Ownership Effects On Bank Performance: A Panel Study Of Indian Banks

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Abstract

In this paper, we use Panel Regression techniques to analyse the effects of ownership on bank performance in the context of an emerging economy, India. The literature points to mixed results in this context. We find that with the entire sample of public sector banks, old private sector banks and new private sector banks, ownership does not seem to have any effect on the Return On Assets but, public sector banks do seem to have higher Net Interest Margin and Operating Cost Ratio. However, when the State Bank of India and its seven associates are dropped from the sample, we find that new private sector banks start showing a higher Return On Assets.



1 Introduction

The Indian financial sector underwent a radical change during the nineties. From the relatively closed and regulated environment in which agents had to operate earlier, the sector was opened up as part of the efficiency enhancing structural policies to bring about high sustainable long-term growth of the economy. The banking sector was also not an exception to this rule. New measures were undertaken to induce efficiency and competition into the system. Accounting and provisioning norms, capital adequacy rules, proper risk management measures, etc. were brought in place and entry regulations were also relaxed. The environment was made friendlier for domestic private sector and foreign banks.² So, as a result, many new private players entered the banking sector giving rise to the heightened competitive pressure.

In this paper, we make an attempt to analyse the effects of ownership on bank performance in this deregulated regime. More specifically, it aims to analyse if public sector banks, old private sector banks and new private sector banks differ significantly in performance, performance being measured in terms of profitability, efficiency in portfolio management and operating efficiency. Except for earlier studies by Sarkar, *et. al.* (1998) and Chaudhuri (2002), there had not been much work along these lines in the Indian context. In the context of other countries, the work that had been done were studies by Sabi (1991) for Hungarian banks and Davies and Brucato (1987) for Australian banks. This paper proposes to analyse the relative performance of different groups of banks in the liberalised environment of India during the nineties.

The methodology followed in this paper is that of *Panel Regression*, which becomes relevant when there are data for a period of time for each of the units being considered and thus, becomes readily applicable to the present case because for the banks that have been considered in this paper, the data on the relevant variables are available for several years. In order to make full use of the available data, this technique assumes relevance. Besides making full use of the data, this technique also has some very important specific advantages. In an analysis of this kind, there might be several bank-specific and time-specific influences that are unobservable and hence not captured by the variables used in the regression. Panel data regression techniques, by making use of "Fixed Effects" and

² For a detailed discussion of the reforms in the financial sector, see Sen and Vaidya (1997).

"Random Effects" that capture these effects via the intercept term or the slope coefficients, account for these unobserved variables. The variance-covariance structure of the error term also changes consequently and this will be discussed later on³. The use of this technique makes this analysis novel.

The structure of the paper is as follows. A brief survey of the literature is contained in the next section. Section 3 describes the Indian banking sector. Section 4 describes the empirical analysis and section 5 concludes the paper.

2 A Survey of the Literature

The relationship between bank ownership and performance has not been analysed extensively and as I had mentioned before, the few references in this regard include the papers by Sabi (1991), Davies and Brucato (1987) and Sarkar, *et. al.* (1998). La Porta, *et. al.* (2000) identify the "development" view and "political" view of the government ownership of banks. The former stresses the need of the government to step in given an underdeveloped institutional set up when the private sector is incapable of carrying out the job. In this context, they rationalise government ownership of banks. The second line delineates the role of the government as a maximising entity and as such, they own banks and financial institutions to siphon off funds for their own benefits. They find more support for the latter view in their empirical exercise but it must be remembered that the difference between the two is blurred. In a democratic set up, the government is also a vote maximising entity, in which case, they run the risk of losing votes if they lean too much to the latter view. As such, there seems to be a trade off between the two motives, the distinction between the two being a subtle one and this has not been analysed in their study.

In the literature, there has been extensive analysis on the issue of ownership and performance of firms. The broad lines of thought in this regard are the property rights approach (as exemplified by the writings of Alchian, 1965 and de Alessi, 1980) and the public choice approach (as represented by the writings of Nickskamen, 1971 and Levy, 1987). The former line stresses that private enterprises are likely to perform better than public enterprises because of the market for corporate control and the resulting threat of takeovers and loss of reputation. The latter line goes on to emphasise that different kinds

³ For a discussion on Panel data regression techniques, see Hsiao (1986).

Ownership Effects on Bank Performance: A Panel Study of Indian Banks

of inefficiencies are likely to creep into a public enterprise, thereby making them low performers.

But, the strength of these two lines of thought have been questioned on the grounds that takeover moves might be initiated by one person or a group of persons but, the benefits are likely to be reaped by many; in such cases the first mover would lose the incentive to make the move as has been argued by Grossman and Hart (1980). Also, it has been argued by Caves and Christensen (1980) that with sufficient competition between the two sectors, public ownership might work equally well. The role of the voting market as a substitute for the market for corporate control has been highlighted by Mueller (1989) to downplay the role of ownership in determining performance.

It must be remembered that most of the evidence on the ownership-performance relationship is centred on developed countries and a similar line of reasoning might not work for developing countries because of the absence of a well-defined market for corporate control. This is so because in many developing countries, there is a lack of free flow of information, lack of transparency and the presence of incomplete markets, which are prerequisites for defining property rights. The ownership-performance effects noticed in the context of developed countries might not be working in these cases.

India, thus, provides an interesting example in this regard because the country has come out from the regulated environment and is moving to a more market-oriented scenario. In this sense of the term, India is an emerging economy and the period chosen for the analysis also begins right after the watershed in India's banking sector reforms. Since the regulatory environment is in a situation of halfway house, it provides a good testing ground for the hypotheses to which we had drawn attention earlier.

3 The Indian Banking Sector

The Indian banking sector consists of the Reserve Bank of India (RBI), which is the central bank, commercial banks and co-operative banks. Commercial banks are of two types – scheduled, which are subject to statutory requirements and non-scheduled, which are not. Scheduled banks can be further classified into public sector banks [comprising of the State bank of India, its seven associates, other nationalised banks and the Regional Rural Banks (RRBs)] and private sector banks, which can be either domestic or foreign.

