background & Data

In 1982, the government of General Ershad initiated the New Industrial Policy, under which over 650 enterprises were privatized. In the jute industry, 31 of the 62 mills were privatized, while the remainder was retained in the public sector. This policy was dubbed "re-privatization". This was a partial reversal of the nationalization of the jute industry

implemented in 1972, soon after the independence of Bangladesh. The jute mills that were owned by Bangladeshi nationals at the time of nationalization were returned to their former owners, while the mills that had belonged to West Pakistani nationals, continued to remain under public ownership. The selection of mills to be privatized was not based on any economic criterion, but rather on the nationality of their former owners. Hence our analysis of the effects of privatization upon employment are not subject to selection bias.

Previous work by Bhaskar and Khan (1985) compared employment levels in 1988 and 1983 and found that public sector mills had "excess employment" of white-collar workers, of the order of 35%. There was no significant difference in the employment of manual workers between public and private sectors. In the period we study (1988-94), the jute sector was under increasing financial pressure. The financial losses accumulated in private and public sector firms were financed primarily by loans from publicly owned banks. The situation was not simple a result of mismanagement, but a followed decline in external demand for Bangladeshi jute products. By 1994 industry output had collapsed by 20 percent relative to 1988.

The World Bank was engaged in negotiations with the government to reduce capacity in the jute industry. The government instituted a Voluntary Departure Scheme for staff and workers in the public mills. In July 1989 the benefits for departure from state owned enterprises were increased substantially. For example, an employee with 30 years service was entitled to 5 years pay as gratuity, in addition to pension benefits. Public sector employees responded positively to these redundancy packages, especially after July 1990. Four state sector mills were closed down in 1993 and a number of additional privatizations were planned but did not materialize. These measures culminated in the World Bank's Jute Sector

Adjustment Credit program of 1994, which financed restructuring of the industry and met the costs of the Voluntary Departure Scheme.

Our data consists of mill-specific employment levels of four categories of workers for the years 1983, 1988, 1991, 1992 and 1994. The first two categories, managers and clerical staff, are white collar. We also have data on permanent manual workers and total manual workers (permanent plus casual). The data was collected from records kept by the Bangladesh Jute Mills Corporation and the Bangladesh Jute Mills Association, organizations representing public and private sector mills respectively. As privatized mills were legally unable to layoff employees for a year after their privatization in 1982, the recorded 1983 figures may be taken to be the pre-privatization figure. We should point out that the data on manual is less reliable than our data on the white-collar categories in the period after 1988. For manual workers, our data shows the numbers registered as employed. These workers are divided in three categories- permanent, temporary and casual. This was a period of substantial production and employment volatility and independent anecdotal evidence suggests that registered employment reported by the mills differed to some extent from the numbers actually employed. Manual workers who availed of the Voluntary Departure Scheme and left do not seem to be immediately reflected in registered employment of blue-collar workers over this period. These problems do not apply to officers and staff, since employment of these categories does not vary on a daily basis. Moreover, since smaller numbers of more important personnel were involved, this data was reliably reported by firms.

3. The Model

Our analysis uses the private sector mills as the benchmark. The objective function of privately owned mills is relatively straightforward. We assume that these owners maximize

profits and do not have any preference for employment-maximization. We also assume that principal-agent problems between owners and managers are minor. The number of owners is usually only one, and at most a few, and hence there are no free-rider problems in monitoring managers. Owners are also actively involved in management and therefore asymmetric information (which could be a source of manager rents) is largely absent.

There is less general agreement about what constitutes a reasonable objective function for the public sector firm. It will be useful to make a distinction between the central authorities as principals and the firm level managers who are their agents. Both central authorities and firm level managers may have a preference for employment creation. However, it seems that the pressures for employment creation are more severe at local rather than at central level. In particular, local politicians may pressurize public firms to create employment for politically important constituencies, a phenomenon we call "clientelism". [1] Additionally, the public sector managers may wish to dole out jobs to those with whom they are connected by bonds of kinship or social affinity. For both these reason, public sector enterprises tend to be biased towards expanding white-collar employment rather than employment of manual workers. The firm level manager's ability to expand employment is subject to constraints and incentives imposed by the central authorities. The problem central

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Clientelism refers to a situation, where politicians dole out public sector jobs in order to maintain their political support base. Bhaskar and Khan (1995) argue that this explanation for public sector excess employment in the white-collar sections is more plausible than a "welfarist" explanation, which would generate excess employment among manual rather than white-collar workers. Clientelism can be augmented by sociological factors, whereby top managers in the public sector create jobs for the middle classes to whom they are tied by bonds of kinship or social affinity.

authorities face is that they lack information on local employment requirements, which is available only to the managers.

