

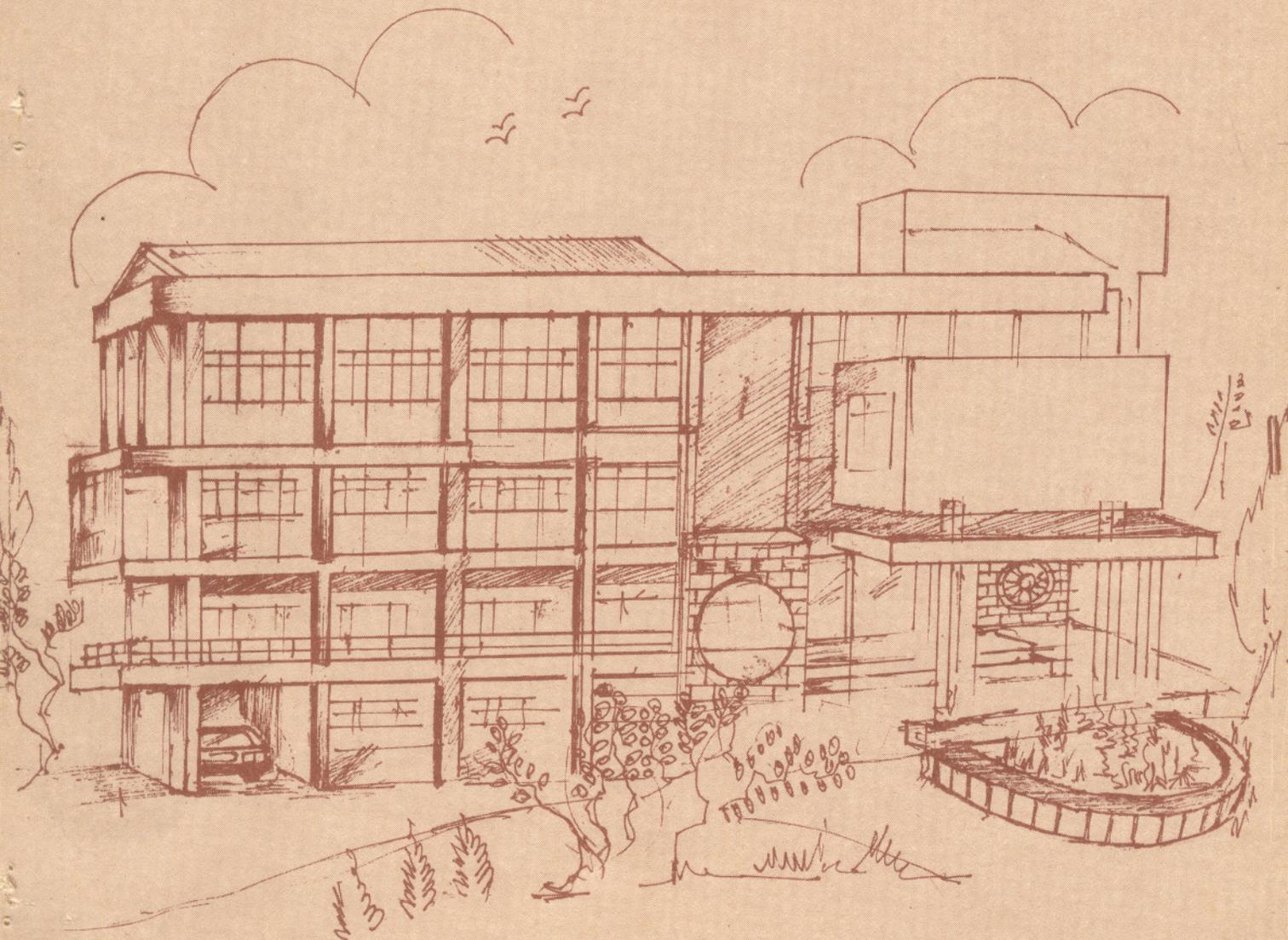
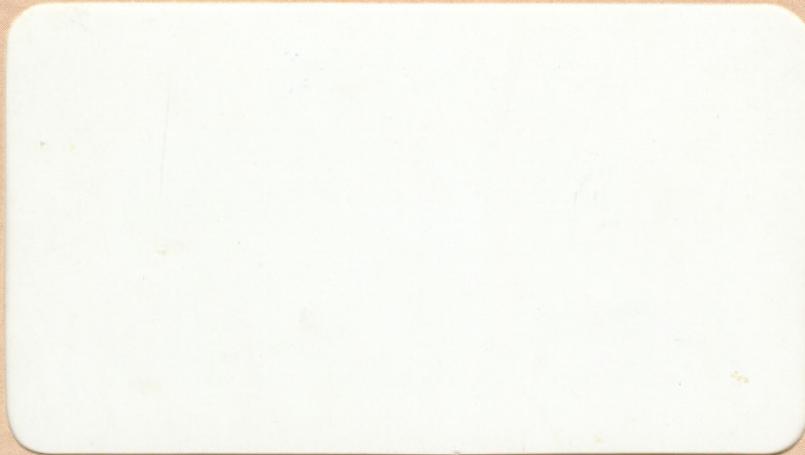


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An Exchange Ratio Determination Model for Demergers

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An Exchange Ratio Determination Model for Demergers

Abstract

Companies in India are increasingly adopting the route of demerger to get more focused, thereby creating shareholders' value. However, it is possible that even if there is synergy in demerger, shareholders of either the transferring company or the transferred company, lose because of the improper determination of the exchange ratio. No model exists in the Finance literature that can help the companies in arriving at an exchange ratio in the case of demerger. In this paper we have proposed a model that can be used both to determine the swap ratio and to find the impact of the demerger on the shareholders' wealth.

