The Effect of Methods of Calculating Depreciation Under the Revaluation Model for Property, Plant and Equipments

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Abstract

This research investigates motivations of companies choosing revaluation model for their PPE presentation. It also aims to find out why some companies proposed that the Federation of Accounting Professions (FAP) still allow the use of original cost as the basis in calculating depreciation of revalued PPE which is inconsistent with the requirement of International Accounting Standard.

The findings suggest that companies that chose the revaluation model for PPE could improve their debt to equity (DE) ratios, but the impact on their net income (NI) depends on the basis used in calculating depreciation. In addition, the strong negative impact of depreciation on revalued basis on NI may be the reason why some companies had proposed FAP to continue the use of original cost as depreciation basis for their revalued PPE.

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I appreciate comments and suggestions from workshop participants at JDBA Research Symposium, October 2007. I thank the Stock Exchange of Thailand for providing research data. Research grant from School of Business Administration, NIDA is also acknowledged.

Introduction

In 2000, the Institute of Certified Accountants and Auditors of Thailand (ICAAT), the predecessor of the Federation of Accounting Professions (FAP), revised Thai Accounting Standard (TAS) 32: Property, Plant and Equipment (PPE) to be consistent with the International Accounting Standard, IAS 16. According to this revised TAS, companies shall choose either the cost or the revaluation model as their accounting policy for all PPE. If they choose the cost model, after the initial recognition as an asset, a given PPE item shall be carried at cost less any accumulated depreciation and accumulated impairment losses. If they choose the revaluation model, after the initial recognition as an asset, a PPE item whose fair value could be measured reliably would be carried at a revalued amount equal to its fair value at the date of the revaluation less any subsequent accumulated depreciation and accumulated impairment losses. If an asset's carrying amount rose due to revaluation, the increase shall be credited directly to equity, as "revaluation surplus." If an asset's carrying amount decreased due to revaluation, the drop shall be deducted from any pre-existing revaluation surplus until that surplus becomes nil. Any remaining decrease shall be recognized in the firm's profit or loss. If there was no pre-existing surplus, then the decline in carrying amount shall be directly recognized in the company's profit or loss.

Under the original version (1989) of TAS 32 (TAS 9 and TAS 10), when PPE is revalued upward, depreciation expense recognized in profit or loss is based on original cost and the additional depreciation amount due to the increased value in PPE is deducted from the revaluation surplus. However, the 2001 version of TAS 32 requires companies to depreciate PPE based on the revalued amount and to transfer the revaluation surplus realized (the amount of the difference between depreciation based on the revalued amount and depreciation based on original cost) directly to retained earnings. Therefore, under the 2001 version of TAS, the depreciation expense of an item of PPE using the revalued model will be higher (and hence show a lower profit) than that under the 1989 version.

When the 2001 version of TAS was adopted by ICAAT, many companies that chose to revalue their PPE were affected by the new depreciation requirement. They lobbied the ICAAT to review the change of depreciation basis. At the time of the economic crisis in 1997, most companies suffered huge losses from the baht devaluation and some of them reported negative shareholders' equity. Many listed companies using the cost model for their PPE changed to the revaluation model, thus recognizing any revaluation surplus and improving their shareholders' equity. It should be emphasized here that most of the PPE revaluation was done in 1997 under the 1989 TAS. Applying the revaluation model increased the shareholders' equity--which improved the firm's debt to equity ratio--but did not affect the profit (or loss) for the period, because the depreciation expense was the same as for an original cost basis.

After considering the economic conditions at that time, reasons for asset appraisal, and the negative effects to entities and to the country as a whole, ICAAT postponed implementing the 2001 TAS 32 standard for revalued PPE by allowing companies, until January 1, 2007, to report depreciation at an amount equal to that calculated based on original cost.

However, in 2006, one year before the depreciation requirement for revalued PPE was to become effective, some companies proposed that FAP continue to postpone the depreciation requirement for revalued PPE, thus allowing them to continue depreciating their revalued PPE at original cost. While these companies continue to argue that depreciating their revalued PPE based on the revalued amount will decrease their profits and make them uncompetitive in the capital market, there are companies which are already appraising their PPE using the new requirement of depreciation method.

