Economics of Transition
Volume 14 (3) 2006, 459–477

Partial privatization and yardstick competition

Evidence from employment dynamics in Bangladesh[1]

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Abstract

We analyse the dynamics of public and private sector employment in Bangladesh, using the natural experiment provided by the partial privatization of the jute industry. The public sector had substantial excess employment of workers initially, but this excess was substantially eroded by the end of the period we studied. The extent of erosion differs between white-collar and manual worker categories, with excess employment persisting only in the former. Our findings suggest that partial privatization increases the efficacy of yardstick competition in the regulation of public firms, because heterogeneous ownership undermines collusion between public sector managers, and also makes excess employment more transparent to the general public.

JEL classifications: L32 (Public Enterprises), L33 (Privatization).
Keywords: Privatization, yardstick competition, excess employment, collusion.

[1] Thanks to Wendy Carlin, Maitreesh Ghatak, Tim Leunig, Pierre Regibeau and seminar participants at the Development Conference at the Centre for Study of Social Sciences (Kolkata), Essex University, the LSE, the Royal Economic Society and the Econometric Society European Meeting for useful comments. We are particularly indebted to Dilip Mookherjee and an anonymous referee for valuable suggestions.

Published by Blackwell Publishing Ltd, 9600 Garsington Road, Oxford OX4 2DQ, UK and 350 Main St, Malden, MA 02148, USA

1. Introduction

Privatization is normally viewed as a strategy that increases the internal efficiency of publicly owned firms. Public sector jobs in many developing countries often yield rents, as wages tend to be larger than the opportunity cost of the workers. Excess job creation in the public sector is a way of making transfers to special interests, and a source of patronage and political influence. Following Coate and Morris (1995), one can argue that making transfers in an inefficient manner, via job creation, may be more viable than direct transfers because the populace at large[2] is unable to observe employment requirements of the public enterprise directly. Boycko, Shliefer and Vishny (1996) argue that privatization restricts the ability of politicians to make transfers to special interests by employment generation, since the subsidies required to support such transfers become explicit. This argument provides a reason why privatization increases internal efficiency in publicly owned firms.

In this paper, we argue that *partial privatization* – the privatization of some firms in an industry, while leaving the rest in the state sector – provides useful *external* information about the firms that remain in the public sector. This information may reduce the ability to sustain inefficient practices, such as excessive employment levels. In conjunction with yardstick competition, partial privatization may play an important role in increasing efficiency in public sector firms. The role of yardstick competition in the regulation of multiple public sector firms is well recognized.[3] However, yardstick competition may not be systematically employed as an incentive scheme since the central authorities in charge of the private sector may have little incentive to improve efficiency. Yardstick competition may also be undermined by collusion between public sector managers. Partial privatization provides a natural benchmark, and makes public sector inefficiencies transparent to the public at large. If the central authorities are keen to reduce inefficiencies, they are also likely to find that yardstick competition is more effective in a situation of heterogeneous ownership. Since private sector firms have no incentive to collude with public sector managers and raise employment levels, they provide an independent source of information that helps regulation. These arguments may be relevant in other contexts – for example, the entry of foreign firms may undermine cosy business practices and provide valuable information to consumers or stockholders.

We present evidence for this argument using firm-level employment data from the jute industry in Bangladesh over the period 1983–94. 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 is of interest in itself, since it provides a unique dataset from which one may disentangle the

[2] Or other 'principals' such as the central budgetary authorities or international financial institutions.

[3] See Laffont and Tirole (1994), Sobel (1999) and Armstrong and Sappington (2005) for analysis of the role of yardstick competition in the context of the regulation of several firms, all of which are homogeneous in terms of their objectives.

effects of ownership structure on economic performance. Bhaskar and Khan (1995) have analysed the early years of this natural experiment. Our empirical work extends this analysis to the dynamic effects of privatization over time.

Our substantive findings are presented in terms of measures of public sector 'excess employment'. We have two alternative measures, depending on whether it adjusts for output changes or not. The adjusted measure shows excess employment in all categories of worker in 1988, but this excess is eliminated for 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 the notion of yardstick competition, where central authorities use information on private sector behaviour to constrain public sector managers. Our second substantive and intriguing finding is that white-collar workers are the main beneficiaries of public sector employment generation. Indeed, even when pressures for employment reduction are very high, manual workers seem to bear the brunt of the burden.

