Exiting the market by M&A.
Does the crisis matter?

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Abstract

M&A have been extensively studied as a result of a decision on market exit. Most attention has been directed to M&A occurring during booms, when many deals take place and prices are high. Conversely, less attention has been devoted to M&A during the crisis or just after recessionary periods.

This exploratory paper focuses on 718 mergers occurred before (536) and after (182) the financial crisis in a sample of firms representative of the European manufacturing industry.

The preliminary empirical evidence shows that factors and motivations behind the exit decisions through M&A are very different before and after the crisis, thus making M&A an exit way dependent on the economic scenario in which they occur. Specifically, the drivers of the probability to be a target before the crisis are innovation (product and process), product portfolio expansion and R&D. Conversely, industry-related variables (sectoral perspectives, market potential), together with liquidity and low leverage are prevalent after the crisis. In addition, M&A were more likely to occur in growing industries before the crisis and in mature sectors after the crisis.

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1. Introduction

In the '70s and '80s, M&A dominated the headlines, with one spectacular and often hostile deal after another. They emerged as a powerful engine of restructuring and way out for a corporate sector viewed as sclerotic and too dense of conglomerates. After the '80s ended in recession, M&A staggered, only to bounce back a few years later and stop again in the dot-com bust of the '90s. By the 2000s, M&A grew again following the business cycle and a record in transactions in global M&A volume was generated in 2007. Then came 2008, and M&A stopped again (Teitelman, 2014).

In all these events, a common feature was the difference between the types and the nature of transactions during the different phases of the business cycle: large versus small deals, domestic versus cross-border deals, related vs unrelated conglomerate deals, cash-financed, or external finance, vs share-backed deals, and so on (Blonigen and Pierce, 2016). This evidence made mergers – as a way of exiting the market for incumbents – dependent on the characteristics and the intensity of the economic climate in which transactions occurred.

The literature on market entry has already addressed this point by showing how external business and economic conditions shape the profile and intensity of the process of entry and innovation (Santarelli and Vivarelli, 2007; Caballero Hammour, 1994). According this literature, market entry occurs conditional on some characteristics of the potential entrants and on their fit with existing market conditions. Studies on post entry survival confirmed this approach (Santarelli and Vivarelli 2004; Mata and Portugal 2007).

This paper strives to make a similar point by studying if exit conditions related to merger activity are different when the business cycle is taken into account. Specifically, using a sample of firms that exited the market by mergers before and after the financial crisis in 2009, the paper examines the industry- and firm-level conditions that facilitated or hindered the merger process around the financial crisis. In addition to motivations that are usually associated to firm exit during economic crisis (scarce liquidity that generates insolvency, low demand conditions, or high business risk), the present paper focus on how these conditions changed before and after the crisis.

Many interdisciplinary studies of the 2007–2008 global financial crisis examine the causes of crisis, corporate governance and firm value, stock market efficiency, new firm registration, macroeconomic performance, and compare this crisis to previous crises (Reddy et al, 2014). However, there is very

limited evidence on mergers or acquisitions with respect to the financial crisis. In this exploratory study, we perform a preliminary investigation using the EFIGE dataset and compare the probability of being a target before and after the crisis, conditional on the default risk of exiting the market in the whole period.

We estimate a probit model to find significant difference between the pre-crisis period (2006–2009) and post-crisis period (2010–2013) in the variables affecting the probability for a firm to be acquired. The preliminary empirical evidence shows that factors and motivations behind the exit decisions through M&A are very different before and after the crisis, thus making M&A an exit way dependent on the economic scenario in which they occur. Major drivers of being acquired before the crisis are innovation (product and process), product portfolio expansion and R&D. Conversely, industry-related variables (sectoral perspectives, market potential), together with liquidity and low leverage are prevalent after the crisis. In addition, M&A are more likely to occur in growing industries before the crisis, and in mature sectors after the crisis.

The remainder of this paper is organized as follows. The second part of the paper is devoted to a brief analysis of the role of recession in affecting some variables behind the M&A process. In Section 3, data and method are introduced, while Section 4 is devoted to empirical analysis and results. Section 5 concludes the paper.

2. Economic crisis and the decision to exit.

Some stylized facts about recession show that economic uncertainty tends to increase during downturns and fall in booms. The comparison between corporate activity during ‘2000s and after the financial crisis (from 2009 onwards) suggests significant differences in the role of uncertainty in driving the company decisions about staying or exiting the market. This makes the company decision endogenous to the business cycle, with lower economic growth inducing greater uncertainty.