Let us consider the implications of this conflict between the central authorities and public firm managers, and the role of yardstick competition in this context. To do this formally, we adapt the standard model of regulation (see for example, Laffont and Tirole (1994)). We consider a one period scenario and assume that the central authorities would like to have employment in firm *i,* E_i, set equal to Z_i, where Z_i is the socially optimal level of employment. The preferences of central authorities are given by

$V(E_i) = -(E_i-Z_i)^2 – t$

Where t is the payment made to the manager. However, the central authorities do not know the level of Z_i , which is known only to the manager of the public firm. The central authorities have the information that $Z_i = Z+e_i$ where Z is distributed with a density function f on the interval [a,b] and e_i is distributed with a density function g on the interval [-e,e]. Z and e_i are independently distributed. It follows that Z_i has support [a-e,b+e].

The manager would like to create extra employment, beyond that desired by the central authorities and the manager's preferences are given by

$U(E_i,t) = -c[E_i-(Z_i+k)]^2 + t$

Where k>0 is a parameter which measures the degree of employment bias of the manager. t is the amount of transfer (or incentive pay) made from the central authorities to the manager – it could also measure other incentive measures, such as promotions. The central authorities can provide incentives by making t depend upon on E_i , so that we can write $t(E_i)$. *c* is a parameter, which measures the relative importance of employment objectives compared to money in the manager's utility function.

The manager has some outside level of reservation utility, u, and the central authorities must ensure that he gets this utility level regardless of the realization of Z_i.

The manager's first order condition for utility maximization is

$2c[E_i-Z_i-k)] = t'(E_i)$

From this condition, it is clear that if the central authority sets $t'(E_i) = -2ck$, the manager will find it optimal to $E_i = Z_i$. In other words, the central authorities can provide incentives so that the manager chooses employment optimally (i.e. without any excess bias), by taxing employment at rate 2ck. Let

$t(E_i) = T - 2ckE_i$.

Where T is the fixed (wage) element of the manager's compensation. The utility of the manager under the scheme, given that he chooses employment optimally, is

given by $t(E_i) - ck^2$, which must exceed his reservation utility u for all possible values of E_i.

His utility is lowest when employment is highest, i.e. when $Z_i = b+e$. This implies that the manager's fixed component is given by

$T = u + ck^2 + 2ck(b+e)$

Notice that for any value of Z_i , the manager gets a rent of $2ck(b+e-Z_i)$, which is strictly positive unless desired employment is at its highest possible level. That is, the central authorities have to make costly transfers in order to provide incentives, i.e. the manager gets a payment which is in general above his reservation utility u. The expected cost to the central authorities of this incentive scheme can be computed, and is given by

$\mathbf{E(C)} = u + 2ck[b+e- \mathbf{E(Z)}] + ck^2$

E(Z)] is the expectation of Z. If the provision of incentives is sufficiently costly, the central authorities may prefer to provide low incentives, in which case there will be excess employment.

Yardstick competition

Yardstick competition may play a useful role in the context, as has been noted in the regulatory context (see Sobel (1999), Shleifer (1985) and Laffont and Tirole (1994)), if there are many public sector firms. In this case, the central authorities can provide incentives by taxing only the excess employment of an individual firm relative to that industry average, or the employment level of other firms. Under such a scheme, it can be verified that the cost of providing incentives is given by

$C' = u + 2cke + ck^2$

In comparing C with C', we find that the central authorities have a cost reduction equal to $2ck[b- \mathbf{E(Z)}]$, i.e. they are able to reduce managerial informational rents. If all public sector managers act individualistically, then yardstick competition can play a useful role even in the absence of the private sector.

However, such incentives schemes for the public sector are vulnerable to collusion between the managers of different public enterprises. Managers could all be better off if they increased employment in a coordinated way. As managers are only penalized for raising employment relative to the industry average, none of them will be punished. Such collusion need not be explicit – there may well be a culture in the public sector of not pursuing aggressive employment cuts and a manager who deviates from this may well become quite unpopular. Such a social sanction may well make yardstick competition ineffectual when it is restricted to the public sector.

