CHAPTER VI

ECONOMIC CONSIDERATION FOR TWO BLOCKS COMBINATION

In order to consider the effect of Block Ringfencing concept on the return to the concessionaire, at least two blocks are needed. As mentioned before, for the two blocks case, the combination of two fields and three fields will be considered. For the combination of two fields, it is assumed that each block has one field. For the combination of three fields, it is assumed that one block has two fields while the other block has one field. The details of fields combination are already shown in Chapter IV. For all combinations, the effects of Block Ringfencing on IRR for various situations – different lag time for development, with loan and without loan, different escalation, with increase or decrease in costs, and different value of K factor in SRB calculation – will be investigated.

The case of two blocks and two fields

Cases with different lag time for development

Before discussing about effect of Block Ringfencing concept, it is useful to consider influence of different lag time for development on IRR. Here two cases are assumed, the second field is developed two years later than the first field and the second field is developed six years later than the first field. The influence on effect of lag time on IRR for the cases without loan is shown in Figure 6-1. In this figure, the x-axis has no scale and each point on the x-axis represents one combination . For example, point 0.5 + 0.5 TCF represents a combination of two gas fields, each having size of 0.5 TCF and each being situated in each block. The arrangement on the x-axis is in the order of the combined sizes, e.g. the first point has a combined size of 1.0 TCF,

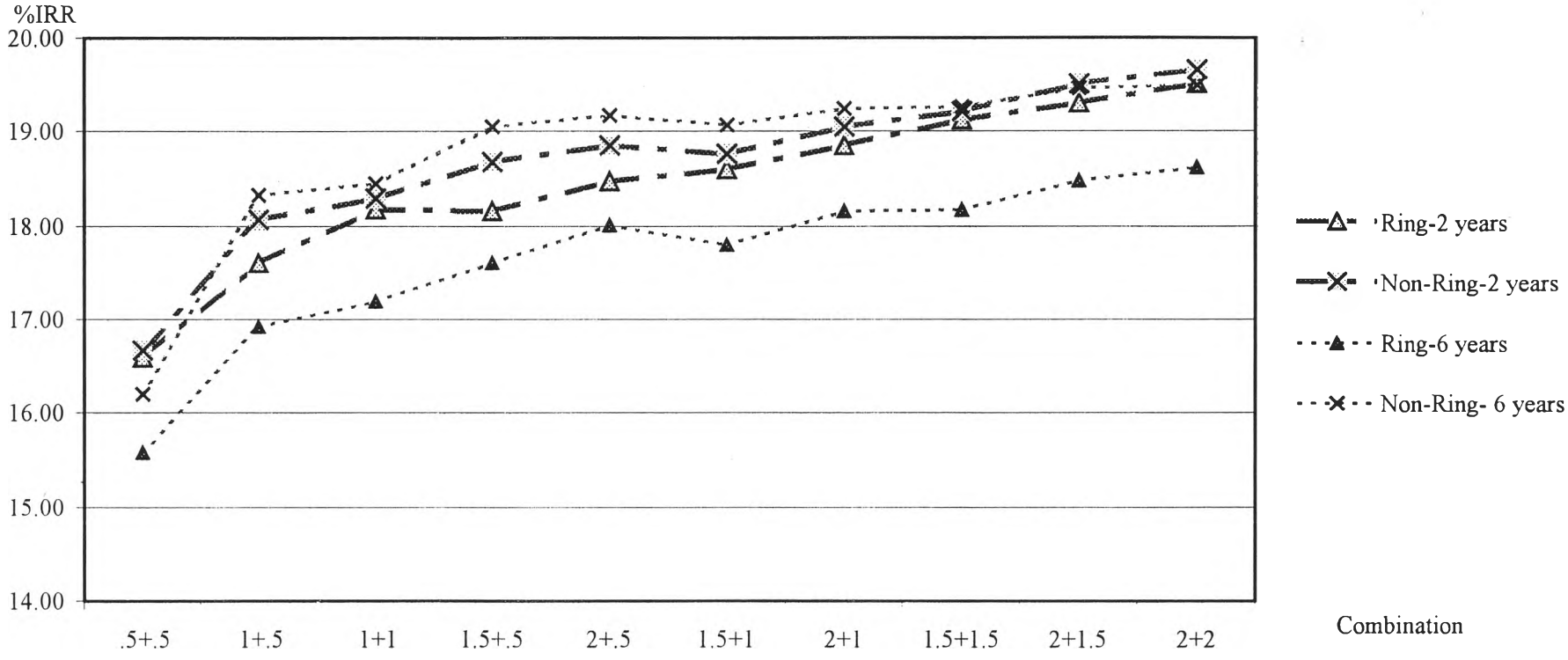

Figure 6-1 Effect of Block Ringfencing concept and different lag time on IRR for the two-field case (without loan and K = 2 x 150,000 for two blocks)

the second point has a combined size of 1.5 TCF, and so on. The y-axis, on the other hand, has scale and represents IRR. There are several points worth considering in Figure 6-1. First, it can be seen that IRR increases as the combined size increases. That is, IRR for combined size of 4 TCF is higher than IRR for combined size of 3.5 TCF or smaller. Second, IRR's of the same combined size are unlikely to be the same, such as for the case of 1.0 + 1.0 TCF and 1.5 + 0.5 TCF , 2.0 + 0.5 TCF and 1.5 + 1.0 TCF, and 2.0 + 1.0 TCF and 1.5 + 1.5 TCF. Third, for the case of not using Block Ringfencing concept, lag time (of 2 years and 6 years) has almost no effect on IRR (the small and large crosses). It is not necessary that IRR's of shorter lag time are higher than IRR's of longer lag time. Fourth, for the case of using Block Ringfencing concept, IRR's of the 2-year lag time are always greater than those of the 6-year lag time for a specific combination (the small and large triangles). In addition, IRR 's of any different lag time for the cases not using Block Ringfencing concept are higher than the cases that use Block Ringfencing concept. This clearly shows the influence of Block Ringfencing concept.

Fifth, effects of Block Ringfencing concept are more pronounced for the case of longer lag time (6 years) than for the case of shorter lag time (2 years) (comparison of the differences of the small crosses and small triangles and the differences of the large crosses and large triangles).

The effects of lag time, as well as Block Ringfencing concept, for the case with loan are shown in Figure 6-2. Partially financing the project by loan causes the effect of lag time to be pronounced for the large field combination. IRR's for 2-year lag time are always higher than IRR 's for 6-year lag time (comparing large triangles with small triangles and large crosses with small crosses). This is true for both cases

