

## Equity carve-outs: A sign of low opportunity industry?

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### Abstract

Equity carve-outs<sup>1</sup> have been studied since long, but the main focus of previous studies has been the firm level impact of carve-outs. We take this discussion to the industry level and argue that equity carve-outs, on average, are carried out in industries, where opportunities are low. These industries have low operating performance, gauged on profitability, cash flow and profit margin compared to industries where there are no carve-outs. In addition to this evidence, we found that the merger and acquisitions activities, in which the target is in industries where carve-out activity happened in last three years, bidders have less value created compared to mergers where the target industry has no carve-out activity. Both, the low operating performance of industries three years post carve-outs and low value created by bidders having targets in industries where carve-outs happen, signal that industries where carve-outs take place have low opportunities ahead.

Key words: Equity carve-outs (IPOs), Mergers and acquisitions, capital restructuring

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<sup>1</sup> Equity carve-outs is the terminology used by researchers for the initial public offering (IPO) of a subsidiary of a firm.

## **Introduction:**

In this paper, we tried to explain and statistically validate our argument that in industry, where the future opportunities are low, assets are carved-out by the firms. This argument took its roots from the findings of Nanda (1991) who claims that firms whose assets are undervalued and whose subsidiary assets are overvalued, choose for a carve-out rather than a seasoned equity offering. Our findings in this paper support this notion. According to our findings, industries, where carve-out activities take place, underperform their peer industries where carve-out activities do not take place. These industries have low operating performance measured on the basis of cash flows, profitability and profit margin.

Similar to Nanda (1991), Nanda and Narayanan (1999) argue in their work that the division that is divested is the division that is overvalued before the divestiture, and that the divested division has performed poorly. They further say that the reason of divestiture is that the firm itself is undervalued. Besides this direct evidence, some indirect evidence comes from John and Ofek (1995) who find that even in the year of sale the operating margins of the firms, who divest, improve. In this case, assuming that the time required implementing changes in the rest of the business and attaining the benefits after divestment is not sufficient, simply suggests that the sold asset was undergoing a poor performance. Nanda and Narayanan (1999) further state that as the firm will choose for divestiture because it is undervalued, its share price should rise on the announcement of the divestiture. Nanda (1991) has derived a similar result. As an empirical evidence, Dereeper and Mashwani (2013) report positive abnormal return to the parent firm on the announcement of equity carve-out. Dereeper and Mashwani have almost the same sample as we have in this paper. Slovin et al. (1995), Hite et al. (1987), Klein (1986), Jain (1985), and Rosenfeld (1984) are among others who report positive stock price reaction for the divesting firms at the announcement of divestitures.

To further advocate our findings, we tested whether there is impact on value creation in merger and acquisition events. Not to our surprise, we find that bidders, who bid in industries having carve-outs in last three years, have low value created than bidders who bid in industries having no carve-outs in the last three years before the event. Our findings are intuitively convincing and statistically significant.

Our work in this paper relates mainly to two literatures: literature on equity carve-outs and slight literature on acquisitions. The in-depth study of carve-outs has explored this phenomenon to a great extent. Price reaction to a carve-out event, performance of carved-

out firms, possible reasons of carve-out etc. has been addressed in literature. But with exceptions of few studies on industry level, all the literature is addressing these all and other questions at firm level. This niche in literature gave us a chance to take the discussion to the industry level.

The decision, whether to go for a seasoned equity offering or an equity carve-out, may be affected by the established fact about seasoned equity offerings, that they lead to the value destruction of the parent firms after the issue. According to Shipper and Smith (1986), the only equity issuance that looks like to have value creation and not value destruction for the parent firm is equity carve-out. Vijh (1999, 2002) Mulherin and Boone (2000) argue that the market, in contrast to SEOs, views equity carve-outs favourably. In an equity carve-out, a parent firm issues stocks in its wholly owned subsidiary to raise capital from general public. It is an IPO but the stocks are issued in the subsidiary. Nanda (1991) argues that though an equity carve-out is similar to IPO in issuance mechanism, the information environment of seasoned equity offering is more close to that of equity carve-out.

If Shipper and Smith (1986) are correct, then why is this specific kind of equity issuance different from the rest? One possible explanation could be that of Nanda (1991) who finds in his theoretical work that firm, which is undervalued by the market, will resort to send its subsidiary in to the market, given the fact, that the market overvalues the subsidiary assets. This idea is analysed on the basis of asymmetry of information, supporting the school of thoughts that support the notion of higher management knowledge about the firm than the market.

If we take on this idea of information asymmetry, and consider that the management knows better than the investors and that the management want to act in the best interest of existing shareholder, the issuance of equity in a wholly owned subsidiary can intuitively be a signal of low asset quality of the subsidiary. Slovin et al. (1995) observed in their work that the competitors of the carved-out entity have a decrease in their value, and they interpret this decrease in value as a supporting evidence for the notion, that the divisions divested in carve-outs are overvalued before the divestiture. As Vijh (2002) argue in his work that subsidiaries that are carved-out are typically in different industries than that of the parent themselves. He also documents that announcement period returns to the parent firm are positive and that these returns are, on average, higher for carve-outs of unrelated subsidiaries. At this stage, the notion of overvaluation of carved-out divisions and subsidiaries can be taken forward to the next level, i.e. the industry level, and can be analysed if those industries (where carve-outs happen) perform different than the industries

where carve-outs do not happen. We addressed this question in our work, and find a significantly different performance of the differently identified industries (industries where carve-outs happen and industries where carve-outs do not happen).