Our estimates of excess employment for 1988 are substantial – of the order of 30 percent for white-collar workers. These estimates provide a lower bound on the total amount of public sector excess employment, since partial privatization took place in 1982, and this may have already resulted in some employment adjustment by the public sector by 1988. The magnitude of these estimates serves to emphasize the inefficiencies in the public sector prior to partial privatization. Indeed, they buttress the main argument of this paper, that yardstick competition is relatively ineffective in the absence of partial privatization.

The layout of the rest of this paper is as follows. Section 2 sets out the institutional background and describes our data. Section 3 sets out a formal model of the role of privatization in the context of yardstick competition. Section 4 reports the empirical results, and the final section contains the conclusions.

2. Background and 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 rest were retained in the public sector. This policy, dubbed as 're-privatization', was a partial reversal of the nationalization of the jute industry implemented in 1972, soon after the independence of Bangladesh. Those 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. This partial privatization provides a panel dataset, which allows us to infer ownership effects on employment. As the selection of mills to be privatized was not based on any economic criterion, but rather on the nationality of their former owners, our analysis is not subject to selection bias. Finally, the manner of re-privatization

implied that government had no incentive to improve performance of the privatized mills, say by reducing labour prior to privatization.[4]

Previous work by Bhaskar and Khan (1995) compared employment levels in 1988 and 1983 and found that public sector mills had 'excess employment' of white-collar workers, of the order of one-third. There was no significant difference in the employment of manual workers between public and private sectors. In the period we studied (1988–94), the jute sector was under increasing financial pressure, due to a decline in demand for Bangladeshi jute products. The accumulated financial losses of private and public sector firms were financed primarily by loans from publicly owned banks. By 1994, industry output had fallen by 20 percent relative to 1988. The World Bank prompted the government to reduce capacity in the jute industry, and in response, the government instituted a voluntary departure scheme for staff and workers in the public mills. In 1989, the benefits for voluntary redundancy for public sector jute employees were increased substantially. For example, an employee with 30 years' service was entitled to 5 years' pay as gratuity, in addition to pension benefits. These measures culminated in the World Bank's Jute Sector Adjustment Credit programme of 1994, which financed restructuring of the industry and met the costs of the voluntary departure scheme.

Our data consist of mill-specific employment levels of four categories of worker 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. The data were 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 lay off employees for a year after their privatization in 1982, the recorded 1983 figures may be taken to be the pre-privatization figure. We should mention that casual manual employment could fluctuate on a day-to-day basis. Therefore, measurement error is likely to be greater in this category than for permanent employees.

3. The model

The purpose of this section is to set out two simple related models which illustrate the informational role that partial privatization can play in the regulation of the public sector. One reason for setting out these models is that in the existing literature, the existence of a private sector does not play any important role. Indeed, in standard models of yardstick competition, the regulator will be able to play off public sector firms against each other, and heterogeneity of ownership does not help.

[4] This appears to be an important factor in many privatizations. Dewenter and Malatesta (2001, p. 321) find that 'much of the firm performance improvement associated with privatization actually occurs over the three years before the government reduces its ownership.'

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. The typical private firm is family-owned, and ownership is relatively concentrated. Even if there are principal–agent problems between owners and managers, these do not give rise to any pressures for employment generation.[5]

Turning to the public sector firm, we distinguish three distinct types of actor, reflecting three distinct levels in decision making:

a) Firm-level *managers*, who are 'agents', in the standard sense;
b) The *central authority* regulating the public sector managers in the ministries of industry and finance. The central authority sets the contracts for public sector managers; and
c) The general *public*, that is, the population at large that evaluates the performance of the central authority. In this category, we may also include international institutions such as the World Bank. While the general public does not directly control the central authority, it retains some ability to 'punish' any failings. The general public can do this by withdrawing political support and international agencies by reducing the level of aid and financial transfers. These are relatively blunt instruments.