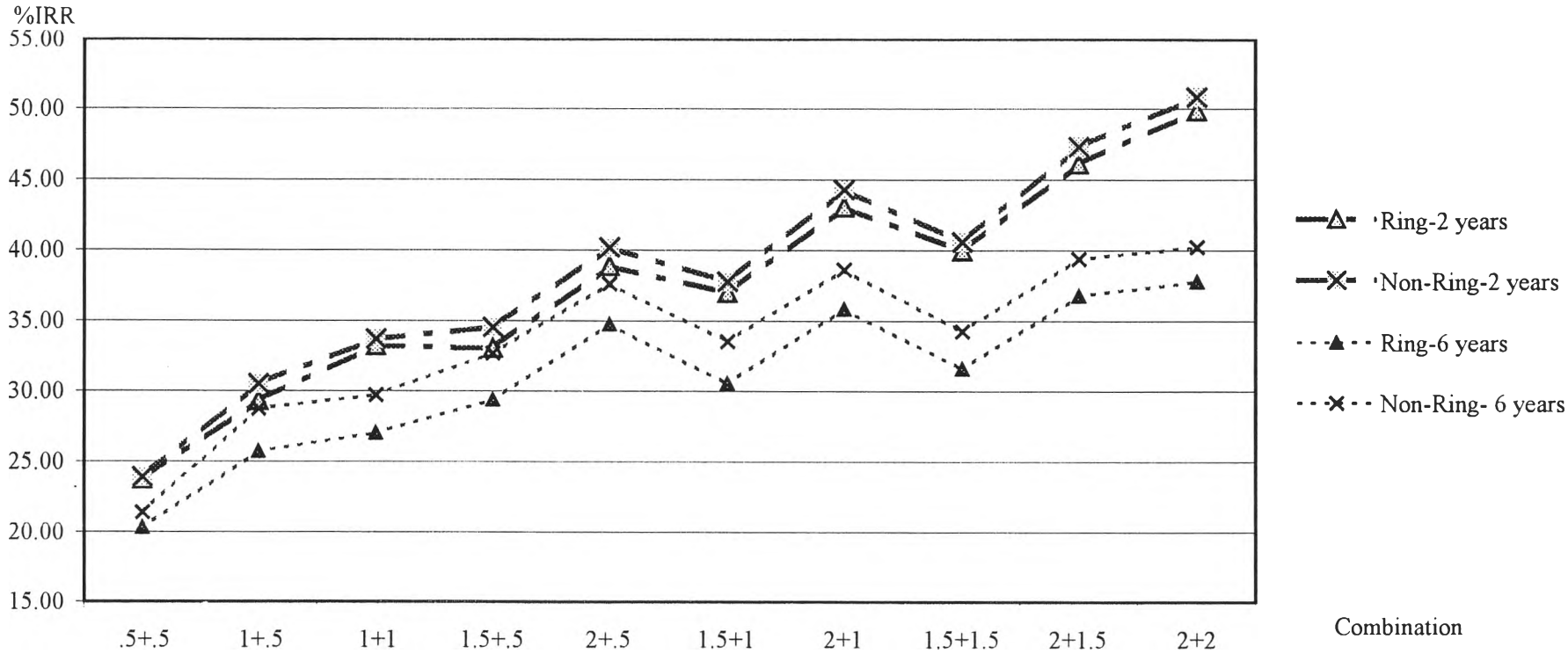

Figure 6-2 Effect of Block Ringfencing concept and different lag time on IRR for the two-field case (with loan and K = 2 x 150,000 for two blocks)

that Block Ringfencing concept are applied and cases that Block Ringfencing concept are not applied. This conclusion is almost the same as the non-loan cases.

In Figure 6-2, the application of Block Ringfencing concept always gives lower values of IRR for both cases. For the 6-year lag time case, the application of Block Ringfencing concept has more influence than the 2-year lag time case. It should be noted that for the case with loan here, the absolute values of IRR are quite high for all cases and the scale in the y-axis is quite small. Therefore, the seemingly small differences between the cases with Block Ringfencing concept and the cases not using Block Ringfencing concept are, in fact, not small when compared to those in Figure 6-1, especially for the case with 2-year lag time.

It can be concluded here that the application of Block Ringfencing concept does not have as much influence as partially financing the project by loan, for both the 2-year and 6-year lag time cases.

Cases with loan and without loan

The influence of Block Ringfencing concept on the cases with loan and without loan is shown in Figure 6-3. It can be seen from this figure that Block Ringfencing concept has significant influence for the loan cases and less effect for the no-loan cases. It seems that the effect of Block Ringfencing concept is less for small combined field sizes. For the cases without loan, the effect of the Block Ringfencing concept on IRR is hardly noticeable even of larger combined field sizes because of small scale of IRR. The results in Figure 6-3 also show that partially financing the project by loan probably has more influence on IRR than application of Block Ringfencing concept. For all cases shown in Figure 6-3, IRR's for cases with Block

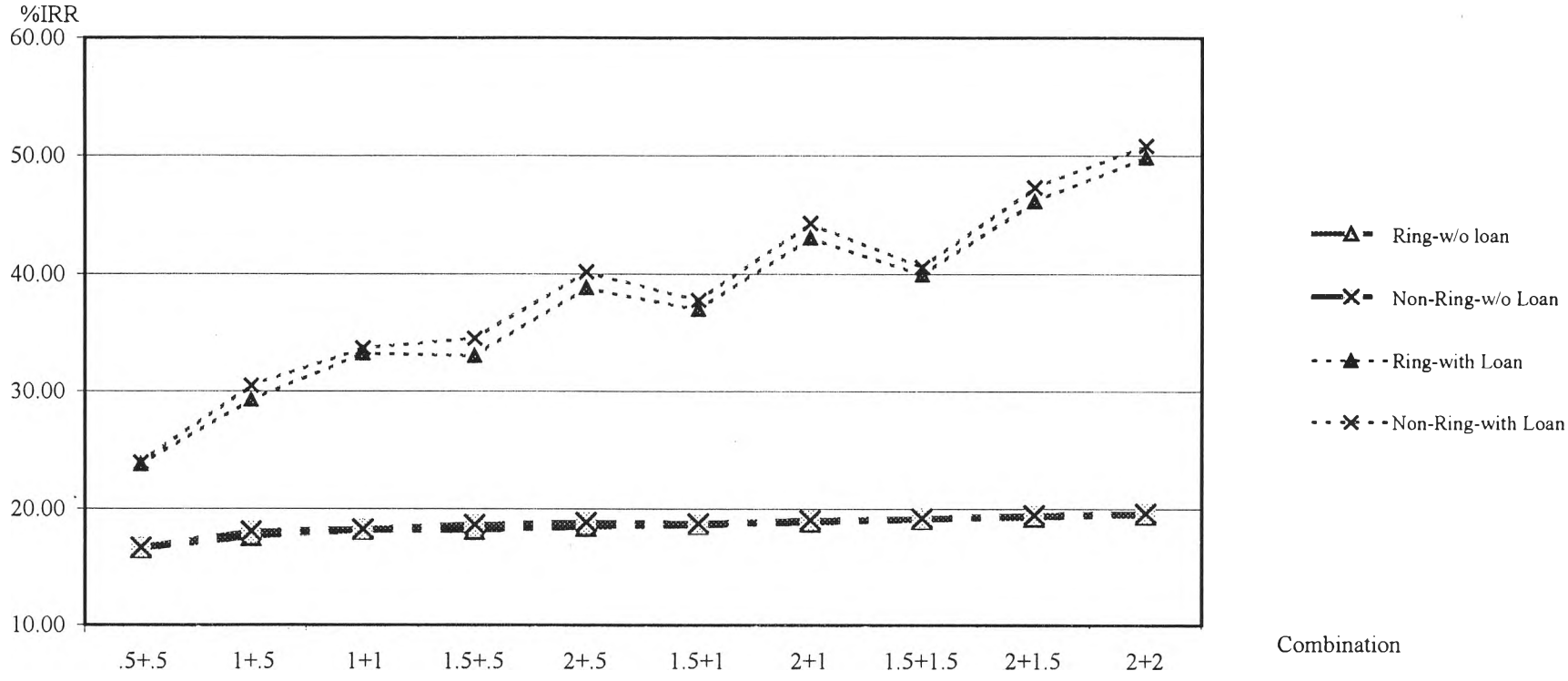

Figure 6-3 Effect of Block Ringfencing concept for cases with and without loan on IRR for the two-field case (K = 2 x 150,000 for two blocks)

Ringfencing concept are lower than IRR's for cases not using Block Ringfencing concept.

