

The Effect of Information Asymmetry on the Method of Payment and Post-M&A Involuntary Delisting*

Ephraim Kwashie Thompson^a, Chang-Ki Kim^b

^aBusiness School, Korea University, South Korea

^bBusiness School, Korea University, South Korea

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Abstract

Purpose - This paper shows an unexplored area related to involuntary delisting. Specifically, this research investigates the effect of target firm information asymmetry on the likelihood that the acquirer or newly merged firm will be forcibly delisted post-merger.

Design/methodology/approach - The research uses a sample gathered on local US mergers and acquisitions from the Thomson Reuters Securities Data Company (SDC) Platinum Mergers and Acquisitions database. It applies the logistic regression with industry and year effects and corrects the error term using clustering at the industry level. The research also matches the forced delisted firms to control firms based on industry, acquisition completion year, and firm size and then employs a matched sample analysis.

Findings - Findings show that M&As between firms where the target firm is opaque and burdened with high information asymmetry issues are likely to be paid for using majority stock and that M&As involving such opaque targets also have a higher likelihood of getting delisted post-merger.

Research implications or Originality - Our results are relevant given the very nature of M&As which involve two players: the acquirer and target who both may have different incentives. Acquirers especially have the tendency to suffer losses and even get delisted if they over-pay for or get merged to a poor target which conceals its poor performance evidenced by higher accruals quality.

Keywords: Information Asymmetry, Involuntary Delisting, Method of Payment

JEL Classifications: G14, G34

I. Introduction

Delisting of listed firms, particularly by the very stock exchanges that courted them from the beginning is an interesting area of research that continues to draw the interest of researchers of late. Termed involuntary delisting, this type of delisting is forced by stock exchanges when firms are found to be in breach of listing requirements and standards or when firms go bankrupt, liquidate their financial interests or undertake a financial restructuring. (Macey, O'Hara and Pompilio, 2008; Pour and Lasfer, 2013).

The literature on delisting, specifically on involuntary delisting has investigated the reasons behind involuntary delisting as well as the economic factors that determine whether a

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^a First Author, E-mail: kwatom002@korea.ac.kr

^b Corresponding Author, E-mail: changki@korea.ac.kr

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firm will be forced to delist or not (Peristiani and Hong, 2004; Li and Zhou, 2006; Charitou, Louca and Vafeas, 2007) Further, the literature on involuntary delisting is filled with interesting studies about the behavior of firms that face the threat of delisting (Leuz, Triantis and Wang, 2008; Yang, 2006; Cornanic and Novak, 2015). While many of these studies on delisting focus on initial public offerings (IPOs) in general (Martinez and Serve, 2017), a very important setting, the M&A market has received little interest and very few studies have explored involuntary delisting of M&As.

The M&A market is characterized by two players, the acquirer and target who may have divergent interests and a propensity for the informed party to take advantage of the uninformed party (Goktan 2013; Akerlof, 1970; Hansen, 1987). Thus, information asymmetry between acquirers and targets have a tendency of greatly influencing the chances of success of the acquirer post-merger. While the literature on forced delisting have investigated the influence of various firm fundamentals on the likelihood of a firm being forcibly delisted (Bartlett, 2009; Pour and Lasfer, 2013; Croci and Del Giudice, 2014; Thomsen and Vinten, 2014), it has neglected to investigate the impact of information asymmetry for the likelihood of a firm being forcibly delisted. The M&A market provides a conducive setting for investigating one of the factors that influence involuntary delisting: information asymmetry problems related to target firm. Specifically, in this paper, we ask these questions: what is the effect of information asymmetry problems of target firm on the likelihood of acquirer involuntary delisting post-merger? And what is the likely method of payment employed in deals with opaque (information asymmetry) targets and is this method of payment associated with the likelihood of involuntary delisting of the acquirer firm?

We thus investigate the effect of target firm information asymmetry on the method of payment for deal consideration and the likelihood that the acquirer or newly merged firm will be forcibly delisted post-merger. Our findings reveal that mergers between firms where the target firm is opaque and burdened with high information asymmetry issues is likely to be paid for using majority stock. Mergers involving such opaque targets also have a higher likelihood of getting delisted post-merger. The results are robust to a matched sample analysis.

Our contribution to the literature is as follows. First, we complement the involuntary delisting literature which is highly scant by investigating one of the determinants of involuntary delisting that have not yet been tackled in the delisting literature. While most previous research have focused on firm fundamentals and corporate governance characteristics as determinants (Martinez and Serve, 2017), we focus on information asymmetry as a determinant of involuntary delisting. Our results give insight into the possible future plight of acquirers that merge with highly opaque targets and gives a cause for them to be cautious in such dealings.

Secondly, to the extent that this study explored the involuntary delisting literature by exploiting the unique features of M&As, our research adds to the vast literature on M&As. While many previous studies have focused on M&A performance, and it is known that many M&As end up being re-acquired or re-merged with other firms as an exit strategy, we document that still a substantial number of M&As get forcibly delisted. We explore the role played by information asymmetry for the payment method and involuntary delisting of ac-

quirers post-merger.