The crisis has affected M&A processes in different fields and from different aspects. The crisis has driven down the volume of transactions and hindered the ability of many companies to pull off deals. Lower profits, a large gap between buyers and sellers when assessing a company's value, greater difficulty in getting financing and lenders' demands for more equity up front are the main factors in this decline. "The expectation value gap" (between what a buyer is willing to pay and what a seller is willing to accept.) has widened because of the economic-financial crisis. As a result, the number of

completed M&A transactions has fallen sharply. This has led to changes in the structure of transactions due to the changes in the value of deals.

There has been extensive discussion of the notion that "recessions are times when productivity improving activities are undertaken because of their temporarily low opportunity costs" (Caballero and Hammour 1994) or because the increase on the probability of bankruptcy due to bad times raises the pressure of managers to initiate organisational changes (Nickell et al. 2001). In these periods, the likelihood that a firm is forced out of business is large, challenging employment stability (Nickell et al. 2001), accelerating the job turnover (Davis and Haltiwanger 1992) and firm turnover (Oulton 1987), or firm survival and M&A (Nishimura et al. 2005; Alvarez and Georg 2009).

Uncertainty appears to rise during recessions. Both industry and firm growth rates accentuate dispersion; also, variance in productivity is largely affected (Bloom N. 2014). During recessions, the flow of new information between firms slows down, thereby raising uncertainty. Individuals are less confident about the future and forecasting is harder. When business is slack, the opportunity cost of reorganisation is lower and firms can find cheaper to try out new ideas and invest in research and investment. However, innovation is more likely to be exploited during boom markets (Caballero and Hammour 1994), when the probability of expanding the business potential of a new product are maximized by a more receptive consumer demand. Uncertainty fostered by recession can make firms cautious about investment and acquisitions, which adjustment costs can make expensive to reverse. Additionally, more cautiousness also means more selective investments, i.e. a change of the investment profile of similar firms before and after the event that affected the perceived level of uncertainty. In 2009, Chief Economist of the IMF Olivier Blanchard wrote in the Economist "uncertainty is largely behind the dramatic collapse in demand. Given the uncertainty, why build a new plant, or introduce a new products? Better to pause until the smoke clears". (The Economist, 2009). Finally, financial resources and investment opportunities are better when the economy is in good shape, thus making company decisions about the future depend on actual and forecasted status of the economy.

All these aspects make innovation-driven M&A more likely before the crisis, and safe firms more likely to be targeted after a major crisis. Recession generates higher risk that, in turn, increases risk premia and raises the cost of finance. It also increases the probability of bankruptcy, which means higher borrowing costs, more selective credit conditions, even in financing deals outside the sectoral affiliation of the company. Therefore, deals outside the sector of affiliation can require higher financing costs, that make them less likely to occur, and preferred by those closely focussed on bidder sectors.

As a general consideration, uncertainty fostered by crisis is expected to introduce significant changes in the scenario that modify the process of exit by mergers and make it different from the process before the crisis. In details, we expect that innovation, technological resources and business connection and practices in international markets are more relevant before the crisis, when favourable economic condition can facilitate the management of risks involved in business transactions. Conversely, we expect firms with better market potential in their own sectors to be target in M&A deals after a major recession. Consequently, the merger market is expected to be more active in growing sectors before recession, and to refocus to mature sectors after recession, also because of the consolidation process.

3. Data and method

3.1 *Sample*

We build our dataset by drawing information from two main sources: (i) the EU-EFIGE Bruegel-UniCredit survey on "European Firms in a Global Economy"; (ii) the BvD-Amadeus database. The EU-EFIGE survey collects detailed qualitative and quantitative information about firm ownership and governance structure, workforce characteristics, innovation and internationalization activities, financial conditions, market structure and competition[1]. The dataset covers a representative sample (at the country and industry level) of 14,759 manufacturing firms with more than ten employees from seven European countries: Austria, France, Germany, Hungary, Italy, Spain and UK. As the survey was run in early 2010, information is mostly collected as a cross-section for the years 2009-2010, although some questions cover the period 2007-2009. To all the surveyed firms, we attach balance-sheet data for the years 2000-2017 provided by BvD-Amadeus, the most comprehensive and widely used source of financial information for public and private enterprises in Europe.

By merging the two datasets, we traced the evolution of the status of the sample of about 14,500 European companies operating in 177 industries. The sample is mainly composed by small- and medium-sized enterprises and established companies: the average firm size is small to medium, with a mean of 70 employees and a median of 27; the surveyed firms have been in business for 24 years on average. The majority of the firms are located in Germany, Italy and Spain (more than 80 percent of the total), while 12 percent of companies operate in UK, 3.5 percent in Hungary and 2.8 percent in Austria.