This controversial issue raises the important question, "Should FAP allow entities to continue depreciating their revalued PPE at original cost?" FAP's policy is to issue TAS in accordance with IAS. However, the Accounting Professional Act requires FAP to consider any negative effects of applying TAS to companies and to the country as a whole. Watts and

Zimmerman's Positive Accounting Theory[1] states that the policy and regulation process may cause conflict of interest among related parties. Formulating and applying mandatory accounting standards is one type of political process, and companies may support or seek to counter a given accounting standard depending on how that standard will affect them.

This study examines the effects of depreciation choice of revalued PPE to profit/loss and to debt-to-equity ratios by comparing the effects of depreciation expense using a revalued amount basis (Group I) versus those using an original cost basis (Group II). To be specific, this study seeks to answer the following two questions: What were the impacts of depreciation base choice on F/S for each group? And why did some companies already adopt the depreciation method based on revaluation amount?

Research Hypotheses

Even though the policy of FAP is to revise TAS 32 in accordance with IAS 16, the Thai Accounting Professional Act requires FAP to consider any negative effects of applying TAS 32 to companies and to the country as a whole. This study aims to find what would be the financial statement impact of the depreciation base choice for companies using revalued amount as depreciation basis (hereafter Group I) and for companies using original costs as depreciation basis (hereafter Group II). The study also examines the effects of depreciation base choice of revalued PPE on both net income (NI) and debt-to-equity (DE) ratios. The hypotheses of this study compare the effects of depreciation base choice for companies both within a group and between groups. Then T-statistical tests were used to test the hypotheses.

The Effects of Depreciation Choice on NI

This study aims to understand why companies that revalued assets chose different bases (original cost or revalue) in calculating depreciation. It is hypothesized that NI of each group is significantly affected by depreciation

[1] Watts, R.L. and Zimmerman, J.R., "Toward a Positive Theory of the Determination of Accounting Standards," *The Accounting Review* (January 1978):112-134.

base choice and that the impact of different depreciation bases on NI of Group II is stronger than that of Group I. This may be the main reason why companies in Group II prefer original cost base depreciation for their revalued assets. Following are three hypotheses:

H1: The choice of depreciation significantly affects NI of Group I.
H2: The choice of depreciation significantly affects NI of Group II.
H3: The impact of different depreciation choices on NI of both groups are the same.

The Effects of Depreciation Choice on DE Ratio

When a firm revalues its PPE, it increases the value of not only an asset but also a revaluation surplus in the equity section, therefore a lower DE ratio. As previously discussed, most companies that chose the revaluation model, revalued their assets right after the 1997 financial crisis to improve their DE ratio; therefore their DE ratios after PPE revaluation should significantly improved. To confirm this, the test of the difference in DE ratio before and after the revaluation is performed.

In order to investigate that the choice of depreciation base is mainly motivated by its impact on NI, a test on whether the DE ratio of Group I and Group II after revaluation was statistically the same is also performed. Three hypotheses are:

H4: The choice of depreciation base significantly affects DE ratio of Group I.
H5: The choice of depreciation base significantly affects DE ratio of Group II.
H6: DE ratios under different models in both groups are different.

Research Method and Results

The samples used in this study are listed companies on The Stock Exchange of Thailand (SET) in 2005 that had chosen the revaluation model

for their PPE. There were 117 companies which revalued PPE, but 42 of them revalued only land. Of 75 companies that revalued depreciable assets, 34 chose to depreciate their PPE on the revalued basis (Group I) and 41 chose to depreciate on the original cost basis (Group II).

Descriptive statistics (Table 1) presents an overview of the NI and DE ratio of companies which revalued PPE. Group I which depreciated PPE on revalued basis, has the average NI (NI_FV) and average DE ratio (DE_FV) of 4,698.75 million THB and 2.360 times. However, if Group I depreciated PPE based on original cost basis, the average NI (NI_COST) and DE ratio (DE_COST) would be 4,849.191 million THB and 2.766 times. Group II which depreciated PPE on original cost basis has the average NI (NI_COST) and DE ratio (DE_COST) of 5.298.512 million THB and 2.357. However, if PPE is depreciated based on revalued basis, the average NI (NI_FV) and DE ratio (DE_FV) would be 3,302.830 million THB and 2.155 times. Using total assets (TA) as the proxy for size, the average TA_FV of Group I and group II are 145,328.5 and 26,257.65 million baht respectively. This indicates that on average the size of Group I is larger than Group II. The result of the t-test (not shown) suggests that the size of these two groups is significantly different.