The primary objective of bank nationalisation in 1969 was to provide assistance at concessional rates of interest to relatively backward areas. Pursuant to the nationalisation,



the banking sector became dominated by a plethora of rules and regulations. Nationalisation increased the scale of banking operations substantially (as depicted in Table 1, which illustrates the major achievements since nationalisation) but, at the cost of profitability and efficiency of the banking system; in many instances, this led to a piling of Non Performing Assets (NPAs) with the banks, causing major concern.

Table 1Major Achievements Since Nationalisation

Business indicators	June 1969	March1991	March 2000
Total Number Of Offices	8,262	60,220	67,339
Population Per Office (000's)	65	14	15
Total Deposits (Rs. billion)	137.8	1101.2	8452
Deposits Per Office (Rs. lakhs)	56	334	1255
Total Credit (Rs. Billion)	106.8	667	4822
Credit Per Office (Rs. lakhs)	44	202	716

Source: Sen and Vaidya (1997) and Statistical Tables Relating to Banks In India: 1999-2000

As part of the reform process initiated after the balance of payments crisis in 1991, largescale reforms were brought about in the financial sector in general and the banking sector in particular. As the architect of these reforms, M. Narasimham (1998) had pointed out, the reforms in the banking sector can be classified into two phases: The first phase consisted of the *curative measures*, which were brought about for making the banking sector more oriented to the market and impart competition to the environment. The second phase consisted of the *preventive measures*, which were brought about to ensure smooth functioning of the banking sector in the long run.

The primary curative measures included the reduction of reserve requirements, interest rate deregulation and lifting of entry barriers. Other important measures introduced in this category included prudential reforms in terms of following capital adequacy norms as well as adhering to well-defined asset classification and provisioning standards. Supervisory and regulatory reforms were introduced to ensure transparency and adequate risk management practices were made mandatory. The thrust of the preventive measures was primarily on privatisation and government stake was reduced to 30%. The establishment of asset reconstruction companies was envisaged and capital adequacy



norms were made more stringent. Besides these, there was an endeavour to convert "weak banks" into "narrow banks" and changes were also brought about in wage negotiations.

With increased competition, in 1994-95, six private banks namely UTI Bank Ltd, IndusInd Bank Ltd, ICICI Banking Corporation Ltd, Global Trust Bank Ltd, Centurion Bank Ltd, and HDFC Bank Ltd were set up. In 1995-96 four more new private banks namely Times Bank Ltd., Bank of Punjab Ltd., Development Credit Bank Ltd., and IDIBI Bank were set up. Thus, by 1995-96, a total of nine private sector banks were in operation. This category of new private sector banks had not been captured in earlier studies of bank ownership and performance and this is an area on which this paper will focus.



Table 2

Business of Public and Private Sector Banks

		1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01
Denosits *	Public	2,33,753	2,63,254 (12.62)	3,03,392 (15.25)	3,48,938 (15.01)	3,90,820 (12.00)	4,49,340 (14.97)	5,31,729 (18.33)	6,36,810 (19.76)	7,37,313 (15.78)	8,59,376 (16.56)
Deposits	Private	12,211	15,359 (25.78)	20,079 (30.73)	26,406 (31.51)	36,151 (36.90)	51,035 (41.17)	69,516 (36.21)	83,518 (20.14)	1,13,670 (36.10)	1,36,687 (24.20)
Advances *	Public	1,43,036	1,53,880 (7.58)	1,46,859 (-4.56)	1,77,781 (21.06)	2,07,533 (16.73)	2,20,258 (6.13)	2,59,903 (17.99)	2,96,121 (13.94)	3,52,109 (18.90)	4,14,628 (17.10)
Auvances	Private	6,407	7,961 (24.25)	9,806 (23.18)	13,970 (42.46)	22,365 (60.09)	28,681 (28.24)	35,449 (23.59)	41399 (16.78)	55,742 (34.64)	68,058 (25.58)
Business Per	Public	36.94	42.00	45.46	58.30	65.17	73.22	100.67	100.67	118.22	152.88
Employee #	Private	30.11	35.10	46.16	62.34	93.17	114.03	143.84	143.84	185.93	195.43
Capital To Risk	Public						10.25	10.86	10.79	11.50	11.89
Weighted Assets Ratio	Private						12.08	11.33	11.42	11.94	12.15
Gross NPAs (% of	Public				4.00	3.60	3.60	3.30	3.10	2.89	3.83
Total Assets)	Private					2.34	2.42	2.46	3.11	2.69	2.71
Net Profit/Loss To	Public	0.27	0.04	0.09	0.30	0.39	0.56	0.82	0.51	0.58	0.40
Total Assets @	Private	0.60	0.41	0.58	0.79	1.07	0.92	0.96	0.79	0.85	0.66
Operating Profits	Public	1.84	0.91	0.99	1.26	1.50	1.77	1.86	1.55	1.70	1.55
(% of Working Funds)	Private	2.09	1.36	1.91	2.39	1.62	1.89	2.25	1.63	2.12	1.77

* Figures are in Crores of Rupees. Figures in parentheses indicate year-on-year growth rates.

Figures are in lakhs of Rupees.

@ Figures indicate the median values.

Source: Compiled from Surti (2001), Report on Trend and Progress of Banking in India 1991-2000, Statistical Tables Relating to Banks in India (RBI) – 1991-2000 and Performance Highlights of Banks published by the Indian Banks' Association (different issues from 1996-97 to 2000-2001).

Ownership Effects on Bank Performance: A Panel Study of Indian Banks

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Some business indicators for public and private sector banks have been shown in Table 2 and they provide an idea of the response of the public and private banks to reforms. It can be noticed that the deposits and loans for both classes of banks had increased, although the increase in both of them was higher for private sector banks. With respect to business per employee, private sector banks had always remained far above public sector ones, although for the latter group there had been substantial increase in the post-liberalisation era. With respect to the Capital Adequacy Ratio, private sector banks had also shown higher figures than public sector banks although public sector banks had also remained lower than that of private sector banks, as measured by the ratio of net profits or losses to total assets. The most recent trends show that public sector banks are facing the problems of a reduction of their market share and squeeze in their profitability (Chaudhuri, 2002).

With respect to asset quality, Non Productive Assets (NPAs) recorded an increase for public sector banks in gross terms but the ratio of gross NPAs to total assets had declined. Private sector banks had consistently recorded a lower figure but it had not declined continuously. Rajaraman and Vasistha (2002) had shown that for public sector banks poor operating efficiency alone could not explain higher level of NPAs, although authors like Bardhan and Marjit (2002) have questioned the methodology being followed by the government for calculating NPAs.