Further, when we talk about carve-outs, we understand, in the light of literature, that decision of a carve-out is of temporary nature or is a transitory arrangement, most of the time. (Only 8% of carved out companies, after 5 years of carve-out remain under the clear control of the issuing company (Annema et al. 2001)). Klein et al. (1991) state that 39 of the 40 carve-outs that occurred before 1983 in their sample were followed by a second event, suggesting that carve-outs are temporary arrangements rather than a permanent restructuring tool. Carved-out subsidiaries are either followed by a re-acquisition, spin-off or are sell-off. Perotti and Rossetto (2007) theoretical work infers that when the underlying motive of an equity carve-out is to unlock the value of subsidiary, the likelihood of acquisition in this type of carve-outs increases. Desai et al. (2011) conjecture on the basis of Perotti and Rossetto (2007) that if unlocking value of subsidiary is the intention of the parent firm, then the parent is interested in understanding its synergy with the subsidiary, and therefore, the acquisition of such carved-out subsidiary, either by the parent or by the third party acquirer, is imminent. These studies show that carve-outs are normally followed by a second event, and one of the possible events is, acquisition. We understand that carve-out is a divestment activity, where as an acquisition is an investment activity. We argue that, if a divestment in an industry is followed by an investment in that industry, both these activities should have impact on the value creation of both the investing and divesting parent firms, and that this impact should be align in an inverse relationship. A vast number of studies in literature on carve-outs confirm that the parent cumulative abnormal announcement stock return is positive and significant. These studies include, Dereeper and Mashwani (2013), Wagner (2004), Hulburt (2003), Mulherin and Boone (2000), Vijh (1999, 2002). Eckbo (2008) also reported a sample-size-weighted average of 1.9% for a total of 1050 cases of carve-outs in 8 different studies. In our present work, we report a negative abnormal return to the acquirer bidding in industries where carve-outs happen in the last three years, which supports our argument.

The literature of mergers and acquisitions has mix results about the abnormal returns to acquirer on the announcement of acquisitions. Espen Eckbo in his book “Hand book of corporate finance” (2008) summarizes several studies, which gave this perception. For example, Fuller, K. et al. (2002) report an average cumulative abnormal return of 1.8 % for a total sample of takeovers (N= 3135) over the time period of 1990 to 2000. Likewise,

using a sample of 12,023 acquisitions, over a period of 1980 to 2001, Moeller et al. (2004) report an average cumulative abnormal return of 1.1% (significant at 1%) at announcement of the acquisition. On the other hand, using a sample of 2511 attempted mergers and tender offers over the period from 1988 to 2000, Officer (2003) reported -1.16% (significant at 1% level) cumulative abnormal return to the bidder. Similarly, in a sample of 388 acquisitions over the period of 1990 and 1999, Moeller (2005) find announcement return of -2.9% to the acquirer.

As our study addresses questions on industry basis, we use the differences-in-differences approach to see the difference in impact of M&A activity on the CAR of acquirers, bidding in classified target industries. We classified the targets' industry on the basis of carve-out activity (targets' industry where carve-outs happen and targets' industry where carve-outs do not happen). The underlying purpose of this follow up is the notion that, if the industries having carve-outs have low operating performance in years ahead, the bidders, with targets in industries having carve-outs, should have low value created compared to bidders with targets in industries having no carve-outs occurred in last three years prior to the acquisition event. Our findings support this notion.

In our knowledge, no study has been done before, on the performance of industries where carve-outs happen. Also, we could not find a single study, which address the value creation by merger and acquisitions in the specific context of industries where carve-outs happen, in relation to the rest of the industries. Our findings imply that investors can possibly interpret carve-outs as part of an exit strategy by the parent firms and that carve-outs can be an indication that the industries of the carved-out firms have poor opportunities in the future.

### **Sample selection and description:**

Equity carve-outs are operations where all previous researchers have faced problems regarding the availability of data. The main impact of these problems is a limited number of observations in previous studies relating to carve-outs. We are no exception regarding this problem. In our sample, we have 193 observations, which fulfil our requirements for the analysis. In the sample, 97 different industries are identified on the basis of 4 digit SIC code. This sample includes only those carve-outs where the subsidiary belongs to a firm, which is already listed on stock exchange. The time period covered in the sample extends from 1987 to 2006 making overall 20 years. For carve-out data, SDC (Securities Data Company) is used as a major source of information. For the carve-out data, following

previous studies, closed end funds, real estate investment trusts (REITs), partnerships, American depository receipts (ADRs) and unit offerings are excluded from the sample. Subsidiaries having SIC (Standard Industrial Classification) code within the range of 6000 and 6999 were considered financial companies and hence were removed from the initial sample. Only issues that were listed on New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and NASDAQ (National Association of Securities Dealers Automated Quotations) were included in the sample.

To be sure that the carve-outs are really the IPOs of subsidiaries of already listed companies, and that they are not part of parent, we used CUSIP (Committee on Uniform Securities Identification Procedures) codes. The criteria was, if the CUSIPs were different we thought them to be true carve-outs but if CUSIP of company going public and that of its ultimate parent were the same, we considered them as incompatible to our requirements and were hence removed from the sample. For counter check, we consulted Dow Jones Factiva for news wires, to confirm that the subsidiaries are fully owned subsidiaries of the parent company or parent owns a major portion of the subsidiary.