Subsequently, we have applied the model to the famous Grasim-Indian Rayon demerger case. We found that the shareholders of both the companies gained handsomely from the demerger.

Introduction

Business strategists are increasingly recommending the strategy of being focused to the companies. Despite the forceful arguments made by Khanna and Palepu (1997,1999), it is being observed that companies are slowly eschewing the path of diversification they have once followed. Empirical research done both in India and abroad have also provided evidence that diversified companies have not created as much value as the focused companies for their shareholders. Mohanty (1998,1999), for example, observed that the value of the Indian diversified companies can be increased by about 28% if such companies operate as stand-alone entities along the lines of their individual businesses.

One of the most preferred routes to become focused is to demerge. In a demerger, a company usually transfers one of its divisions to another company for some consideration. A demerger, may also take the shape of a spin-off where, an existing company is split into two (or more) companies. In the first type of demerger, the consideration may be in the form of cash or stock. Thus, for example, Indian Rayon, in a demerger transaction transferred its cement division to Grasim. Grasim, in turn, issued three shares to the shareholders of Indian Rayon for every ten shares they hold. In the second type of demerger, shares of the new company are issued to the existing

shareholders. One can give the example of Wockhardt here, which decided to split its activities into two units, namely, Wockhardt Life Sciences Limited and Wockhardt Limited. IBID database reports that during 1998 and 1999 alone, seventeen demergers have taken place in India.

Though, demergers are justified on the ground that they create shareholders' value, it is possible that in the first type of demerger discussed above, if the exchange ratio is not determined properly, the shareholders may lose from the demerger transaction. Even though there is synergy¹ in demerger, the entire benefit from this demerger may go to only one of the shareholding group. Thus, for example, assume that "A" has transferred one of its divisions to "B" in a share swap transaction. If, however, the exchange ratio is decidedly in favor of "B", then even if there is synergy in the demerger, shareholders of "A" may lose. It is therefore, very important that the exchange ratio is determined appropriately before any demerger transaction is carried out. This will ensure that the shareholders of both the transferring company and the transferred company gain from the demerger.

Though, some models exist in the Finance Literature that help one in determining the exchange ratio in mergers (see Larson and Gonedes (1969), for example), no model exists that can be used to determine exchange ratio in demerger. In this paper, therefore, an attempt has been made to develop an exchange ratio determination model for analysing a demerger proposal. In particular, we have attempted to see if there exists any exchange ratio that can satisfy both the groups of shareholders. Then an attempt has been made to apply the model to the famous Grasim Industries Limited and India Rayon Industries Limited demerger.

The rest of the paper is organised as follows. Section I develops the model for the determination of the exchange ratio in demergers. Section II applies the model to the famous Grasim and Indian Rayon demerger case. Finally, Section III discusses the various implications of the findings. It then concludes the paper.

¹ Defined elsewhere in the paper.

Section I

Larson and Gonedes (1969) (LG, hereafter) have developed a model that can be used to determine the exchange ratio in mergers. Conn and Neisen (1977) have developed the LG model further using a graphical approach. The LG model serves two important purposes. Based on some predicted post-merger P-E ratio of the combined entity, one can determine a range of exchange ratios that are acceptable to the shareholders of both the merged and the merging companies. One can also find out how the shareholders of the two companies shared the actual synergy-gains after the merger is over. In this paper, an attempt has been made to develop a model that can serve two purposes.

- Based on some predicted synergy (given either in rupees or in terms of P-E ratio²), one can find out a range of exchange ratios that are acceptable to the shareholders of both the transferring company and the transferred company. Once the companies come to know of this range, they can decide on some actual exchange ratio that will be acceptable to both of them. The actual exchange ratio, will, of course, depend on the relative bargaining ability of both the groups of shareholders.
- By observing the actual synergy (reflected in the post-announcement stock prices), one can also find out the relative gains (or losses) of the different groups of shareholders from the demerger.

The model:

Assume that there are two companies, namely, A Limited and B Limited involved in the demerger transaction. B³ gives one division with a market value equal to D to A. A, in turn issues shares to B. Unlike a typical merger, here both the companies continue to exist after the demerger. The following table gives the necessary details about the two companies.

	A Limited	B Limited
No. of shares (before demerger)	n_1	n_2
Stock Price per share (before demerger)	p_1	p_2
Earnings per share (before demerger)	EPS_1	EPS_2
Value before demerger	$p_1 * n_1$	$p_2 * n_2$
Value after demerger	$p_1 * n_1 + D + S_1^4$	$p_2 * n_2 - D + S_2^4$

² The LG model, however, does not link the actual synergy for the merger with the exchange ratio.