4 **Empirical Analysis**

The effect of ownership on banking performance can be analysed by estimating an empirical model that would test the hypothesis of any significant effect of ownership variables on performance. In this section, a model to test this hypothesis is estimated. This section is divided into two subsections. The first one deals with the model specification and variables. In the second one, I discuss the results.

4.1 Model Specification, Data and Description of Variables

The model that we use in testing for the presence of ownership effects on bank performance is the following:

$$(Performance)_{ii} = \mathbf{m} + \mathbf{d}' D + \mathbf{b}' X_{ii} + v_{ii}$$
(1)

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Here, (*Performance*)_{*it*} is the performance measure for the *i*th bank during the *t*th period, *D* is a vector of dummy variables that characterise ownership, X_{it} is a vector of other control variables that might affect performance and v_{it} is a random error term. *d* and *b* are the column vectors of the coefficients to be estimated. The elements of *b* characterise the ownership effects. The error structure of the model is given by the following:

$$v = u_{it} + \mathbf{a}_{i} + \mathbf{l}_{t}$$

$$u_{it} \sim N(0, \mathbf{s}_{u}^{2}), \mathbf{a}_{i} \sim N(0, \mathbf{s}_{a}^{2}), \mathbf{l}_{t} \sim N(0, \mathbf{s}_{1}^{2})$$

$$Cov(u_{it}, u_{js}) = \mathbf{s}_{u}^{2}, ifi = j$$

$$Cov(u_{it}, u_{js}) = 0, otherwise$$

$$Cov(\mathbf{a}_{i}, \mathbf{a}_{j}) = \mathbf{s}_{a}^{2}, ifi = j$$

$$Cov(\mathbf{a}_{i}, \mathbf{a}_{j}) = 0, otherwise$$

$$Cov(\mathbf{l}_{i}, \mathbf{l}_{s}) = \mathbf{s}_{1}^{2}, ift = s$$

$$Cov(\mathbf{l}_{i}, \mathbf{l}_{s}) = 0, otherwise$$

$$Cov(X_{it}, u_{js}) = Cov(X_{it}, \mathbf{a}_{j}) = Cov(X_{it}, \mathbf{l}_{s}) = Cov(u_{it}, \mathbf{l}_{s}) = Cov(\mathbf{a}_{i}, \mathbf{l}_{t}) = 0,$$

$$\forall i, j, s, t$$

$$(2)$$

The system of equations designated by (2) describes the error structure of the model. This is a random effects model, which controls for unobserved bank-specific and time-specific effects. The intercept term contains the bank-specific and time-specific effects which are clubbed along with the error term. u_{it} has the classical error structure, but, due to the presence of the bank-specific and time-specific terms in v_{it} , the variance-covariance matrix of v_{it} does not remain diagonal any more. That is, it does not remain the case that the covariance of the error terms of two different periods will be zero and the variance will remain constant for all periods. This violates one of the assumptions of the classical regression model and therefore, we need a different technique to estimate this model.

The reason for choosing a random effects model over a fixed effects one is primarily driven by data. In a fixed effects model, in this case, the presence of the ownership dummy which takes the same value for the same bank across all time-periods gives rise to a matrix of explanatory variables which is singular, that is, the value of the determinant of that matrix becomes zero and as such, it cannot be inverted. This happens because a linear combination of the vectors of ownership dummies gives rise to the intercept vector. As the explanatory variable matrix cannot be inverted because of the collinearity of the regressors, the coefficients cannot be estimated. The description and construction of the performance, control and dummy variables will be explained later on.

Since the variance-covariance matrix of the error term does not satisfy the assumptions of the classical regression model in this case, Ordinary Least Squares (OLS) cannot be used to estimate this model. If OLS is used, then the coefficients will no longer retain the property of "minimum variance" which should be one of the properties of a good estimator. So, the model will be estimated using the technique of Generalised Least Squares (GLS). This method of panel regression also takes care of the endogeneity problem to a certain extent. The endogeneity problem in this case would mean a debate on whether it is ownership which is affecting performance or is it the other way round, with performance dictating the ownership structure. In India, the choice of the ownership structure is policy-driven and it has less frequently been the case that a poorly functioning bank is taken over by the government. Thus, in any case, the probability of the presence of the endogeneity problem is quite low. Coupled with this, since the regression technique uses data for several time-periods, any past period performance affecting future ownership, f at all any such effect is present, will be taken care of and thus, the problem will be reduced.

Performance of banks can be judged from several angles but in this paper I consider the profitability and efficiency aspects of performance. The measure of profitability that has been used in this paper is Return On Assets (ROA) and the measures of efficiency used here are Net Interest Margin (NIM) and Operating Cost Ratio (OCR) because they capture different aspects of performance.

The measure of profitability, ROA is defined as the net profits of the banks divided by the average total assets. This measure, thus, summarises the ability of the management to produce net earnings from the assets of the banks. Since the operating profits of a bank include some provisions and contingencies which the net profits do not and since the provisions and contingencies are likely to increase with the riskiness of the loans advanced by the banks, ROA can be taken as a proxy for risk adjusted return.

The first measure of effidency used here, the Net Interest Margin (NIM) is defined as the difference between interest earned and interest expended as a proportion of average total assets. NIM measures the efficiency of portfolio management of banks. The second measure, Operating Cost Ratio (OCR) is defined as the ratio of the total operating cost of the bank divided by the average total assets. It indicates the total amount of inputs

needed to manage the assets of the bank and as such, is a broad measure of operating efficiency of the banks. These measures had also been used in earlier studies of bank ownership and performance [See, for example, Sarkar, *et. al.* (1998) and Davies and Brucato (1987)].