Finally, this paper augments what we know with respect to information asymmetry. The disparity of information between two parties to a transaction; whether between buyers and sellers, insurers and the insured, principals and agents, acquirers and targets, etc in different settings have been a subject of high research interest in the literature (Goktan 2013; Akerlof, 1970; Hansen, 1987). In such transactions, the party with greater information has an advantage over the misformed or less informed party. Our paper contributes to this literature by showing the consequences of information asymmetry in the acquirer-target relationship.

The remaining part of this study is structured as follows. We review the literature on involuntary delisting and information asymmetry and develop the testable hypotheses in section 2. The data and methodology applied is explained in section 3. The results are presented and discussed in section 4 while the study concludes in section 5.

II. Literature Review and Formulation of Hypotheses

We begin this section by discussing the dichotomy of delisting in the finance literature and summarizing the research findings related to involuntary delisting. We then discuss the testable hypotheses investigated in this study. Delisting is defined as the removal of a listed company from trading on a stock exchange. (Martinez and Serve, 2017). It is reported by Martinez and Serve in their survey paper that the first seminal paper on delisting was published by DeAngelo, DeAngelo and Rice in 1984.

The dichotomy of delisting in the literature is mainly based on the initiator of the delisting process (Macey, O'Hara and Pompilio, 2008). According to Macey, O'Hara and Pompilio (2008), if firms choose to delist, it is referred to as voluntary delisting as the term implies. Voluntary delisting is usually due to going private transactions, cross-delisting, deregistration and M&As of firms. In contrast, involuntary or forced delisting is initiated by the stock exchange because a firm has fallen short of the listing requirements or has gone bankrupt. Li and Zhou (2006) describe involuntary delisting as delisting due to performance failure. Such delisting, as initiated by the stock exchanges themselves, are mostly performance related and include minimum numerical requirements such as minimum distribution requirement, minimum market capitalization, and minimum price of share. There are also discretionary standards such as corporate governance requirements which are applied by the stock exchanges at their discretion (Harris, Panchapagesan and Werner, 2008). Additionally, regardless of these minimum listing requirements, when firms go bankrupt or liquidate which normally indicates performance failure, they naturally become candidates for forced delisting by the stock exchanges.

The effect of involuntary delisting has been documented in the literature. Forced delisting have a clear negative effect on the firms which suffer such forms of delisting initiated by the very stock exchanges which permitted their listing in the first place. Macey, O'Hara and Pompilio (2008) document in their findings employing a sample of NYSE firms delisted in 2002 that the share prices of delisted firms fall approximately in half, their percentage

spread triples and stock price volatility doubles. Another paper also reports large average delisting return of about -30% for firms delisted during 1962 - 1993 (Shumway, 1997). Fama and French (2004) have studied new IPOs and reported the poor performance of such firms before they are delisted. They indicate that about 40% of firms are delisted within 10 years because of performance-related reasons. Some other studies also report the deteriorating consequences that involuntary delisting has on shareholder value of the delisted firms (Serrano, 2013).

Commensurate with the grave economic costs associated with forced delisting, investigating the economic determinants of such involuntary delisting which is usually beyond the control of the affected firms and yet greatly impacts them negatively is important. In this regard, the prior literature has investigated some of these economic determinants of involuntary delisting and reported interesting findings. Peristiani and Hong (2004) examine the characteristics of IPO firms which influence their risk of involuntary delisting. They find that the delisted firms performed poorly before their listing and their poor performance explain their subsequent delisting. In another paper, Li and Zhou (2006) examine the earnings management of IPO firms and its predictive power for their delisting or subsequent merger. They report that IPO firms characterized by aggressive earnings management are more likely to delist for performance failure, and tend to delist sooner while those characterized by conservative earnings management are more likely to be merged or acquired and earn positive abnormal returns. Charitou, Louca and Vafeas (2007) explore the economic determinants of involuntary delisting from the corporate governance perspective and document that firms characterized by good governance in terms of having more outside directors and higher levels of insider ownership, are less likely to be forcibly delisted from the NYSE. The study by Bhattacharya, Borisov and Yu (2015) also show that the quality of intermediaries is a significant determinant of the survival of IPOs and that firms having high quality underwriters are associated with decreases in the risk of involuntary delisting. Finally, the literature has documented that firms that face the risk of forced delisting have the propensity to engage in earnings management (Leuz, Triantis and Wang, 2008; Yang, 2006; Cornanic and Novak, 2015)

While many of these studies on delisting focus on initial public offerings (IPOs) or all firms in general, a very important setting, the M&A market has received little interest and the number of studies exploring involuntary delisting of M&As are few. The M&A market is characterized by two players, the acquirer and target who may have divergent interests and the propensity for the informed party to take advantage of the uninformed party (Goktan, 2013; Akerlof, 1970; Hansen, 1987). Thus, information asymmetry between acquirers and targets have a tendency of greatly influencing the chances of success of the acquirer post-merger but the literature has neglected to investigate the impact of information asymmetry for the likelihood of a firm being involuntarily delisted. The M&A market provides a conducive setting for investigating information asymmetry effects for involuntary delisting. In this paper we ask: what is the effect of information asymmetry problems of target firm on the likelihood of acquirer involuntary delisting post-merger? And what is the likely method of payment employed in deals with opaque (information asymmetry) targets and is this method of payment associated with the likelihood of involuntary delisting of the acquirer

firm?