After following the above stated criteria, as shown in table 1, we have 193 deals (carve-outs) in time frame of our study.

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Table 1 carve-out sample  
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The number of deals is not stable over the sample period and is changing from year to year. The weighted average proceeds from these deals accounts for about \$68 million with median of \$47,67 million. In this sample period, parent firms have, on average, 77 percent post IPO stakes in their subsidiaries, meaning 27% of subsidiaries were sold in the IPO. The average underpricing of the issued shares during this period and in this sample is 18 percent. In our previous work, Dereeper and Mashwani (2013), where we had almost the same sample, the average CAR (cumulative abnormal return), calculated for the parent firm at the event of announcement of the carve-out (event window of -2 to 2), accounts for about 2 percent (significant at 1%). Eckbo (2008) also reports in his book (referring to different studies e.g. Wagner 2004 and others) a positive abnormal return to the parent in the event of announcement. We have 50 percent deals in same industry i.e. the parent and the subsidiary both belong to same industry. Operational performance, including profit margin, profitability, and cash flow is extracted from Compustat.

We follow Golubov et al (2015) for our sample of M&As, which is similar to most samples in literature, with slight changes. Mergers and acquisitions data is extracted from the mergers and acquisition section of Securities Data Company (SDC) and CRSP (Center for Research in Security Prices) database. This data spreads over the period of 22 years starting from January 1, 1990 to December 31, 2011. During this time period, we have 18459 merger and acquisition deals in total, among which 3671 deals are concerned. It means that 3671 mergers and acquisition deals occurred in the industries where carve-out happened in the last three years of the activity. Bidders in our sample are US public listed companies whereas the target firms are public, private or subsidiary firms (not necessarily US firms). Further, the acquirer must acquire 100% of the target firm, however, it should own less than 50% of the target firm before the acquisition. The transaction should exceed one million dollar, and it should be at least one percent of the acquirer market capitalization 11 days before the announcement of the event. The daily stock price data of the acquirer is extracted from CRSP for 300 trading days prior to the announcement of the event. The accounting data of the acquirer for the year-end, immediately prior to the announcement, is acquired from Compustat. Similarly, multiple deals announced on the same day by the same firm are not included in the sample.

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#### Table 3 M&A sample

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The weighted average deal value for our sample is \$305 million where the median deal value reports about \$31 million. Relative size calculated as deal value divided by market value of acquirer is 26 percent, on average. The deals where target was a private firm makes, on average, about 50 percent of the sample. Deals where targets were paid in stocks makes about 16 percent on average where as the horizontal deals make 61 percent of the sample, on average. CRSP is used to measure the returns to the whole market and the Fama-French three factors are taken from Fama-French web site.

### **Results:**

#### **Regression for operational performance:**

In pursuit of our first hypothesis, which states that industries where carve-outs happen have low performance in years ahead or carve-outs happen because there is low future opportunity, we embark in to our first regression. The performance is measured here by cash flow (Income before extraordinary items (IBC) divided by total assets), profitability

(Operating income before depreciation (OIBDP) divided by total assets) and profit margin (Income before extraordinary items (IB) + depreciation and amortization (DP) divided by sales (SALE). These proxies are calculated by using items from COMPUSTAT. We conceive that these proxies for the performance can better unveil the underlying phenomenon of low opportunity or high opportunity. To measure the relationship of carve-out activity and the performance of industry or to understand one of the possible reasons that persuade the parent firm to relinquish power by opting equity carve-out, we regress the different performance indicators on a dummy variable called DCarve in the presence of year and sector fixed effects. It is important to mention about the methodology, that we use differences-in-differences (DD) approach using panel data. DCarve is an indicator variable equal to “1” if the firm is in the industry where carve-out occurred in the last three years and “0” if the firm is not in the industry where carve-out occurred in the last three years. An OLS regression is used to serve the purpose.

Regression line is:

$$\text{Perf}_{i,s,t} = \alpha_s + \alpha_t + \beta \text{DCarve}_{s,t} + \varepsilon_{i,s,t}$$

Where ‘Perf’ is the performance (measured through cash flow, profitability and profit margin which are defined in the above paragraph) of firm ‘i’, belonging to the industry ‘s’, during period ‘t’.  $\alpha_s$  and  $\alpha_t$  are industry and time fixed effect and “DCarve<sub>s,t</sub>” is indicator variable equal to 1 if the industry ‘s’ at time ‘t’ had a carveout during the past three years. Table 2 presents the results of our regression. We see in our results that, in industries where carve-out happen in the last three years, there is a negative cash flow, which is statistically significant at 5 percent.

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Table 2  
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Profitability, another measure of performance, is also negative and significant at 5 percent level, which is further a relief and support to our hypothesis. The final proxy used for performance, i.e. the profit margin, is also negative and significant at 10 percent level. All proxies for performance indicate, that in industries, where carve-outs happen, performance in the coming years (three years in our calculations) is significantly lower than industries where carve-outs do not happen.

In our understanding, it is not because the carve-outs cause the lower performance, as carve-outs are not an activity that occur in bulk, but it looks like the parent firms perceive



and expect low performance in the given industry in the coming years and hence they embark on the decision to carve-out. We argue that carve-outs do not result the low performance of the industries but contrary to that, the perceived low performance of industries may incite the carve-outs. Though 50 percent of carve-outs in our sample happen in same industry, the logic behind this could be the understanding of the parent firm that they should get rid of as much of their assets in the low opportunity industries as possible to minimize the loss as they foresee it. On the other hand, the average cumulative abnormal return to the parent firm is positive and significant at announcement of carve-out, as mentioned in sample description, which depicts that the market is also not optimistic about the future performance of the carved-out firm, potentially because the market as a whole has negative perception of the underlying industry.