All the measures of profitability and efficiency used in this paper are based on accounting information and as such, are accounting measures. As such, they do not capture the underlying determinants of shareholder value [See for example, Padhye and Sharma (2002)]. As has been pointed out by Padhye and Sharma (2002) and Mor and Sharma (2002) in this context, Economic Value Added (EVA) or Shareholder Value Added (SVA) might be better measures of performance of banks. The reasons for using the accounting measures in spite of their inherent imperfections are primarily twofold. Firstly, the data requirements for calculating these measures include stock market data as well, and as such, will be available only for the listed banks in our sample. Since our sample contains many unlisted banks as well, this would have resulted in loss of data points. Secondly, the balance sheets of banks are highly opaque and the cash flow statements required for the calculation of these measures are extremely difficult to obtain. For the calculation of SVA for example, one needs to have a forecast of future cash flows for the bank in question. This job would have been next to impossible for our sample of banks belonging to different categories and concentrated in different regions. The need was thus felt to continue using the accounting measures and as has been pointed out earlier, these measures had also been used in earlier studies.

The variables of interest to us in this paper are the dummy variables, the coefficients of which capture the ownership effects. In this context, I estimated the preliminary sets of regressions using one ownership dummy, PUBLIC that took the value of 1 if the bank in question was in the public sector and 0 if it was in the private sector. The results did not point to any significant effect of ownership on the performance indicators. I hypothesised that these results might be driven by the large number of old private sector banks in the sample.

As I had discussed in the previous section, the Indian banking sector was and even now is dominated by public sector banks, which include the State Bank of India and its associates and the nationalised banks. They are thus the ones, which had been around for a long time. However, during the regulated regime itself, there were a number of private sector banks that had come into the picture. They functioned alongside the public

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sector banks and their functions were not much different from the public sector banks. The government also used these banks to meet its targets in the same manner as they used public sector banks. The new private sector banks, on the other hand, were the ones that came up primarily after the financial sector liberalisation. Their structure and nature of operations are thus, expected to be different from the old private sector banks. So, for the next round of regressions, I use two dummy variables, PUBLIC and NPRIVATE. The dummy PUBLIC takes a value of 1 if the bank in question is a public sector bank and 0 otherwise. The dummy NPRIVATE takes a value of 1 if the bank in question is a new private sector bank and 0 otherwise. The performance of these two categories of banks are thus, measured with respect to the performance of old private sector banks, both in terms of profitability and efficiency.

The control variables include the set of variables other than ownership that might affect the performance of banks and in the context of this paper, primarily represent the variables depicting the regulatory environment. The control variables include the logarithm of total assets (LNASSETS), proportion of investment in Government of India securities (INVGSEC), the proportion of loans made to the priority sector (LOANSPR), the proportion of rural and semi-urban branches (RSB) and the proportion of non-interest income in total income (NONINT). LNASSETS is introduced in the regression in order to control for any scale effects. Lately, over the past few years, much of the profits of commercial banks have been coming from their treasury operations in government securities. The variable INVGSEC is introduced in the regression to control for this effect. LOANSPR, RSB are introduced to capture the effect of the regulatory environment on bank performance. NONINT is brought into the picture to capture the extent of diversification of the banks into fee-based services which do not bring about a corresponding liability. This is expected to affect the performance favourably. The variables chosen in this paper had been used earlier in the literature and in this choice I primarily follow Sarkar, et. al. (1998).

I have collected data on all the relevant variables from the year ending March 31, 1997 to the year ending March 31, 2001 for five years. Thus, for each bank in my sample, I have five data-points for all the relevant variables. The sources of the data are different issues of the annual publication *Performance Highlights of Banks* published by the *Economics Department of the Indian Banks' Association.* The reason for choosing this particular time period is the following. It has been discussed in the previous section that a degree of competition was injected into the banking sector as part of the financial sector

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liberalisation programme. As a result of this policy shift, many new private banks made their entry into the banking sector in 1994-95 and 1995-96. Time needed to be given to these banks to settle down. Besides this, the Reserve Bank of India implemented many of the income provisioning norms and other mandatory regulations in 1995-96 and the full effect of these regulations would have taken some time to be realised. Taking these two issues into consideration, the earliest time-period that one could take was the year ending March 31, 1997. The latest data available from the Indian Banks' Association pertained to the year ending March 31, 2001. This provides the rationale for choosing that particular time-period.

In my sample, there are 58 banks in all. 27 of these banks belong to the public sector (which include the State Bank of India and its 7 associates), 23 belong to the old private sector and 8 belong to the new private sector. Thus, we have data for 5 years on each of these 58 banks for all the relevant variables. Table A.1 to Table A.8 in the appendix describe the behaviour of each of the variables over all the years. An examination of these tables shows that with respect to ROA, new private sector banks had been doing the best. For example, in 2001, while the average ROA for public sector banks was 0.0036, the figure for new private sector banks was 0.0026, the figure for new private sector banks was 0.00201 respectively. With respect to the OCR, new private banks had the lowest average (0.0175 in 2001) followed by old private sector banks (0.0211) and public sector banks recorded the highest average (0.0265).

With respect to the other variables, the average assets of all the three groups had increased over the years but public sector banks had dominated the scene. The variation in asset size had been highest for old private sector banks. With respect to investment in Government of India securities, public sector banks had the highest proportion and with respect to advances to the priority sector, public sector banks had led the way, being overtaken, on average, by the group of old private sector banks in 1999. On examining the branching pattern, public sector banks had the largest proportion of rural and semi-urban branches with new private sector banks recording the lowest average. New private sector banks had the largest average activities, with public sector banks and old private sector banks moving very close to each other. A proper analysis of ownership effects on bank performance needs to control for all these factors.

4.2 Results

The estimation procedure is begun by estimating three models. Firstly, I estimate equation (1) with error structure given by (2), using ROA as the performance variable (Model 1). Then, NIM and OCR are used as performance variables in conjunction with the same set of explanatory variables and the same error structure (Model 2 and Model 3 respectively). The results are presented in Table 3.

Table 3

	Model 1		Mode	Model 2		el 3
Variable	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
LNASSETS	-0.00001	-0.009	-0.0040	-5.414***	-0.0037	-8.962***
INVGSEC	-0.00461	-1.653*	-0.0019	-0.385	-0.0066	-4.986 ***
LOANSPR	-0.00102	-0.448	-0.0022	-0.757	0.0015	2.252 ***
RSB	-0.00065	-0.143	0.0074	1.457	0.0025	1.314
NONINT	0.00266	1.775*	0.0008	0.18ć	0.0016	1.592
PUBLIC	-0.00070	-0.280	0.0119	4.834***	0.0125	8.426 ***
NPRIVATE	0.00482	1.632	0.0024	0.769	-0.0016	-0.889
Constant	0.00921	1.715*	0.0516	6.879***	0.0529	15.466 ***
R-Squared		0.29		0.33		0.43

Regression Results

* Significant at 10%

** Significant at 5%

*** Significant at 1%

On examining the table, it becomes evident that for Model 1, none of the ownership dummies seem to have any significant effect on Return On Assets. The ownership dummy NPRIVATE does have a positive effect on the Return On Assets but the effect is not significant. In fact, this is the regression that has the lowest overall significance. Thus, from the results of the estimation of Model 1, it appears that ownership does not have any significant effect whatsoever on the Return On Assets of banks. This is in contrast to the view that privatisation would improve the profitability of economic organisations.