³ Here B refers to B Limited. For sake of gravity, only B has been used.

Here it has been assumed that there is some synergy in the demerger. Synergy in demerger is sometimes referred to as anergy. Here, the firms are becoming more focused after the merger. Hence, there will be synergy in the demerger.⁵ One can give a small example to illustrate how synergy is computed in demerger. Suppose, the value of Company A is Rs.100 crores and that of B is Rs.50 crores. Suppose, A transfers a division worth Rs.10 crores to B. Suppose value of A after the above transfer is Rs.95 crores and that of B is Rs.64 crores. Then the synergy for A is Rs.5 crores and that for B is Rs.4 crores.

Let ER stand for the exchange ratio. Here A will issue ER number of shares to B for each share of B.

Analysis from the point of view of shareholders of A:

Suppose the share price of A after the demerger is P_{1D} . Then the shareholders of A will accept the demerger proposal if

$$P_{1D} > P_1 \dots (1)$$

If the synergy expected from the demerger is high, then P_{1D} will be higher, and hence shareholders of A will accept the demerger proposal. One can develop the model in two ways here. If the shareholders know what is the rupee amount of the actual synergy, then they can decide whether the demerger is in their interest or not. Alternatively, if they can forecast the post-demerger P-E ratio, then also they can decide whether to accept the demerger proposal or not. We have attempted to link the exchange ratio to both the synergy and the P-E ratio. We call the former the synergy approach and the latter as the P-E approach here.⁶

In the P-E approach one needs to know the EPS of A, B, and the division transferred after the demerger. It is important to keep in mind that for an analyst (without any inside information) it would be difficult to compute this because it may not be possible to find out what part of the profit of B can be attributed to the division transferred. It is easy to find out the EBIT of the division. But for any analyst it would be difficult to attribute a part of the total debt of B to this division. Thus to compute the debt of the division, one

⁴ S1 refers to the synergy in the demerger.

⁵ Mohanty (1998) has found out that the value of the diversified companies in India will increase if they are split up along the different lines of business.

⁶ LG used only the P-E approach.

has to ask this question, "What would have been the total debt of B, had this division not been there?" Once, this amount is found out, one can apportion the difference between the actual debt of B and the debt that would have been there with B without this division, to the division, and then compute its EPS. Another simple way of finding of the EPS of the division would be to study the demerger proposal carefully. As part of the demerger scheme, B may transfer part of its debt to A. Then one can easily attribute this debt to the division and then compute its EPS.

P_{1D} can be written as the product of $(P/E)_{1D}$ and EPS_{1D} . Then Equation 1 can be written as

$$\begin{aligned} (PE)_{1D} \times (EPS)_{1D} &\geq p_1 \\ \Rightarrow (PE)_{1D} \times \left(\frac{E_1 + E_D}{n_1 + n_2 \times ER} \right) &\geq p_1 \\ \Rightarrow (PE)_{1D} \times (E_1 + E_D) &\geq p_1 \times n_1 + p_1 \times n_2 \times ER \\ \Rightarrow ER &\leq \frac{-p_1 \times n_1}{p_1 \times n_2} + (PE)_{1D} \times \frac{(E_1 + E_D)}{p_1 \times n_2} \\ \Rightarrow ER &\leq \frac{-n_1}{-n_2} + \frac{(E_1 + E_D)}{p_1 \times n_2} (PE)_{1D} \dots (2) \end{aligned}$$

Here, equation 2 looks very similar to the one in the LG model. This is not surprising, however, since from the shareholders of A's point of view this demerger is equivalent to a similar merger with another company into the same business as is the division of B and is of the same size as the division. In Figure 1, we have plotted the exchange ratio against the expected post-demerger P-E ratio of company A. One can see that the shareholders of A will not mind swapping a larger number of their own shares for shares of B if the expected P-E ratio is large.

One can also determine the exchange ratio using the synergy approach. One needs to know the value of the division transferred here. We know that after the demerger, the value of A will be $p_1 * n_1 + D + S_1$.

Hence, P_{1D} will be equal to $(p_1 * n_1 + D + S_1) / (n_1 + ER * n_2)$. Substituting this into equation 1 one can write

$$\frac{p_1 \times n_1 + D + S_1}{n_1 + n_2 \times ER} \geq p_1$$

$$\Rightarrow p_1 \times n_1 + D + S_1 \geq p_1 \times n_1 + p_1 \times n_2 \times ER$$

$$\Rightarrow ER \leq \frac{(D + S_1)}{p_1 \times n_2} \dots (3)$$

Both equations 2 and 3 will give the same answer if S_1 and $(PE)_{1D}$ are computed correctly. In Figure 2, we have plotted the exchange ratio against the synergy expected from the demerger. One can see that the shareholders of A will be willing to give more number of shares to the shareholders of B (that is ER will be higher), if the expected synergy is high. This finding is also consistent with what we got by using the P-E approach. If the synergy from the demerger is high, then the post-demerger P-E ratio will be higher.

