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The Production Efficiency Effects Of Bank Mergers: Evidence From Malaysia

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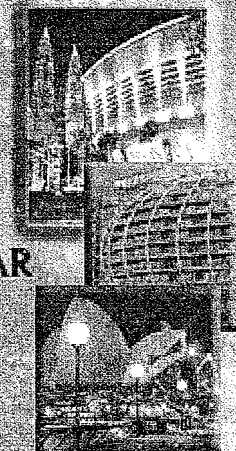
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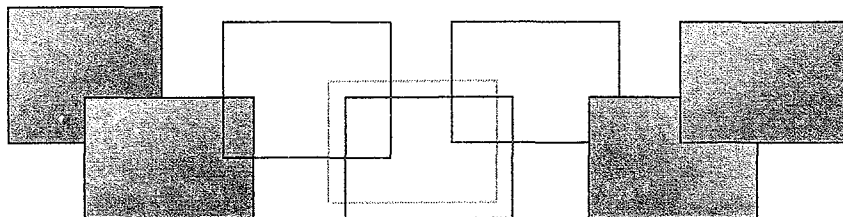
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THE PRODUCTION EFFICIENCY EFFECTS OF BANK MERGER: EVIDENCE FROM MALAYSIA

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ABSTRACT

The purpose of this study is to analyze the technical and scale efficiency of Malaysian domestic banks pre and post merger over the period 1995 - 2006 by employing the non-parametric frontier approach, Data Envelopment Analysis. The evidence shows mixed results, the largest anchor bank is less efficient than the target banks and the smaller sized anchor banks are more efficient than the targets. However, the anchor banks do not necessarily retain their pre merger efficiency levels. Overall, banks improve their efficiency scores during the merger period and continue to progress during the post merger period. The study offers support for the government's merger incentive policy in particular to the large scale banks with little cling to the smaller sized acquiring banks.

Key words: merger, efficiency, data envelopment analysis

INTRODUCTION

The economic malaise in the end of 1990s has motivated many changes in Malaysia economic structure, with no exception on the financial industry. The government appears fully committed to continue with reform in the financial sector and to follow a more responsible fiscal policy. Specifically, the government has forced Malaysia-based industries to merge, theoretically creating more robust banks capable of competing internationally.

Mergers and acquisitions in Malaysia banking industry can be traced to the historical reluctance of local banks to merge. Malaysia witnessed its market driven bank merger as early as in 1932, late 1960s and in the 1990s with the takeover of United Asian Bank by Bank of Commerce and Kwong Yik Bank by Rashid Hussain Group. As a result of the economic recession in mid 1980s, Bank Negara Malaysia introduced a rescue scheme to maintain integrity of public savings and the stability of the financial system. The rescue scheme was costly, yet the market only experienced a gradual diminution in the number of banks. Even with the government's effort, the banking institutions were rather sluggish in responding to the nation call. There were 71 banking institutions in the country with 2,712 branches. Apparently, Malaysia was over-banked and led to inefficient use of resources and duplication of resources and infrastructure of domestic

market. To worsen things, Malaysia was affected by the currency crisis and financial crisis in July 1997, pushing a sharp impact of recession on Malaysia (Bank Negara Malaysia, 1999).

The government came forward to push the consolidation process with Bank Negara Malaysia expressed its intention to consolidate the local banks in April 1999. On July 29, Bank Negara Malaysia announced the unprecedented measure by forcing 58 financial institutions to merge into six core banking groups (Bank Negara Malaysia, July 1999). On August 6, Bank Negara Malaysia unveiled the six anchor banks (Bank Negara Malaysia, August 1999). Due to the strong protests, in October 20 Bank Negara Malaysia revised the merger scheme by allowing banks to choose their own partners and their leaders (Bank Negara Malaysia, October 1999). On February 14 2000, Bank Negara Malaysia announced 10 anchor banks (by maintaining the initial 6 anchor banks selected) as part of the merger program with 13 foreign-owned banks were left untouched (Bank Negara Malaysia, February 2000). By 2001, all banks were merged into the ten banking groups except Bank Utama. The ten anchor banks are Maybank Bhd, Bumiputra Commerce Bank Bhd, RHB Bank Bhd, Public Bank Bhd, Arab-Malaysian Bank Bhd, Hong Leong Bank Bhd, Perwira Affin Bank Bhd, Multi-Purpose Bank Bhd, Southern Bank Bhd and EON Bank Bhd. Each bank had minimum shareholders' funds of RM2 billion and asset base of at least RM25 billion.