[1] For additional information about the EU-EFIGE survey, see Altomonte and Aquilante (2012).

As for the exit process, we selected 14,034 firms that declared to be "active" in 2009. We traced the evolution of each firm up to 2017 and allocated each firm in one competing status in 2017: active, bankruptcy, dissolved, in liquidation, inactive, unknown. Each of these statuses has multiple sub-items: Active is complemented by five other configuration of "active firm", i.e. defaulting, dormant, insolvency proceeding, re-organization, rescue plan. Dissolved is split into two complementary sub-groups, i.e. dissolved (with no indication of the motivation behind the liquidation) and dissolved with motivations (bankruptcy, demerger, liquidation, merger). The status "In liquidation" includes firms in the process of liquidation and that will be dissolved at the end of the process. The term "in liquidation" is reserved mainly to friendly or voluntary liquidation. Together with mergers, it represents the group of firms that exits the market by "out-of-the-court" procedure, whereas bankruptcy and dissolved after bankruptcy are "court-driven" procedures.

Table 1A and 1B reports some descriptive statistics on the exit process occurred between 2010 and 2017 in the sample firms. Out of 14,034 firms active in 2009, 11,417, i.e. almost 80%, resulted active also in 2017. As for the 20% of non-active firms (Dunne, Roberts and Samuelson, 1988; Audretsch, 1995), dissolved firms with no specific motivations is the largest group (8.5%) followed by dissolved after bankruptcy. Firms dissolved after a merger are less than 1.4%, i.e. less than 200 firms exited the market in the period 2010-17. Differences between firms that exited the market before the crisis and after the crisis are not significant for size and profitability, whereas they are significant for leverage (Table 3). As for firms that exited the market before the crisis, we rely on the specific question A14 of the survey that is: "Has the firm been acquired or incorporated by other firms over the period 2007-2009?" Answer to this question returned 536 firms that was acquired in the period 2007-09 and that we coded as pre-recession mergers.

3.2 The sample of companies that exited the market by M&A.

The paper focusses on mergers as a deliberate market exit. Following Cefis and Marsili (2011 & 2012), Balcaen et al (2011) and Balcaen et al (2012), we first distinguished distress-related exit in two subgroups, i.e. court-driven exit and out-of-court exit. Within this last group, we distinguished voluntary liquidations from M&A exits, the latter being the focus of our empirical analysis.

Question A14 in the Efige survey asks firm if they have been acquired or incorporated in the period 2007-09. Answers to this question permits to identify our first group of exited companies, i.e. firms

that have been acquired before the crisis.[2] From the dataset, 536 firms have declared they have been acquired in the three-year period 2007-2009. This sample constitutes our group of firms that exited the market through a merge or an acquisition before the crisis.

As for the second group, i.e. firms that exited the market in 2010 and onward because of a merger, we followed longitudinally all firms active in 2009 and that was registered as exited in 2017. From the group of inactive firms in 2017, we selected those that exited the market for a merge during the period 2010-2017 and ended up with 182 companies resulted target of an M&A. These firms constitutes the group of firms that left the market after a successful merger after the crisis.

3.3 Definition of the variables

3.3.1 Dependent variable

To account for the exploratory approach of the paper, the dependent variables is the merger status of the company. It is a dummy variable that is set equal to 1 if the company has been acquired by another bidding company and zero if not. As for mergers, a company is identified as dissolved because of merger or takeover when it no longer exists as a legal entity because it has been included in a merger or was subject of a take-over. Detailed information on the classification of exit patterns can be found in Appendix that summarizes the company status definition used by Bureau van Dijk.

3.3.2 Explanatory variables

The set of variables included in the model is rather large, as it is finalised to collect all major motivations behind the decision to acquire a company. Most variables have been obtained from the Efige dataset, that provides a large and detailed informative set. Specifically, variables have been grouped in one industry/sector group and four further firm-level groups (the type in parenthesis):

Domestic turnover growth (industry). The Domestic Turnover Index proxies for the domestic industry demand conditions. It is a business cycle indicator that shows the evolution of the market of goods and services in the industrial sector. It records the evolution of turnover over longer periods of time. It is therefore the objective of this indicator to measure the market activity in the industrial sector in value.

[2] As the timing of the questions includes also 2009, it may happen that some firms have been acquired during the crisis and not strictly before it. However, from the extant literature on crisis, we have noticed that most companies have stopped their acquisition activity at the very first insurgence of the crisis, because of the increased uncertainty, thus making mergers during the peak of the crisis highly unlikely to be observed.