Analysis from the point of view of shareholders of B:

The difference between a traditional merger and demerger is that shareholders of company B will get ER number of shares for each 1 share of B they have with them. They will also retain their shares in B. Shareholders of B will accept the demerger proposal if the following condition is satisfied.

$$p_{2D} + ER * p_{1D} > p_2 \dots (4)$$

One can develop a model to determine the exchange ratio that will be acceptable to the shareholders of B using the PE approach or the synergy approach.

Determination of the exchange ratio using the PE approach

Equation 4 can be written as

$$\begin{aligned}
& (PE)_{2D} \times \left(\frac{E_2 - E_D}{n_2} \right) + ER \times (PE)_{1D} \times \left(\frac{E_1 + E_D}{n_1 + n_2 \times ER} \right) \geq p_2 \\
\Rightarrow & ER \left(\frac{E_1 + E_D}{n_1 + n_2 \times ER} \right) \times (PE)_{1D} \geq p_2 - \left(\frac{E_2 - E_D}{n_2} \right) \times (PE)_{2D} \\
\Rightarrow & ER \left(\frac{E_1 + E_D}{n_1 + n_2 \times ER} \right) \times (PE)_{1D} \geq \frac{p_2 n_2 - (E_2 - E_D)(PE)_{2D}}{n_2} \\
\Rightarrow & ER \geq \frac{p_2 \times n_2 - (E_2 - E_D) \times (PE)_{2D}}{(E_1 + E_D) \times (PE)_{1D}} \times \frac{n_1 + n_2 \times ER}{n_2} \\
\Rightarrow & ER \geq \frac{(p_2 \times n_2 - (E_2 - E_D) \times (PE)_{2D})}{(E_1 + E_D) \times (PE)_{1D} - (p_2 \times n_2 - (E_2 - E_D) \times (PE)_{2D})} \times \frac{n_1}{n_2} \dots (5)
\end{aligned}$$

In Figure 1, we have plotted the exchange ratio against the expected P-E ratio of A. One can plot exchange ratio against the P-E ratios of both A and B using a three-dimensional graph. To keep things simple, we have kept the P-E of B constant (in each hyperbola) while drawing the hyperbola in Figure 1. One can observe that as the expected post-demerger P-E of B increases, the hyperbola moves closer to the horizontal axis. This means that if the shareholders of B expect the price-to-earnings ratio to increase after the demerger, then they will not mind accepting a lower exchange ratio from A. Shareholders of A are not at all affected by any change in the P-E ratio of B. This is not surprising because they are not getting any benefits from the increase in the value of B. Strategically, therefore, B should show a lower expected P-E ratio of B to the management of A. This will help them to bargain for a higher exchange ratio.

For the sake of convenience, we have divided Figure 1 into four regions. In region 1 lie all exchange ratios that are acceptable to both the groups of shareholders. Region 2 contain exchange ratios that are acceptable only to company B. Similarly Region 4 contain exchange ratios that are acceptable only to the shareholders of Company A. Region 3, on the other hand, contain exchange ratios that are not acceptable to either company. In a rational world, one should find all actual exchange ratios to lie in Region 1 only.

One can also determine the exchange ratio that is acceptable to the shareholders of B using the synergy approach.

One can rewrite equation 4 as

$$\begin{aligned}
 & \frac{p_2 \times n_2 - D + S_2}{n_2} + ER \times \left(\frac{p_1 \times n_1 + D + S_1}{n_1 + ER \times n_2} \right) \geq p_2 \\
 \Rightarrow & ER \times \left(\frac{p_1 \times n_1 + D + S_1}{n_1 + ER \times n_2} \right) \geq \frac{p_2 \times n_2 - p_2 \times n_2 + D - S_2}{n_2} \\
 \Rightarrow & ER \times \left(\frac{p_1 \times n_1 + D + S_1}{n_1 + ER \times n_2} \right) \geq \frac{D - S_2}{n_2} \\
 \Rightarrow & ER \times (p_1 \times n_1 \times n_2 + D \times n_2 + S_1 \times n_2) \geq D \times n_1 - S_2 \times n_1 + ER \times n_2 \times D - ER \times S_2 \times n_2 \\
 \Rightarrow & ER \times (p_1 \times n_1 \times n_2 + D \times n_2 + S_1 \times n_2 - n_2 \times D + S_2 \times n_2) \geq (D - S_2) \times n_1 \\
 \Rightarrow & ER \geq \frac{(D - S_2) \times n_1}{p_1 \times n_1 \times n_2 + S_1 \times n_2 + S_2 \times n_2} \dots (6)
 \end{aligned}$$

We have plotted the exchange ratio against the expected synergy of A in Figure 2, keeping the synergy of B constant. As in equation (5), equation (6) also links the exchange ratio to the synergies of both A and B. This is not surprising since after the demerger, shareholders of B are going to be the shareholders of both A and B. Instead of using a three-dimensional graph, we have used a two-dimensional one. Hence, we have kept the synergy of B constant in each hyperbola. If the expected synergy in B is zero, then the two curves will intersect at the origin. At this point, the synergy expected from A is also zero. This means that if neither company expects any synergy from the demerger, then the only exchange ratio that will be acceptable to both the groups of shareholders is given by $(D/p_1 \times n_2)$.