Moving on to Model 2, in this case, we find that the ownership dummy PUBLIC has a positive coefficient (0.0119) and is highly significant as is shown by the high value of the t-ratio. The effect of the dummy NPRIVATE is also positive but not significant. Thus, after controlling for other factors, public sector banks seem to be having a higher Net Interest Margin than old private sector banks. This feature is because of the following reason. Most of the public sector banks have access to low cost funds in the nature of current

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accounts, huge savings accounts and large amount of floating funds. The primary reasons for this access is their reach and the very fact that they have been in business for a long period of time. The other important reason for the high net interest margins of public sector banks is the fact that this group of banks charge high rates of interest on loans given to small and medium enterprises (SMEs). Because of their large network, they are in a position to cater to the needs of all such enterprises that are situated in non-metropolitan areas. Till recently, private sector banks and foreign banks were at a relative disadvantage at reaching out to this category of enterprises on account of their smaller network. Thus, more than their efficiency at managing their portfolios better, the higher NIM of public sector banks reflect the very fact that these banks have reached a stability and maturity, which the new banks are yet to achieve.

The estimation results for Model 3 show that the ownership dummy PUBLIC has a positive coefficient (0.0125), which is highly significant. The dummy NPRIVATE impacts on OCR negatively but the effect is not significant. This result shows that public sector banks have a significantly higher Operating Cost Ratio compared to old private sector banks, whereas new private sector banks do not have a significantly lower Operating Cost Ratio than their old counterparts. Public sector banks thus, have lower operating efficiency than other categories of banks.

Among the control variables, while LNASSETS does not have any significant effect in the ROA regression, it is seen to have negatively significant effects in both the NIM and OCR regressions. In the case of the NIM regression, this points to a decline in interest spreads with the increase in scale and in the case of the OCR regression, the negative effect maybe a result of the presence of fixed costs like insurance, lawyer's fees, auditor's fees, etc. INVGSEC has a negatively significant effect on ROA, indicating the dampening effect of the low returns on government securities on profitability. The negatively significant effect of INVGSEC in the OCR regression is more a result of variable creation than anything else. This happens because investment in Government of India securities forms part of the assets of the banks and assets also form a part of the denominator of the dependent variable, thus, giving rise to the negative influence. LOANSPR does not have any significant impact on ROA, which runs contrary to the popular belief that priority sector lending has a dampening effect on profitability. But, this maybe because of the fact that the interest subsidy on priority sector loans exceeding Rs. 20,000 had been substantially reduced from 1993 onwards. LOANSPR is also seen to have a positively significant effect in the OCR regression, indicating to a certain extent, the higher network

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of branches generally associated with higher lending to the priority sector. The variable NONINT has a positively significant effect on ROA, confirming our earlier conjecture that non-interest income does have a positive effect on profitability. This variable, however, does not have any affect whatsoever on NIM and OCR. In this context, it should be kept in mind that the high and positive tratio of NONINT in the OCR regression is a pointer to the higher costs and relatively higher salaries that need to be paid to the skilled specialists and highly qualified professionals needed to carry out the fee-based activities of banks.

Thus, we find that in case of the entire sample, government ownership of banks seems to affect the Net Interest Margin and Operating Cost Ratio. Public sector banks, thus, manage to have higher Net Interest Margins on account of their larger branching network and their Operating Cost Ratio on account of the larger network. Thus, while they are losing out on one count, they are gaining on the other and as such, there is a trade-off involved in the operations of this category of banks. In order to gain a proper understanding, a pair-wise comparison of the different ownership groups becomes necessary. I perform this estimation as the next step. In order to do so, I first take the sample of only the public sector banks and old private sector banks and perform the same regression analysis with the model given by equation (1) and error structure (2). The regression with Return On Assets did not yield very different results than those reported under Model 1. The regressions with NIM and OCR as dependent variables yield results that have been reported in Model 4 and Model 5 in Table 4.

Table 4

Regression Results (Public Sector and Old private Sector Banks)

	Мос	del 4	Mode	15
Variable	Coefficient	t-value	Coefficient	t-value
LNASSETS	-0.0038	-5.34 ***	-0.0037	-9.06 ***
INVGSEC	-0.0023	-0.47	-0.0065	-4.57***
LOANSPR	-0.0023	-0.81	0.0016	2.13**
RSB	0.0053	1.252	0.0035	1.92*
NONINT	0.0010	0.226	0.0016	1.46
PUBLIC	0.0113	4.792 ***	0.0128	9.33***
Constant	0.0522	7.035 ***	0.0519	14.57***
R-Squared		0.31		0.43

* Significant at 10%

** Significant at 5%

*** Significant at 1%

The results show that government ownership of banks has a positive effect again on the NIM (for reasons that have been explained earlier) and government owned banks have a higher OCR than old private sector banks. With respect to the regression with OCR as the dependent variable, OCR is seen to increase with a rise in LOANSPR and RSB and decline with an increase in INVGSEC. Thus, a higher proportion of loans to the priority sector and larger proportion of rural and semi-urban branches seem to increase the operating costs of banks while INVGSEC has a negative effect because of the construction of variables.

Table 5 shows the results of same set of regressions performed with the sample of only the public sector banks and new private sector banks with NIM and OCR as the dependent variables (Model 6 and Model 7 respectively). The results for ROA have not been reported once again because they are not much different. From the tables, it can be seen that public sector banks on an average have higher NIM and OCR than new private sector banks. LOANSPR and RSB are again seen to result in an increase of OCR while investment in government securities is seen to reduce the OCR. The reasons for the positive effect of government ownership on NIM are the same as the ones that had been stated for the earlier cases.