Another explanation could be that, the parent might have foreseen the low opportunity of the industry, but there is possibility that those parents who think they can sustain the growth and performance despite the fact the industry as a whole is in crisis, will decide to send their very proper information in to the market for evaluation. After all if they would have the idea to get rid of its assets, they would sell the whole subsidiary, not only 27 % on average. This discussion is beyond the scope of this paper and should be explored. Here, we stick to the initial hypothesis developed in the light of literature.

### **Regression for CAR of the acquirer:**

After discussing and having significant proof that performance in industries, having equity carve-outs in the last three years, is lower than industries where no such activity takes place, we go deeper in to our pursuit. If our results in the previous regressions are true, then we expect that the cumulative abnormal returns (CAR) of the acquirer bidding in the industry of above stated characteristics should be different from other industries, or to be more specific, CAR of bidders in these specific industries should be lower than other industries. We regress the CAR of bidder at announcement, first on the dummy variable DCarveT (DCarveT is equal to one if the target firm is in industry where equity carve-out happened in the last three years, and zero if other wise), and then in the presence of DCarveT on an extensive list of other control variables, found in several high quality studies on acquirer returns (Masulis et al. (2007), Golubov et al. (2012), Harford et al. (2012)), to see if the CAR is different. We follow Golubov et al. (2015), for bidder size, free cash flow, Tobin's Q, idiosyncratic stock return volatility (sigma), stock price run-up, and leverage. Besides these, we also include deal-specific controls variables, like relative

size, relatedness of the industry of target (dummy), tender offer (dummy) and hostile dummy. Also a set of interactions between target listing status and the payment method (Pub X Cash, Pub X Stock, Priv X Cash, Priv X Stock, Sub X Cash) were added as the controls.

The OLS regression line is:

$$CAR_{i,t} = \alpha_s + \alpha_t + \beta DCarveT_{i,t} + \gamma Firm\ Characteriscics_{i,t} + \delta Deal\ Characteristics_i + \varepsilon_{i,t}$$

Where ‘CAR’ is the cumulative abnormal return to firm ‘i’ at time ‘t’, DCarveT is the dummy variable equal to 1 if the target firm is in industry where carve-out happened in the last three years and 0 if otherwise.

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Table 4  
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We can observe in table 4, that our hypothesis still stands true. The CAR of bidders who bid in the industries where equity carve-out happened in the last three years is significantly lower than the bidders who bid in industries where no carve-out activity happened in the last three years. Firstly, we regress the CAR of bidder on DCarveT and we see that we have lower CAR for the industries where carve-outs happen. The difference in the CAR is significant at 10%. Then we add year fixed effect to the regression, and the results become stronger, the difference in CAR increased and the level of significance increased to 5%. In the next level we added all the control variables along with year fixed effect and the story remains the same, with a slight increase in the difference of CAR. The level of significance of the difference remains at 5% level. After the addition of another fixed effect (bidder sector fixed effect), the difference in CAR between the bidders, bidding in carve-out industry and non carve-out industry, became more significant (1 % level). Eliminating the bidder sector fixed effect and replacing it by bidder fixed effect decrease the level of significance but the results are still significant at 10%.

These results support our hypothesis that if an acquirer acquires a firm in the industry where there have been carve-out activity happened in the last three years, its CAR will be lower and will have low value created as a result of acquisition deal. These results are in line with the results of the regressions performed for the performance of industry where

carve-outs happened in the last three years. The parent firms, who decide to go for a carve-out, have positive abnormal return on announcement; the performance of the industry of carve-out declined in the next three years; and now the CAR of the acquirer in the carve-out industry is reduced. All these results leads to the conclusion that bidding in the industry of carve-out is not a good idea in terms of value creation.

The rest of the control variables are mostly showing the expected signs, which are consistent with the previous studies, albeit, they are not significant, always. Acquirer size and interaction term of public target and stock payment are the most consistently significant (at 1% level) variables across all the three regressions in which they are added. They are negatively associated with the acquirer CAR, which is consistent with the literature (Golubov, A., et al. 2015, Harford, J. et al. 2012, Golubov, A., et al. 2012, Moeller et al. 2004). The interaction term of private target and stock payment is also highly significant across all the three regressions, and is positively associated with the acquirer CAR. This positive association with the acquirer CAR is also consistent with the literature (Harford, J., Humphery-Jenner, M. & Powell, R., 2012; Fuller, K. et al. 2002). The different sign of the interaction term 'public target and stock payment' and interaction term 'private target and stock' payment could be the reason that bidder receive better price when he buys private firms. The underlying reason behind this could be the liquidity effect as Fuller, K. et al. (2002) explain in their work. Public traded firms are easier to be sold compared to private firms. This difference of liquidity makes the public firms more attractive and the private firms less attractive and less valuable. The acquirer understands it and captures this discount while bidding for the private firms. Further, the different sign of interaction terms 'public and cash' and 'public and stock' is also in line with findings of Travlos (1987) who argue that lower announcement returns accrue to the acquirers who acquire public firms with stock payments. Stock price run-up is negatively associated with the acquirer CAR and is highly significant at 1% in its first and third regression but is significant at 5% in the second regression. Golubov, A., Yawson, A. & Zhang, H., (2015) have reported similar association of price run-up with the CAR of the acquirer. Tobin's Q is also negatively associated with the acquirer's CAR but is significant only in first regression where there is not bidder sector fixed effect and bidder fixed effect. Sigma is highly significant at 1% level and is positively associated with the bidder CAR. Relative size is also positively and highly significant (at 1%). Asquith et al (1983) also report a positive and significant relationship between bidding firm CER (cumulative excess return) and the relative size of target firm's equity. Leverage is significant at 1% and 5%, but the