It is in this context that privatization can play a useful role. Notice that the managers in the private sector will seek to maximize profits and therefore, they will not have any employment bias. Employment in the private sector can be a useful benchmark for providing incentives to the public sector managers. In other words, the private sector will not be part of a culture of excess employment and be an independent source of information to discipline public firm managers.

Consider the implications of this model in the context of Bangladesh. Our hypothesis is that the central authorities were increasingly able to use yardstick competition, vis-à-vis the private sector, as a way of controlling excess employment in the public sector relatively cheaply. This hypothesis implies that public sector excess employment is likely to diminish over time as the informational rents enjoyed by the public sector managers diminish. In addition, the preferences of the central authorities regarding excess employment may also have changed over time.

Based on these considerations, our specification for employment in each category is as follows:

$$\ln(E_{it}) = a_i + d_t + b_t O_{it} + e_{it}$$

where a_i is the firm-specific effect, d_t is the term capturing industry wide time varying effects, and e_{it} is a white-noise error term. O_{it}, the ownership dummy, takes a value of 1 when the firm is publicly owned, and is zero if the firm is privately owned. The parameter of interest is , b_t , which is the effect of ownership on employment. This is allowed to be period specific, in order to capture the effect of the changing constraints upon public sector behaviour. Our interest is on how the estimates of b_t evolve over time.

4. Empirical Results

The dynamics of public and private sector output and employment present an interesting picture. We have the aggregate output levels for the two sector, but not the levels on employment. We have firm-level employment figures for the two sectors, but not output figures. Using both, this paper analyzes the relative changes in public sector employment.

Public sector output declined between 1983 and 1986, fluctuated thereafter, but never recovered the 1983 level. The picture is different for the private sector. Total output increased and remained above the 1983 level until 1992. (See table 1, figure 1). There is evidence of increase in capacity in the private sector in our firm-level data set.

Table 2 presents the changes in average employment and capacity in the two sectors by different categories of employees. We find an increase in white-collar categories between 1983 and 1988 despite a decline in average capacity. In the private sector, on the other hand, average capacity increases, but employment declines in both white- collar and blue -collar categories. Our new finding is that after 1988, public sector employment trends in white-collar categories appear to track the trend in the private sector.

Tables 4 and 5 show the mean percentage changes in employment by category of worker, for the public sector and private sector mills. We find that the public sectors had significantly expanded the employment of all permanent workers (white-collar workers as well as permanent manual workers) up to 1988, although total employment of manual workers shows a slight decline. However, retrenchment occurred in subsequent years and by 1994, there was a large decline in employment of all categories of workers. This was particularly pronounced in the manual worker category, being over 50%. When compared with private sector figures, we find that the decline in employment began in 1988 for the white-collar

categories. Employment declined further in subsequent years, but the extent of retrenchment was smaller than in the public sector and also more evenly distributed across white collar and manual worker categories, as compared to the public sector.

Table 3 reports the evolution of aggregate output, sector-wise. Our focus is on the years for which we have firm level employment data, i.e. the years 1988, 1991, 1992 and 1994. This table reports the percentage change in output in each of these years relative to 1983, for private and public sector mills. Public sector output contracted quite sharply- output over these four years was, on average, 31% lower than its level in 1983. In contrast, the private sector did not see such a decline and was on average almost 2% higher as compared to 1983, declining only in 1994. The final column of this table reports the difference in output changes between the two sectors – on average, private sector output rose by 33% relative to public sector output (see figure 2).

These output data suggest that one may use two alternative benchmarks to measure "excess employment" in the public sector in any year. The first measure, which we label the *unadjusted* measure, is the difference between the change in employment in the public sector and the change in employment in the private sector, in that year, where the change is computed relative to 1983. This is the measure, which is used by Bhaskar and Khan (1995). Alternatively, one can adjust this figure for the change in sectoral output. If we assume that employment requirements for any category of worker are proportional to the output produced, we should subtract the difference in output change between sectors from the unadjusted measure of excess employment, to get the *adjusted measure.* Note here that in performing this adjustment we are using aggregate sectoral outputs, rather than firm level outputs, since we do not have data on firm level output.