Table 5

Regression Results (Public Sector Banks and New Private Sector Banks)

	Mode	16	Mode	el 7
Variable	Coefficient	t-value	Coefficient	t-value
LNASSETS	-0.0038	-5.34 ***	-0.0037	-9.06 ***
INVGSEC	-0.0023	-0.47	-0.0065	-4.57 ***
LOANSPR	-0.0023	-0.81	0.0016	2.13**
RSB	0.0053	1.25	0.0035	1.92*
NONINT	0.0010	0.23	0.0016	1.46
PUBLIC	0.0113	4.79 ***	0.0128	9.33***
Constant	0.0522	7.04 ***	0.0519	14.57 ***
R-Squared		0.30		0.43

* Significant at 10%

** Significant at 5%

*** Significant at 1%

Table 6

Regression Results (Old Private Sector Banks and New Private Sector Banks)

	Model 8		Mode	9
Variable	Coefficient	t-value	Coefficient	t-value
LNASSETS	-0.0038	-5.34 ***	-0.0037	-9.06 ***
INVGSEC	-0.0023	-0.47	-0.0065	-4.57 ***
LOANSPR	-0.0023	-0.81	0.0016	2.13**
RSB	0.0053	1.25	0.0035	1.92 *
NONINT	0.0010	0.23	0.0016	1.46
OPRIVATE	0.0113	4.79 ***	0.0128	9.33***
Constant	0.0522	7.04 ***	0.0519	14.57 ***
R-Squared		0.31		0.44

* Significant at 10%

** Significant at 5%

*** Significant at 1%

The pair-wise comparison ends with new private sector banks and old private sector banks. The regressions are estimated with the panel for old and new private sector banks only. The results have been reported in Table 6, with the regressions for NIM and OCR being given by Model 8 and Model 9 respectively. The models were estimated by introducing a new dummy variable, OPRIVATE that takes the value of 1 if the bank belongs to the group of old private sector banks and 0 otherwise. The regression for ROA has not been reported because in that case, none of the ownership groups were

seen to be having significant effects. The results in Table 6 show that old private sector banks have a higher NIM and OCR than new private sector banks. For old private sector banks, NIM was found to be higher because of their reach and their age vis-à-vis new private sector banks. The operating efficiency of the new private sector banks, however, turned out to be higher than that of old private sector banks. Here again, LOANSPR and RSB are seen to increase the OCR of banks while, as noted earlier, INVGSEC is seen to reduce the OCR.

Among the public sector banks, the State Bank of India and its seven associates belong to a different category and their financials are also stronger. In order to examine if the presence of these strong financials is driving the results or not, I re-estimate the models after excluding the State Bank of India and its seven associates from the sample. There is another reason for dropping these banks from the sample. The data for all these analyses have been calculated using the reported data in the annual publication of the Indian Banks' Association. It is understood that the State Bank of India and its seven associates follow a different accounting and reporting procedure while reporting their income and expenses. This feature might introduce a bias in the results and dropping these banks from the sample is likely to reduce the extent of bias or remove it altogether. The new dummy variable used in this case is PUBLIC1, which takes a value of 1 if the bank in question belongs to the public sector (excluding the State Bank of India and its seven associates) and 0 otherwise.

Table 7

Regression Results (Excluding the State Bank of India and Its Seven Associates)

	Model	10	Model	11	Model	12
Variable	Coefficient	t-value	Coefficien	t t-valu e	Coefficient	t-value
LNASSETS	-0.0001	-0.01	-0.0040	-5.41 ***	-0.0037	-8.96 ***
INVGSEC	-0.0046	-1.13	-0.0019	-0.39	-0.0066	-4.99 ***
LOANSPR	-0.0010	-0.45	-0.0022	-0.76	0.0015	2.25 * *
RSB	-0.0006	-0.14	0.0074	1.46	0.0025	1.31
NONINT	0.0027	0.78	0.0008	0.19	0.0016	1.59
PUBLIC 1	-0.0007	-0.28	0.0119	4.83 ***	0.0125	8.43***
NPRIVATE	0.0048	1.65 *	0.0024	0.77	-0.0016	-0.89
Constant	0.0092	1.72*	0.0516	6.88 ***	0.0529	15.47 ***
R-Squared		0.29		0.33		0.43

* Significant at 10%

** Significant at 5%

*** Significant at 1%

Ownership Effects on Bank Performance: A Panel Study of Indian Banks

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Models 10, 11 and 12 reported in Table 7 show the regression results with the dataset excluding the State Bank of India and its seven associates. Although the regression for ROA (Model 10) does not show a very good fit, the interesting fact to notice from the table is that the positive coefficient of NPRIVATE becomes mildly significant, indicating a positively significant effect of belonging to the group of new private sector banks. Thus, the earlier result of insignificance that we had obtained was partially the result of the State Bank of India and its seven associates in the sample. But, the negatively significant effect of INVGSEC that had been noticed earlier does not remain any more. The regression results with NIM and OCR as the dependent variables (Model 11 and Model 12 respectively) do not change much, with government ownership of banks resulting in higher NIM and higher OCR for reasons stated earlier. In the OCR regression, LOANSPR still continues to increase OCR and INVGSEC continues to have the negative impact because of the construction of the variables. In this case, however, the positively significant effect of RSB recorded earlier is seen to become insignificant.

5 Discussion and Conclusion

This paper has examined the effects of ownership on performance in the context of Indian banks. The performance indicators chosen were Return on Assets, Net Interest Margin and Operating Cost Ratio to reflect the profitability as well as the efficiency aspects of performance. The control variables used in the regressions reflect the regulatory environment and business operations of the different ownership groups. These control variables had also been used in earlier studies on ownership and bank performance in the Indian context (See, for example, Sarkar, *et. al.*, 1998) as well as in studies in the context of other countries (Davies and Brucato, 1987). The variables of interest in the regressions are the dummies capturing the ownership groups.

The results of our regression analysis have shown that with respect to Return On Assets, there are no significant ownership effects. However, in this context, an interesting observation was that when the State Bank of India and its seven associates were dropped from the sample, banks belonging to the new private sector were seen to have a statistically significant positive effect on Return On Assets, though at the 10% level of significance. With respect to Net Interest Margin and Operating Cost Ratio, the results were fairly robust. Public sector banks consistently had higher levels of Net Interest Margin than the other groups but they also showed a significantly higher Operating Cost Ratio that were fairly than other groups of banks. These results stood out in all the regressions that were

carried out with all the samples and are in sharp contrast to the study by Sarkar, *et. al.* (1998), which found no significant effects of ownership on performance.