Cases with different escalation

The effects of Block Ringfencing concept when the escalations for cost and price are different are shown in Figure 6-4. Generally, the effects of Block Ringfencing for both cases (cases with 3% and 5% escalation) on IRR are about the same and the effect of Block Ringfencing concept is variable for various combinations of field sizes. This suggests that when investigating the effect of Block Ringfencing concept, several scenarios of different escalation percentages, which are expected, should be tried to see the effect thoroughly.

Cases with increase or decrease in costs

The effects of application of Block Ringfencing concept for the case with increase or decrease in costs are shown in Figure 6-5. The middle pair of curves is for the base case while the lower and upper pairs are for the 25% increase and 25% decrease in costs, respectively. From these curves, it can be seen that the application of Block Ringfencing concept has about the same effect on the base case as on the case with 25% increase and 25% decrease in costs. IRR's for cases without Block Ringfencing concept are all slightly higher than IRR's for cases with Block Ringfencing concept. This implies that Block Ringfencing concept always gives lower profit to the concessionaire no matter how costs will change in the future, provided, however, that other conditions remain the same.

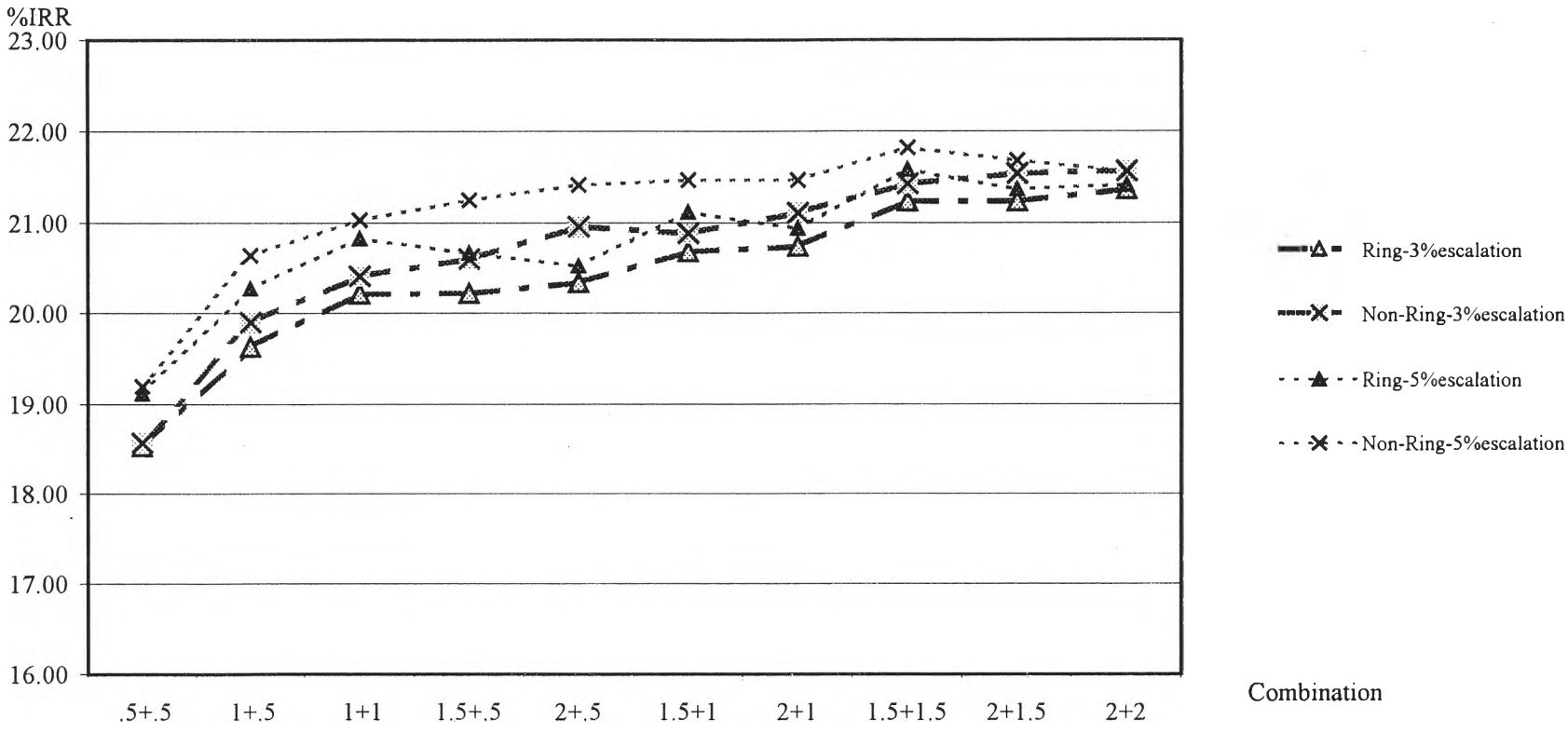

Figure 6-4 Effect of Block Ringfencing concept and different escalation on IRR for two-field case (K = 2 x 150,000 for two blocks)