Both central authorities and firm-level managers may have preferences for employment creation, although it is likely that pressures for employment creation are more severe at local, rather than at central, level. In particular, local politicians may pressure public firms to create employment for politically important constituencies, a phenomenon we call 'clientelism'.[6]

The firm-level manager's ability to expand employment is subject to constraints and incentives imposed by the central authorities. However, the central authorities lack information on local employment requirements, which is available only to the managers. In addition, they may also lack the incentive themselves to rigorously regulate the managers, either because they also like to create employment, or because of a desire for a quiet life. Finally, the general public is uninformed, and also lacks the ability to directly set the incentive scheme of managers.

We assume that the preferences of central authorities are given by

$$V(E_i, T) = \alpha(E_i - Z_i) - 0.5(E_i - Z_i)^2 - T, \quad (1)$$

[5] There do appear to be some agency problems, which are unique to our milieu, and are not of the usual sort arising from dispersed share ownership. The joint family system is prone to conflict and such conflicts between owners sometimes allow managers increased leverage.

[6] Clientelism refers to a situation where politicians dole out public sector jobs in order to maintain their political support base (see for example Shleifer and Vishny, 1994). 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.

where E_i is employment in firm i, Z_i is a state variable that denotes the optimal level of employment (from the point of view of the general public), and T is the payment made to the manager. $\alpha \geq 0$ measures the employment bias of the central authorities, i.e., their desire for excess employment. The central authorities do not know the level of Z_i, which is known only to the manager of the public firm. At this point we assume that the Z_i are random variables with bounded support that are identically distributed across firms.

The manager would like to create extra employment, possibly beyond that desired by the central authorities. His preferences are given by

$$U(E_i, T) = \beta(E_i - Z_i) - 0.5(E_i - Z_i)^2 + T, \tag{2}$$

where $\beta \geq \alpha$ parameterizes the employment bias of the manager. We assume that the manager has a reservation utility $\bar{U}$. Any contract that he is offered must meet his individual rational constraint in every state of the world.

The general public has a similar quadratic loss function with no linear term, so it would like to have each firm's employment level equal to Z_i. That is, we assume that the managers have the greatest desire for excess employment, followed by the central authority, relative to the general public's preference for employment.

The central authorities can provide incentives by making T depend upon on E_i, as well as the employment of other firms in the industry. Bear in mind that T represents the expected value of incentive measures, such as promotions to a higher level, which can be made contingent on managerial performance. There may be institutional constraints upon how variable T can be. The general public (or international financial institutions) have no means of influencing the managers; however, it does have some power over the central authorities since it can withdraw political/financial support. Specifically, we assume that the general public can make the tenure of the central authority contingent upon the average level of employment in the public sector and other observables. We also assume that the central authorities have an overriding concern for tenure as compared to employment.

2.1 Partial privatization and transparency

Our first model to illustrate the role of privatization and yardstick competition is quite simple. Assume that the central authority likes employment to the same extent as the manager, so that $\alpha = \beta > 0$.[7] In this case, when all firms are in the public sector, the general public cannot discipline the central authorities in any significant way. Given their lack of information regarding the state variable (that is, the required employment levels), they have no way of making the tenure of the

[7] Alternatitvely $\alpha \approx \beta$ so that the conflict of interest is small, and central authority simply seeks a quiet life.

central authorities contingent on the discrepancy between the state and actual employment levels. They face a restricted choice and can only throw out the central authorities in the event that realized employment in the public sector is outrageously high, for example, greater than some level $\check{Z}$. In choosing this bound, the general public faces a trade-off, since a tight upper bound can reduce excess employment in some states, but may also reduce employment below the desired level in states where required employment is in fact high. In such a situation, the general public may well believe that there is excess employment with high probability, but, despite the overseers having influence over the tenure decisions of the central authorities, they will be unable to use this influence effectively in order to provide incentives for employment reduction.

The informational role of partial privatization in this context is quite straightforward. Assume that the Z_i's are correlated across firms – this is reasonable because they employ a common technology. The privatized firms will reduce employment levels by setting the profit-maximizing level of employment. While this may differ from the general public's desired level of employment (Z_i), a private firm's employment choice allows Z_i to be inferred, and provides information on the appropriate employment levels in public firms. The general public can make the tenure of the central authorities contingent upon the difference in average employment levels between public and private firms. This creates pressure on the central authorities, who in turn will be compelled to provide incentives to the public sector managers to reduce employment. More generally, one would expect that partial privatization makes the magnitude of public sector excess employment transparent, thereby increasing the pressure on the central authorities to take steps in order to reduce this. This process is likely to take time: with partial privatization, we expect employment to fall in privatized firms, with the public sector firms following suit with a lag.