The other interesting aspect of this study is the rough ordering that we obtained with respect to the ownership effects on bank performance. From the pair-wise regressions, it was observed that with respect to both Net Interest Margin and Operating Cost Ratio, public sector banks had the highest NIM and OCR, followed by old private sector banks, which in turn was followed by new private sector banks. Thus, although the reach and age of public sector banks gave them an edge in accessing low cost funds and high interest earnings on their investment in government securities, they could not match up with new private sector banks in terms of operating efficiency because the new private sector banks had the lowest Operating Cost Ratio.

The important point to be noted in this context is that public sector banks have displayed higher Net Interest Margin and Operating Cost Ratio. With respect to the former, however, this is more an indication of the reach and age of most of these public sector banks than their efficiency at managing their portfolios more efficiently. There is also a question of trade-off involved in this. For the public sector banks, their higher Net Interest Margins stem from their reach and network, which in turn increases their cost of operation. This might also be partially responsible for their higher Operating Cost Ratio. Thus, they are gaining at one end and losing out at the other.

For new private sector banks to reach the magnitude of public sector banks it would still take a long time and in many cases, for the new private sector banks, their attention to details and providing customer satisfaction seem to be the main impetus rather than growing in magnitude. When it comes to managing operations efficiently, the new private sector banks have done a better job and this is reflected in their lower operating cost ratio and higher Return on Assets (for the sample excluding the State Bank of India and its seven associates). The smaller and well managed network of these banks is partially responsible for this but, the automation process followed by them and the modernisation drive implemented by many of them have helped them to cut their costs and this provides them with the competitive edge. A more detailed study of specific banks may help us in throwing more light on these issues.

The analysis can be extended in several ways. In my analysis, I have not taken into account the role of the stock market as a disciplining device. In other words, I have not differentiated between traded and non-traded banks in my analysis. While differentiating

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between these two categories of banks, it must be borne in mind that there maybe some banks which are less frequently traded than others and as such, the disciplining force of the stock market would be weaker for this category of banks. This fact needs to be incorporated into our analysis to gain better understanding of the situation. The other point is that this analysis has been carried out without considering foreign banks. With the recent permission given to foreign banks enabling them to operate in India through subsidiaries rather than branches, the role of foreign banks is likely to become more important in the liberalising economy. The analysis can me made richer by including these banks because competition rather than ownership is likely to assume more importance in future.



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Appendix

Table A.1

Behaviour of Return On Assets

			Return On	Assets	
	N	Aaximun	n Minimum	Average	Std. Dev.
Public Sect	or	0.0148	-0.0208	0.0044	0.0073
¹⁹⁹⁷ Old Private	Sector	0.0201	0.0009	0.0082	0.0054
New Private	Sector	0.0214	0.0046	0.0153	0.0065
Public Sect	or	0.0142	-0.0144	0.0067	0.0060
1998 Old Private	Sector	0.0214	-0.0236	0.0076	0.0087
New Private	Sector	0.0204	0.0049	0.0144	0.0058
Public Sect	or	0.0123	-0.0342	0.0041	0.0083
1999 Old Private	Sector	0.0154	-0.0230	0.0040	0.0087
New Private	Sector	0.0170	0.0059	0.0103	0.0042
Public Sect	or	0.0131	-0.0172	0.0052	0.0054
2000 Old Private	Sector	0.0181	-0.0053	0.0071	0.0053
New Private	Sector	0.0131	0.0014	0.0093	0.0026
Public Sect	or	0.0126	-0.0143	0.0036	0.0055
2001 Old Private	Sector	0.0162	-0.0619	0.0014	0.0171
New Private	Sector	0.0125	0.0012	0.0067	0.0036

Table A.2

Behaviour of Net Interest Margin

	I	Net Interes	st Margin	
	Maximum	Minimum	Average	Std. Dev.
Public Sector	0.0526	0.0065	0.0303	0.0084
1997 Old Private Sector	0.0420	0.0124	0.0290	0.0076
New Private Sector	0.0818	0.0199	0.0269	0.0065
Public Sector	0.0427	0.0053	0.0290	0.0068
1998 Old Private Sector	0.0387	0.0116	0.0253	0.0068
New Private Sector	0.0333	0.0099	0.0212	0.0067
Public Sector	0.0364	0.0087	0.0273	0.0059
1999 Old Private Sector	0.0407	-0.0134	0.0206	0.0100
New Private Sector	0.0313	0.0096	0.0194	0.0077
Public Sector	0.0334	0.0045	0.0198	0.0054
2000 Old Private Sector	0.0381	0.0110	0.0227	0.0065
New Private Sector	0.0239	0.0145	0.0185	0.0043
Public Sector	0.0818	0.0133	0.0294	0.0118
2001 Old Private Sector	0.0378	0.0088	0.0233	0.0077
New Private Sector	0.0302	0.0086	0.0201	0.0071

Table A.3

Behaviour of Operating Cost Ratio

	0	perating (Cost Ratio)
	Maximum	Minimum	Average	Std. Dev.
Public Sector	0.0478	0.0208	0.0284	0.0053
1997 Old Private Sector	0.0341	0.0090	0.0250	0.0065
New Private Sector	0.0371	0.0135	0.0190	0.0048
Public Sector	0.0342	0.0194	0.0263	0.0037
1998 Old Private Sector	0.0321	0.0006	0.0228	0.0065
New Private Sector	0.0305	0.0118	0.0173	0.0056
Public Sector	0.0354	0.0173	0.0260	0.0041
1999 Old Private Sector	0.0345	0.0091	0.0228	0.0055
New Private Sector	0.0355	0.0112	0.0179	0.0077
Public Sector	0.0338	0.0168	0.0249	0.0038
2000 Old Private Sector	0.0318	0.0107	0.0219	0.0052
New Private Sector	0.0205	0.0107	0.0143	0.0040
Public Sector	0.0371	0.0141	0.0265	0.0048
2001 Old Private Sector	0.0307	0.0128	0.0211	0.0053
New Private Sector	0.0244	0.0110	0.0175	0.0050