One can see from Figure 2 that if at least either company expects some synergy from the demerger, then there will exist a range of exchange ratios that will be acceptable to both the groups of shareholders. We can also divide Figure 2 into four regions. This is very similar to what we have done for Figure 1. Hence, we have not shown the four regions in Figure 2.

One should note that if synergy is properly computed, then both these two approaches will give identical answer. However, these two approaches can be used by the analysts at different points of time. Thus for example, before the demerger takes place, an analyst can use the synergy approach to find out the exchange ratios that will be acceptable to both the groups of shareholders. The management of a company can use these models to

determine the actual exchange ratio in the case of demergers. One can also use the model to determine the relative gains of the different groups of shareholders. For this type of an approach, the P-E method is better, since one does not require an estimate of synergy here. In the next Section, we have given the example Grasim Industries Limited and Indian Rayon Limited to show how this model can be used.

Section II

THE CASE OF DEMERGER OF CEMENT DIVISION OF INDIAN RAYON INDUSTRIES LIMITED INTO GRASIM INDUSTRIES:

In this section, we have attempted to analyse one real life demerger case. In particular, we have attempted to see how the model developed in the previous section can be used to give us insights to any demerger. We have taken the example of Grasim Industries Limited and Indian Rayon Industries Limited here. Indian Rayon Industries Limited transferred its cements division to Grasim Industries Limited in a share swap transaction in 1998.

Background of the case:

Grasim Industries Ltd., (GIL) is an Aditya Birla group company, which is highly diversified into several commodity businesses such as viscose staple fibre, rayon grade pulp, man-made fibre yarn, cement, sponge iron and chemicals. GIL is the country's largest manufacturer of viscose staple fibre accounting for about 80 per cent of the total market. During the years 1997-98 and the following year, GIL emerged as a significant cement manufacturer, having taken over a couple of cement units.

The cement division commenced operations during the mid-eighties when two plants were initially commissioned. GIL has plants located at Jawad and Raipur in Madhya Pradesh and Shambhupara in Rajasthan. The company had an installed capacity of 52 lakh tonnes which by various mergers and acquisitions (including the merger of cement division of Indian Rayon into itself) rose to 105 lakh tonnes by 1998-99. Until 1998 the cement division contributed to almost twenty-four percent of the turnover of the company.

Indian Rayon and Industries Ltd., (Indian Rayon), also part of Aditya Birla Group, manufactures viscose filament yarn, caustic soda, textiles, carbon black, insulators, sea

water magnesia and argon gas. In September 1998, Indian Rayon's cement division was hived off to be merged with group company Grasim's cement division. This division had an installed capacity of 3 million tons of portland cement and 0.36 million tons of white cement.

The Aditya Birla Group in its effort to strengthen its businesses, decided to concentrate on businesses like cement, viscose staple fibre, carbon black and chemicals and enter into new avenues like power, petrochemicals and telecom through joint ventures. As part of this restructuring exercise it decided to club all its cement businesses under one company. As a part of this restructuring exercise, Indian Rayon transferred its cement business as a going concern to Grasim by way of a scheme of demerger. The swap was fixed at 3:10 i.e., 3 Equity Shares of Grasim for every 10 shares held by the shareholders of Indian Rayon including the GDR holders as well.

Application of the Model:

For the sake of illustration, we have used only the synergy approach here. In the previous section, we have argued that this model can be used both for the determination of the exchange ratio and for an ex-post analysis of demerger. For the determination of the exchange ratio, however, we require information about certain parameters like synergy, etc., which are not available to the outsiders.

The management of both the companies claimed that there is synergy in the demerger. However, they never quantified it in rupee terms. One can, however, estimate synergy by observing the market price behaviour immediately after the demerger announcement is made⁷. In an efficient capital market, one does not need to wait till the actual transfer of the division to estimate the synergy. One has to however, adjust for two factors before estimating synergy from the actual price movements. On the date of announcement of the demerger there will be some change in the equity value of the company which is independent of the demerger announcement. Thus, for example, if the market is in an up mood, then the stocks with a positive beta are also likely to experience an increase in the prices. One has to therefore, adjust for the market effects before estimating synergy. This can be done by using event studies. Secondly, the actual increase in the equity value (after market adjustment) will not be equal to synergy. This can be illustrated by giving

⁷ This estimated synergy may be different from what the management has actually estimated.

the example of Grasim and Indian Rayon. Shareholders of Grasim are not going to appropriate the entire synergy, since after the demerger, shareholders of Indian Rayon are also going to be the shareholders of Grasim. Hence, on the date of the announcement of demerger, the actual increase in the equity value of Grasim will be less than the synergy for Grasim. Since shareholders of Indian Rayon are going to hold shares of both Grasim and Indian Rayon after the demerger, the actual increase in the equity value of Indian Rayon will incorporate in it, part of the synergy of Grasim and the entire synergy of Indian Rayon. One has to use the following equations to estimate the synergy.

$$\Delta V_{Grasim} = \frac{n_{Grasim}}{n_{Grasim} + ER \times n_{Indian_Rayon}} \times Synergy_{Grasim} \dots (7)$$

$$\Delta V_{Indian_Rayon} = \frac{ER \times n_{Indian_Rayon}}{n_{Grasim} + ER \times n_{Indian_Rayon}} \times Synergy_{Grasim} + Synergy_{Indian_Rayon} \dots (8)$$

Here, ΔV refers to the change in the equity value of a company. One can observe that the sum of the change in value of both the companies is equal to the combined synergies of both the companies put together.