association is not consistently positive or negative, though it is consistent with the literature. In the absence of bidder fixed effect, leverage is positively and significantly related to abnormal returns which is in line with Maloney et al. (1993) as they say that firms with higher leverage normally make better acquisitions than firms with lower leverage. Free cash flow, relatedness, tender offer, hostile and interaction term of private target and cash payments are not significant but their signs are mostly consistent with the previous studies.

### **Regression for stock performance:**

Previously, we look in to differences of the operational performance of industries where carve-outs happen and industries where these events do not happen. Now we want to check, if there is any difference in the stock performance of industries where carve-out events happen and industries where they do not. We regress the stock performance on DCarve in the presence of Fama-French three factors (market risk premium, small minus big *market capitalization*, and high minus low *book to market ratio*) in table 5. Differences-in-differences (DD) approach using panel data is used to measure the cumulative average of stock returns. The OLS regression is:

$$R_{i,s,t} = \alpha + \alpha' DCarve_{s,t} + \beta(MKRTF_t) + \gamma(SMB_t) + \delta(HML_t) + \varepsilon_{i,t}$$

Where  $R_{i,s,t}$  is return on stocks to firm  $i$ , in industry  $s$ , at time  $t$ . " $DCarve_{s,t}$ " is indicator variable equal to 1 if the industry ' $s$ ' at time ' $t$ ' had a carve-out during the past three years. We can see, that the returns on stocks of industries where carve-outs happen are not different from the returns on stocks of industries where there was no carve-out in the last three years.

These results, show that the carve-outs may be a signal of low operational performance in the years ahead in a given industry, but the stock performance is not different in years ahead despite the fact that carve-outs happen in given industries.

### **Regression for checking premium effect:**

After observing that the industries where carve-outs happen have low performance in the years ahead, and that acquirers undertaking mergers and acquisition activities in such industries have low value created, some doubts may prevail about these results. One of the doubts may be to question the level of premium paid in the deals undertaken in such

industries. As Roll (1986) argue that the managers of acquiring firms may overpay in acquisition deals because the managers may suffer from hubris. The notion is, if acquirers pay high premium in the acquisition deals happening in the industries of carve-outs compared to other industries, then the CAR of the acquirer should logically be low in the carve-out industries. To clarify this doubt, in table 6 we regress the premium for four weeks on the dummy variable DCarveT and an extensive list of control variables including Tobin's Q, share price run-up, free cash flow, relative size, deal value, relatedness of acquirer and target industries, tender-off (dummy equal to 1 if yes, 0 other wise), hostile (dummy equal 1 if yes), method of payment if cash or stock and toehold.

The regression line is:

$$Premium_i = \alpha + \beta DCarveT_{i,t} + \gamma Firm\ Characteristics_{i,t} + \delta Deal\ Characteristics_{i,t} + \varepsilon_{i,t}$$

In the first regression, when only DCarveT is used as independent variable, we see that no significant difference exists in the premium paid in deals occurred in carve-out industries and deals occurred in non carve-out industries. After adding the extensive list of control variables and certain fixed effects, the results sustain and we observe no significant change in premium paid in the deals occurring in the two different categories of industries.

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Table 6  
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Further we see that Tobin's Q and share price run-up are positively and highly significantly related to the premium paid in deals. Deal value is negatively and highly significantly related to the premium paid. Both the payment methods (cash and stock) are significantly related to the premium; however, the level of significance does not remain the same. In addition, the cash is positively related, whereas stock is negatively related to the premium. Further, the free cash flow and industry relatedness are negatively related to the premium, though the relationship is not significant. Relative size, tender-offer, hostile and toehold are positively related to the premium. However, the relation is not significant.

These results affirm at this stage, that the low value created by the bidders after bidding in the industry where carve-out happened in the last three years is not because of the high premium paid by the bidder for such deals but looks like the difference arise because of the fact that bidder bid in carve-out industry.

**Conclusion:**

Equity carve-outs have been studied in the past as a mean of divestiture, and its impact on the parent shareholders' wealth, its consequences and the underlying reasons for the choice of this route of divestiture. One area, to our best knowledge, that is not yet explored is the industry performance. While peeking in to this niche, we came to know that industries where carve-outs happen are industries where the opportunities are bleak. These industries suffer from low performance in the years ahead. Our findings reveal that over the period of three years post carve-out, the performance of industries where carve-outs happen is low compared to industries where there is no carve-out activity. The performance is surrogated by profitability, profit margin and cash flow. We also observe that at the announcement of carve-out, the parent firms receive a significantly positive abnormal return, which can intuitively lead to the notion that either the subsidiary is not performing well or the future opportunities in the subsidiary industry are not good.