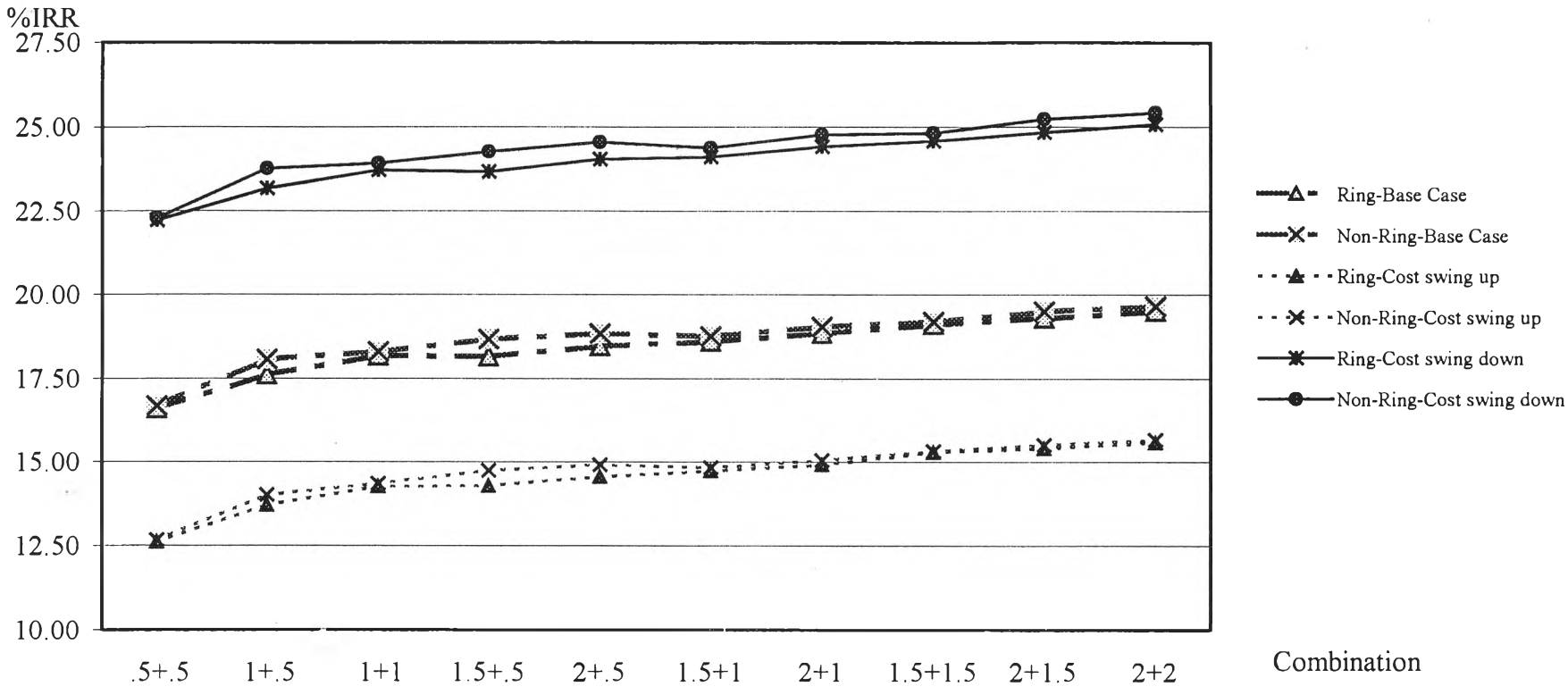

Figure 6-5 Effect of Block Ringfencing concept for cases with and without cost change on IRR for the two-field case (K = 2 x 150,000 for two blocks)

Case with different K (geological constant) value

From the above discussion in this chapter, the results of the study are based on the principle that for the case of not using Block Ringfencing concept, the value of K factor is doubled (2×150,000) for two blocks and the result shows that the value of K factor made IRR's for the case not using Block Ringfencing concept significantly different from IRR's for the case using Block Ringfencing concept. As the value of K factor represents the potential of an area (mechanism of Thailand III in Chapter III), it is recommended that the case of not using Block Ringfencing concept with the value of K = 150,000 for two blocks should be studied.

The effects of application of Block Ringfencing concept for the cases with value of K = 150,000 for two blocks are shown in Figure 6-6. IRR's of any different lag time (2 years and 6 years lag time) for the case of using Block Ringfencing concept are much higher than the cases of not using Block Ringfencing concept. This result is totally different from the case of K for two blocks equal to 2×150,000. Also the effect of Block Ringfencing concept are more pronounced for the case of shorter lag time (2 years) than for the case of longer lag time (6 years). This is also quite different from the cases with K = 2×150,000 where the Block Ringfencing concept has more pronounced effect for the cases with 6 years lag time than for the cases with 2 years lag time (Figure 6-1). In addition, for the case of using Block Ringfencing concept, IRR's of the 2-year lag time are always higher than that of the 6-year lag time and for the case of not using Block Ringfencing concept, IRR's of the 2-year and 6-year lag time are only slightly different. The last observation is also true for the cases with K = 2×150,000.

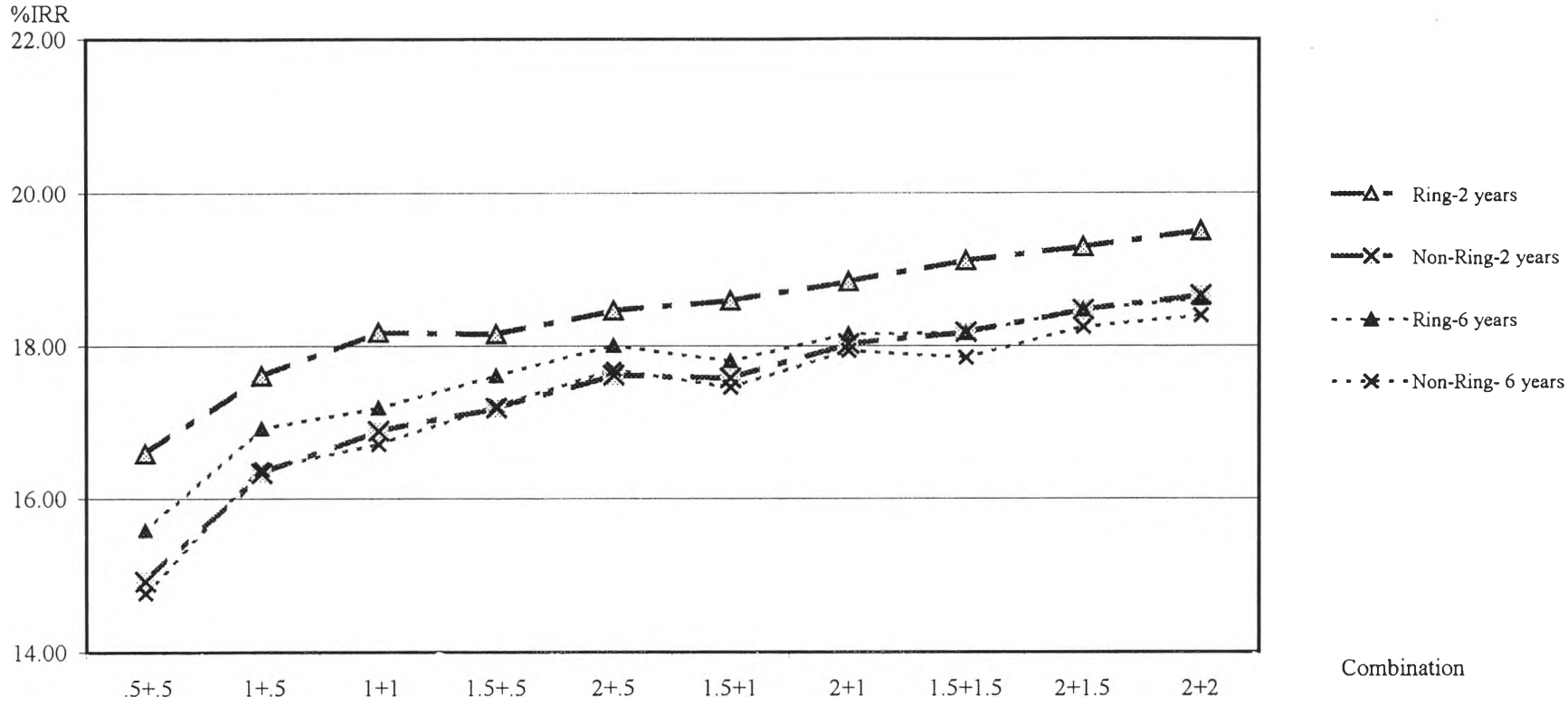

Figure 6-6 Effect of Block Ringfencing concept and different lag time on IRR for the two-field case (without loan and K= 150,000 for two blocks)

Comparison of Figures 6-1 and 6-6, one can see that while IRR's for the cases of using Block Ringfencing concept are the same (for cases with same combination and same lag time) no matter which K value is used (for two blocks), IRR's for the cases of not using Block Ringfencing concept are different. The cases with K for two blocks equal to 2×150,000 have higher IRR's than the cases with K for two blocks equal to 150,000. In fact, K (for two blocks) value of 2×150,000 causes IRR's for the cases of not using Block Ringfencing concept to be higher than IRR's for the cases of using Block Ringfencing concept and K (for two blocks) value of 150,000 causes IRR's for the cases of not using Block Ringfencing concept to be lower than IRR's for the cases of using Block Ringfencing concept. This is not surprising because when K (for two blocks) for the non- Block Ringfencing cases is equal to 2×150,000 the rate for SRB will be less (than the rate for SRB for the non-Block Ringfencing concept cases with K for two blocks equal to 150,000), resulting in higher IRR's. It should also be further noticed that IRR's in both Figures 6-1 and 6-6 are equal for the cases of using Block Ringfencing concept because in either figure, SRB will be the same (for specific combination) if Block Ringfencing concept is applied.