We have used the event study methodology to quantify the synergy. In the current context, adoption of this methodology will create some measurement error. While doing event studies, one needs to be aware of the fact that the market came to know of many value relevant information other than demerger during the sample period. Hence, the entire change in the equity value cannot be directly attributed to the event that one is studying. To avoid this problem, financial economists usually deal with a very large sample while doing event studies⁸. However, our major objective in carrying out this exercise was not to get a precise estimate of synergy, but rather to show how with a given estimate of synergy, one should proceed to determine the exchange ratio. Hence, we have attempted to estimate the synergy using the event-study methodology (being fully aware that it may contain some measurement error).

While doing event studies, one has to be very careful while determining the actual event date. After going through the news-clippings (obtained both from the Prowess database

⁸ This ensures that the effects of other events get cancelled out and hence, we can observe the effect of only one event.

and the IBID database) we found that the demerger announcement was first made on September 16, 1998.⁹ We could not find out whether, the news was announced before or after the trading hours. Hence, we have taken both September 16 and 17 as the day immediately after the event announcement date. It is perfectly possible that insiders knew of the demerger move before that. In fact, our event study results show that the market came to know of the demerger announcement two trading days before the actual announcement. This may also create some measurement error.

In event studies, it is very important that the regression slope coefficient and the intercept remain stationary over time. Roll (1986) has argued that one has to adjust for the change in leverage before drawing any conclusion from the event studies conducted to see the value effects of merger and acquisition announcement. If the demerger changes the business risk or the financial risk of either company, then the market will revise its estimate of the beta of the company. Thus, other things remaining constant, the pre-demerger beta and the post-demerger beta will be different. In such cases, it is advisable to estimate beta using post-demerger data only. If demerger increases the leverage of the company, for example, then including the pre-demerger data will show that the market reacts favorably to the announcement even when such an effect is not there. It will be just the opposite if demerger decreases the leverage.

The post demerger beta may also be different from the pre-demerger beta because the operating leverage changes after demerger. The pre-demerger beta of India Rayon, for example, was the weighted average of the betas of the different segments in which it was operating. After the demerger, since the cement division was transferred to Grasim, cement beta will not affect Indian Rayon beta any more. This is one more reason as to why in any such event study, only the post-demerger period should be used to estimate the beta.

We have adopted the following method to carry out the event study. We collected data on stock prices of both Grasim and Indian rayon and S&P CNX Nifty from the Prowess database for the period 18 August, 1998 till 11 November, 1999. At first, a window consisting of both twenty days before and twenty days after the event was created. Then

⁹ This news item appeared in the newspapers on 17 September, 1998.

using the post-window period data, the following regression equation was run for both Grasim and Indian Rayon.

$$R_{i,t} = \alpha_i + \beta_i * R_{m,t} + e_{i,t}.$$

Using the above estimates of α and β , the expected returns during the window period was computed. Then using the actual return figures, the abnormal return and the cumulative abnormal return figures were obtained. It was assumed that the entire abnormal return was due to the announcement of the demerger. As mentioned earlier, we have taken both 16 and 17 September as day 1. Using the abnormal return figures for day -2, -1, 0, and 1, we estimated the increase in equity value of the two companies. We found that the value of Indian Rayon has increased by 7.03% after the demerger announcement. The corresponding figure for Indian rayon is 11.05%. These are market-adjusted figures.

Multiplying these percentage-increase figures with the pre-demerger values, we get the increase in the market value of equity of both the companies. To estimate the synergy figures, we need to use equations 7 and 8. We require two additional adjustments before, we can use the above two equations. Before the demerger, Grasim had about 4.4% stake in Indian Rayon. After the demerger, since Grasim cannot issue shares to itself, the number of shares that Grasim has to issue is given by

$$(\text{number of shares of Indian Rayon}) * (1 - 0.044) * (3/10).$$

Therefore, in equations 7 and 8, we need to multiply $n_{\text{Indian-Rayon}}$ with $(1 - 0.044)$.

Secondly, equations 7 and 8 have got three variables, namely, synergy of Grasim, synergy of Indian Rayon and the exchange ratio. But with a system of two equations, we cannot arrive at definitive solutions to three variables. The exchange ratio was not announced on 17 September. It was announced only on 28 September. Hence, the market did not know of the swap ratio of 17 September. We, therefore, need an estimate of the expected exchange ratio figure before we can estimate the synergy. Using equations 3 and 6, we found that with zero synergy, the maximum exchange ratio that is acceptable to the shareholders of Grasim is 0.3. The minimum exchange ratio that is acceptable to the shareholders of Indian Rayon under the same assumptions is 0.28. When the expected synergy from the demerger is zero, the two exchange ratio curves intersect¹⁰. We got different numbers for the two companies because of the above-mentioned cross-holding.

¹⁰ See Figure 2.