2.2 *Partial privatization, collusion and yardstick competition*

Our second model abstracts from the role of the general public, and considers how partial privatization enhances the ability of the central authority to more effectively regulate the managers. To simplify exposition, let us assume that $\alpha = 0$, so the central authority has no employment bias, and would like E_i set equal to Z_i. For simplicity, we assume now that Z_i belongs to the set $\{Z_H, Z_L\}$, $Z_H > Z_L$, where the prior probability of Z_L is μ.

The solution to optimal regulation for the single agent is a simple application of the standard model of regulation (see, for example, Laffont and Tirole, 1994; Armstrong and Sappington, 2005). Let E_i^*, $i = H,L$, denote the first best levels of employment corresponding to the states Z_H and Z_L. Given quasi-linear pay-offs, this is the employment level that maximizes the sum of pay-offs of the manager and the central authority:

$$E_i^* = Z_i + \beta/2. \tag{3}$$

Optimal regulation under information asymmetry requires that employment is E_L^*, the first best level when the state is Z_L, with the manager obtaining an informational rent via transfers in order to induce truthful revelation. In order to reduce this informational rent, employment is distorted below its first best level when the state is Z_H. It is worth noting that the standard model of regulation yields employment that is *too low* relative to the best level, despite the manager's employment bias.

Yardstick competition may enable the central authorities to reduce managerial rents when there are multiple public sector firms (even where there is no privatization) as has been noted in the regulatory context (Sobel, 1999). The central authorities can provide incentives by making the transfers to any firm depend upon the employment of an individual firm *relative* to the average employment level of other firms. Let us consider the following model of yardstick competition. For simplicity, we assume that Z_i is perfectly positively correlated across firms, so that with probability μ, $Z_i = Z_L$ for all firms, and with probability $1 - \mu$, $Z_i = Z_H$. The central authority allows firms to choose between the first best employment levels, E_L^* and E_H^*. If all firms choose the same employment level (E_L^* or E_H^*), then every manager receives transfers such that his utility equals $\bar{U}$, his reservation utility, given that the state corresponds to the common choice. If firms choose different employment levels, then a manager who chooses E_H^* is fined an amount F, ensuring that his utility is strictly less than $\bar{U}$. A manager who chooses E_L^* is rewarded and gets total utility $\bar{U} + R$.

Let $G(E_H^*, Z_L)$ denote the gain in utility (relative to $\bar{U}$) for a manager when they *all* choose E_H^* given that the state is Z_L. Define $\Delta Z = Z_H - Z_L$. From the incentive scheme, it follows that

$$G(E_H^*, Z_L) = 0.5[\beta(\Delta Z) - (\Delta Z)^2]. \tag{4}$$

This gain is positive, provided that the employment bias of a manager, β, is larger than ΔZ, a condition we shall assume. Similarly, let $L(E_L^*, Z_H)$ denote the loss in utility suffered (relative to $\bar{U}$) by a manager when all the managers choose E_L^* given that the state is Z_H.

$$L(E_L^*, Z_H) = 0.5[\beta(\Delta Z) - (\Delta Z)^2]. \tag{5}$$

Equations (4) and (5) verify that $L(E_L^*, Z_H) > G(E_H^*, Z_L) > 0$, since the manager's pay-off function satisfies a single crossing condition in the relevant range. Let R be chosen so as to satisfy the inequality

$$L(E_L^*, Z_H) > R > G(E_H^*, Z_L). \tag{6}$$

The fine F ensures that when the state is Z_L, it is a strict Nash equilibrium for all firms to choose E_L^*. Furthermore, since R is greater than $G(E_H^*, Z_L)$, this is the

unique Nash equilibrium at this state. When the state is Z_H, the fact that $R < L(E_L^*, Z_H)$ ensures that it is a Nash equilibrium for all managers to choose E_H^*.[8] Thus, this incentive scheme ensures first best employment levels, without allowing the managers any informational rent.