Table 1: Malaysian Banks Mergers and Acquisitions

Anchor Banks	Target Banks	Affiliation	Post Merger Asset
Malayan Banking Bhd	Phileo Allied Bank Bhd Pacific Bank Bhd	MAY PHILEO PAC	150
Bumiputra Commerce Bank Bhd		BCB	67
RHB Bank Bhd	Bank Utama Bhd	RHB BU	56
Public Bank Berhad	Hock Hua Bank Bhd	PUB HOCK	50
Arab Malaysian Bank Bhd		AM	39
Hong Leong Bank Bhd	Wah Tat Bank Bhd	HL WAH	35
Affin Bank Bhd	BSN Commercial Bank Bhd	AFF BSN	30
EON Bank Bhd	Oriental Bank Bhd,	EON ORI	25
Southern Bank Bhd**	Ban Hin Lee Bank Bhd	SB BHL	25
Alliance Bank Bhd	International Bank Malaysia Bhd Sabah Bank Berhad	ALL IBM SABAH	14

Source: Bank Negara Malaysia Annual Report, 2001 and Bank's Annual Report, various issues

Note: * Bumiputera Commerce Bank changed its name to CIMB Bank on 7 September 2006

** Southern Bank Bhd. merged with CIMB Bank on 1 November 2006

The merger scheme represents a major structural enhancement to the domestic banking industry in heading the world of liberalization and globalization as well as enlarging and strengthening the domestic banks in Malaysia. The structural efficiency is fundamental in ensuring the role of domestic banks as an effective intermediary in the economy. It is noteworthy that the banking consolidation process in Malaysia is distinct and exclusive from the process occurs in other countries. In developed countries such as United States of America (US) and Europe, the bank mergers and acquisitions involve mainly domestic banks while in Latin American, the process occurs mostly amongst domestic and foreign banks. In Malaysia, the consolidation process absorbs all domestic banks in the sector under ten anchor banks with the foreign banks are unaffected. In addition, the consolidation process in Malaysia is primarily due to government induced by the need to construct domestic banks that are more efficient and competitive, whereas the process is a market driven consolidation in developed countries. On top of that, the banking restructuring reform in Malaysia is undertaken in the aftermath of a financial crisis whilst in developed countries, the process has been on a consolidation wave. Nevertheless, despite the substantial structural changes and importance of the banking sector, not much is known regarding the effect of bank mergers and acquisitions in Malaysia. As such, the overall objective of this study is to investigate the implications of government driven merger on the efficiency gains of the Malaysian banking sector.

PREVIOUS STUDIES

The possibility that bank mergers especially horizontal mergers will yield efficiency gains is an issue that has been subject to considerable debate, much is yet to be understood. The bulk of empirical research shows merely no evidence of efficiency gains from bank mergers (Kohers, Huang and Kohers, 2000; Cuesta and Orea, 2002; Focarelli et al., 2002; Amel et al., 2004; and Havrylchuk, 2004). On the other hand, some researchers expressed cynicism (Becher, 2000; and Houston et al., 2001) while few studies suggest that the benefits of mergers and acquisitions seem to accrue only after certain years of time (Rhoades, 1998; Focarelli et al., 2002; Cuesta and Orea, 2002; Berger, 2003 and Campa and Hernando, 2006). In a nutshell, there is no strong support for the hypothesis that mergers have a beneficial effect on merged banks and the banking industry as a whole. Nevertheless, the merger activity continues to receive attention from the authorities while the practitioners persistently praise its benefit. Amel et al. (2004) offer possible explanations for the divergence between the econometric evidence and bankers' beliefs on the bank merger benefits, explicitly the regulation; difficulties in measuring the improvements in efficiency; the merger gains only emerge fully after some time; and the presence of agency problems between managers and shareholders.