Comparing on different depreciation bases, both groups reported a lower NI and lower DE ratio under the revalued basis. When comparing between two groups, the average NI_COST of Group I is less than Group II but NI_FV of Group I is higher than Group II which indicates that NI of Group II is affected more by the depreciation base choice than Group I. Both the average DE_COST and DE_FV of Group I are higher than Group II which indicates that Group I using more debt in financing its investment than Group II.

Results

Hypotheses 1 and 2 test, within each group, the effect of different depreciation basis (revalued vs. original cost) on NI. NI under revalued basis was compared with that under original cost basis and deflated by NI under revalued basis [NI_FV – NI_COST)/NI_FV] for each group. T-test was then

performed for the difference between NI under these two bases of each group. Table 2 shows that NI of Group I under revalued basis significantly differs from that under original cost basis at 0.01 level. NI of Group II under revalued basis also significantly differs from that under original cost basis at 0.05 level. As expected, the choice of depreciation base has a significant effect on NI of both groups.

Hypotheses 4 and 5 examine, within each group, the effect of different depreciation bases (revalued basis vs. original basis) on DE ratio. DE under revalued basis was compared with DE ratio under original cost basis (DE_FV-DE_COST) for each group. T-test was used to test for any difference between these two bases of each group. Three sample companies in Group I and four sample companies in Group II were eliminated as they reported negative equities. Table 3 shows that DE ratio of both Group I and Group II under revalued basis significantly differs from that under original cost basis at 0.01 level. The results support the conclusion that the choice of depreciation base has a significant effect on DE ratio of both groups. DE ratio under revaluation model of PPE is lower than that under cost model for both groups; this suggests that companies' choice of the revaluation model for depreciation instead of the cost model is motivated by the desire to lower the DE ratio.

Hypothesis 3 tests, between groups, whether the effect of a different depreciation basis on NI of Group I significantly differs from that of Group II. An independent sample test is used. Table 4 shows that the effect of the different depreciation basis on NI of Group I significantly differs from that of Group II. As shown in table 2 the effect of different depreciation basis on Group II is larger than on Group I. It can be concluded that Group II was affected more by the choice of depreciation basis than Group I was.

In Hypothesis 6, DE ratio under the revalued basis of Group I is compared with that of Group II. Independent sample test is used to test whether DE ratio under revalued basis of both groups is different[2]. Table 4

[2] The result of the difference in DE ratio of both groups under cost model is also performed. The result shows that it is not significantly different.

shows that DE ratio of both groups is not significantly different which suggests that choice of depreciation base is not motivated by DE ratio.

Conclusions and Implications

This study is motivated by the controversial issue--whether the latest revised TAS 32 should be in accordance with revised IAS 16. Under revised IAS 16, companies can choose to report PPE under either cost model or revaluation model. If the revaluation model is selected, companies must depreciate their PPE based on revalued amount, and are not allowed to transfer revaluation surplus in the equity section to offset depreciation expenses in their income statements.

However, in Thailand, some listed companies that chose revaluation model claimed that there are negative effects of applying revised TAS 32 on their profits, thereby making them less competitive in the capital market. These companies had asked FAP to allow the choice of depreciating revalued PPE at original cost. Still, there are other listed companies that depreciated their revalued PPE on revalued basis. This raises a question of whether FAP should continue to allow such a choice and make TAS differ from IAS.

This study investigates what are motivations for companies to choose revaluation model for their PPE and why some of these companies lobbied for the choice of depreciating revalued PPE based on the original cost. Based on data of 2005, 34 companies applied the revaluation model for PPE and depreciated their revalued PPE based on revalued amount (Group I). In contrast, 41 companies which also used the revaluation model for their PPE chose the temporary alternative provided by FAP (ICAAT) in depreciating assets based on original cost (Group II).

The result in this study shows that DE ratio under revaluation model of both groups significantly lower than that under original cost. Moreover, if depreciation was calculated based on revalued amount their NI are significantly lower than that calculated based on original cost. It can be concluded that companies that choose revaluation model benefit from lower

DE ratio but their NI would be negatively affected if they use revalued basis for calculating depreciation. When compare between groups, it is found that DE under revaluation model of these two groups are not significantly different. However, the negative impact of depreciation under revalued basis as compare to original cost basis on NI of Group II (currently use original cost in calculating depreciation) is larger than that of Group I (currently use revalued amount in calculating depreciation).

