"Thai financial sector efficiency prior to the East Asian financial crisis"

by

Dr. Mark Bailey, School of Economics & Politics, University of Ulster, UK.

Dr. Deb Ghosh, Coventry Business School, Coventry University, UK.

Dr. Sailesh Tanna, Coventry Business School, Coventry University, UK.

Abstract

This paper looks at whether differences in the form of ownership were not the cause of the productivity differences but that these differences were due to individual firm effects. We also want to examine the belief that inefficiency in the Thai financial sector was not one of the causal factors in the currency crisis in 1997 with a high level of overall efficiency and some firms outperforming this norm. A regression of total revenue on capital, labour, company dummies and time dummies reveals that the average growth rate of total revenue allowing for changes in labour and capital and inter-firm efficiency differences was 3.6% for the period 1989 to 1996. The same regression also provides evidence that in the Thai insurance sector, larger companies are more efficient. However, no such similar evidence exists for the Thai banking sector.

Correspondence Address

Dr Mark F. Bailey

School of Economics & Politics

University of Ulster at Jordanstown

Shore Road

Newtownabbey

County Antrim

Northern Ireland

BT37 0QB

E-mail mf.bailey@ulst.ac.uk

Fax 028 9036 6847

Introduction

In a previous paper, Ghosh et al (2000), the current authors looked at efficiency differences between Thai public and private firms finding that whilst there were some basic underlying efficiency differences between the two groups of firms, it was difficult to attribute such differences as being due to the difference in the type of ownership. This lead us to argue that efficiency gains from the on-going privatisation efforts in Thailand may not be realised without adequate measures designed to promote competition.

In this paper, we wish to look at two issues. Firstly, we want to shed more light on the efficiency question and justify our belief that differences in the form of ownership was not necessarily the cause of the differences in productivity that were observed. Secondly, we want to examine the belief that inefficiency in the Thai financial sector was one of the causal factors in the currency crisis in 1997 as claimed in such papers as BIS (1997) with IMF (1997) discussing "imprudent lending". Such statements are in stark contrast to the earlier view in World Bank (1993) that Thailand was an 'East-Asian miracle' with high total factor productivity growth which is usually related to efficient factor allocation including that of lending.

The background

The Thai financial sector has been criticised for relationship lending, e.g. in IMF (1997), but this has been argued by such authors as Menkhoff (2000) as being a result of the asymmetric information that exists between borrowers and lenders. The explanation is thus; in an industrialised country, the ex-ante situation of borrowers having more information about the riskiness of projects is met by reliable accounting frameworks. However, such frameworks are still being developed in industrialising countries so the lender needs a means of assessing risk which may be achieved by having a close working relationship with your borrowers, indeed one which could be argue to parallel that in Germany where bankers often sit on the boards of companies.

Because of restrictions on the issue of new banking licenses, with no new licenses being issued for several decades until new regulations were implemented in 1993 allowing 15 new banks to commence operations, banks had developed relationships with their established clients and knew about their financial situation. Thus it is conceivable that client-based

relationship banking, which we see as being efficient (in the technical sense of the word[1]), was replaced by an embryonic market-oriented competitive banking situation which may have lead to inexperienced banks lending inappropriately and thus contributing to the financial situation that developed in 1996.

The data

The data for the Banking and Insurance firms is pooled giving 173 observations on 27 firms over an 8 year period prior to the East Asian currency crisis. There are 5 firms which were state owned in 1996 (Krung Thai Bank, Government Savings Bank, Government Housing Bank, Bank for Agriculture and Agricultural Co-operatives in banking and Dhipaya in Insurance) and 22 firms which were privately owned in 1996 (Bangkok Bank, Thai Farmer Bank, Siam Commercial Bank, Bank of Ayudhya, Thai Military Bank, Bank of Asia, Nakornathon Bank plc, First Bangkok City Bank, Siam City Bank, Bangkok Metropolitan Bank, Union Bank, Bangkok Bank of Commerce, Laem Thong Bank in banking and Phatra, Syn Munkong, Khoom Khao, Ayudya, Bangkok and Navakij, Bangkok Union, Safety and Pacific in Insurance). Some of the privately owned banks no longer exist in the aftermath of the 1997 financial crisis with the assets of Bangkok Bank of Commerce transferred to Krung Thai Bank, Union Bank merging with Krung Thai Thanakit (a subsidiary of Krung Thai Bank) to become Thai Bank and Laem Thong Bank merging with a new state owned bank called Radanasin Bank. It is important to note that not all firms have observations for all years as shown in Table 1.