From the above observation, it is expected that if K for two blocks is between 150,000 and 2×150,000, IRR's for the non-Block Ringfencing cases should be between IRR's of the cases with K for two blocks equal to 150,000 and IRR's of the cases with K for two blocks equal to 2×150,000. This clearly shows the effect of K for two blocks (or for several blocks) on IRR's of the cases of not using Block Ringfencing concept. It is, Therefore, possible to use K for two blocks (or for several blocks) as one of the

parameters to control IRR such that returns to the host government and concessionaire are appropriate.

The case of two blocks and three fields

Cases with different lag time for development

Effects of different lag time and Block Ringfencing concept are shown in Figure 6-7 for cases of two fields in one block and one field in the other block. The figures in brackets under the x-axis in Figure 6-7 are the sizes of two gas fields in one block that are developed first for the case that combination field size is the same or larger than the third field and the figure outside the brackets is the size of one gas field in the other block. In Figure 6-7, for the case of using Block Ringfencing concept, all the cases with 2-year lag time have higher IRR than the cases with 6-year lag time except for the large combination case (4 TCF) which IRR for the case of 6-year lag time is higher than IRR for the case of 2-year lag time. For the case of not using Block Ringfencing concept, lag time (of 2 years and 6 years) has almost no effect on IRR except for the large combined size (4TCF) where IRR for the case of 6-year lag time is significantly higher than IRR for the case of 2-year lag time.

This figure also shows that IRR's for the case of not using Block Ringfencing concept are always higher than IRR's for the case of using Block Ringfencing concept for any different lag time (2 years or 6 years) and the effect of Block Ringfencing concept are more pronounced for the case of longer lag time (6 years) than for the case of shorter lag time (2 years).

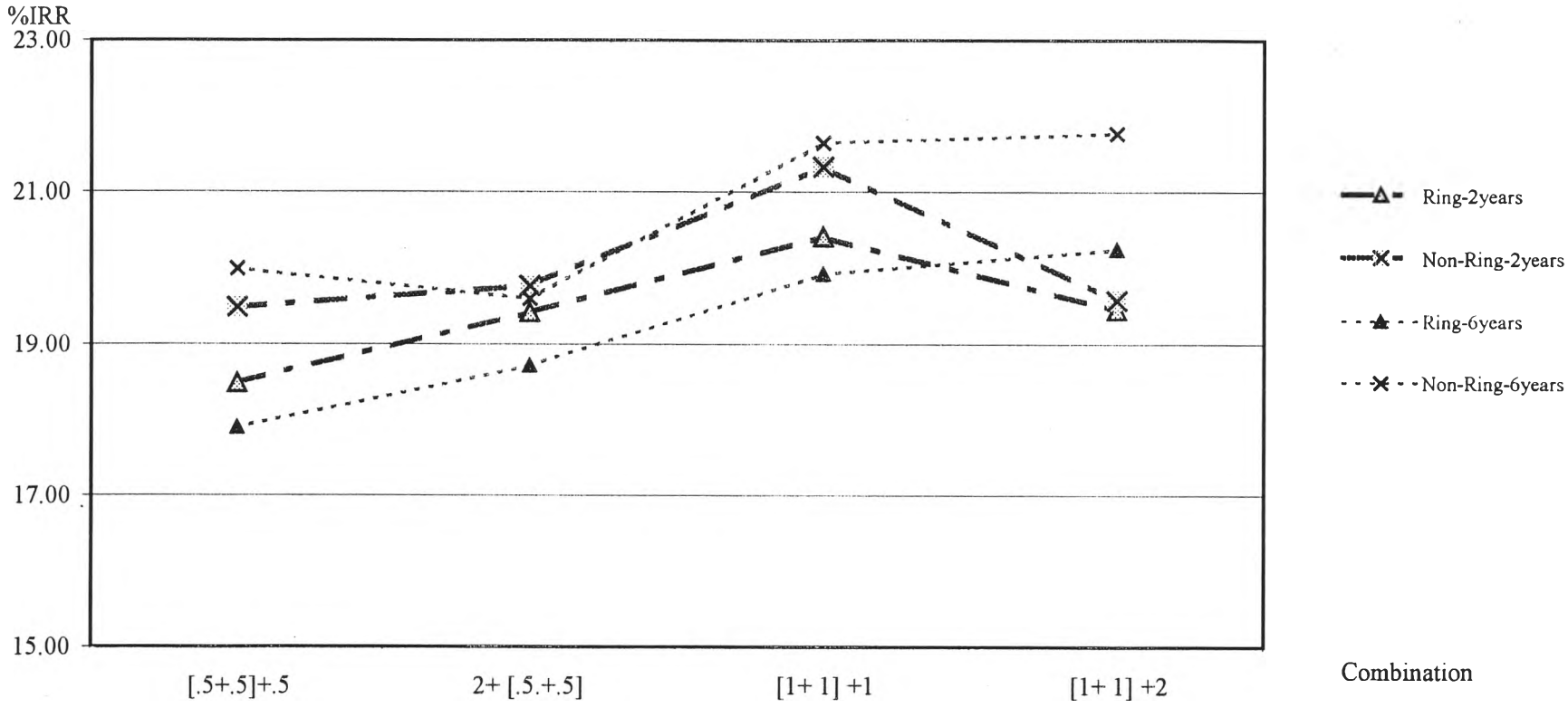

Figure 6-7 Effect of Block Ringfencing concept and different lag time on IRR for the three-field case (without loan and K = 2 x 150,000 for two blocks)

The effects of lag time, as well as Block Ringfencing concept, for the case with loan are shown in Figure 6-8. Partially financing the project by loan causes the effect of lag time to be more pronounced. IRR's for 2-year lag time are always higher than IRR's for 6-year lag time. This is true for both cases that the Block Ringfencing concept are applied and cases that the Block Ringfencing concept are not applied.

In Figure 6-8, IRR's for the case of not using Block Ringfencing concept are always higher than IRR's for the cases of using Block Ringfencing concept no matter the lag time for development (2 years or 6 years) is. And effect of Block Ringfencing concept are more pronounced for the case of longer lag time (6 years) than for the case of shorter lag time (2 years).

Cases with loan and without loan

Figure 6-9 shows both effects of Block Ringfencing concept and the means of financing. It is clear that the project partially financed by loan has higher IRR than the project with no-loan. IRR 's for the cases of not using Block Ringfencing concept are higher than IRR's for the cases using Block Ringfencing concept for both cases (with and without loan) and this effect is less for the largest combined field size (4 TCF).