Our main results are shown in table 6, which presents measures for excess employment, unadjusted as well as adjusted, for each category of worker and for each year in our sample. Our results differ between the white-collar and manual categories, but are rather similar within each of these categories. For white-collar employees, in 1988 there was a large amount of excess employment, of the order of 30 percent by the unadjusted measure, for both managers and clerical staff. However, unadjusted excess employment declines secularly in subsequent years. Although the public sector still has positive excess employment by the end of the period, this is not statistically significant. Indeed, there is no significant difference in unadjusted excess employment in the category of clerical workers by 1994 and in managerial workers by 1992. However, since the public sector suffered an output contraction relative to the private sector, adjusted excess employment of white-collar workers is larger and remains significant throughout this period. Nevertheless, excess employment does fall to the order of 25% by 1994.

For manual workers, the picture is rather different. Although there was no significant excess employment of total manual workers in 1988, by the unadjusted measure, the output contraction implied that the adjusted measure was of the order of 33%. However, by 1991, there was no significant excess employment, even by the adjusted figure. In other words, the public sector appears to have shed manual workers more or less in line with its reduction in output. (The regression results are in tables 7 and 8)

5. Conclusions

Consistent with our assumption that the private sector is profit maximizing and suffers from few informational asymmetries between owners and managers, employment of white-collar workers fell dramatically following privatization in 1982. The public sector did not

immediately follow the private sector in reducing white-collar employment. However, from 1991 the employment levels in the public sector started to decline, although this decline was less than the fall in relative sectoral output. For manual workers, the fall in employment mirrored that of relative output, so that there is no excess employment even by the adjusted measure by the end of the period.

There are two interesting features of our results. First, the difference between white collar and manual categories persists throughout this period, with the public sector consistently focusing its employment generation upon the white-collar category. We have suggested that this could be due to sociological reasons – decision-makers in the public sector may have bonds of affinity with middle class employees, and would be less inclined to sack them. Alternatively, this could be due to greater political voice of this educated and articulate class. These explanations are obviously incomplete, and our work suggests a need for explanations for such a white-collar bias within a populist political economy.

Our second interesting result is on the dynamics of public sector employment, whereby excess employment is gradually reduced, in all categories. There could be two reasons for such gradualism. The first is that over time, private sector behavior provided valuable information to the central authorities and allowed them to control managers. Once the informational rents of firm level managers had been revealed, pressure on managers and cuts in subsidies forced the convergence with the private sector. The evidence that the Voluntary Departure Scheme was adopted only reluctantly by public sector mill management, in response to central pressure, is consistent with this interpretation. An alternative possibility is that the central authorities initially had a higher employment preference in the jute sector but external shocks forced them to evaluate the cost of employment creation through subsidies to

jute manufacturing. This interpretation is consistent with the observation that the policy response of the central authorities coincides with increased public sector losses in the early nineties. This raised the subsidy required to maintain the existing employment levels. The second interpretation is not inconsistent with the role of yardstick competition with the private sector revealing rents. Indeed the information revealed by the private sectors earlier response might have made the evaluation of the costs of employment creation explicit.

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TABLE 1: **OUTPUT AND PROFITABILITY OF JUTE MILLS**

YEAR	OUTPUT OF PUBLIC SECTOR '000 Tons	OUTPUT OF PRIVATE SECTOR '000 Tons	TOTAL OUTPUT '000 Tons	PROFIT/LOSS OF PUBLIC SECTOR Million Takas
1983	399.4	170.5	569.9	184
1984	337.9	206.3	544.2	-310
1985	327.3	188.9	516.2	-1462
1986	275.1	182.9	458.0	-1583
1987	331.6	205.3	536.9	-420
1988	325.9	196.7	522.6	-1431
1989	316.9	185.8	502.7	-1882
1990	322.3	206.8	529.1	-3709
1991	260.5	173.4	433.9	-2473
1992	244.1	172.3	416.4	-3175
1993	282.9	162.9	445.8	-5216
1994	271.2	150.6	421.8	-587

Source: Quarterly Jute Good Statistics various issues,

World Bank (1992) Table 8.2, World Bank (1995) Table 5.5.