Even after having significant proof about our argument, we do not content with these results and proceed to the next step, which can approve our results or can disapprove our results so far, leaving no ground for us to establish our point. The notion is, if there is low performance in these specific industries, it should transfer some impact of this low performance to the acquiring firms, which engage in mergers and acquisition activities in these industries. To do that, we calculated the cumulative abnormal returns (CAR) to the firms bidding in industries where carve-out activities happen in the last three years before the acquisition announcement date. Here, we find significant evidence that the firms bidding in carve-out industries have low value created than those, which bid in non carve-out industries. With these two evidences in hand, we are now in the position to pre-warn investors that they should be careful while investing in firms belonging to industries where carve-out activities happen, as the future is bleak in these industries. Our results are robust to specific industry returns and also to the premium effect.

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**Table 1: Sample for carve-outs**

This table presents the descriptive statistics for our sample of carve-outs over a period of 20 years from 1987 to 2011. The calculations in this table are based on data taken from SDC (Security Data Company). Our dataset does not contain financial firms (SIC between 6000 and 6999), American depository receipts (ADRs) and real estate investment trusts (REITs) following other studies done on carve-outs. All the parent in our dataset are listed firms on three main US stock exchanges i.e. NYSE, AMEX and NASDAQ. YYYY is the year of carve-out spreading over the period of 20 years. Num\_deal is the number of deals in the respective years. Avg\_proceeds are the average proceeds received from the carved-out subsidiaries in the given year. Med\_proceeds is the median of proceeds in the respective years. Avg\_carved-out is the average percentage of subsidiary being carved-out by the parent firm in its offering. Avg\_UP is the average underpricing of the carved-out subsidiary shares one day after the offering. Avg\_CAR is the average CAR for the parent at the event of announcement of carve-out. Pct\_horz is the percentage of carve-out activity done in the same industry, meaning both the parent and subsidiary are in the same industry.

YYYY	Num_deal	Avg_proceeds	Med_proceeds	Avg_carved-out	Avg_UP	Pct_horz
1987	20	53.81	14.78	0.2294	0.0520	0.3000
1988	7	55.43	42.00	0.3343	0.3294	0.2900
1989	8	38.89	22.05	0.2848	0.1317	0.2500
1990	3	77.29	41.88	0.2077	0.0317	0.6700
1991	13	47.66	32.50	0.2915	0.0942	0.2300
1992	18	24.24	21.78	0.2722	0.1288	0.7200
1993	25	35.91	26.25	0.3212	0.1009	0.6800
1994	21	37.24	24.00	0.3304	0.0391	0.7600
1995	4	43.82	44.60	0.3823	0.1542	0.5000
1996	18	54.27	43.98	0.2688	0.2548	0.4400
1997	8	30.90	21.45	0.2015	0.0387	0.5000
1998	6	44.43	38.51	0.2408	0.2713	0.6700
1999	17	142.69	95.40	0.2651	0.5206	0.5900
2000	11	200.49	117.76	0.1680	0.6136	0.3600
2001	10	112.77	110.25	0.3007	-0.0076	0.3000
2002	1	101.25	101.25	0.2350	0.1151	0.0000
2003	0	n.a.	n.a.	n.a.	n.a.	n.a.
2004	0	n.a.	n.a.	n.a.	n.a.	n.a.
2005	1	267.19	267.19	0.3380	0.3132	0.0000
2006	2	286.67	286.67	0.0755	0.4825	0.5000
total	193	67.92	47.67	0.27	0.18	0.50

**Table 2: Regression for effect of carve-out on performance**

This table presents if there is any difference in the performance of industries where carve-outs happen and performance of industries where carve-outs do not happen.

Regression line is  $Perf_{i,s,t} = \alpha_s + \alpha_t + \beta DCarve_{s,t} + \varepsilon_{i,s,t}$

where  $Perf$  is the performance (measured through cash flow, profitability and profit margin) of firm  $i$ , belonging to the industry  $s$ , during period  $t$ .  $\alpha_s$  and  $\alpha_t$  are sector and time fixed effect and  $DCarve_{s,t}$  is indicator variable equal to 1 if the industry  $s$  at time  $t$  had a carveout during the past three years. Cash flow, profitability and profit margin are defined in appendix 1

	(1)	(2)	(3)
	Cash_Flow	Profitability	Profit_Margin
DCarve	-0.0173** (0.011)	-0.0160** (0.036)	-0.0164* (0.084)
Year Dummy	Yes	Yes	Yes
Sector Dummy	Yes	Yes	Yes
N	113995	113995	113995
Adj. R-Sq	0.010	0.004	0.008

**Table 3: Sample for Mergers & Acquisitions**

This table presents the descriptive statistics for our sample of mergers and acquisitions. Bidder is always listed in our sample, where as target can be listed or not. Data is taken from SDC. YYYY is the year for corresponding M&A activity. #Deals is the total number of deals done in a particular year. #Deals “concerned” is the number of M&A deals done in the industry where carve-out happened in the last three years. It shows that one fifth (1/5) of the total deals that happened during 1990 to 2011 belong to industries where carve-outs happened in the last three years. Avg\_deal\_value represents the average deal value each year in the sample, corresponding to the total number of deals (#Deals). Median deal\_value is the median of deal value for the total deals happened in a particular year. Relsize is the relative size of the deal calculated as the ratio of target size to acquirer size. Private is an indicator variable equal to “1” if the target is private. Stock is indicator variable which is equal to “1” if the target is paid in stock. Horz is an indicator variable equal to “1” if deal is horizontal (if target and acquirer are in the same industry)