TableA.4

Behaviour of the Logarithm of Total Assets

	L	Log of Total Assets					
	Maximum	Minimum	Average	Std. Dev.			
Public Sector	12.0447	8.2306	9.5820	0.8106			
1997 Old Private Sector	8.8399	4.4088	7.1401	1.0486			
New Private Sector	12.6876	6.6783	7.4994	0.5105			
Public Sector	12.1459	8.3969	9.7262	0.8111			
1998 Old Private Sector	8.9370	4.6512	7.3523	1.0397			
New Private Sector	8.5915	7.3697	7.9904	0.4090			
Public Sector	12.3535	8.5834	9.8915	0.8060			
1999Old Private Sector	9.0416	4.8252	7.5158	1.0559			
New Private Sector	8.9120	7.6611	8.3750	0.4133			
Public Sector	12.4830	8.8112	10.0429	0.7839			
2000 Old Private Sector	9.2881	5.0116	7.7005	1.0476			
New Private Sector	9.4599	5.0116	8.8642	0.4854			
Public Sector	12.6876	9.0644	10.1840	0.7852			
2001 Old Private Sector	9.4660	5.1669	7.8339	1.0569			
New Private Sector	9.9507	8.2311	9.1143	0.5823			

Table A.5

	Proportio	n of inves	tment in	GOI Sec.
	Maximum	Minimum	Average	Std. Dev.
Public Sector	0.8267	0.5211	0.7050	0.0757
1997 Old Private Sector	0.8885	0.4455	0.6964	0.0978
New Private Sector	0.9470	0.4557	0.6691	0.1935
Public Sector	0.8212	0.4977	0.6884	0.0855
1998 Old Private Sector	0.8555	0.4789	0.6653	0.1003
New Private Sector	0.8021	0.4501	0.6333	0.1209
Public Sector	0.8723	0.5191	0.6860	0.0848
1999 Old Private Sector	0.8960	0.5080	0.6563	0.0905
New Private Sector	0.7096	0.4505	0.5642	0.0971
Public Sector	0.8591	0.4813	0.7132	0.0904
2000 Old Private Sector	0.8398	0.3760	0.6515	0.1073
New Private Sector	0.7646	0.6027	0.6164	0.0962
Public Sector	0.8835	0.0674	0.7109	0.1527
2001 Old Private Sector	0.9088	0.4475	0.6886	0.1149
New Private Sector	0.7473	0.4654	0.5933	0.1111

Behaviour of the Proportion of Investment in GOI Securities

Table A.6

Behaviour of the Proportion of Loans to the Priority Sector

	Proportion	n of loans	to priori	ty sector
	Maximum	Minimum	Average	Std. Dev.
Public Sector	0.4029	0.2584	0.3434	0.0404
1997 Old Private Secto	r 0.5181	0.0553	0.3210	0.0990
New Private Secto	r 0.3101	0.0589	0.2046	0.0789
Public Sector	0.4339	0.2376	0.3481	0.0561
1998 Old Private Secto	r 0.5321	0.0923	0.3303	0.0997
New Private Secto	r 0.3163	0.0803	0.2058	0.0765
Public Sector	0.4339	0.2376	0.3481	0.0561
1999 Old Private Secto	c 2.3956	0.1254	0.4361	0.4365
New Private Secto	r 0.2438	0.0834	0.1811	0.0641
Public Sector	0.4319	0.2348	0.3380	0.0601
2000 Old Private Secto	r 0.5329	0.1180	0.3332	0.0935
New Private Secto	r 0.2679	0.1180	0.1680	0.0722
Public Sector	0.4319	0.2348	0.3380	0.0601
2001 Old Private Secto	c 0.5329	0.1180	0.3332	0.0935
New Private Secto	r 0.2193	0.0722	0.1583	0.0429

Table A.7

	Proportion	of rural and	l semi-urba	n branches
	Maximum	Minimum	Average	Std. Dev.
Public Sector	0.7737	0.5365	0.6571	0.0507
1997 Old Private Sector	0.8056	0.0000	0.5748	0.2124
New Private Sector	0.4000	0.0000	0.1323	0.1594
Public Sector	0.7727	0.5267	0.6483	0.0533
1998 Old Private Sector	0.7838	0.0000	0.5711	0.2102
New Private Sector	0.5000	0.0588	0.2623	0.1388
Public Sector	0.7711	0.5089	0.6409	0.0551
1999 Old Private Sector	0.7733	0.0000	0.5639	0.1951
New Private Sector	0.4000	0.0588	0.2370	0.0972
Public Sector	0.7706	0.4907	0.6343	0.0597
2000 Old Private Sector	0.7733	0.0000	0.5611	0.1917
New Private Sector	0.2840	0.0000	0.2647	0.0141
Public Sector	0.7675	0.4893	0.6288	0.0609
2001 Old Private Sector	0.7250	0.0000	0.5568	0.1809
New Private Sector	0.5131	0.2188	0.2808	0.0964

Behaviour of the Proportion of Rural and Semi-urban Branches

Table A.8

Behaviour of the Proportion of Non-interest Income

	Proportion of non-interest income in total income			
	Maximum	Minimum	Average	Std. Dev.
Public Sector	0.1502	0.0770	0.1100	0.0209
1997 Old Private Sector	0.1976	0.0446	0.1165	0.0404
New Private Sector	0.2190	0.1116	0.1632	0.0390
Public Sector	0.1605	0.0766	0.1194	0.0228
1998 Old Private Sector	0.2791	0.0430	0.1389	0.0551
New Private Sector	0.2467	0.1056	0.1981	0.0476
Public Sector	0.1664	0.0731	0.1127	0.0229
1999 Old Private Sector	0.1712	0.0446	0.1102	0.0324
New Private Sector	0.2295	0.0892	0.1417	0.0471
Public Sector	0.1935	0.0760	0.1261	0.0280
2000 Old Private Sector	0.2242	0.0519	0.1449	0.0444
New Private Sector	0.2088	0.0519	0.1657	0.0283
Public Sector	0.1865	0.0770	0.1193	0.0258
2001 Old Private Sector	0.1898	0.0409	0.1165	0.0336
New Private Sector	0.1549	0.1117	0.1381	0.0180