The regulator generally used their authority together with economic incentives to encourage consolidation in financial industry in order to improve market efficiency and competition. The impact of financial deregulation and liberalization are far from reaching the consensus. One view holds that the deregulation hinders the competitiveness of the sector with deleterious impacts on the efficiency (Corvoisier and Gropp, 2002; Berger and Mester, 2003; Casu, Girardone, Molyneux, 2004; Demirgüç-Kunt, Laeven and Levine, 2004; and Yildirim and Phillipatos, 2007). In contrast, few studies record a significant efficiency gains during the financial deregulation (Isik and Hassan, 2003; di Patti and Hardy, 2005; Nakane and Weintraub, 2005; and Mahesh and Rajeev, 2006). In addition, studies on the implications of financial deregulation on the banking competition focus on the foreign penetration to the local markets (Williams and Nguyen, 2005;

Yildirim and Phillipapotos, 2006; and Yeyati and Micco, 2007) and on the structural aspect of banks (Berger et al., 2004).

Despite the substantial structural changes and the pivotal role of Malaysian banking sector to the economy, research on this area appears to be not only limited but also neglected. Krishnasamy *et al.* (2003) examine Malaysian banks post merger productivity growth within a short period, 2000 - 2001. The results show no evidence of improvement in scale efficiency except for two banks by suggesting that the technological change of Malaysian banks range from 5 per cent to 16.8 per cent. Fadzlan (2004) extends the study of Katib and Mathews (2000), Okuda and Hashimoto (2004) and Krishnasamy *et al.* (2003) on more recent data, by examining the efficiency changes. The findings reveal that Malaysian banks operate on overall efficiency level of 95.9 per cent during 1998 – 2003 with the small and medium size banks benefited most from the merger program. The study concludes that the policy makers should be more careful in promoting mergers as a tool of efficiency gains. In addition, Fauzias *et al.* (2006) indicate that the merger does not improve efficiency of Malaysian domestic banks and the financial performance remains unchanged before and after the merger.

Specifically, this study contributes to the established literature in three important aspects. First, this study adds evidence on the effect of compulsory basis merger policy on the efficiency of Malaysian domestic banks. Second, the study reports efficiency analysis relative to the common frontier, allows the comparison of banks against the same benchmark. Third, this study does not assess efficiency gains for anchor banks alone; this study also reports the efficiency levels for target banks on pre merger period. Last but not least, the study contributes to the public policy implications, particularly with respect to the Malaysia Financial Sector Master Plan (FSMP) in realizing a more competitive and efficient financial system.

DATA AND METHODOLOGY

This study covers the period from 1995 to 2006, consists ten domestic anchor banks as the acquirers and the other ten commercial banks as the targets from 1995 to 1999 during pre merger. Annual data is taken from published balance sheet information in annual reports of each bank. The definition and measurement of inputs and outputs in the banking function remains a contentious issue among researchers. In the banking theory literature, there are two main approaches competing with each other in this regard: the production and intermediation approaches (Sealey and Lindley, 1977). Under the production approach, a financial institution is defined as a producer of services for account holders, that is, they perform transactions on deposit accounts and process documents such as loans. The intermediation approach on the other hand assumes that financial firms act as an intermediary between savers and borrowers and posits total loans and securities as outputs, whereas deposits along with labor and physical capital are defined as inputs.

This research will employs non-parametric estimates, data envelopment analysis (DEA) to measure the efficiency of Malaysian banks. The method allows for the decomposition of the efficiency and productivity differences into one representing the banks' efficiency and productivity levels relative to their peers best practice frontiers. This study employs the input-based approach where inputs are contracted proportionally with exogenous outputs. In this study overall technical efficiency is decomposes into a pure technical

efficiency and scale-based efficiency. Scale efficiency refers to the output loss due to inefficient scale operating while the former simply refers to deviations from the efficient frontier, which results from the failure to utilize the resources efficiently.

Charnes, Cooper and Rhoades model (CCR) was first introduced by Charnes et al. (1978) to measure the efficiency of each decision making unit (DMU), that is obtained as a maximum of a ratio of weighted outputs to weighted inputs. This denotes that the more the output produced from given inputs, the more efficient is the production. The weights for the ratio are determined by a restriction that the similar ratios for every DMU have to be less than or equal to unity. This definition of efficiency measure allows multiple outputs and inputs without requiring pre-assigned weights. Multiple inputs and outputs are reduced to single "virtual" input and single "virtual" output by optimal weights. The efficiency measure is then a function of multipliers of the "virtual" input-output combination.