The classification follows the NACE Rev. 1 (Statistical classification of economic activities in the European Community, Eurostat, 1996). The turnover of industry index is not deflated. The version used here is the index 2000 = 100. The Index breakdown by industry provides a very close connection between the demand at the country level and the trend of single company sales. The industry breakdown is for 101 sectors by NACE 3 digits. The choice to select a highly disaggregated index of industry sales (101 sectors) originates from the drawback signaled by Sraer and Thesmar (2007, page 732) on aggregate industry data. If the industry classification is too crude to account for the relevant market of the firm, the estimated sensitivity parameters may have a substantial downward bias, much akin to a measurement error (*i.e.* a 13-industry classification may show a very modest explanatory power). This weakness has been tackled by using a detailed 3-digit 101-industry classification.

External turnover growth (industry). The External Turnover Index proxies for the industry demand conditions that the country faces outside the domestic market. It is the external version of the Domestic Turnover Index discussed above

Demand Variability (industry/firm). Firms face substantial amount of transitory demand shocks in their daily operation. These shocks may come from different sources, such as transitory preference shocks or other unexpected changes that affect individual firm demand. The transitory demand shocks may have an impact on firm turnover and investment decisions, especially when firms faces credit constraints and/or when manager/shareholders' sentiment is affected by these short-term shocks, which could be quite common in practice. In this paper, we use a measure of short-term unexpected demand shocks developed by Kumar and Zang, 2016. And use their practical approach that uses inventory data, which are typically available in firm-level production datasets. Inventory share is calculated as the ratio of value of inventory to the value of sales at the firm level and exploit the idea that within firm variation of inventory may contains direct information about demand shocks.

Firm potential market (firm). To assess firm potential market, an index of market potential growth has been developed that summarizes the market “stage of development” and its future perspectives. The index is computed as the ratio between the actual market size and its “saturation” level, i.e. the level the market will probably reach in the future. As a proxy for the future opportunities, the index provides a snapshot of the market potential estimated from historical data. The index has been computed using trade data from 1998 up to 2008 and from 2009 to 2015 for the two samples respectively, and provides an estimate of the potential market growth from 2008 and 2015 onwards (3 to 10 years). Therefore, it is the best market forecast available to the group of exporters. Being exogenous to individual firm’s decisions, past market performances and future perspectives can be used to identify how merger

decisions correlate to structural market characteristics. In particular, this permits to test if and to what extent the future market potential affects firm decisions concerning the likelihood of the company to be an M&A target.

Firm sale growth (firm). It is the annual growth rate of sale for firms included in the sample.

ROA (firm). It is the return on sales of firms included in the sample.

Product to order (firm). Question E1 in the survey Efige, indicates which percentage of firm's turnover was made up by sales of produced-to-order goods.

TFP growth (firm). It is the annual TFP growth computed at firm level for the firms in the Efige sample.

To measure technological innovation and distinguish product-oriented and process-oriented innovations, we use firms' responses to the EFIGE survey. The questions asking about the type of innovation carried out by the sample firms are question from C14 to C17 of the EFIGE survey.

Product innovation. Question c14_m_c1. It is a dummy variable equal to one if the company has answered yes to the question: "On average in the last three years, did the firm carry out any product innovation?" The variable is a dummy variable equal to one if the firm introduced either a new good or a significantly improved product that was already available in the market from its competitors, and zero otherwise.

Process innovation (firm). Question c14_m_c2. It is a dummy variable equal to one if the company has answered yes to the question: "On average in the last three years, did the firm carry out any process innovation?"

Organisational innovation (firm). Question c14_m_c3. It is a dummy variable equal to one if the company has answered yes to the question: "On average in the last three years, did the firm carry out any organisational innovation?"

Product range (firm). Question Ea. During the last year, the product range offered by your company has: been widened (coded 1); remained the same or reduced (coded 0)

R&D in house (firm). Question C20_1. In the last three years, has the firm undertaken any R&D activity carried out in-house?

R&D acquired from another firm in the group (firm). Question C20_2. In the last three years, has the firm undertaken any R&D activity acquired from another firm in the group?

R&D acquired from external sources (firm). Question C20_3. In the last three years, has the firm undertaken any R&D activity acquired from external sources?

Patents (firm). It indicates the number of patents hold by the company

Exporter (firm). Question D1. Has the firm sold abroad some or all of its products?

Active and passive outsourcer. Question D30a. Purchase of raw material and intermediate goods from abroad.

FDI (firm). Foreign direct investments by target firm.