Hansen (1987) developed a theory to explain that acquirers prefer to pay by stock rather than by cash when there is higher information asymmetry between acquirers and targets. Other papers have tested these predictions and report that information asymmetry significantly influences the payment method in M&As (Shleifer and Vishny, 2003; Rhodes-Kropf and Viswanathan, 2004). Officer, Poulsen and Stegemoller (2009) also show that acquirer returns are significantly higher in stock-paid acquisitions of high information asymmetry targets (difficult-to-value targets), as proxied by R&D intensity and idiosyncratic return volatility. Despite the fact that information asymmetry is supported in the literature as influencing the tendency for stock payments, Cornett and De (1991) and Ismail and Krause (2010) both find evidence contradicting the role of asymmetric information for stock payment. Given the mixed findings in the literature concerning the role of information asymmetry for the method of payment in M&As, we test the role of information asymmetry for the method of payment in H1 in our study. This is an important element in our paper as it helps us naturally progress to the next two hypotheses of our paper.

H1: Mergers involving targets with high information asymmetry problems are more likely to be paid for by majority stock, *ceteris paribus*.

When acquirers use stock payment as the method of payment, it doubtlessly reduces the risk and negative consequences from dealing with a poor opaque target. Nevertheless, the literature suggests that payment by stock would be a negative signal to shareholders which may lead to reduction in price of the stocks (Myers and Majluf, 1984). Stock-paid deals signal that acquirers are uncertain and pessimistic about the deal and at the same time, payment by stock is also read to mean overvaluation of the stocks of the acquirer. Conversely, when acquirers are more optimistic about the future prospects of the transaction, they tend to pay by cash to make shareholders of the target firm unable to participate in the subsequent gains in the value of its stocks. From the foregoing, since acquirers are pessimistic about deals with high information asymmetry targets for which reason they are cautious to reduce risk by settling the consideration by stock, there is a higher tendency that such deals will suffer from poor performance post-merger and consequently suffer forced delisting for performance failure.

H2: Mergers characterized by majority stock payment are more likely to suffer involuntary delisting post-M&A, *ceteris paribus*.

Further information asymmetry enables firms to hide/conceal poor performance and engage in earnings management, etc which affects the performance and survival of a deal post-merger (Easterwood, 1998; Louis and Sun, 2016). In the next hypothesis, we posit that involuntary/forced delisting risk due to performance failure is related to the quality of the target and that high information asymmetry target firms are more likely to be of poor quality. (Li and Zhou, 2006)

H3: Mergers involving targets with high information asymmetry problems are more likely to suffer involuntary delisting post-M&A, *ceteris paribus*.

III. Data and Methodology

1. Data

We collect the sample for this analysis from three main sources: merger and acquisition data from Thomson Reuters Securities Data Company (SDC) Platinum Mergers and Acquisitions database, delisting data from the Center for Research in Security Prices (CRSP) and firm fundamentals from COMPUSTAT. The sample period is 1990-2018 and consists of completed M&As of US public firms. We collect information on the ownership percentage after close of deal, the value of transaction, and the Standard Industry Classification (SIC) codes of the acquirer and target.

As indicated in the preceding section, research findings have shown how firm fundamentals are related with the likelihood of delisting. We control for these variables in our regressions. Specifically, we use Tobin's Q of the acquirer to control for market valuation effects, log of total assets to control for size of the acquirer, the cash flow of the acquirer to control for acquirer cash effects, total liabilities scaled by total assets of the acquirer to control for leverage effects, GDP growth and total stock market development growth to control for national level economic and growth effects. Particularly for H1, we additionally include the log of total assets of the target to control for size of the target which may influence whether the acquirer can pay for the target fully in cash or would need to necessarily pay in stock. Further, we include in all regressions a financial crisis dummy which equals 1 if the deal is consummated during the period of the global financial crisis (2007-2009) since such periods of high global financial instability can be related to increased involuntary delisting. We add the financial crisis dummy to ensure that our results are not in any way driven by the financial crisis. Detailed descriptions of these control variables can be found in Appendix A of this paper.

With information asymmetry being a central part of this paper, we employ a number of variables used in the literature to proxy for information asymmetry of the target. We first use accruals quality which was developed by Dechow and Dichev (2002) and applied by Francis et al. (2005), Kim and Qi (2010) and other several papers. Accruals quality measure the extent to which total current accruals map into operating cash flow realizations. Though accruals quality has been used to proxy for many effects in the finance and accounting literature, they mainly proxy for earnings management and information asymmetry.

It is worth noting at this point that a number of papers have already studied the effect of earnings management by firms or acquirers on involuntary delisting, as well as the propensity for firms or acquirers to engage in such earning management in order to avoid forced delisting using accruals quality of the firm or acquirer to proxy for earnings management. Rather than accruals quality of the acquirer, we employ accruals quality of the target firm and argue that, though accruals quality of the target firm could also proxy

for earnings management by the target firm, in the M&A context, from the point view of the acquirer such actions amount to a distortion of information valuable to the acquirer and thus represent information asymmetry between the two firms. Thus a distinct feature of this paper is that we use and are interested in accruals quality of the target firm, not the acquirer firm per se. Additionally, we make use of intangible assets scaled by sales of the target as well as the Tobin's Q of the target to proxy for information asymmetry related to the target firm.