YYYY	#Deals	#Deals "concerned"	Avg deal_value	Median deal_value	Relsize	Private	Stock	Horz
1990	343	56	94.50	15.00	0.3766	0.3644	0.1633	0.5600
1991	371	67	61.28	12.00	0.3038	0.4151	0.1941	0.6000
1992	503	106	69.40	12.49	0.3715	0.4831	0.2425	0.6200
1993	659	145	102.11	14.87	0.3509	0.4492	0.2140	0.6000
1994	807	219	121.61	14.90	0.6423	0.4808	0.2169	0.5700
1995	942	306	172.38	22.00	0.3321	0.5000	0.2675	0.6100
1996	1 145	290	180.92	25.00	0.2792	0.5100	0.2524	0.5800
1997	1 519	285	178.46	24.00	0.2996	0.5425	0.2291	0.6000
1998	1 512	365	308.79	29.00	0.2422	0.5258	0.2004	0.6000
1999	1 302	407	491.22	35.58	0.2635	0.5100	0.2350	0.6200
2000	1 139	501	640.03	45.00	0.2092	0.5338	0.2678	0.6000
2001	870	388	379.52	35.61	0.2399	0.4483	0.1701	0.6000
2002	822	284	208.72	27.75	0.1735	0.4586	0.0949	0.6300
2003	762	182	182.36	31.00	0.1869	0.4751	0.0892	0.6300
2004	902	49	248.53	38.96	0.1774	0.5488	0.0599	0.6500
2005	889	2	441.51	42.50	0.1712	0.5219	0.0574	0.6500
2006	863	3	402.56	46.50	0.1690	0.5342	0.0510	0.6000
2007	889	8	372.61	45.37	0.1939	0.5591	0.0315	0.6100
2008	622	8	265.30	42.37	0.2517	0.5498	0.0418	0.6500
2009	466	0	625.67	37.69	0.2009	0.4678	0.0687	0.6200
2010	556	0	416.63	77.42	0.1806	0.5000	0.0360	0.6300
2011	576	0	475.24	76.17	0.1759	0.5434	0.0226	0.6200
Total	18459	3671	304.98	30.79	0.2595	0.5065	0.1588	0.6101

**Table 4: Regression for CAR of acquirer**

In this table, we present if the CAR of an acquirer bidding in the industry of carve-out is different from those who do not bid in the industry of carve-out. DCarveT is the indicator variable equal to “1” if the acquirer bids in the industry where carve-out happened in the last three years and “0” other wise. Other variables are explained in appendix 1

$$CAR_{i,t} = \alpha_s + \alpha_t + \beta DCarveT_{i,t} + \gamma Firm\ Characteriscics_{i,t} + \delta Deal\ Characteristics_i + \varepsilon_{i,t}$$

	(1)	(2)	(3)	(4)	(5)
	CAR	CAR	CAR	CAR	CAR
DCarveT	-0.00429** (0.046)	-0.00525** (0.019)	-0.00578** (0.015)	-0.00493*** (0.004)	-0.00518* (0.075)
Ln_bidder_size			-0.00353*** (0.000)	-0.00359*** (0.000)	-0.0154*** (0.000)
Tobin's Q			-0.00118** (0.037)	-0.000921 (0.152)	0.00103 (0.218)
Run_up			-0.00547*** (0.001)	-0.00546** (0.034)	-0.00495*** (0.009)
Free cash flow			0.00402 (0.646)	0.00418 (0.539)	-0.00417 (0.752)
Leverage			0.0166*** (0.007)	0.0116** (0.048)	-0.0308** (0.015)
Sigma			0.519*** (0.000)	0.554*** (0.003)	0.287* (0.099)
Relsize			0.00189*** (0.192)	0.00181 (0.217)	0.00837*** (0.001)
Relatedness			-0.00106 (0.484)	0.000105 (0.948)	-0.000902 (0.662)
Tender_offer			0.000272 (0.944)	-0.0000658 (0.982)	-0.000696 (0.869)
Hostile			-0.00737 (0.453)	-0.00617 (0.594)	-0.0146 (0.198)
Pub X Cash			0.00399 (0.244)	0.00448 (0.214)	-0.000726 (0.854)
Pub X Stock			-0.0332*** (0.000)	-0.0325*** (0.000)	-0.0344*** (0.000)
Priv X Cash			-0.00156 (0.434)	-0.00101 (0.528)	0.000565 (0.815)
Priv X Stock			0.0107*** (0.003)	0.0115*** (0.000)	0.0176*** (0.000)
Sub X Cash			0.00508*** (0.009)	0.00507** (0.047)	0.00406* (0.076)
Const	0.0148*** (0.000)	0.00558 (0.223)	0.0385*** (0.000)	0.0365*** (0.001)	0.190*** (0.000)
Year FE	No	Yes	Yes	Yes	Yes
Sector bidder FE	No	No	No	Yes	No
Bidder FE	No	No	No	No	Yes
N	18459	18459	18456	18456	18456
Adj. R-sq	0.000	0.008	0.041	0.040	0.036

**Table 5: Regression for stocks performance**

This table presents if there is any difference in the performance of stock returns of firms belonging to industry of carve-out and performance of stock returns of firms not belonging to the industry of carve-out. Regression line is :

$$R_{i,s,t} = \alpha + \alpha' DCarve_{i,t} + \beta(MKRTF_t) + \gamma(SMB_t) + \delta(HML_t) + \varepsilon_{i,t}$$

where  $R_{i,s,t}$  is return on stocks to firm  $i$ , in industry  $s$ , at time  $t$ .