TABLE 2:

AVERAGE EMPLOYMENT AND CAPACITY BY SECTOR

		EMPLOYMENT PUBLIC (EMPLOYEES)	CAPACITY PUBLIC (LOOMS)	EMPLOYMENT PRIVATE (EMPLOYEES)	CAPACITY PRIVATE (LOOMS)
1983	MANAGERIAL	122.19	465.2	72.19	248.8
	CLERICAL	406.23		244.38	
	MANUAL	4636.29		2482.0	
1988	MANAGERIAL	149.35	395.2	65.93	311.3
	CLERICAL	450.26		212.97	
	MANUAL	4568.1		2407.8	
1992	MANAGERIAL	110.68	395.2	62.42	341.3
	CLERICAL	352.32		212.87	
	MANUAL	2799.5		2139.5	
1994	MANAGERIAL	90.25	395.2	57.81	341.3
	CLERICAL	279.9		173.77	
	MANUAL	2541.5		1893.9	

NOTE: Number of mills: 31 state owned mills and 31 privatized mills

TABLE 3

PERCENTAGE CHANGE IN OUTPUT RELATIVE TO 1983

	PUBLIC	**PRIVATE**	**DIFFERENCE**
1988	-18	+16	-34
1991	-35	+2	-37
1992	-39	+1	-40
1994	-32	-12	-20

Table 4

PERCENTAGE CHANGE IN PUBLIC SECTOR EMPLOYMENT, RELATIVE TO 1983

	1988	**1991**	**1992**	**1994**
MANAGERS	+22	+1	-8	-24
CLERICAL	+16	-5	-14	-30
TOTAL MANUAL	-4	-39	-50	-53
PERMANENT MANUAL	+14	-40	-39	-50

Table 5

PERCENTAGE CHANGE IN PRIVATE SECTOR EMPLOYMENT, RELATIVE TO 1983

	1988	**1991**	**1992**	**1994**
MANAGERS	-9	-9	-14	-25
CLERICAL	-12	-17	-16	-37
TOTAL MANUAL	-3	+6	-15	-27
PERMANENT MANUAL	+6	-8	-12	-27

Table 6: **EXCESS EMPLOYMENT IN THE PUBLIC SECTOR (PERCENT)**

		1988	1991	1992	1994
	Unadjusted	31	10	6	1
		(5.4**)	(1.7)	(1.1)	(0.2)
MANAGERS	Adjusted	65	47	46	21
		(11.3**)	(8.0**)	(8.4**)	(4.2**)
	Unadjusted	28	12	2	7
CLERICAL		(3.3**)	(1.4)	(0.3)	(0.8)
	Adjusted	62	49	42	27
		(7.3**)	(5.7**)	(6.3**)	(3.3**)
TOTAL	Unadjusted	-1	-45	-35	-26
MANUAL		(0.1)	(7.8**)	(6.0**)	(4.5**)
	Adjusted	33	-8	5	-6
		(3.3**)	(1.4)	(0.9)	(1.0)
PERMANEN	Unadjusted	8	-32	-27	-23
T		(2.0*)	(7.9**)	(6.8**)	(5.6**)
MANUAL	Adjusted	42	5	13	-3
		(10.5**)	(1.2)	(3.3**)	(0.7)

Note: Unadjusted excess employment is the difference in difference estimate of (log) employment, category wise. The adjusted figure subtracts the mean difference in difference in log output between the two sectors.

TABLE 7

CHANGES IN WHITE-COLLAR EMPLOYMENT RELATIVE TO 1983

YEAR	CATEGORY OF EMPLOYEE	PUBLIC SECTOR	PRIVATE SECTOR	EXCESS EMPLOYMENT IN PUBLIC SECTOR
1988	MANAGERIAL	0.22 (5.5)**	-0.09 (2.2)*	0.31 (5.4)**
	CLERICAL	0.16 (2.7)**	-0.12 (1.9)*	0.28 (3.3)**
1991	MANAGERIAL	0.01 (0.2)	-0.09 (2.2)*	0.10 (1.7)
	CLERICAL	-0.05 (0.8)	-0.17 (2.8)**	0.12 (1.4)
1992	MANAGERIAL	-0.08 (1.8)*	-0.14 (3.3)**	0.06 (1.1)
	CLERICAL	-0.14 (2.2)*	-0.16 (2.6)**	0.02 (0.3)
1994	MANAGERIAL	-0.24 (5.5)**	-0.25 (6.0)**	0.01 (0.2)
	CLERICAL	-0.30 (4.7)**	-0.37 (6.0)**	0.07 (0.8)

Note: The t-ratio is given in parentheses.

* Significant at 10 per cent level.