Yardstick competition-based incentives schemes for the public sector are, however, vulnerable to collusion between the managers of different public enterprises. Collusion may be sustained relatively easily since managers are involved in a repeated interaction. To formalize this, we assume that at every date k, the basic one-period model is played anew. At the beginning of the period k, nature chooses whether Z_H or Z_L is realized, and these draws are independently and identically distributed across periods. We assume that the yardstick competition incentive scheme set out above is in place, at all dates. At the end of each period, the employment levels chosen by all public sector firms are public information in the industry. Managers maximize the discounted sum of pay-offs, where δ is the discount factor.

Suppose now that managers collude by setting employment equal to E_H^* irrespective of the state of the world. In this case, the expected discounted present value of a manager is given by

$$W = \mu G(E_H^*, Z_L^*) / (1 - \delta). \tag{7}$$

We see therefore that the managers can achieve an informational rent in any period where $Z = Z_L$, by choosing a higher level of employment. It remains to be seen whether collusion can be sustained. Consider a repeated game-strategy profile where each manager chooses the collusive level of employment as long as every manager has done so in every previous period. However, if any manager has failed to comply with the collusive scheme at any time in the past, every manager reverts to playing a Nash equilibrium of the stage game. Given this strategy profile, a manager can benefit in a single period when Z_L is realized by choosing E_H^*. This deviation is unprofitable, provided that

$$R \leq \delta W / (1 - \delta). \tag{8}$$

We see therefore that full collusion can be sustained, provided that the reward R is small relative to the long-term gains from collusion. While inequality (6) provides an upper bound on R, institutional constraints may constrain it further since promotions for managers are subject to bureaucratic rules. Low-powered incentives make it easier to sustain collusion.

In the collusive equilibrium, employment will be excessive. Collusion in the presence of yardstick competition thereby provides an explanation for excess employment. Note that collusion need not be explicit – there may well be a culture

[8] Notice that it can never be part of an equilibrium of the overall game for all managers to choose E_L^* when the state is Z_H, since in this case no manager's individual rationality constraint will be satisfied.

in the public sector of not pursuing aggressive employment cuts and a manager who deviates from this may well become quite unpopular. Apart from repeated game considerations, social sanctions may make yardstick competition ineffectual when it is restricted to the public sector.

We now see that partial privatization can effectively undermine collusion. Managers in the private sector will choose the profit-maximizing level of employment. This allows the central authorities to infer the level of Z_i, independently of the behaviour of the public sector managers. This may not be to the liking of public sector managers but there is little sanction that they can bring to bear on the private sector. This enables the private sector to play an informational role – the central authorities will learn over time about the collusive behaviour in the public sector, and can therefore take steps to undermine it, possibly by employing sanctions on all public sector managers. In other words, employment in the private sector can be a useful benchmark for providing incentives to the public sector managers. The private sector will not be part of a culture of excess employment but will be an independent source of information to discipline public sector managers.[9]

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. As a caveat, we should also emphasize that the model we have developed is illustrative, and is intended to allow us to interpret the data, and indeed other interpretations may well be consistent with our empirical findings. Based on these considerations, our empirical specification for employment for each category of employee is as follows:

$$\ln(E_{it}) = \xi_I + \theta_t + \rho_t O_{it} + \eta_{it}, \tag{9}$$

where ξ_i is the firm-specific effect, θ_t is the term capturing industry-wide time varying effects, and η_{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 ρ_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 in how the estimates of ρ_t evolve over time.

Before proceeding to the empirical analysis, we outline a couple of other implications of the argument of this section. Our argument suggests that partial privatization

[9] The recent mechanism design literature investigates mechanisms, which are robust to collusion – e.g., Laffont and Martimort (2000) and Tangeras (2002). Our point is somewhat different, since we argue that institutional and ownership change makes collusion unsustainable by changing the objective functions of agents.

may play a useful informational role in disciplining the firms which remain in the public sector. Indeed, in many developing countries and transitional economies, shortages of capital and entrepreneurial skills imply that large-scale privatization may be impossible. In addition, there may be political constraints on large-scale privatization.[10] In this context, partial privatization may be very appealing since only a small fraction of any given industry need be privatized in order to provide informational benefits. If there is noise in the information provided by private firms, then this fraction cannot be too small, so that the signal utilized in yardstick competition is sufficiently accurate. However, the informational benefits from marginal privatizations within the same industry are likely to be declining in the extent of privatization, so that partial privatization may well be optimal in the presence of other costs of privatization.