We regress stock returns on Fama-French three factors (market risk premium, small minus big {market capitalisation} and high minus low {book to market ratio}) and DCarve (indicator variable, equal to 1 if firm is in industry where carve-out happened in the last three years, and 0 other wise). Our results stick to our notion.

	(1)	(2)	(3)	(4)	(5)	(6)
	Returns	Returns	Returns	Returns	Returns	Returns
DCarve	0.000994 (0.483)	0.00104 (0.460)	0.00109 (0.441)	0.000575 (0.705)	0.000564 (0.708)	0.000603 (0.690)
MKTRF		1.052 (0.000)	1.029 (0.000)		1.052 (0.000)	1.029 (0.000)
SMB			0.623 (0.000)			0.622 (0.000)
HML			0.257 (0.000)			0.257 (0.000)
Sector dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
N	307967	307967	307967	307967	307967	307967
Adj. R-sq	0.013	0.128	0.144	0.013	0.127	0.143

**Table 6: Regression for checking the premium effect**

In this table we present regression results for checking if the premium paid in M&A deal can be the possible reason for lower CAR noticed in table 4. Pr4w in table below stands for premium for four weeks. We observe that the premium paid in deals, in industries where carve-outs happen, are not significantly different from deals other industries. The control variables are explained in appendix 1.

$$Premium_i = \alpha + \beta DCarveT_{i,t} + \gamma Firm\ Characteristics_{i,t} + \delta Deal\ Characteristics_{i,t} + \varepsilon_{i,t}$$

	(1)	(2)	(3)	(4)
	Pr4w	Pr4w	Pr4w	Pr4w
DCarveT	0.0310 (0.288)	0.0130 (0.648)	0.0207 (0.521)	0.0238 (0.383)
Tobin's Q		0.0176*** (0.001)	0.0151*** (0.003)	0.0158*** (0.000)
Run_up		0.0864*** (0.000)	0.0906*** (0.000)	0.0874*** (0.000)
Free cash flow		-0.145 (0.241)	-0.0975 (0.247)	-0.118 (0.277)
Relsize		0.00922 (0.443)	0.0130 (0.218)	0.0125 (0.317)
Ln_deal		-0.0347*** (0.000)	-0.0363*** (0.000)	-0.0336*** (0.000)
Relatedness		-0.00751 (0.733)	-0.00283 (0.907)	0.00233 (0.896)
Tender_offer		0.0510* (0.068)	0.0417 (0.112)	0.0445 (0.119)
Hostile		0.133* (0.013)	0.101 (0.108)	0.112* (0.088)
Cash		0.0650** (0.024)	0.0557* (0.089)	0.0656* (0.090)
Stock		-0.0488* (0.072)	-0.0542*** (0.007)	-0.0498** (0.015)
Toehold		0.0205 (0.729)	0.0267 (0.689)	0.0206 (0.748)
Const	0.601*** (0.000)	0.619*** (0.000)	0.630*** (0.000)	0.645*** (0.000)
Year FE	Yes	Yes	Yes	Yes
Sector target FE	No	No	No	Yes
Sector bidder FE	No	No	Yes	No
N	2189	2189	2189	2189
Adj. R-sq	0.024	0.064	0.056	0.056

## Appendix 1

### Tobin's Q

Market value of the acquiring firm's assets divided by book value of its assets for the fiscal year prior to the acquisition. The market value of assets is equal to book value of assets plus market value of common stock minus book value of common stock minus balance sheet deferred taxes. The data are obtained from both CRSP and Compustat.

### Leverage

The sum of the acquiring firm's long-term debt and short-term debt divided by the market value of its total assets measured at the end of the fiscal year prior to the acquisition. The data are obtained from both CRSP and Compustat.

### Free cash flow

The acquiring firm's operating income before depreciation minus interest expense minus income tax plus changes in deferred taxes and investment tax credits minus dividends on both preferred and common share divided by its book value of total assets at the fiscal year-end before the announcement date from Compustat.

### Sigma

Standard deviation of the market-adjusted daily returns of the acquirer's stock over a 200-day window (-210, -11) from CRSP.

### Run-up

Market-adjusted buy-and-hold return of the acquirer's stock over a 200-day window (-210, -11) from CRSP.

### Public

Indicator variable: one if the bid is for a public target and zero otherwise.

### Private

Indicator variable: one if the bid is for a private target and zero otherwise.

### Subsidiary

Indicator variable: one if the bid is for a subsidiary target and zero otherwise.

### Cash

Indicator variable: one if the payment



	is pure cash and zero otherwise.
Stock	Indicator variable: one if the payment includes stock and zero otherwise.
Relative size	The deal value from Thomson Financial SDC divided by the market value of the bidding firm's equity 11 days prior to the announcement date from CRSP.
Relatedness	Indicator variable: one if the bidder and the target are operating in the same industries with a common two-digit Standard Industrial Classification (SIC) code and zero otherwise. Data from Thomson Financial SDC.
Hostile	Indicator variable: one if the deal is classified as 'hostile' by Thomson Financial SDC and zero otherwise.
Tender offer	Indicator variable: one if the deal is a tender-offer and zero otherwise. Data from Thomson Financial SDC.
Cash flow	Income before extraordinary items (IBC) divided by total assets.
Profitability	Operating income before depreciation (OIBDP) divided by total assets
Profit margin	Income before extraordinary items (IB) + depreciation and amortization (DP) divided by sales (SALE).