Family firm (firm). The EFIGE survey asks each firm to report detailed ownership information, such as the type and equity share of the main shareholders. Hence, to define family firms, we directly rely on firms' self- reported data. In particular, we identify Family firm using a dummy variable equal to one if the firm is family owned, and zero otherwise (see Appendix 1 for a detailed description of the survey questions). As reported in Table 1, in our sample, 74.5 percent of firms are family owned.

4. The empirical analysis

4.1 Baseline regression

To test our hypotheses, we use a simple probit model that estimates the probability of firms to be acquired as follows:

$$y_i = \begin{cases} 1 & \text{if } y_i^* > 0 \\ 0 & \text{otherwise} \end{cases} \quad (1)$$

$$y_i^* = \alpha X_i + \beta Z_i + u_i \quad (2)$$

where y_i represents the observed dependent variables, i.e. the 1/0 dummy variable indicating a merger; y_i^* is the associated latent variable; X_i is the vector of explanatory variables discussed in Section 3); Z_i is a vector of exogenous covariates; u_i is the error term. As our dependent variables are dummy variables taking values zero and one, we estimate Equation (2) by maximum likelihood probit regressions. Table 3 displays the correlation matrix.

4.2 The empirical model

To check whether the merger process unfolds differently before and after the crisis, we tested a probit model of exit by merger conditional on the probability of the company to be a target for the merger. Specifically, we first computed the probability of a company to be targeted in an M&A using the following empirical specification:

Pr(target) = Pr(size, country, 3-digit Nace sector, profitability) (1)

In a second step, we compute the probability to exit by merge in the period 2007-2009 (before the crisis) and 2010-2015 (after the crisis) using the following sets of explanatory variables:

1. X_1, Industry-level economic variables
2. X_2, Firm-level variables related to productive efficiency and product portfolio management
3. X_3, Firm-level variables related to innovation and technological resources
4. X_4, Firm-level variables related to business activity in international markets
5. X_5, Firm-level variables related to financial structure and ownership structure

In details, we estimated the following model:

$Pr(merger = 1/0) = Pr(X_i, Z_1,, PmerHat)$ (2)

where i=1..5, Z_1, are controls for size, country, 3-digit Nace sector, and *PmerHat* is the probability to be target from Equ (1). By including the first stage (selection) equation for the propensity of being target of a merger (*PmerHat*) into the outcome equation, we are able to compare the influence of the (same) set of variables on mergers before and after the crisis, conditional on the probability of being exposed as a target to mergers. By including all firms that survived could bias the results because mergers occurred in the second period are a subset of surviving firms once the first period mergers have occurred. This structure can generate a selection bias in the second-period firms, that can be labelled as those not interesting for the first wave of bids, or that have remained un-acquired after the best matches have been done in the first period. In a sense,

4.3 Results

Table 5 summarizes estimation results of Eq (2). Empirical results have been estimated separately for the five groups of variables: industry, performance and products, innovation and technological resources, international activity, finance and ownership.

Industry variables are relevant in explaining the probability of a company to be acquired in an M&A after recession. Both indexes (domestic and external market) have a positive and significant coefficient, indicating that M&A are more likely to occur in sectors with better performance after

recession. By contrast, their influence in transactions before recession is statistically not significant, albeit positive. As for the indicator of demand variability (industry-adjusted inventories levels), the variable is not significant, even if the negative coefficient signals the preference for firms in sectors with low uncertainty in demand.

The position of the company in the sectoral value chain is important for M&A both before and after recession, as target firms are less likely to manage product-to-order businesses: the higher the share of sales produced on order, the lower the probability of the company to be involved in a M&A transaction.

Basic performance indicators, like ROA and sale growth, do not appear significant in explaining the probability to exit the industry by M&A. Conversely, foreign potential market is a major driver for mergers in post-recession deals, whereas it plays negative in transaction before the crisis. A plausible explanation relies on the different approach of the M&A activity after the crisis, more focused on the commercial viability of the company – especially in international markets. Finally, a net change is observed in the efficiency/portfolio approach of the target firms: while firms that increased their product portfolio while reducing efficiency were target before crisis, after the recession bidders looked for more efficient firms and firms that were refocusing their product portfolio.

As for the innovation and R&D resources, pre-crisis targets appeared characterized by significant product and process innovation, together with sizable investment in R&D, either developed in house or acquired externally. Conversely, no significant impact is observed for the same variables after the crisis, except for R&D acquired from firms belonging to the same group. Moreover, a large number of patents favored M&A before the crisis, whereas they hindered them after the crisis. In general, the almost insignificant role of technological resources and innovation in the deals occurred after recession provides a confirmation of the substantial change in the external conditions that altered the M&A dynamic before and after the crisis.