Our analysis of the role of yardstick information in the regulation of public firms also has implications for the interpretation of the empirical evidence on the effects of ownership on economic performance. One strand of this literature (Caves and Christensen, 1980; Parker and Martin, 1995) finds that product-market conditions rather than ownership is the important factor promoting efficiency.[11] They find that under competitive conditions, there are no significant efficiency differences between private and public firms. Our model suggests that information revelation rather than product-market competition may be playing the critical role here. Furthermore, it is not merely competition, as expressed for example in the number of firms, but the heterogeneity of ownership, which promotes public sector efficiency.

Our analysis also suggests that the magnitude of excess employment may depend systematically upon our ability to measure it. Measuring ownership effects is inherently a difficult problem – cross-sectional studies cannot control for firm-specific fixed effects (or industry-specific effects, if private and public firms are in different sectors), while studies of the privatization of natural monopolies may not be able to control for time-varying effects. If regulators of public firms are also constrained by the same data limitations as empirical economists are, this suggests that regulation will be more successful where inference about ownership effects can be made with more confidence. Thus, if the central authorities are concerned with controlling excess employment, we may expect excess employment to be lower in those instances where we as empirical economists are able to measure it with confidence. Thus, reliably measured excess employment is likely to be biased downwards.

The information revelation role of the yardstick competition with heterogeneous ownership also applies to other contexts. For example, when foreign firms enter a

[10] In transition economies, capital shortages imply that large-scale privatization be associated with widespread foreign ownership of 'strategic' sectors, which may be politically unpopular.

[11] Boardman and Vining (1989), Kumbhakar and Hjalmarsson (1998) and Dewenter and Malatesta (2001) find significant efficiency differences.

protected market, consumers and the shareholders of domestic firms may gain new information on possibilities. Competition between existing firms may not play the same role since managers may be reluctant to abandon their mutual accommodation.

4. Empirical results

We have data on firm-level employment, for the following categories of employee: officers, staff and manual. There are three types of manual workers: permanent, temporary and casual.[12] It is useful to distinguish two broad groups: white-collar, which consists of the officer and staff categories, and manual workers. The data on total manual workers are less reliable as these measure less accurately the variable of interest. Since the employment of casual workers can fluctuate on a day-to-day basis, and our data pertain to employment at a point in time, the margin of error in treating this as average employment over the year may be large. These problems do not arise with white-collar employment, where there is no casual component. Table 1 presents summary statistics for the relevant years for public and private sectors. The public sector firm is, on average, larger than the private sector firm, as shown by employment and capacity indicators. A part of this difference in means is attributable to the presence of one very large firm in the public sector (Adamjee). The dispersion of firms across the three major regions of Bangladesh (Dhaka, Chittagong and Khulna) also shows some difference across sectors, with the private firms more likely to be in Dhaka than the public firms (18 private firms are located in Dhaka, as compared to 10 public firms). While there does not seem to be any reason why the difference in regional dispersion should result in differential employment outcomes, we will test for the robustness of our results by allowing for differential regional effects over time.

Table 1 shows that there was an increase in white-collar employment in the public sector 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. In the period after 1988, public sector employment trends in white-collar categories tracks the trend in the private sector.

Tables 2 and 3 report the mean percentage change in employment relative to 1983, at mill level, for the two sectors. We find that the public sector 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, workers were retrenched in the following years and by 1994 there was a large decline in employment of all categories of workers. The decline was significant in the manual worker category. In the private

[12] Casual workers have a more precarious employment status than temporary workers, since they are hired on a day-to-day basis.

Table 1. Average employment and capacity by sector

		Employment public (Employees)	Capacity public (Looms)	Employment private (Employees)	Capacity private (Looms)
1983	Managerial	122.2	465.2	72.2	248.8
	Clerical	406.2		244.4	
	Manual	4,636.3		2,482.0	
1988	Managerial	149.4	395.2	65.9	311.3
	Clerical	450.3		213.0	
	Manual	4,568.1		2,407.8	
1992	Managerial	110.7	395.2	62.4	341.3
	Clerical	352.3		212.9	
	Manual	2,799.5		2,139.5	
1994	Managerial	90.3	395.2	57.8	341.3
	Clerical	279.9		173.8	
	Manual	2,541.5		1,893.9	

***Note*:** Number of mills: 31 state-owned mills and 31 privatized mills.
***Source*:** Bangladesh Jute Mills Association. *Employment Records*, Dhaka. Bangladesh Jute Mills Corporation. *Employment Records*, Dhaka.