Cases with different escalation

Effects of Block Ringfencing concept on cases with different escalation in cost and price are shown in Figure 6-10. In all cases studied, the cases of not using Block Ringfencing concept have higher IRR than the cases of using Block Ringfencing concept no matter what the situation in cost and price is. In the case of same combined size, 2+(.5+.5)TCF and (1+1)+1 TCF, the effect of Block Ringfencing for (1+1)+1 TCF is more pronounced than the other combination. This probably implies

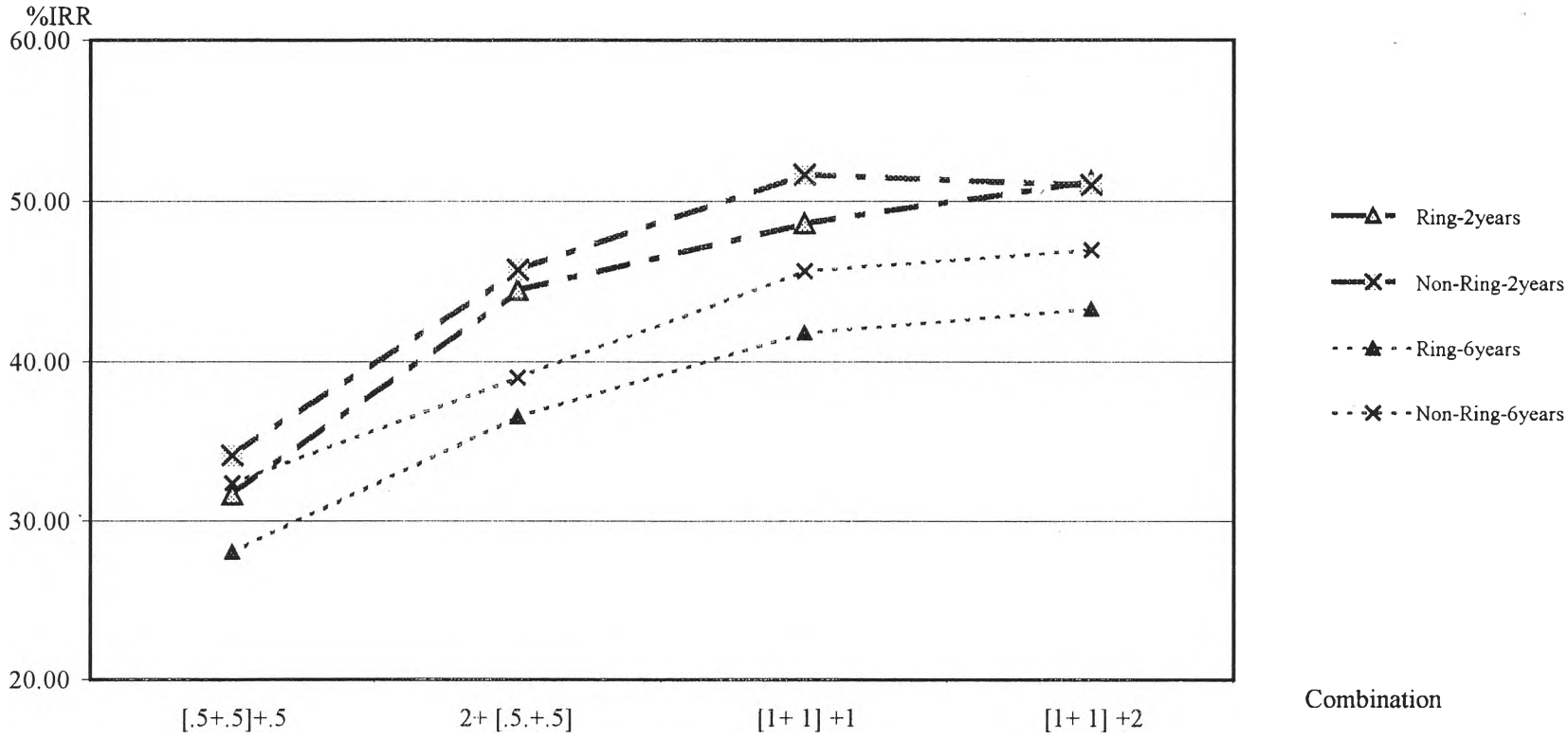

Figure 6-8 Effect of Block Ringfencing concept and different lag time on IRR for the three-field case (with loan and K = 2 x 150,000 for two blocks)

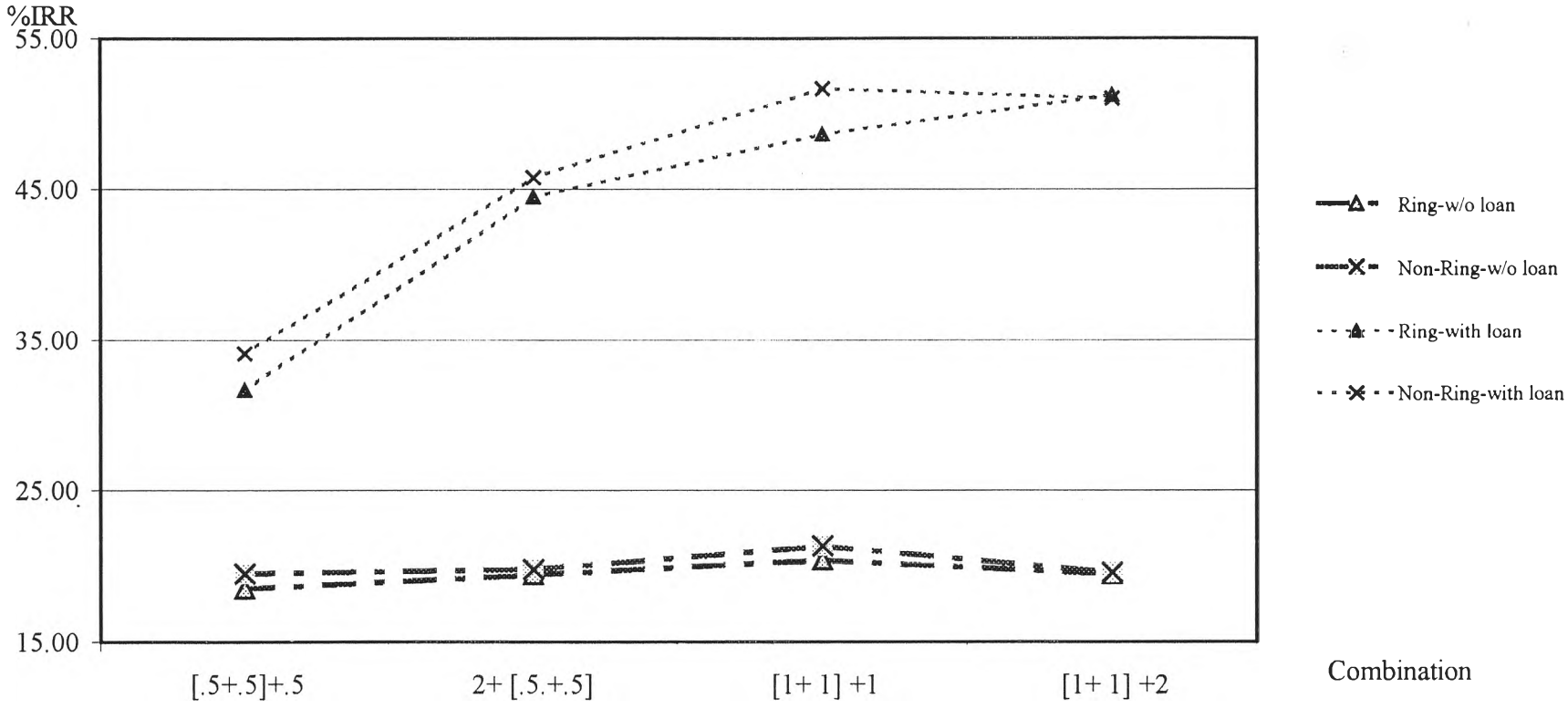

Figure 6-9 Effect of Block Ringfencing concept for cases with and without loan on IRR for the three-field case
(K = 2 x 150,000 for two blocks)