We, therefore, assumed that the expected exchange ratio is 0.29. It is important to keep in mind that we are not assuming that the actual synergies are zero. One can show that the zero-synergy exchange ratio is perfectly consistent with a positive synergy exchange ratio. The property of a zero-synergy exchange ratio is that both the groups of shareholders share equally in any synergy. Thus, what we are in fact assuming is that the market expects the exchange ratio to be equally favorable to both the groups of shareholders. Since both Grasim and Indian Rayon are Aditya Birla Group Companies, this assumption is not unrealistic.

From equations 7 and 8, we obtained that the value of synergy for Grasim is about Rs.162.25 crores. The corresponding figure for Indian rayon is Rs.30.82 crores.

To apply the synergy model, we require an estimate for the value of the division transferred. The Economic Times reported that the value of the division was about Rs.750 crores¹¹. Indian rayon also transferred debt of Rs.437 crores along with the division. Hence, the equity value of the division was Rs.313 crores. One should keep in mind that in equations 3 and 6, 'D' refers to the equity value of division and not the total market value of the division.

Using the above data, we obtained the exchange ratio equations (rather in-equations) for both Grasim and Indian Rayon. We have plotted the graph in Figure 3. For the given level of synergy, Grasim was willing to exchange a maximum of 0.46 of its shares for every share of Indian rayon. Indian Rayon was willing to receive a minimum of 0.22 shares of Grasim for every share of Indian rayon. The actual exchange ratio was 0.3. This has been marked as a darkened triangle. This lies in the first region. This shows that the actual exchange ratio was acceptable to both the groups of shareholders. Therefore, shareholders of both Grasim and Indian Rayon gained handsomely from the demerger.

Section III

Summary and Conclusion

We have attempted to develop a model that can help the management in determining the swap ratios in case of demerger. The model shows that for positive synergy expected from the demerger, there will always be a range of swap ratios, which will be acceptable

¹¹ Refer to the Economic Times, September 29, 1998, page 6.

to both the groups of shareholders. This leaves a lot of scope for negotiation between the two groups of management to arrive at the actual exchange ratio. One can therefore, use this model to find out the possible exchange ratios that will be acceptable to both the groups of shareholders.

The model has got another important use. If somebody is interested in analysing the impact of the demerger on shareholders' wealth, then also the model can be used.

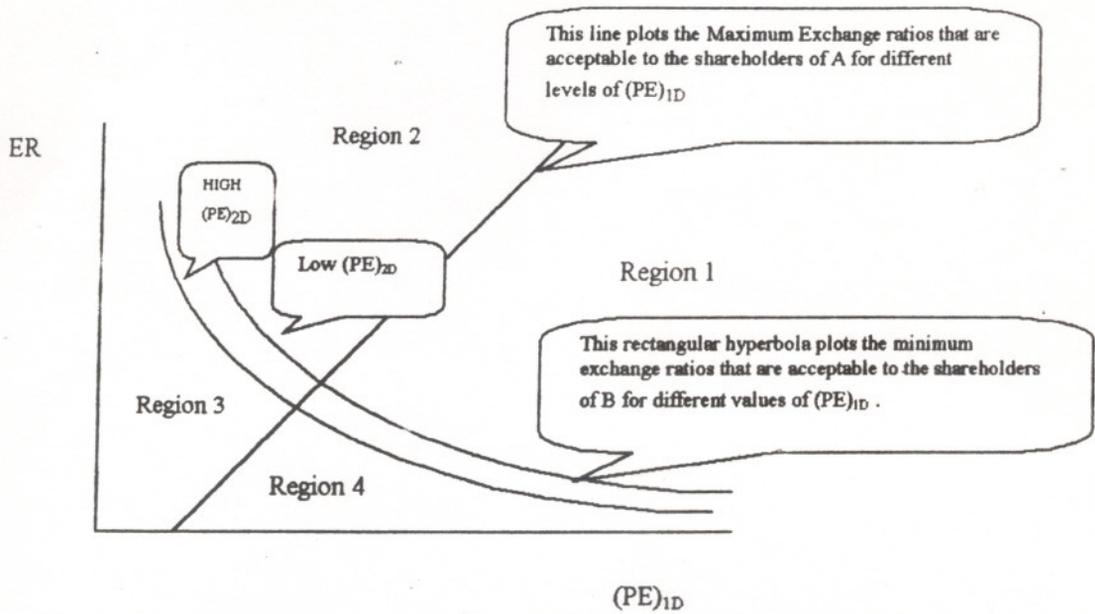
We have applied the model to the famous Grasim-Indian Rayon demerger. Using event-study methodology, we estimated the synergy expected by the market. We found that the shareholders of Grasim were willing to exchange 0.46 share of Grasim for every share of Indian rayon. The shareholders of Indian Rayon, on the other hand, were willing to receive at least 0.22 share of Grasim for every share of Indian Rayon. The actual exchange ratio of 0.3 share of Grasim for every share of Indian rayon was therefore, acceptable to both the groups of shareholders. We found that the market reacted favorably when the demerger announcement was made. Since demerger makes a company more focused, it shows that there is a focus-premium in the Indian stock market.