The CCR model presupposes that there is no significant relationship between the scale of operations and efficiency by assuming constant returns to scale (CRS), and it delivers the overall technical efficiency. The CRS assumption is only justifiable when all DMUs are operating at an optimal scale. However, firms or DMUs in practice might face either economies or diseconomies of scale. Thus, if one makes the CRS assumption when not all DMUs are operating at the optimal scale, the computed measures of technical efficiency will be contaminated with scale efficiencies. Banker et al. (1984) extended the CCR model by relaxing the CRS assumption. The resulting Banker, Charnes and Cooper (BCC) (1984) model was used to assess the efficiency of DMUs characterized by variable returns to scale (VRTS). The VRTS assumption provides the measurement of pure technical efficiency, which is the measurement of technical efficiency devoid of the scale efficiency effects. If there appears to be a difference between the technical efficiency and pure technical efficiency scores of a particular DMU, then it indicates the existence of scale inefficiency.

RESULTS AND DISCUSSIONS

Efficiency estimates are computed using the DEAP program (Coelli, 1996). The efficiency scores are computed relative to the global common frontier. The common frontier is defined following the traditional approach by pooling the data set for all banks in the sample period, from year 1995 to 2006. Table 1, 2 and 3 illustrate the efficiency scores for all anchor and target banks relative to the whole sample (refer appendices). Overall, the results demonstrate relatively low efficiency scores. Table 4 below summarizes the efficiency scores for all banks in the sample period into three sub periods; pre merger (1995 - 1999), merger (2000 - 2001) and post merger (2002 - 2006). The findings reveal an improvement in the average efficiency scores for almost all banks in the sample period with exceptional cases for AM Bank, Hong Leong Bank, Affin Bank and Southern Bank.

Table 4: Efficiency Scores of Anchors and Targets (Pre, Merger and Post Merger)

BANK	Pre Merger			Merger			Post Merger		
	TE*	PTE*	SE*	TE*	PTE*	SE*	TE*	PTE*	SE*
MAY**	0.318	0.549	0.589	0.307	0.721	0.427	0.369	0.955	0.386
PHILEO	0.693	0.733	0.948						
PAC	0.321	0.381	0.844						
BCB**	0.452	0.486	0.959	0.289	0.365	0.861	0.478	0.834	0.584
RHB**	0.506	0.553	0.928	0.417	0.597	0.698	0.566	0.889	0.642
BU	0.491	0.611	0.791						
PUB**	0.365	0.478	0.813	0.277	0.319	0.882	0.425	0.555	0.714
HOCK	0.335	0.459	0.729						
AM**	0.707	0.811	0.888	0.756	0.801	0.926	0.352	0.416	0.872
HL**	0.292	0.344	0.850	0.746	0.750	0.992	0.478	0.540	0.898
WAH	0.200	0.912	0.218						
AFF**	0.387	0.409	0.954	0.356	0.386	0.921	0.367	0.403	0.922
BSN	0.435	0.521	0.838						
EON**	0.409	0.526	0.774	0.524	0.566	0.929	0.425	0.443	0.958
ORI	0.443	0.483	0.886						
SB**	0.496	0.556	0.852	0.294	0.300	0.979	0.329	0.335	0.982
BHL	0.252	0.335	0.752						
ALL**	0.273	0.321	0.849	0.333	0.357	0.932	0.483	0.495	0.972
SABAH	0.204	0.498	0.414						
IBM	0.151	0.834	0.181						

Note: * TE indicates technical efficiency; PTE represents pure technical efficiency and SE stands for scale efficiency

** Ten bank written in bold indicate the anchors followed by the targets subsequently

Table 1 shows the three largest banks with respect to total assets namely Maybank, Bumiputera Commerce Bank and RHB Bank exemplify small increments in overall efficiency levels. Maybank records an increment from 0.318 to 0.369 with improvements from 0.452 to 0.478 and 0.506 to 0.566 for Bumiputera Commerce Bank and RHB Bank. It is noteworthy that all the three banks record a major improvement in pure technical efficiency whilst a main decline in scale efficiency scores. Maybank reports the highest post merger score for pure technical efficiency at 0.955 as compared to 0.549 before merger while Bumiputera Commerce efficiency score increases to 0.834 from 0.486. The latter bank shows an increment of pure technical efficiency score from 0.553 to 0.889 after the merger. The results completely twist for scale efficiency scores; Maybank records a drop from 0.589 to 0.386, Bumiputera Commerce and RHB demonstrate a major plunge from 0.959 to 0.584 for the former and 0.928 to 0.624 for the latter. It shows that the largest bank in Malaysian domestic banks really put advancement on technological but with a negligence on the managerial aspects. If this managerial can be tackled wisely and efficiently, it will improve Maybank's performance even more.