2. Methodology

We mainly employ a logistic regression for the analysis in this paper. First for H1, where we investigate the effect of information asymmetry on the likelihood of settling the M&A consideration by majority stock payment, we run a logistic regression with a stock payment dummy as the dependent variable in Equation (1).

$$\begin{aligned} \Pr(\text{Stock Payment}_{it} = 1) \\ = f(\alpha + \beta_1 * \text{Information Asymmetry}_{it} \\ + \gamma' \text{Control variables}_{it} + y_t + i_t) \end{aligned} \quad (1)$$

where $f(\cdot)$ is the logistic function, Stock Payment represents a dummy variable which equals one for majority stock payment and zero otherwise, Information Asymmetry refers to accruals quality, intangible assets scaled by sales, and Tobin's Q of the target firm used to proxy for information asymmetry in this study, i_t represents industry effect and y_t represents year effect.

Secondly, to test the effect of method of payment, specifically stock payment on the likelihood of involuntary delisting which is H2 in our study, we run the following logistic regression in Equation (2).

$$\begin{aligned} \Pr(\text{Involuntary Delisting}_{it} = 1) \\ = f(\alpha + \beta_1 * \text{Stock Payment}_{it} + \gamma' \text{Control variables}_{it} + y_t \\ + i_t) \end{aligned} \quad (2)$$

where $f(\cdot)$ is the logistic function, Involuntary Delisting represents a dummy variable which equals 1 if the acquirer firm is forcibly delisted by the stock exchange and zero otherwise, Stock Payment represents a dummy variable which equals one for majority stock payment and zero otherwise, i_t represents industry effect and y_t represents year effect.

Again, for H3 where we test the effect of information asymmetry on the likelihood of acquirer forced delisting, we run the logistic regression in Equation (3).

$$\begin{aligned} \Pr(\text{Involuntary Delisting}_{it} = 1) \\ = f(\alpha + \beta_1 * \text{Information Asymmetry}_{it} \\ + \gamma' \text{Control variables}_{it} + y_t + i_t) \end{aligned} \quad (3)$$

where $f(\cdot)$ is the logistic function, Involuntary Delisting represents a dummy variable

which equals 1 if the acquirer firm is forcibly delisted by the stock exchange and zero otherwise, Information Asymmetry represents accruals quality, intangible assets scaled by sales, and Tobin's Q of the target firm used to proxy for information asymmetry in this study, i_t represents industry effect and y_t represents year effect.

Finally, for robustness, we perform a matched sample analysis where we first match the delisted firms in our sample with control firms based on firm size, industry and M&A acquisition completion year following (Charitou, Louca and Vafeas, 2007). After matching, we perform a matched sample analysis for H2 and H3 by running the regressions in Equation (2) and Equation (3) above in which case Involuntary Delisting represents a dummy variable which equals one for forcibly delisted firms and zero for control firms. We note in advance that due to many missing observations for the firm fundamentals, we are unable to find suitable matches for some of the delisted firms and thus our sample size reduces when we apply the matched sample analysis.

IV. Empirical Results

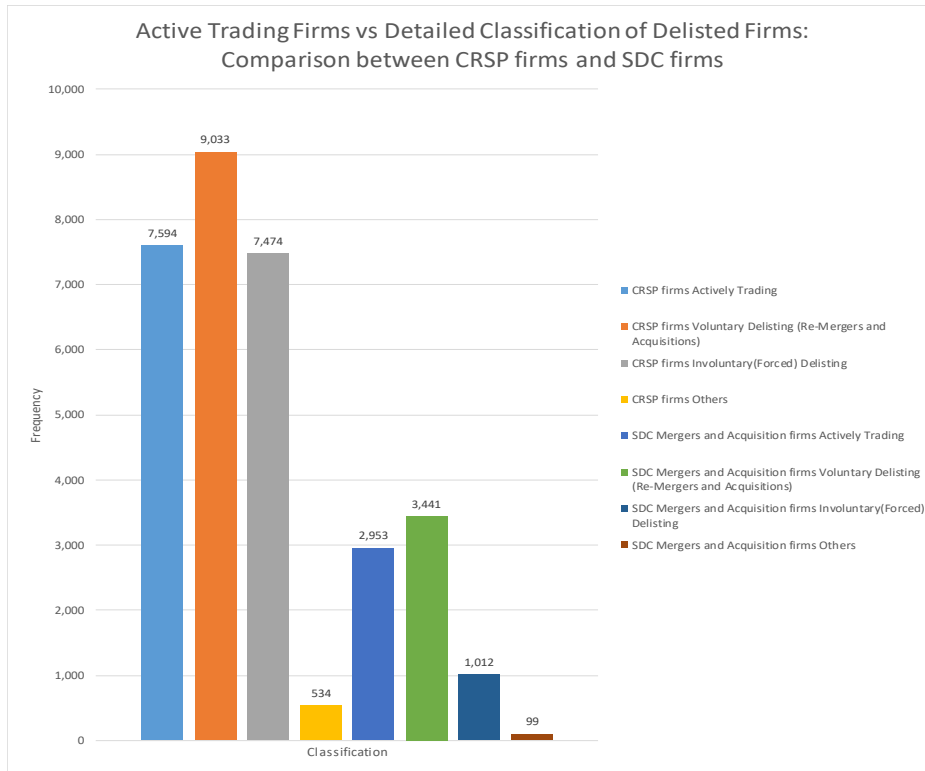
1. Summary Statistics

The summary statistics of the sample used for the study is presented in this section. We start by first presenting a classification of delisted firms based on the reasons for/initiator of the delisting. We show this classification for all CRSP firms and then for only M&A firms in the SDC database for comparison. <Table 1> shows this classification and <Fig. 1> shows this pictorially.