Less evident is the role of the involvement of the company in international business. Being an exporter mildly helps being targeted in an M&A transaction after the crisis, together with not being a passive outsourcer whose only driver is cost savings. By contrast, the international involvement – either as an exporter, an outsourcer or a FDI investor – was a significant prerequisite for mergers before the crisis.

As for the ownership, being a family firm lowers the probability of being involved in a merger in a similar way both in pre- and post-crisis deals. Similarly, firms that experienced a CEO succession are more likely to be a target, either before or after the recession, probably because founders slow down the functioning of the market for corporate control. After the recession, targets are more liquid (more

cash in the balance sheet) and less levered, whereas the negative (even if not significant) influence of secured debt on the merger as an exit way is consistent with willingness of senior creditor to liquidate the company, instead of have their position weakened in the post-deal situation.

Finally, the maturity of the industry has a negative and significant influence on the probability to exit the market by M&A in pre-recession transactions, thus making deals in growing sector more likely during expansionary periods. By contrast, the consolidation process that usually happens after a major recession makes deals in mature sectors more likely to occurr.

5. Concluding remarks

To summarize, variables affecting the probability of exiting the market have a different influence before and after a major recession. This evidence corroborates the intuition that recession changes the drivers behind the M&A process, thus making the process of exit strongly dependent on how recession modifies the intensity of uncertainty in the economy.

By estimating a probit model on a sample of firms that exited the market in two different periods before the crisis (2006–2009) and after the crisis period (2010–2013), the paper finds significant differences in the relative importance of variables in affecting the probability for a firm to be acquired. Major drivers of M&A before the crisis are innovation (product and process), product portfolio expansion and R&D. Conversely, industry-related variables (sectoral perspectives, market potential), together with liquidity and low leverage are prevalent after the crisis. Finally, M&A were more likely to occur in growing industries before the crisis and in mature sectors after the crisis.

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Table 1 A – Sample of firms included in the analysis (companies with status "Active" in 2009)

Status 2018	Non family Business	Family Business		Total sample
		ext CEO	fam CEO	
Active	3,195	890	7,094	11,179
Active (default of payment)	8	2	23	33
Active (dormant)	35	6	29	70
Active (insolvency proceeding	29	12	78	119
Active (reorganization)	3	4	5	12
Active (rescue plan)	1		3	4
Bankruptcy	82	24	131	237
Dissolved	458	113	618	1,189
Dissolved (bankruptcy)	144	20	265	429
Dissolved (demerger)	9		11	20
Dissolved (liquidation)	33	12	120	165
Dissolved (merger or take-ove	84	19	95	198
In liquidation	48	11	129	188
Inactive (no precision)	10	7	47	64
Status unknown	20	10	97	127
Total	4,159	1,130	8,745	14,034

Table 1 B – Sample of firms included in the analysis (companies with status "Active" in 2009)

Status 2018	Non family Business	Family Business		Total sample
		ext CEO	fam CEO	
Active	3,271	914	7,232	11,417
Non active	888	216	1513	2617
Bankruptcy	226	44	396	666
Liquidation	81	23	249	353
Merger or take over	84	19	95	198
Status unknown/Dissolved	497	130	773	1400
Total sample	4,159	1,130	8,745	14,034

Table 2 – Sample of firms included in the analysis (companies with status "Active" in 2009)

Status 2018	Non family Business	Family Business		Total sample	Non family Business	Family Business		Total sample
		ext CEO	fam CEO			ext CEO	fam CEO	
Active	76.8	78.8	81.1	79.7	28.6	8.0	63.5	100.0
Active (default of payment)	0.2	0.2	0.3	0.2	24.2	6.1	69.7	100.0
Active (dormant)	0.8	0.5	0.3	0.5	50.0	8.6	41.4	100.0
Active (insolvency proceedings)	0.7	1.1	0.9	0.8	24.4	10.1	65.5	100.0
Active (reorganization)	0.1	0.4	0.1	0.1	25.0	33.3	41.7	100.0
Active (rescue plan)	0.0	0.0	0.0	0.0	25.0	0.0	75.0	100.0
Bankruptcy	2.0	2.1	1.5	1.7	34.6	10.1	55.3	100.0
Dissolved	11.0	10.0	7.1	8.5	38.5	9.5	52.0	100.0
Dissolved (bankruptcy)	3.5	1.8	3.0	3.1	33.6	4.7	61.8	100.0
Dissolved (demerger)	0.2	0.0	0.1	0.1	45.0	0.0	55.0	100.0
Dissolved (liquidation)	0.8	1.1	1.4	1.2	20.0	7.3	72.7	100.0
Dissolved (merger or take-over)	2.0	1.7	1.1	1.4	42.4	9.6	48.0	100.0
In liquidation	1.2	1.0	1.5	1.3	25.5	5.9	68.6	100.0
Inactive (no precision)	0.2	0.6	0.5	0.5	15.6	10.9	73.4	100.0
Status unknown	0.5	0.9	1.1	0.9	15.7	7.9	76.4	100.0
Total	100.0	100.0	100.0	100.0	29.6	8.1	62.3	100.0