The major objective of the paper was to develop a model that can be used to determine the swap ratios in case of mergers. If some body has all the information required in the model, then one can easily obtain the range of exchange ratios that will be acceptable to both the groups of shareholders. Since, we did not have information regarding synergy from the demerger, we made certain assumptions regarding market behaviour to estimate synergy. One may not agree with the assumptions made by us. However, one can use this model to analyse any real life demerger, if one has the necessary information.

References:

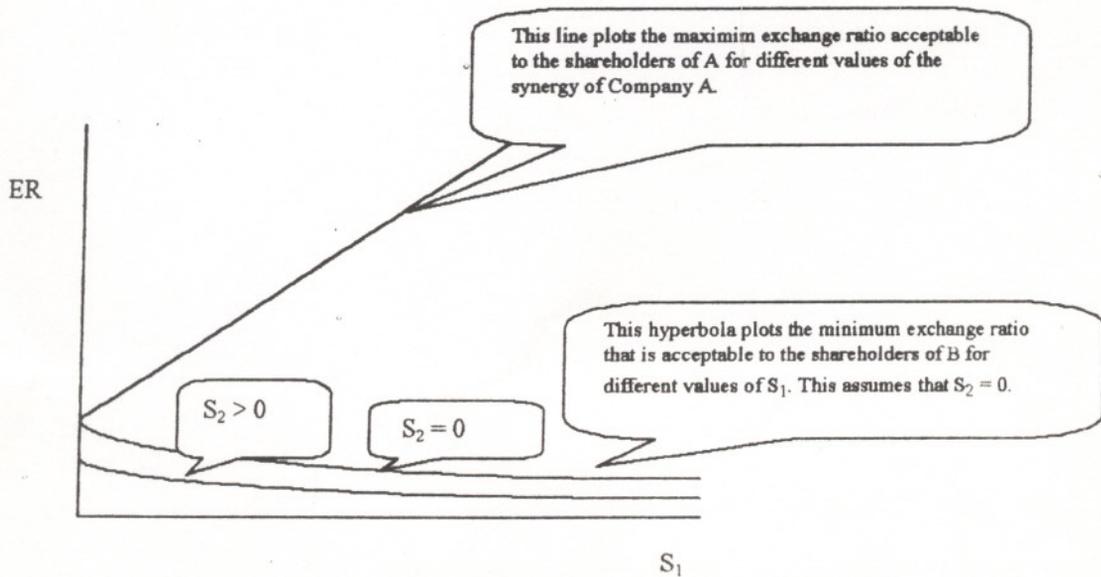
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Figure 1



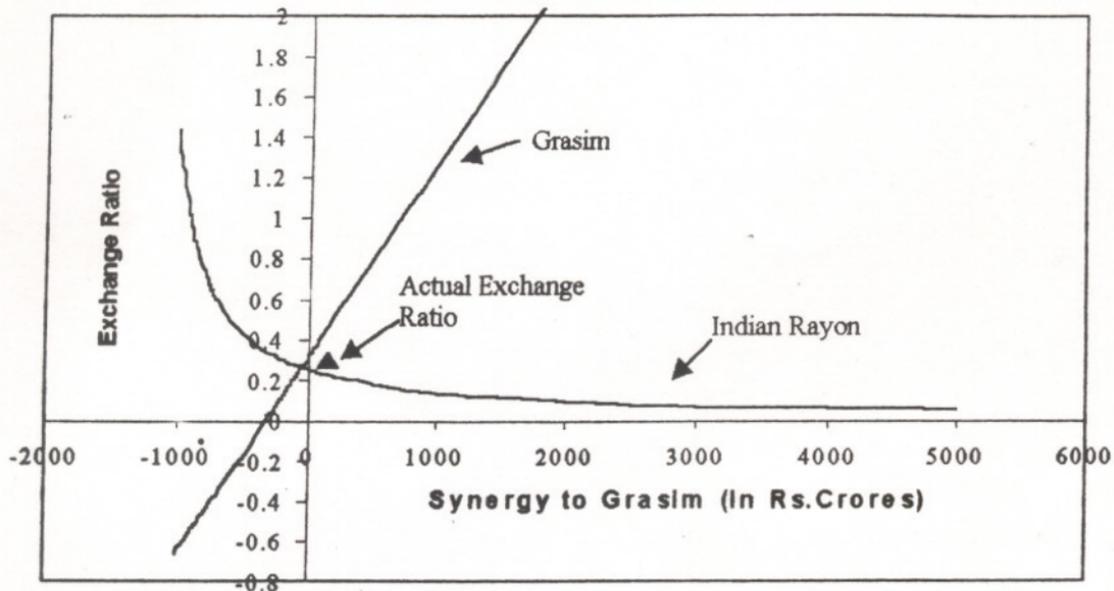
The above figure explains how the exchange ratio is influenced by the post-demerger Price Earnings ratios of the two companies.

Figure 2



The above figure explains how the exchange ratio is determined by the post-demerger synergy of both the companies.

Figure 3: Chart plotting exchange ratio based on actual synergy for both Grasim and Indian Rayon (Synergy of Indian Rayon kept fixed)



(In the above figure, the curves are not intersecting on the vertical axis because of the cross-holding).