Table 1. Active Trading Firms vs Detailed Classification of Delisted Firms: Comparison between CRSP firms and SDC firms

Classification of Delisting	Frequency	Percentage
CRSP Sample (1990-2018)		
Actively Trading	7,594	30.83
Voluntary Delisting (Re-mergers and Acquisitions)	9,033	36.67
Involuntary (Forced) Delisting	7,474	30.34
Others	534	2.17
Total	24,635	100
SDC Mergers and Acquisition Firms		
Actively Trading	2,953	39.35
Voluntary Delisting (Re-mergers and Acquisitions)	3,441	45.85
Involuntary (Forced) Delisting	1,012	13.48
Others	99	1.32
Total	7,505	100

Source: Center for Research in Security Prices (CRSP), Thomson Reuters Securities Data Company (SDC) Platinum Mergers and Acquisitions database

Fig. 1. Active Trading Firms vs Detailed Classification of Delisted Firms: Comparison between CRSP firms and SDC firms**Table 2.** Classification of Type of Acquirer Delisting by Effective Year of Deal

Effective Year	Actively Trading	Voluntary Delisting (Re-mergers and Acquisitions)	Involuntary (Forced) Delisting	Others	Total
1990	65	130	69	10	274
1991	56	150	78	5	289
1992	74	142	56	9	281
1993	81	159	55	4	299
1994	106	253	48	5	412
1995	119	293	68	5	485
1996	146	325	84	5	560
1997	143	302	83	3	531
1998	156	305	94	8	563

1999	156	258	89	16	519
2000	145	210	62	7	424
2001	131	153	43	4	331
2002	90	98	33	2	223
2003	79	78	14	1	172
2004	93	91	18	4	206
2005	90	80	15	1	186
2006	94	69	13	4	180
2007	125	65	14	1	205
2008	100	57	18	0	175
2009	45	27	12	0	84
2010	61	26	3	1	91
2011	76	25	7	1	109
2012	76	25	6	0	107
2013	88	29	9	1	127
2014	98	22	6	0	126
2015	132	31	5	0	168
2016	97	19	3	1	120
2017	100	17	2	0	119
2018	99	2	3	1	105
2019	32	0	2	0	34
Total	2,953	3,441	1,012	99	7,505

As can be seen from (Table 1), for all unique US listed firms in the CRSP database from 1990-2018, about 31% were actively trading, about 37% were voluntarily delisted due to their engagement in M&As while about 30% were delisted forcibly by the stock exchanges they were listed on either due to breach of listing requirements or for bankruptcy and liquidation reasons. Zooming in specifically on M&As, we find that about 39% of M&A firms continue to trade, about 46% are either re-acquired or re-merged with other firms while about 13% are delisted involuntarily by their respective stock exchanges.

Given the negative reactions of the market to involuntary delisting as opposed to the positive reactions of the market to voluntary delisting, it is economically meaningful to explore the reasons and triggers for involuntary delisting. Though for the M&A sample from SDC, only about 13% end up being forcibly delisted which is lower than the corresponding 30% for the full sample of CRSP firms, the fact that about as much as 13% of M&A firms end up being involuntary delisted puts a spotlight on this method of delisting. This is more so given the fact that these firms do not opt to be delisted on their own accord but are obliged to be delisted due to their performance failure.

We also report the classification of delisting information for M&A by effective year of deal in (Table 2). The table shows an increasing number of firms were delisted in the 1990s and early 2000s but the numbers have decreased after the global financial crisis.

Table 3. Descriptive Statistics

Variables	Mean	S.D.	Min	Max
Target accruals quality	0.05	0.05	0.00	0.53
Target Tobin's Q	1.82	1.34	0.23	15.65
Target intangible asset	0.31	6.03	0.00	253.23
Stock payment	0.39	0.49	0.00	1.00
Time until deal completion	5.68	10.46	0.00	175.67
Difference in industry	0.11	0.31	0.00	1.00
Ownership percentage	0.56	0.44	0.00	1.00
Value of transaction	4.30	2.38	-2.30	11.40
Target size	5.37	1.98	-1.23	12.13
Acquirer size	6.83	2.23	1.12	14.60
Cash flow	0.09	0.11	0.00	0.99
Leverage	0.53	0.23	0.01	3.06
Acquirer Tobin's Q	1.94	1.51	0.23	20.01
GDP growth	2.95	1.51	-2.78	4.69
Total stock traded growth	0.21	0.25	-0.30	0.58

Next (Table 3) presents the descriptive statistics of the variables used in the analysis of this paper. The mean of accrual quality is 0.05 which is the same as the standard deviation since accrual quality is defined in terms of standard deviation itself. Its minimum is zero signaling targets without any discrepancy between the financial accruals they report and the subsequent realization of the accruals into cash flows, an indication of very little or no information asymmetry issues for such target firms while for targets with information asymmetry issues, a maximum as high as 0.53 is observed. The sample also shows a mean target Tobin's Q of about 1.82 indicating that most of the targets are overvalued on average.