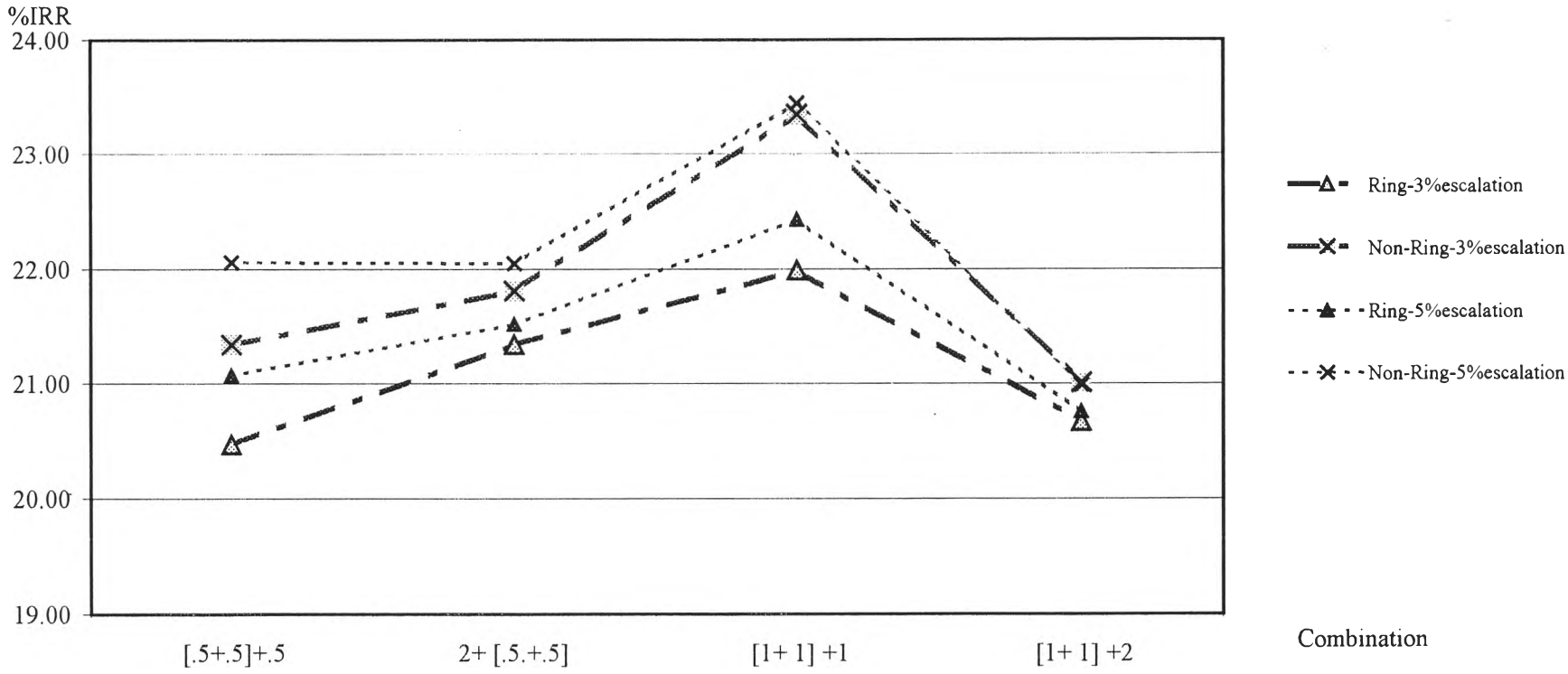

Figure 6-10 Effect of Block Ringfencing concept and different escalation on IRR for the three-field case
(K = 2 x 150,000 for two blocks)

that the order of development of the gas fields also has impact on the effect of Block Ringfencing concept on IRR's. In addition, it can be noticed that IRR's of the case with 3% escalation and 5% escalation for both cases where Block Ringfencing concept are applied and cases where Block Ringfencing concept are not applied are almost the same for the large combined field size (4TCF).

Cases with increase or decrease in costs

The effects of Block Ringfencing on IRR for three cases of different cost – the base case, the 25% increase-in-cost case, and the 25% decrease-in-cost case – are shown in Figure 6-11. The influence of Block Ringfencing concept for all three cases is similar for each corresponding combination. This result allows one to predict that no matter how the costs of the project may change, the effect of Block Ringfencing concept will be about the same as for the base case, and the effect of Block Ringfencing concept is less for the largest combined field size (4TCF).

Case with different K (geological factor) value

As in the cases of two blocks with one field in each block, the case of not using Block Ringfencing concept with the value of K for two blocks equal to 150,000 is studied for the case of two blocks with two fields in one block and one field in the other block.

The effects of Block Ringfencing concept with different lag time for the cases with K = 150,000 for two blocks are shown in Figure 6-12. IRR's of 2-year lag time for the cases of using Block Ringfencing concept are higher than the cases of not using Block Ringfencing concept, while IRR's of 6-year lag time have mixed effect. This is quite different from the cases with K for two blocks equal to 2×150,000. For