Length of data history	Number of firms with this length of data history
1 year	0
2 years	0
3 years	0
4 years	2
5 years	3
6 years	13
7 years	0
8 years	9

Table 1 The length of data histories

[1] The type of efficiency that we are interested in here is technical or productive efficiency as opposed to allocative efficiency.

The variables used are (logarithms of) output *(Q)*, labour *(L)* and capital *(K)*, which are defined as follows. *Q* is measured by total revenue in millions of baht deflated by a price index (1990=100). *K* is represented by real assets in millions of baht defined as the sum of equity and loan capital and deflated by the same price index. *L* is defined as the number of employees for that particular year.

As a matter of comparison, Sarel (1997) finds that total productivity growth in Thailand averaged 2% per annum for the period 1978 to 1996; if a regression of total revenue on capital, labour, company dummies and time dummies is carried out, then it is found that the average growth rate of total revenue is almost 4% for our data for this period of 1989 to 1996.

The model

We will compare the factor productivities of the firms using a standard neo-classical production function with the model being a panel data one specified as follows

$$\ln Q_{ij} = \mathrm{B}_0 + \mathrm{B}_1 \ln K_{ij} + \mathrm{B}_2 \ln L_{ij} + \mathrm{B}_{3i} T_i + \mathrm{B}_{4j} F_j + e_{ij}$$

where
- Q_{ij} is the output of firm *j* in time period *i*
- K_{ij} is the capital usage of firm *j* in time period *i*
- L_{ij} is the labour usage of firm *j* in time period *i*
- T_i is a time trend
- F_j is a dummy variable for each firm

The key difference in this framework is that we can now take into account the individual specific characteristics of the firms, such as differing levels of entrepreneurship or corporate culture[2], into our analysis as these are indicated by a shift in the production function

[2] Public banks have a "developmental role", as pointed out by the World Bank Report (1994) which suggests that private banks by having greater freedom in exploiting more immediate, short-term, financial opportunities have the ability to obtain higher profitability. Conversely, the relatively higher marginal physical product of capital for public firms discussed in Ghosh et al (2000) could be associated with the monopoly status of public sector banks, having an advantage over private banks in their dealings with other state-owned enterprises.

In the previous study, the status of the firms was defined as being privately or publicly owned for the whole period although some institutions did switch state both ways with publicly owned banks being privatised during our sample period and some privately owned banks being brought under state control in the aftermath of the 1997 financial crisis; here we assign a dummy variable for each company so that we can have separate efficiency measures for each regardless of the state of their ownership throughout the study.

A Cobb-Douglas production function (assuming neutral technical progress) is then estimated using a panel data form of OLS giving the following relationship:

$$Q = 1.4215\, K^{0.5598}\, L^{0.3107}$$

The coefficient of capital is significant at the 99.9999% level of statistical significance, the coefficient of labour is significant at the 99.99% level of statistical significance while the coefficient of the constant term is significant at the 93% level of statistical significance. We can reject the null hypothesis of constant returns to scale at the 99% level of statistical significance. Overall the model is significant at the 97% level of statistical significance.

A likelihood ratio test shows that we can reject the null hypotheses that a model with independent variables or group effects but not both is a better model than the model with independent variables **and** group effects at the 99.9999% level with a χ^2 statistic of 134.576 and 26 degrees of freedom. Similarly, another likelihood ratio test shows that we can reject the null hypotheses that a model with only independent variables and group effects but not time effects is a better model than the model with independent variables, group effects and time effects at the 99.9999% level with a χ^2 statistic of 168.338 and 34 degrees of freedom.

Using appropriate mean values (shown in Table 2), we derive the factor productivities for public and private firms as shown in Table 3.

Variable	*Mean*
K	121888
L	5389
Q	13104
Q/L	2.4315
Q/K	0.1075
K/L	22.6159

Table 2 Mean values from the data

Productivity	*Public*
MPP_L	0.8314
APP_L	2.6761
MPP_K	0.0662
APP_K	0.1183

Table 3 Factor Productivity estimates

A more traditional analysis with firm and time dummies is included as appendix 1 which illustrates the ideas that efficiency was rising over time albeit with dips and that efficiency did vary across companies albeit not always statistically significantly. This reveals that some of the companies had a statistically significantly different production function to the overall production function of $Q = 0.2484\ K^{0.7588}\ L^{0.2008}$ with all of these firms being more efficient that the norm.