(Table 3) also shows that about 39% of M&A deals are paid for by majority stock. The average time until deal completion is about 6 months while about 11% of the deals are between firms in different industries. In terms of firm fundamentals, acquirers keep on average a cash flow which is about 9% of their total assets while most of the acquirers are highly levered on average of about 53% of their total assets. Comparing Tobin's Q between targets and acquirers, the descriptive statistics show that acquirers are on average overvalued than targets.

The correlation table shown in (Table 4) do not particularly show very high correlations among the variables employed in this study. However noteworthy is a high correlation between the Tobin's Q of both acquirers and targets. Finally, acquirer size is also highly correlated with value of transaction which is expected since it is large firms that have higher likelihood for being engaged in the costliest deals in terms of value of transaction. A similar observation can also be seen with respect to the correlation between target size and value of transaction.

Table 4. Correlation Table

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
TAQ (1)	1														
TTQ (2)	0	1													
TIA (3)	-0.03	-0.01	1												
SP (4)	0.08*	0.04	0.03	1											
TC (5)	-0.05*	0.13*	-0.01	-0.15*	1										
DI (6)	0.04	0.05	0	0.07*	-0.07*	1									
OP (7)	0.11*	0	0.03	0.29*	-0.15*	0.22*	1								
VT (8)	-0.22*	0.24*	0.02	0.06*	0.07*	0.07*	0.48*	1							
TS (9)	-0.35*	0.06	0	-0.14*	0.16*	-0.06*	-0.19*	0.66*	1						
AS (10)	-0.21*	0.19*	0.01	-0.02	0.04	0.16*	0.31*	0.77*	0.64*	1					
CF (11)	0.12*	0.07*	0.04	0.01	0.01	-0.04	-0.06*	-0.18*	-0.23*	-0.26*	1				
LV (12)	-0.08*	0	0.01	-0.03	-0.01	0.1*	0.11*	0.24*	0.3*	0.32*	-0.33*	1			
ATQ (13)	0.05*	0.79*	-0.01	0.11*	0.06*	-0.01	0.09*	0.15*	-0.08*	0.06*	0.13*	-0.13*	1		
GDP (14)	-0.04	0.08*	-0.01	0.03	0	-0.03	-0.06*	-0.05*	-0.05*	-0.08*	-0.1*	0	0.1*	1	
TSG (15)	-0.08*	0.06*	0.02	0.03	0.04	0.01	0.01	0.04	0.01	0	-0.1*	0.02	0.09*	0.66*	1

Notes: TAQ represents target accrual quality, TTQ represents target Tobin's Q and TIA represents target intangible asset. SP represents the stock payment dummy, TC represents time until deal completion, DI represents the difference in industry dummy, OP represents ownership percentage while VT represents value of the deal transaction. TS represents target size, AS represents acquirer size, CF represents acquirer cash flow while LV represents acquirer leverage. ATQ represents acquirer Tobin's q, GDP represents gross domestic growth rate while TSG represents the total stock growth rate. * p<0.05

2. Main Results

We now present the main findings for our analysis with respect to the three proposed hypotheses. We proceed by first examining the effect of target firm information asymmetry on the choice of payment of the consideration of the deal. As mentioned earlier, we run the logistic regression in Equation (1) and present the results in (Table 5) below.

Among the three proxies we use for target firm information asymmetry, only target intangible asset is an insignificant predictor of the likelihood that a deal will be paid for by majority stock. All the other two proxies; target accrual quality, and target Tobin's Q are significant and positively related to the likelihood of majority stock payment. The results provide support for H1 and suggests that when the target firm in a deal is plagued with information asymmetry problems, the acquirer firm would most likely choose to pay for the consideration of the deal with stock rather than with cash confirming the previous results reported in the literature (Yook et. al, 1999; Shleifer and Vishny, 2003; Rhodes-Kropf and Viswanathan, 2004; Officer, Poulsen and Stegemoller, 2009) and contrasting the results of Cornett and De (1991) and Ismail and Krause (2010).