Table 2. Percentage change in white-collar employment relative to 1983

Year	Category of employee	Public sector	Private sector	Excess employment in public sector
1988	Managerial	0.22	–0.09	0.31 (5.4)**
	Clerical	0.16	–0.12	0.28 (3.3)**
1991	Managerial	0.01	–0.09	0.10 (1.7)**
	Clerical	–0.05	–0.17	0.12 (1.4*)
1992	Managerial	–0.08	–0.14	0.06 (1.1)
	Clerical	–0.14	–0.16	0.02 (0.3)
1994	Managerial	–0.24	–0.25	0.01 (0.2)
	Clerical	–0.30	–0.37	0.07 (0.8)

***Note*:** Absolute t-ratios in parentheses.
* Significant at 10 percent level.
** Significant at 5 percent level.

Table 3. Percentage change in manual 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	–0.45 (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 Manual	–0.53	–0.27	–0.26 (4.5)**
	Permanent	–0.50	–0.27	–0.23 (5.6)**

Note: Absolute t-ratios in parentheses.
* Significant at 10 percent level.
** Significant at 5 percent level.

sector, on the other hand, we find evidence of retrenchment in the white-collar categories as early as 1988. Employment declined further in subsequent years and was more evenly distributed across white-collar and manual worker categories compared with the public sector.

To check on the robustness of these results, we allow for region-specific year effects – that is, we interact region dummies with year dummies for the years 1988 and after, and introduce these as additional regressors. This is to allow for the possibility that excess employment was particularly pronounced at the time of privatization in the politically central Dhaka region, where the privatized mills are over-represented. Our point estimates of excess public sector employment are hardly affected by these controls, although there is some increase in the standard errors. This suggests that the differential regional distribution of private and public mills is not responsible for our findings.

Table 4 reports the evolution of aggregate output, sector-wise, for the years for which we have firm-level employment data, relative to the 1982 benchmark. We have data on aggregate output for the private and public sectors, for all the years since 1982, and also have firm-level data on output for 1982. Since we do not have firm-level output data for the later years, we rely on aggregate sector-level output data for our analysis.[13] Public sector output contracted quite sharply. By 1994,

[13] The two sets of data seem quite consistent for the years in which we have both. Two of our privatized firms were still in the public sector in 1982–83, and were only privatized subsequently. We have made adjustments in the aggregate data to take this into account. We choose 1982 as our benchmark in the case of output since there was no constraint on adjusting output, unlike employment, where there was a bar against laying off workers for a year after privatization.

Table 4. Percentage change in output relative to 1982

	Public	Private	Difference
1988	–16	+3	–19
1991	–36	–5	–31
1992	–25	–10	–15
1994	–27	–17	–10

***Source*:** Bangladesh Jute Mills Association and Bangladesh Jute Mills Corporation Reports. Information on sectoral output (in tons), supplemented by firm-level data for 1982.

output was 27 percent lower compared to output in 1982. In contrast, the private sector was higher in 1988 and only 5 percent lower in 1991. The final column of the table reports the difference in output changes between the two sectors – on average, public sector output declined faster than private sector output.

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 that is used by Bhaskar and Khan (1995). Alternatively, one can adjust this figure for the differential change in sectoral outputs. 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 for all years.

Our main results are in Table 5, which presents two measures for excess employment (unadjusted and adjusted), by 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 declined secularly in subsequent years. The public sector still had positive excess employment by the end of the period, but 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, when we take into account the larger output contraction in the public sector, adjusted excess employment of white-collar workers turned out to be larger and remained statistically significant throughout this period.