Of the Insurance companies, Dhipaya Insurance (Company 9) has a production function of $Q = 1.1793\ K^{0.7588}\ L^{0.2008}$, Syn Munkong Insurance (Company 11) has a production function of $Q = 1.3326\ K^{0.7588}\ L^{0.2008}$, Khoom Khao (Company 12) has a production function of $Q = 1.0384\ K^{0.7588}\ L^{0.2008}$, Bangkok Insurance (Company 14) has a production function of $Q = 1.6455\ K^{0.7588}\ L^{0.2008}$ and Pacific Insurance (Company 27) has a production function of $Q = 0.8630\ K^{0.7588}\ L^{0.2008}$. Of the banks, only Bangkok Bank (Company 28) having a production function of $Q = 0.3047\ K^{0.7588}\ L^{0.2008}$ has a statistically significantly different production function to the overall production function .

The difference between these firms and the whole sample appears to be in terms of the means of capital and labour[3] with these firms being larger than the average insurance firm by some 50%. Thus it would appear that, at least for the Thai insurance sector, that big is beautiful or at least more efficient

Conclusions

If a regression of total revenue on capital, labour, company dummies and time dummies is carried out (as detailed in Appendix 1), then it is found that the average growth rate of total revenue allowing for (a) changes in labour and capital and (b) inter-firm efficiency differences, is 3.6% for our data for this period of 1989 to 1996. Also, this regression provides evidence that in the Thai insurance sector, larger companies are more efficient. However, no such similar evidence exists for the Thai banking sector.

[3] The sectoral means for capital and labour are 840 and 352 respectively, while the means for this group are 1271 and 507. A 2 sample t-test assuming unequal variances is significant at the 98% level in both cases.

References

Bank for International Settlements (1998), *68th Annual Report*, Basle, Switzerland.

Ghosh, D., Tanna, S., Sukrattanawong, S. and Bailey M. (2000), "Assessing efficiency differences between Thai public and private firms", *Global Business & Economics Review - Anthology 2000,* pp. 232 - 246

International Monetary Fund (1997), *World Economic Outlook : Interim Assessment*, Washington DC, USA.

Menkoff, L (2000), "Bad Banking in Thailand? An Empirical Analysis of Macro Indicators", *The Journal of Development Studies*, **36**, pp. 135 - 168

Sarel, M (1997), "Growth and Productivity in ASEAN Countries", IMF Working Paper WP/97/07,

Thai Ministry of Finance : Comptroller-General's Department (1999a), "Summary of Master Plan Contents", Bangkok, Thailand

Thai Ministry of Finance (1999b), 'Thailand's Economic Report", Bangkok, Thailand.

World Bank (1993), *The East Asian Miracle*, Oxford University Press, Oxford, UK.

World Bank (1994), *Thailand Sector Report: Increasing Private Sector Participation and Improving Efficiency in State Enterprises*, Report No. 13132-TH, World Bank, Washington, DC, 1994.

Appendix 1

A regression of total revenue on capital, labour, firm dummies and time dummies using a traditional Ordinary Least Squares method as opposed to panel data analysis.

This model is also of the form

$$\ln Q_{ij} = \mathrm{B}_0 + \mathrm{B}_1 \ln K_{ij} + \mathrm{B}_2 \ln L_{ij} + \mathrm{B}_{3i} T_i + \mathrm{B}_{4j} F_j + e_{ij}$$

Variable	Coefficient	t-ratio
Constant	-1.3926	-1.228
K	**0.7588**	**9.153**
L	0.2008	1.722
Company 2	-0.1207	-1.228
Company 3	0.1861	0.649
Company 4	-0.2417	-1.951
Company 5	0.0851	1.365
Company 6	0.1130	1.546
Company 7	0.0971	0.916
Company 8	0.1163	1.217
Company 9	**1.5575**	**3.228**
Company 10	0.4935	0.923
Company 11	**1.6797**	**3.616**
Company 12	**1.4303**	**2.558**
Company 13	0.2709	0.524
Company 14	**0.9548**	**2.486**
Company 15	0.9687	1.730
Company 25	0.7762	1.408
Company 26	0.9524	1.941
Company 27	**1.2453**	**2.343**
Company 28	**0.2041**	**2.426**
Company 29	-0.0095	-0.061
Company 30	0.0024	0.015
Company 31	0.1889	0.987

Company 32	0.1341	0.894
Company 33	-0.0233	-0.084
Company 34	-0.0537	-0.235
Company 35	0.0802	0.373
Company 36	-0.0135	-0.039
Year 2	**0.1340**	**2.225**
Year 3	**0.2829**	**5.010**
Year 4	**0.2004**	**3.172**
Year 5	**0.1942**	**2.657**
Year 6	**0.1620**	**1.973**
Year 7	**0.1930**	**2.159**
Year 8	**0.2866**	**3.062**

The variables in bold are statistically significant at the 95% level

This model is significant overall at the 99.9999% level.