Table 5. Effect of Target Firm Information Asymmetry on the Method of Deal Payment

Stock Payment	(1)	(2)	(3)
Target accruals quality	2.3213**		
Target Tobin's Q		0.1257*	
Target intangible asset			0.0240
Time until deal completion	-0.0603***	-0.1836***	-0.0620***
Difference in industry	0.2606*	0.1837	-0.0216
Ownership percentage	1.8803***	1.2502***	2.3800***
Value of transaction	0.0054	-0.0077	-0.0610
Target size	0.1286**	-0.1863*	0.1884**
Acquirer size	-0.1259***	0.2194***	-0.1119**
Cash flow	0.2430	0.2445	0.2378
Leverage	-0.5458**	-0.1455	-0.4834**
Acquirer Tobin's Q	0.1672***	0.0336	0.1151***
GDP growth	-0.1046	0.1935	0.5830**
Total stock traded growth	4.5919	2.4996	-2.1753
Financial crisis dummy	1.5273	2.2255	2.4800**
Industry effect	Y	Y	Y
Year effect	Y	Y	Y
Constant	-3.0346***	-3.3560	-2.8600***
Observations	2,156	1,322	2,401
Pseudo R-squared	0.178	0.221	0.178

Notes: The table represents a logistic regression of stock payment dummy on proxies for target firm information asymmetry and control variables. We test the effect of target firm information asymmetry on the likelihood that a deal will be settled by majority stock payment. Control variables include the national- and firm-level and deal-specific variables as explained in Appendix A. Industry fixed effect and year fixed effects are included in all models and standard errors are corrected for heteroscedasticity and clustered at the industry level. *** p<0.01, ** p<0.05, * p<0.1

Next, in (Table 6), we test H2 which proposes that mergers paid for by majority stock are associated with a higher likelihood of involuntary delisting than those paid for by majority cash. To test this relationship, we run a logistic regression of involuntary delisting dummy on the majority stock payment dummy and control variables with industry and year effect as in Equation (2) above. The results are presented in (Table 6).

Though only significant at the 10% level, the results in (Table 6) lends some support to H2. We find that payment of deal consideration by majority stock is positively related to the likelihood of post-merger involuntary delisting. Put differently, majority stock deals perform poorly than majority cash deals and have the propensity of being forcibly delisted by the stock exchange for failure to meet listing requirements or due to their liquidation or bankruptcy.

Table 6. Effect of Method of Deal Payment on the Likelihood of Involuntary Delisting.

Involuntary Delisting	Original Sample	Matched Sample
	(1)	(2)
Stock payment	0.2548*	0.3368*
Time until deal completion	0.0020	-0.0015
Difference in industry	0.3226	0.2012
Ownership percentage	0.4017*	0.4449
Value of transaction	-0.0340	0.0246
Acquirer size	-0.7287***	-0.4559***
Cash flow	-0.2850	0.0337
Leverage	2.1628***	2.2217***
Acquirer Tobin's Q	-0.2380***	-0.2642***
GDP growth	-0.6961	13.0540
Total stock traded growth	12.6290	-121.7508
Financial crisis dummy	2.2277	22.6862
Industry effect	Y	Y
Year effect	Y	Y
Constant	0.7703	-16.8121
Observations	2,999	608
Pseudo R-squared	0.273	0.124

Notes: The table represents a logistic regression of acquirer firm involuntary delisting dummy on the method of deal payment and control variables. We test the effect of method of payment on the likelihood that an acquirer will be delisted forcibly by the Exchange. We show results for both the original sample and a matched sample based on matching delisted firms with undelisted control firms of the same size, same industry and same merger and acquisition completion year. Control variables include the national- and firm-level and deal-specific variables as explained in Appendix A. Industry fixed effect and year fixed effects are included in all models and standard errors are corrected for heteroscedasticity and clustered at the industry level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

As for the control variables, we find most of them have the expected signs as reported in the literature. For example, acquirer size is significantly negatively related to the likelihood of involuntary delisting. As documented by previous literature, larger firms have greater ability to efficiently amortize fixed costs, while small firms may prefer to go private

when the cost of listing is deterrent (Weir, Wright and Scholes, 2008; Bartlett, 2009). Leverage is also significant and has the expected sign: it is positively related with the likelihood of involuntary delisting (Bharat and Dittmar, 2010; Pour and Lasfer, 2013). As for Tobin's Q, we report a negative coefficient while some previous studies report a positive relationship with delisting (Renneboog, Simons and Wright, 2007; Bharat and Dittmar, 2010; Croci and Del Giudice, 2014; Thomsen and Vinten, 2014). As for the financial crisis dummy, we report that it is insignificant though positive. Thus the results we report are not driven by or necessarily associated with the financial crisis period.

We now turn our attention to the main hypothesis of our study which is H3. In H3, we posited that mergers involving targets with high information asymmetry problems are more likely to suffer involuntary delisting post-M&A, *ceteris paribus*. We present the results of our logistic regression of the involuntary delisting dummy on the proxies for target firm information asymmetry in (Table 7) and discuss the results as follows.