The findings imply that companies choosing the revaluation model for PPE to improve their DE ratio but the large negative impact of depreciation basis on NI led some companies to propose FAP to continue the use of original cost as the depreciation basis for their revalued PPE. This is consistent with Watts and Zimmerman's Positive Accounting Policy, which states that "Formulating and applying mandatory accounting standards is one type of political process." Companies may seek to counter a given accounting standard depending on how that standard will affect the given companies.

Understanding motivations for companies lobbying this standard together with the fact that only 41 companies reported their depreciation of revalued PPE using original cost, it should be easy for FAP to decide whether it is worthwhile to allow the choice of original cost depreciation for revalued PPE and make TAS 32 on PPE inconsistent with IAS 16.

Table 1: Descriptive Statistics before Outliers Elimination
[NI in thousand THB]

Variable	N	Min	Max	Mean	SD
Panel A: Group I					
NI_FV[1]	34	-447.540	60,769.920	4,698.75	11,537.07
NI_COST[2]	34	-436.277	61,915.131	4,849.191	11,806.723
DE_FV[3]	34	-3.282	12.995	2.360	3.721
DE_COST[4]	34	-2.626	13.913	2.766	4.055
TA_FV	34	434.13	1,398,842	145,328.5	55,146.69
Panel B: Group II					
NI_COST[2]	41	-1,691.300	40,357.630	5,298.512	8,943.718
NI_FV[1]	41	-2,248.339	34,402.620	3,302.830	6,020.892
DE_COST[3]	41	-3.220	22.427	2.357	4.247
DE_FV[4]	41	-7.246	17.644	2.155	4.185
TA_FV	41	124.83	647,371.37	26,257.65	15,732.51

Note: 1. NI_FV is NI that depreciation expense was based on the revalued amount.
2. NI_COST is NI that depreciation expense was based on the original cost.
3. DE_FV is DE ratio that depreciation expense was based on the revalued amount.
4. DE_COST is DE ratio that depreciation expense was based on the original cost.

Table 2: The Impact of the Choice of Depreciation Base on NI

Hypothesis	**Variable[1]**	**N**	**Mean**	**t-test[2]**	**Sig (2-tailed)**
H1:	NIFV_NICOST_NIFV (Group I)	34	-0.171	-2.770	0.009***
H2:	NIFV_NICOST_NIFV (Group II)	41	-0.445	-2.410	0.021**

Note: 1. NIFV_NICOST_NIFV is the difference in NI using revalued amount and original cost for depreciation expense deflated by NI using revalued amount basis.
2. t-test is one sample t-test.
3. * 0.10 significant level, ** 0.05 significant level, *** 0.01 significant level.

Table 3: The Impact of Depreciation Base Choice on DE Ratio

Hypothesis	Variable[1]	N	Mean	t-test[2]	Sig (2-tailed)
H4:	DE_FV-DE_COST (Group I)	31	-0.422	-0.381	.001***
H5:	DE_FV-DE_COST (Group II)	37	-1.188	-4.322	.000***

Note: 1. DE_FV-DE_COST is the difference in DE ratio using revalued amount and original cost for depreciation expense
2. t-test is a pair sample t-test.
3. * 0.10 significant level, ** 0.05 significant level, *** 0.01 significant level.

Table 4: Comparison of the Effect of Depreciation Base Choice on NI and the Comparison of DE Ratio under Revaluation Model between Group I and Group II

Hypothesis	Variable[1]	N	Mean	t-test[2]	Sig (2-tailed)
H3:	NIFV_NICOST_NIFV (Group I VS Group II)	75	0.338	1.791	0.080*
H6:	DE_FV	71	0.270	0.284	0.777
	DE_COST		0.610	0.640	0.730
	(Group I VS Group II)				

Note: 1. NIFV_NICOST_NIFV is the difference in NI using revalued amount and original cost for depreciation expense deflated by NI using revalued amount basis.
2. t-test is an independent sample test.
3.* 0.10 significant level, ** 0.05 significant level, *** 0.01 significant level.

References

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