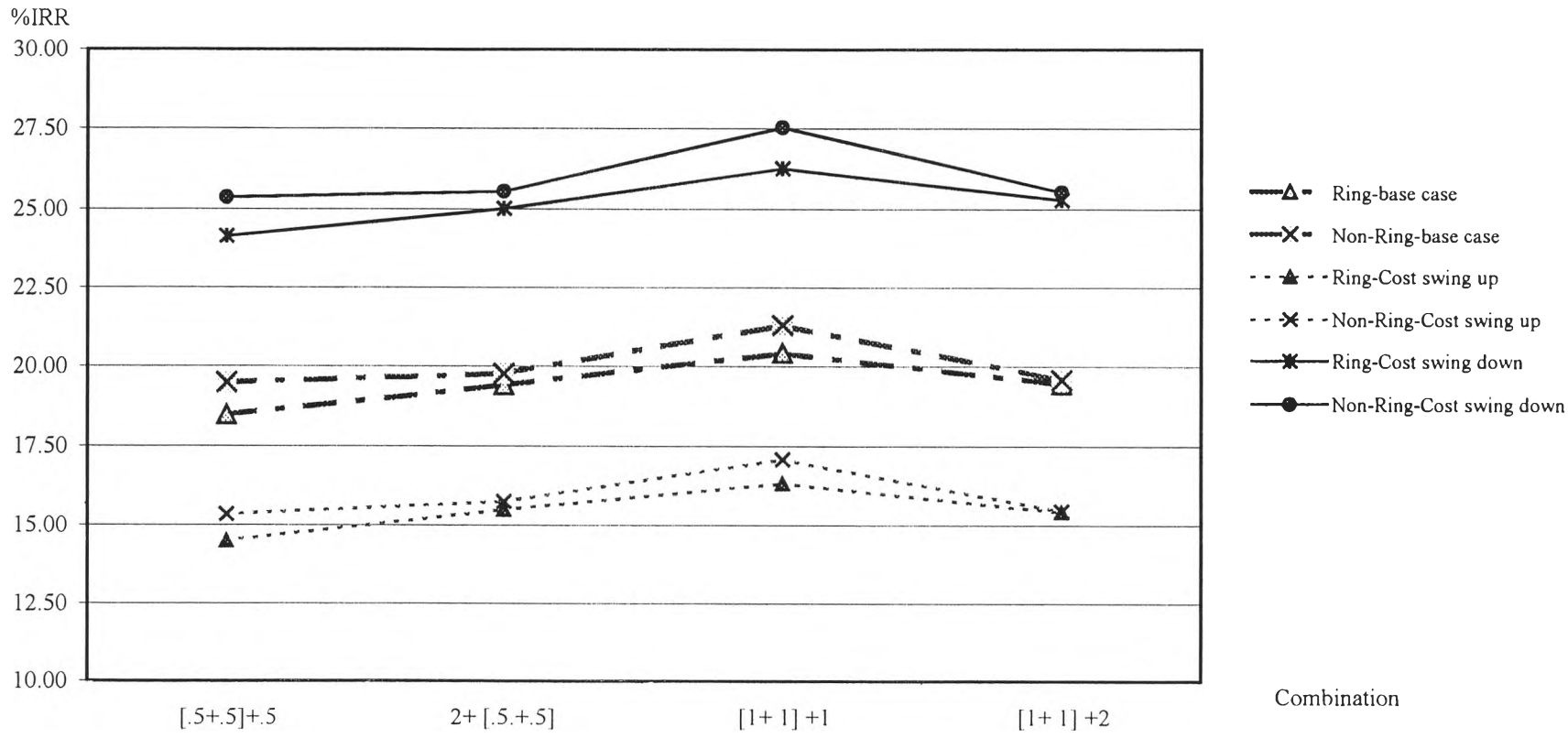

Figure 6-11 Effect of Block Ringfencing concept for cases with and without cost change on IRR for the three-field case (and K = 2 x 150,000 for two blocks)

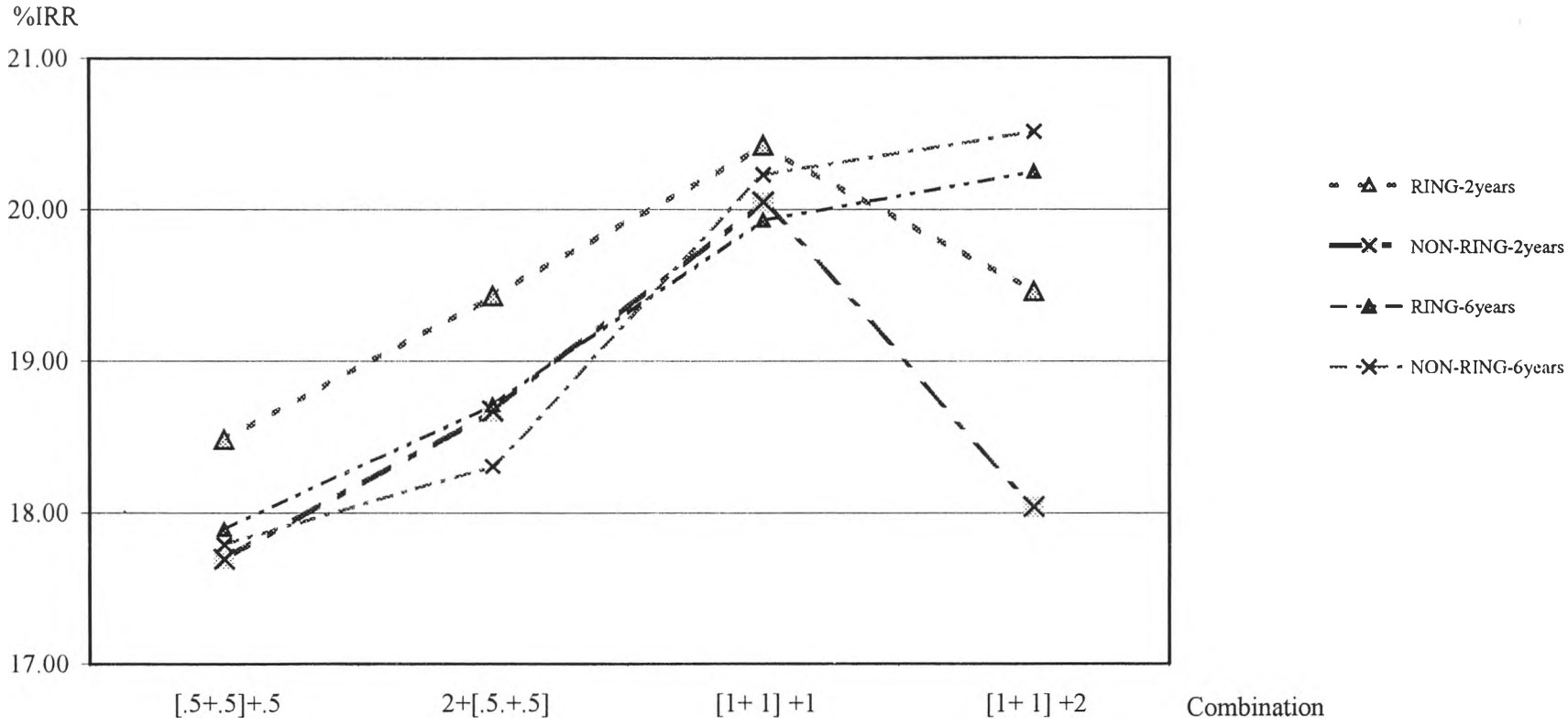

Figure 6-12 Effect of Block Ring Fencing concept and different lag time on IRR for the three-field case (without loan and K = 150,000 for two blocks)

the cases with K for two blocks equal to 2×150,000, the opposite is true for IRR's of 2-year lag time and for 6-year lag time IRR's for the non-Block Ringfencing concept cases are always higher than IRR's for the Block Ringfencing concept cases. Effect of Block Ringfencing concept are more pronouned for the cases of shorter lag time (2 years) than for the cases of longer lag time (6 years). The opposite is also true for the cases with K for two blocks equal to 2×150,000, when effect of Block Ringfencing concept are more pronounced for the cases of longer lag time than for the cases of shorter lag time.

For the cases of using Block Ringfencing concept, IRR's of the 2-year lag time are higher than that of the 6-year lag time except for the largest combined size (4 TCF) where IRR's of 6-year lag time is higher than IRR's of 2-year lag time. On the other hand, for the case of not using Block Ringfencing concept, IRR's of the 6-year lag time are higher than that of the 2-year lag time except for the combined size of 2.0+(0.5+0.5) TCF where IRR's of 2-year lag time is higher than IRR's of 6-year lag time.

It should be emphasized here that using different K-for-two-blocks values, 150,000 and 2×150,000, resulting in effect of Block Ringfencing concept in opposite directions. That is, it can be generally said that for the case with K for two blocks equal to 150,000, IRR's for the cases with Block Ringfencing concept are higher than IRR's for the cases without Block Ringfencing concept while for the case with K for two blocks equal to 2×150,000, the opposite is true. (Notice that from the results of this study, though the previous sentence is not always true, it is general true.)