Table 3 - Wilcoxon rank-sum test of differences between median values for Sales, ROA and Gearing

		Sales	ROA	Gearing
Pre crisis		5,193	4.3	48.0
Post crisis		5,736	4.9	79.8
	Total	5,366	4.6	58.2
z	=	-1.149	-0.714	-4.086
Prob > z	=	0.251	0.475	0.000

Tab 4 – Sample of firms included in the analysis (companies with status "Active" in 2009) – Pairwise Correlations

	liquid	mer	bank	fam_firm	hgf	tfpd	product innov
Liquid	1						
Mer	-0.0061*	1					
bank	-0.0116*	-0.0119*	1				
imp_fam	0.0062*	-0.0232*	-0.0166*	1			
Hgf	-0.0205*	-0.0254*	-0.0493*	-0.0216*	1		
Tfpd	-0.0124*	-0.0003	-0.0425*	0.0031	-0.0147*	1	
product_in~v	-0.0066*	0.0055*	-0.0181*	0.0032	0.0066*	0.0025	1
range	0.0057*	-0.004	-0.0148*	0.0105*	0.0042	0.0143*	0.3504*
Tech	-0.0105*	-0.0012	-0.0203*	-0.0773*	0.0055	0.0361*	0.2138*
c20_m_c3	0.0003	-0.0011	-0.0077*	-0.0173*	0.0049*	-0.0071*	0.1855*
k37_1	-0.0086*	-0.004	-0.0090*	-0.0324*	-0.0132*	0.0171*	-0.0102*
replic2	0.0019	0.0195*	-0.0029	-0.0331*	0.0117*	-0.0326*	0.1566*
newprod2	-0.002	0.0026	0.0071*	-0.0200*	0.0111*	-0.0220*	0.0242*
eta	-0.0087*	-0.004	-0.0254*	0.0665*	-0.0380*	-0.0193*	0.0223*
roa	-0.0953*	-0.0226*	-0.1710*	-0.0166*	0.1065*	0.0805*	0.0224*

	range	tech	ext_R&D	potential market	replication	new product	firm age
range	1						
tech	0.1260*	1					
c20_m_c3	0.1072*	0.1735*	1				
k37_1	0.0015	0.0170*	-0.0074*	1			
replic2	0.0933*	0.0877*	0.0819*	-0.0009	1		
newprod2	0.0163*	0.0173*	0.0184*	0.0001	-0.1704*	1	
eta	-0.0140*	0.0305*	0.0133*	0.0203*	0.0384*	-0.0164*	1
roa	0.0234*	0.0328*	0.0106*	0.0156*	0.0333*	-0.0152*	0.0144*