** Significant at 5 percent level.

TABLE 8

CHANGES IN MANUAL WORKERS EMPLOYMENT RELATIVE TO 1983

YEAR	CATEGORY OF EMPLOYEE	PUBLIC SECTOR	PRIVATE SECTOR	EXCESS EMPLOYMENT IN PUBLIC SECTOR
1988	TOTAL	-0.04	-0.03	-0.01 (0.1)
	PERMANENT	0.14	0.06	0.08 (2.0)*
1991	TOTAL	-0.39	0.06	-.45 (7.8)**
	PERMANENT	-0.40	-0.08	-0.32 (7.9)**
1992	TOTAL	-0.50	-0.15	-0.35 (6.0)**
	PERMANENT	-0.39	-0.12	-0.27 (6.8)**
1994	TOTAL	-0.53	-.27	-0.26 (4.5)**
	PERMANENT	-0.50	-0.27	-0.23 (5.6)**

Figure 1

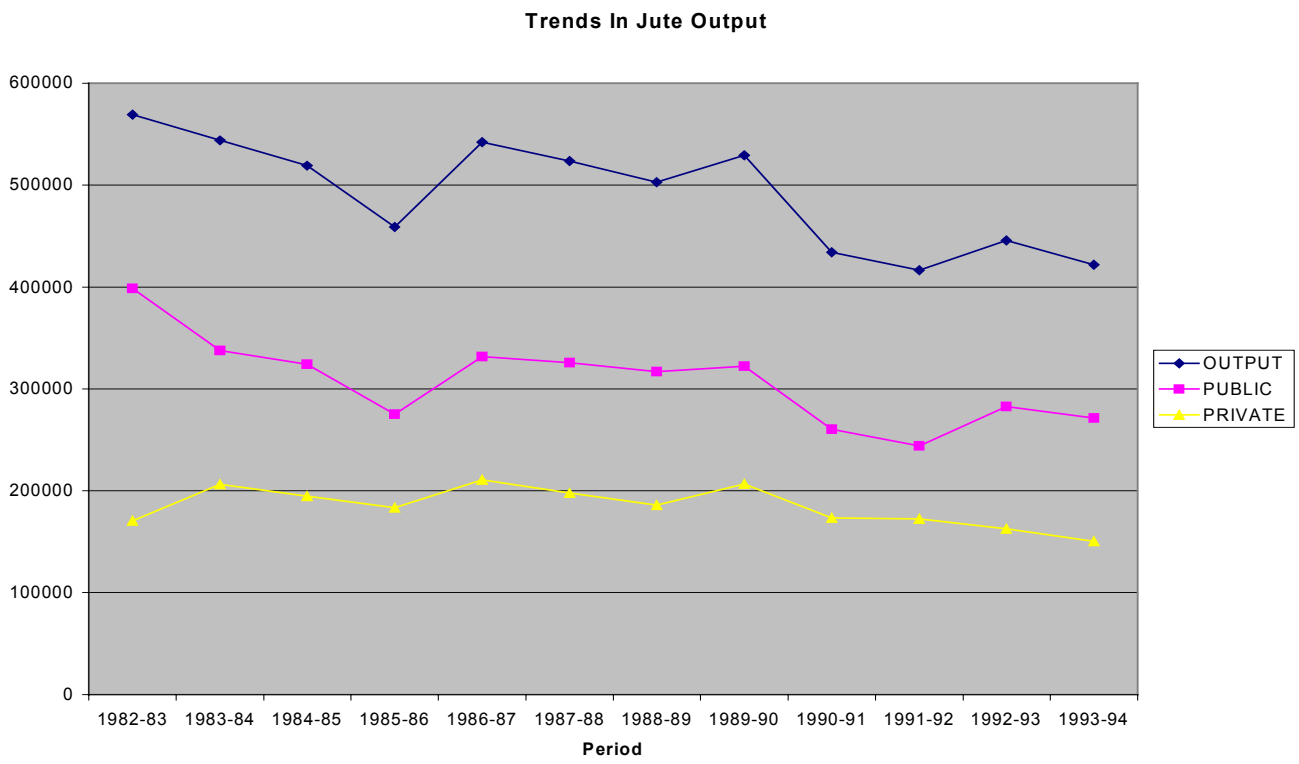
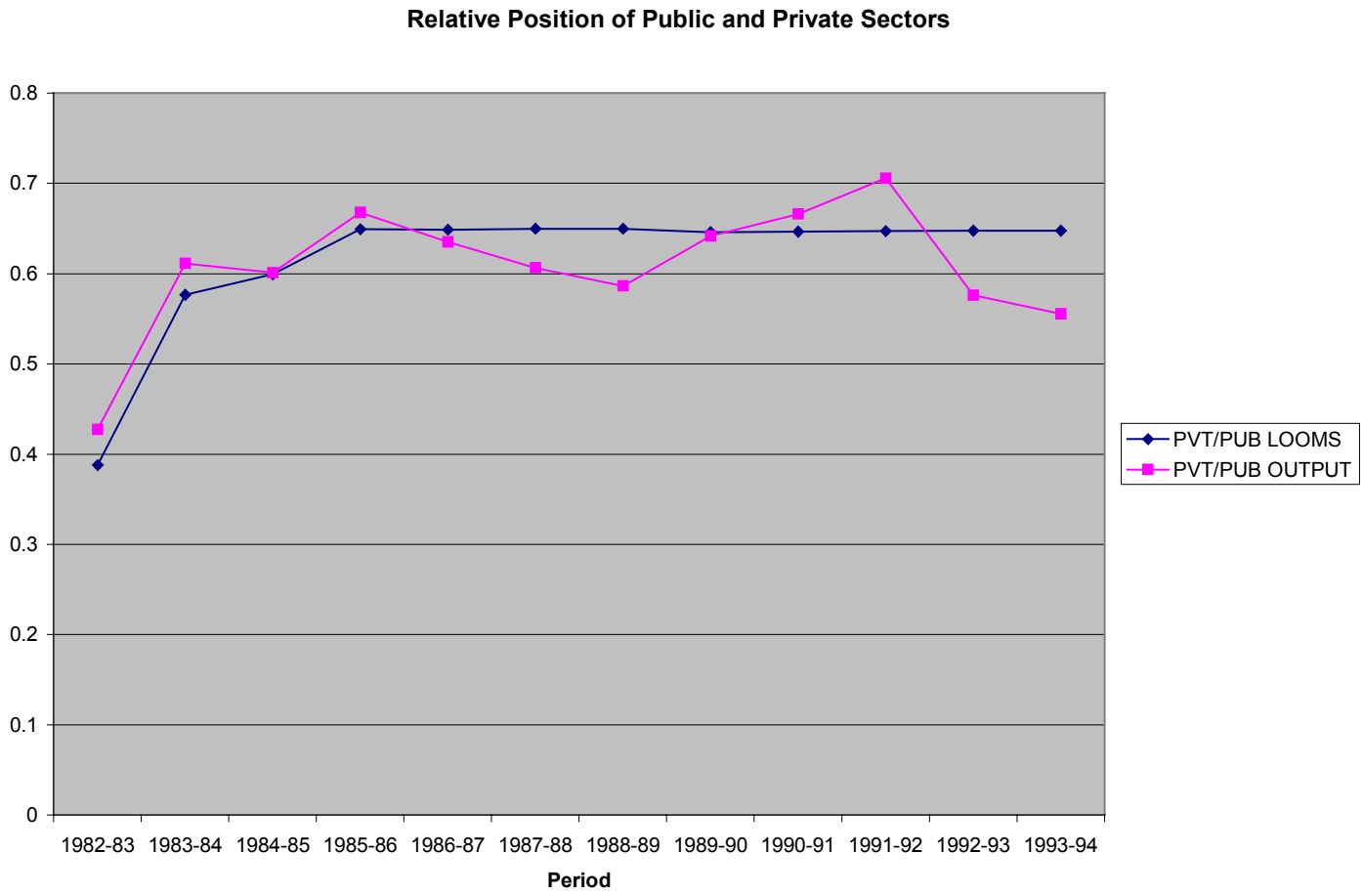

Trends In Jute Output
600000
500000
400000
300000
200000
100000
0
1982-83
1983-84
1984-85
1985-86
1986-87
1987-88
1988-89
1989-90
1990-91
1991-92
1992-93
1993-94
Period
OUTPUT
PUBLIC
PRIVATE

Figure 2


Relative Position of Public and Private Sectors
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1982-83
1983-84
1984-85
1985-86
1986-87
1987-88
1988-89
1989-90
1990-91
1991-92
1992-93
1993-94
Period
PVT/PUB LOOMS
PVT/PUB OUTPUT