AM Bank, Affin Bank and Southern Bank show a decline in overall efficiency scores with the major drop is recorded by AM Bank, pre merger score at 0.707 jumps down to 0.352 after the merger, followed by Southern Bank and a slight plunge for Affin Bank. With respect to the sources of efficiency, pure technical efficiency contributes mainly to the inefficiency level of the banks. Pure technical efficiency for AM Bank falls from 0.811 to 0.416 after the merger with a minor drop for scale efficiency, in parallel with Southern

Bank results, a main drop in pure technical efficiency and a small cut in scale efficiency. On the other hand, Affin Bank records a small slump for both sources of efficiency.

The efficiency results for the remaining banks; Public Bank, Hong Leong Bank, EON Bank and Alliance Bank demonstrate an increased in overall efficiency scores with the leading improvement is recorded by Alliance Bank from 0.273 before the merger to 0.483 during post merger. In terms of pure technical efficiency, all banks report an increment except EON bank which shows a slight drop from 0.526 to 0.443 after the merger. In contrast to that, EON banks records the highest improvement of scale efficiency from 0.774 to 0.958 with the only bank that reports a decline in scale efficiency is Public Bank, pre merger score at 0.813 drop to 0.714.

Looking at the perspectives of anchors and targets efficiency scores during pre merger periods, the results produce mixed results. The anchor banks that record a progress in overall efficiency scores may comprise target banks that are more or less efficient than them. Maybank for example, is less efficient than the targets namely Phileo Allied Bank and Pacific Bank but the bank yields efficiency gains during post merger period; the same explanation goes well with EON Bank. With regards to that; RHB Bank, Hong Leong and Alliance Bank which are more efficient than their targets perform better after the merger. On the other hand, the banks that demonstrate a decline in efficiency scores after the merger not necessarily to consist the less efficient target banks. Southern Bank which is more efficient than the target, Ban Hin Lee Bank shows a decline in efficiency scores after the merger. The same results apply to Affin Bank which records a decline in performance despite being more efficient than the target during pre merger.

CONCLUSIONS

The evidence shows mixed results, the largest anchor bank is less efficient than the target banks and the smaller size of anchor banks are more efficient than the targets. However, the anchor banks do not necessarily retain their pre merger efficiency levels. Overall, banks improve their efficiency scores during merger period and continue to progress for the post merger period. The study offers support for the government incentive merger policy in particular to the large scale banks with little cling to the smaller size acquiring banks.

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Appendices

Table 1: Technical Efficiency Scores of Anchors and Targets (1995 – 2006)

BANK	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
MAY	0.315	0.322	0.331	0.299	0.323	0.313	0.301	0.354	0.361	0.404	0.337	0.389
PHILEO		0.701	0.647	0.649	0.773							
PAC	0.340	0.272	0.378	0.294								
BCB	0.434	0.374	0.345	0.259	0.849	0.431	0.146	0.546	0.446	0.397	0.511	0.490
RHB		0.625		0.348	0.545	0.419	0.414	0.453	0.561	0.605	0.565	0.647
BU	0.265	0.332	0.471	0.432	0.499	0.627	0.466	0.835				
PUB	0.235	0.275	0.341	0.517	0.457	0.264	0.290	0.341	0.277	0.270	0.236	1.000
HOCK		0.362	0.354	0.333	0.353	0.274						
AM	0.628	0.745	0.695	0.795	0.674	1.000	0.512	0.541	0.339	0.433	0.199	0.246
HL	0.243	0.273	0.288	0.343	0.314	1.000	0.491	0.424	0.636	0.492	0.340	0.497
WAH		0.234	0.194	0.226	0.147							
AFF	0.524	0.332	0.410	0.341	0.330	0.371	0.340	0.416	0.418	0.428	0.341	0.232
BSN	0.320	0.471	0.497	0.463	0.424							
EON	0.281	0.325	0.401	0.512	0.524	0.643	0.405	0.578	0.504	0.365	0.298	0.381
ORI	1.000	0.256	0.365	0.338		0.258						
SB	0.224	0.313	0.467	0.477	1.000	0.307	0.280	0.267	0.308	0.413		
BHL	0.231	0.231	0.315	0.235	0.250							
ALL		0.227	0.286	0.320	0.258	0.309	0.356	0.416	0.427	0.440	0.443	0.687
IBM		0.148	0.099	0.215	0.143							
SABAH	0.223	0.213	0.188	0.192								