Tab 5 – Regression results

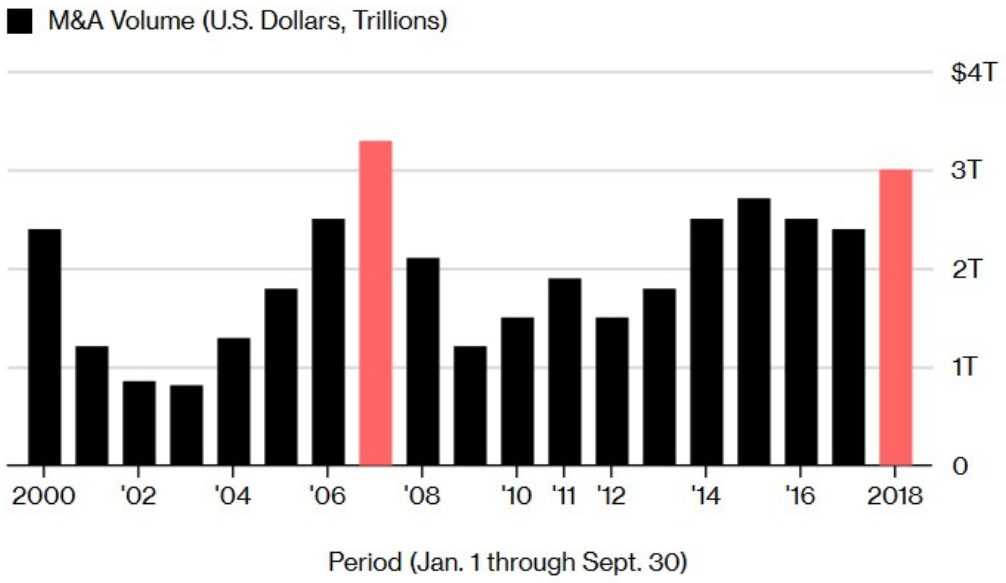
	Mergers before recession (2007-09)	Mergers after recession (2009-15)
Industry variables		
Domestic_turnover_growth	0.0646 (0.23)	1.273* (2.37)
External_turnover_growth	0.0671 (0.29)	0.861* (2.72)
Demand variability	-0.00456 (-0.26)	-0.00191 (-0.43)
Performance and products		
Product to order	-0.00824*** (-4.88)	-0.00173*** (-4.70)
ROA	0.00689 (0.73)	0.00307 (0.99)
Firm sales growth	-0.00116 (-0.39)	-0.0868 (-0.79)
Firm potential market	-0.701** (-2.61)	3.055*** (4.80)
TFP growth	-0.0492*** (-3.55)	0.274*** (9.57)
Product range	0.0336** (2.60)	-0.0977*** (-3.34)
Innov and tech resources		
Product_innovation	0.118*** (8.46)	-0.0340 (-1.13)
Process_innovation	0.0868*** (6.07)	0.00619 (0.20)
Organizational_innovation	-0.00502 (-0.33)	0.0250 (0.75)
R&D in house	0.179*** (11.91)	-0.0189 (-0.53)
R&D acquired in the group	0.257*** (7.40)	0.04* (2.31)
R&D from external sources	0.0914*** (4.26)	-0.101 (-1.82)
Patents (number)	0.00970*** (6.55)	-0.0183*** (-3.35)
International activity		
Exporter	0.221*** (10.29)	0.028* (2.14)
Active_outsourcer	0.120*** (4.35)	-0.018 (-1.04)
Passive_outsourcer	0.0463*** (3.32)	-0.141*** (-4.62)
FDI	0.0921*** (3.72)	-0.0954 (-1.19)
Finance and ownership		
Family firm	-0.578*** (-17.59)	-0.479*** (-6.85)
Succession occurred	0.110** (3.02)	0.319*** (4.20)

Liquidity ratio (%)	-0.0805***	0.0173**
	(-6.60)	(2.72)
Secured debt	-0.00569	-0.0179
	(-1.08)	(-1.25)
Gearing (%)	0.00565	-0.0780*
	(1.88)	(-2.13)
Industry maturity	-0.0617***	0.0104**
	(-4.54)	(2.87)
Constant	-1.631***	-1.971***
	(-31.43)	(-27.03)
Observations	532	181
Adjusted R^2	0.155	0.140

Controls include: firm age, firm age squared, country, firm size, 3-digit sector (NACE 2.1).

t statistics in parentheses – * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Exhibit 1 – Post-crisis Highs. Volumes of M&A from 2000 to 2018



Source: Data compiled by Bloomberg

Company status definition (source: Bureau van Dijk)

According to the BvD company status definition, bankruptcy is a legally declared inability of a company to pays its creditors. The company is in the process of bankruptcy. The assets are being sold in order to repay the creditors. At the end the company will be dissolved and will no longer exist.
As for mergers, a company is identified as dissolved because of merger or takeover when it no longer exists as a legal entity because it has been included in a merger or was subject of a take-over.
When it comes to liquidation, the company is in the process of liquidation; all assets of the company are being sold. The next step will be that the company will be dissolved and will no longer exist.
It is important to stress that BvD reserves the term "in liquidation" mainly to friendly or voluntary liquidation. The reason for the liquidation can be the termination of the company as per the company status, voluntary dissolution, or another reason that is not linked to payment/credit difficulties. In some cases however the need for liquidation proceedings can be viewed as self-addressing creditor problems (when an insolvent debtor's assets are insufficient to meet the claims of all creditors it will be in a creditor's own best interest to take action to recover its claim before other creditors can take similar action).
The three potential exit options have different degrees of voluntary choice, the lowest being the bankruptcy (where an external authority or a court declares the insolvency status), while the highest is the liquidation, which is the natural voluntary termination of the activity in the company life.