Table 5. Excess employment in the public sector (%)

		1988	1991	1992	1994
Managers	Unadjusted	31 (5.4**)	10 (1.7**)	6 (1.1)	1 (0.2)
	Adjusted	50 (8.7**)	41 (7.0**)	21 (3.9**)	11 (2.2**)
Clerical	Unadjusted	28 (3.3**)	12 (1.4*)	2 (0.3)	7 (0.8)
	Adjusted	47 (5.5**)	43 (5.0**)	17 (2.6**)	17 (1.9**)
Total manual	Unadjusted	–1 (0.1)	–45 (7.8**)	–35 (6.0**)	–26 (4.5**)
	Adjusted	18 (1.8**)	–14 (2.4**)	–20 (3.4**)	–16 (2.8**)
Permanent manual	Unadjusted	8 (2.0**)	–32 (7.9**)	–27 (6.8**)	–23 (5.6**)
	Adjusted	27 (6.8**)	–1 (0.2)	–12 (3.0**)	–13 (3.2**)

***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.
* Significant at 10 percent level.
** Significant at 5 percent level.

Nevertheless, adjusted excess employment in the managerial category diminished from 50 percent in 1988 to 11 percent in 1994 for managers and from 47 percent to 17 percent for clerical staff.

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 adjusted measure showed an excess employment of the order of 18 percent. However, by 1991 the public sector has negative excess employment of total manual workers according to the adjusted measure, and by 1994, this is also true for the permanent manual worker category, which should be measured with greater accuracy. This suggests that public sector managers may have concentrated the bulk of employment reductions upon manual workers rather than white-collar workers, since the former were less able to resist such cuts.

To summarize, we find that employment of white-collar workers fell dramatically in the privatized mills 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, so that some excess white-collar employment remains. For manual workers, the fall in employment mirrored that of relative output, so that excess employment is eliminated (and indeed becomes negative) even by the adjusted measure by the end of the period. This behaviour over the period, with the gradual convergence of the public sector towards the employment norms in the public sector, is consistent with our argument that private sector behaviour provided valuable information to the central authorities and allowed them to control managers.

Table 6. Changes in non-financial public sector employment

	Jute		Non-jute (thousands)	
	Average per mill	Index	Total	Index
1984	5,165	100	80.1	100.0
1988	5,168	100	158.2	197.5
1992	3,263	63.1	160.7	200.9
1994	2,912	56.4	131.2	163.4

***Sources*:** For aggregate non-financial public employment, Bakht and Bhattacharya (1991), Table 16, and World Bank and Asian Development Bank (May 2003), Bangladesh Public Expenditure Review, Statistical Appendix Table A.3.2. Data on average jute employment as in Table 1 (1983 figure used for 1984, for ensuring comparability).

While our empirical results provide some support for the theoretical model of the role of privatization, we must emphasize that other explanations are also possible. For example, the central authorities may have been increasingly constrained financially in the 1990s, and this may have increased the pressures to reduce public sector employment. To investigate this possibility, we consider total employment in public sector non-financial corporations other than jute, reported in Table 6. From 1984 we find that total public sector non-jute employment rises sharply, and doubles by 1988. This figure is maintained in 1992, and then declines, so that the 1994 figure is about 19 percent lower than the 1992 level. Nevertheless, this is still 60 percent above the 1984 level.[14] In contrast, the first column shows that average employment in public sector jute mills is approximately constant till 1988, but then falls sharply, so that it is 40 percent below its 1983 level in 1994. This suggests that generalized financial pressures are not entirely responsible for the fall in public sector jute employment. Finally, it could also be argued that the voluntary departure scheme introduced by the central authorities played an important role in reducing public sector jute employment. This is undoubtedly true; however, it is also likely that revelation of the extent of excess employment by yardstick competition facilitated the introduction of the voluntary departure scheme.

5. Concluding comments

We have argued in this paper that partial privatization, in conjunction with yardstick competition, can provide useful information for the regulation of public firms.

[14] This figure overstates the fall in public sector employment since some of the reduction is due to privatization and reclassification of enterprises, and it also includes the jute sector.

Evidence in support of this argument comes from the dynamics of employment in the partially privatized jute industry in Bangladesh. The privatized mills take the lead in reducing employment, but this is followed thereafter by the public sector, and excess public sector employment is gradually reduced, in all categories. We argue that partial privatization made the fact of public sector excess employment more transparent to the central authorities, international financial institutions and the general populace.

Notwithstanding the partial convergence of employment norms across the two sectors, we find that excess white-collar employment is larger to begin with and persists to a greater degree, as compared to the employment of manual workers. 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 the 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.

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