Table 2: Pure Technical Efficiency Scores of Anchors and Targets (1995 – 2006)

BANK	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
MAY	0.465	0.485	0.561	0.553	0.683	0.693	0.749	0.892	0.921	1.000	0.963	1.000
PHILEO		0.818	0.676	0.658	0.778							
PAC	0.439	0.335	0.421	0.328								
BCB	0.436	0.375	0.350	0.268	1.000	0.580	0.149	0.884	0.659	0.647	0.981	1.000
RHB		0.698		0.349	0.611	0.617	0.577	0.647	1.000	0.886	0.911	1.000
BU	0.520	0.456	0.561	0.518	0.582	0.727	0.565	0.960				
PUB	0.237	0.334	0.412	0.846	0.563	0.276	0.361	0.450	0.370	0.460	0.496	1.000
HOCK		0.485	0.478	0.465	0.467	0.401						
AM	1.000	0.830	0.729	0.807	0.691	1.000	0.602	0.718	0.394	0.482	0.202	0.285
HL	0.349	0.333	0.327	0.372	0.338	1.000	0.499	0.424	0.636	0.514	0.401	0.727
WAH		1.000	0.927	1.000	0.719							
AFF	0.586	0.365	0.414	0.346	0.333	0.397	0.374	0.506	0.475	0.429	0.363	0.240
BSN	0.547	0.538	0.538	0.512	0.471							
EON	0.545	0.460	0.477	0.554	0.594	0.704	0.428	0.591	0.517	0.386	0.309	0.413
ORI	1.000	0.348	0.392	0.370		0.303						
SB	0.331	0.395	0.521	0.535	1.000	0.314	0.286	0.278	0.313	0.414		
BHL	0.347	0.323	0.371	0.312	0.322							
ALL		0.299	0.316	0.376	0.293	0.335	0.379	0.433	0.436	0.451	0.468	0.688
SABAH	0.596	0.535	0.458	0.403								
IBM		0.979	0.695	0.948	0.712							

Table 3: Scale Efficiency Scores of Anchors and Targets (1995 – 2006)

BANK	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
MAY	0.677	0.664	0.591	0.541	0.473	0.452	0.401	0.396	0.392	0.404	0.350	0.389
PHILEO		0.857	0.957	0.985	0.993							
PAC	0.774	0.812	0.896	0.895								
BCB	0.995	0.998	0.987	0.967	0.849	0.742	0.979	0.618	0.677	0.614	0.521	0.490
RHB		0.895		0.996	0.893	0.678	0.717	0.700	0.561	0.682	0.620	0.647
BU	0.510	0.729	0.839	0.834	0.859	0.863	0.825	0.870				
PUB	0.993	0.824	0.827	0.611	0.812	0.960	0.804	0.758	0.750	0.588	0.475	1.000
HOCK		0.746	0.742	0.718	0.757	0.684						
AM	0.628	0.898	0.953	0.985	0.975	1.000	0.851	0.753	0.858	0.898	0.986	0.863
HL	0.696	0.821	0.881	0.923	0.928	1.000	0.984	0.999	1.000	0.957	0.849	0.683
WAH		0.234	0.209	0.226	0.204							
AFF	0.894	0.910	0.990	0.985	0.992	0.932	0.909	0.822	0.880	0.999	0.939	0.969
BSN	0.584	0.876	0.925	0.905	0.901							
EON	0.516	0.708	0.840	0.925	0.883	0.913	0.945	0.978	0.976	0.945	0.966	0.923
ORI	1.000	0.734	0.931	0.916		0.851						
SB	0.677	0.794	0.897	0.891	1.000	0.979	0.979	0.961	0.985	0.999		
BHL	0.665	0.715	0.850	0.753	0.778							
ALL		0.761	0.904	0.849	0.880	0.924	0.939	0.960	0.980	0.976	0.947	0.999
SABAH	0.374	0.398	0.410	0.475								
IBM		0.152	0.143	0.227	0.201							