Table 7. Effect of Target Firm Information Asymmetry on the Likelihood of Involuntary Delisting

Involuntary Delisting	Original Sample			Matched Sample		
	(1)	(2)	(3)	(4)	(5)	(6)
Target accruals quality	5.0268***			3.3714*		
Target Tobin's Q		0.1599			0.8646**	
Target intangible asset			-0.0049			0.8038**
Time until deal completion	0.0064	0.0020	0.0041	0.0159	-0.0036	0.0158
Difference in industry	0.1486	0.8844**	0.4118	0.3544	0.9102	0.3474
Ownership percentage	0.5438**	1.0402**	0.5816**	0.4299	1.8651**	0.4643
Value of transaction	-0.0511	-0.0749	-0.0156	0.0714	-0.0325	0.1620
Acquirer size	-0.6911***	-0.7882***	-0.7795***	-0.5199***	-0.6755***	-0.6510***
Cash flow	0.2079	0.1146	-0.4006	0.7181	0.7807	0.4580
Leverage	2.5057***	2.4585***	2.7683***	2.9327***	3.1692***	3.3465***
Acquirer Tobin's Q	-0.3858**	-0.3883**	-0.4193***	-0.4293**	-1.0448**	-0.4588***
GDP growth	0.0469	-1.4093	0.3689	0.0771	-0.8161	0.4819
Total stock traded growth	6.1724	13.3520	4.8332	-1.9545	2.4230	-1.8711
Financial crisis dummy	3.9340	-1.7584	5.1564	0.7078	-1.3641	3.4548
Industry effect	Y	Y	Y	Y	Y	Y
Year effect	Y	Y	Y	Y	Y	Y
Constant	-0.3296	4.0840	-1.3781	1.2784	4.1806**	0.2694
Observations	2,037	1,254	2,231	426	334	445
Pseudo R-squared	0.293	0.264	0.287	0.173	0.199	0.163

Notes: The table represents a logistic regression of acquirer firm involuntary delisting dummy on proxies for target firm information asymmetry and control variables. We test the effect of target firm information asymmetry on the likelihood that an acquirer will be delisted forcibly by the Exchange. We show results for both the original sample and a matched sample based on matching delisted firms with undelisted control firms of the same size, same industry and same merger and acquisition completion year. Control variables include the national- and firm-level and deal-specific variables as explained in Appendix A. Industry fixed effect and year fixed effects are included in all models and standard errors are corrected for heteroscedasticity and clustered at the industry level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

First, we find that only one of our proxies; target accruals quality is significantly and positively related to the likelihood of forced delisting. One of the proxies we employ; target Tobin's Q has the expected sign but is not significant. As for target intangible asset, it is in-

significant and is negatively related with the likelihood of involuntary delisting. Since accruals quality which is one of the main variables used to proxy for information asymmetry in the literature and has been posited to be a better measure of information asymmetry than other measures (Lee and Masulis, 2009) is positively and significantly related to the likelihood of post-merger forced delisting, we believe the reported results provide enough support for the assertions in H3. Nevertheless, we perform a robustness test which strengthen our results further, presented in the next section.

3. Robustness

Despite the interesting results we have obtained so far, a concern exists that our sample contains undelisted firms which are not comparable to the delisted firms. We thus employ a matched sample analysis in which we match the delisted firms to comparable control firms based on firm size, same industry and same acquisition completion year. We rerun the previous regressions in Equation (2) and Equation (3) above on the matched sample for H2 and H3 respectively where Involuntary Delisting now represents a dummy variable which equals one for the forced delisted firms and zero for the matched control firms. As explained earlier in the methodology section, we are unable to match some of the firms due to lack of data and suitable control firms. Nevertheless, the results for this robustness analysis for the firms for which we found suitable controls is shown in the second panel of <Table 6> for H2 and <Table 7> for H3 respectively.

As can be seen, when we apply the matched sample logistic regressions, we still find significant results that the choice of majority stock payment is positively related to the likelihood of involuntary delisting lending support for H2. Our results are much more strengthened when we employ the matched sample robustness analysis for testing H3. Specifically, from <Table 7>, it can be seen that all three target information asymmetry proxies are positively and significantly related to the likelihood of forced delisting by the respective stock exchanges post-merger. Thus, our results obtained so far in this study provide support for the projections in H1, H2 and H3.

V. Conclusion

The disparity of information between two parties to a transaction; whether between buyers and sellers, insurers and the insured, principals and agents, acquirers and targets, etc in different settings have been a subject of high research interest in the literature (Goktan, 2013; Akerlof, 1970; Hansen, 1987). In such transactions, the party with greater information has an advantage over the misformed or less informed party. In this study, we have zoomed in on M&As which provide a conducive setting for investigating the effect of target firm information asymmetry. Particularly, the study has explored how information asymmetry influences the choice of payment in M&As and whether target firm information asymmetry/opaque-ness is a significant determinant of the post-merger likelihood of forced delisting for performance failure of the related acquirers.

We find support for each of the three hypotheses we tested in this paper. First, our findings show that M&As between firms where the target firm is opaque and burdened with high information asymmetry issues is likely to be paid for using majority stock. Further, the empirical evidence suggests that M&As for which consideration is paid for by majority stock have a tendency to suffer from forced delisting post-merger. Finally, M&As that involve opaque targets also have a higher likelihood of getting delisted post-merger.

Our results are relevant given the very nature of M&As which involve two players: the acquirer and target who both may have different incentives. Acquirers especially have the tendency to suffer losses and even get delisted if they over-pay for or get merged to a poor target which conceals its poor performance evidenced by higher accruals quality: discrepancy between accruals and actual cash flows. From the perspective of the acquirer, poor accruals quality of the target is a clear signal of information disparity between the two firms which could spell disaster for the acquirer post-merger.

Our results show that, acquirers in anticipation of these issues prefer stock payment as the choice of payment when dealing with an opaque target. And when acquirers finally merge with opaque targets, they still have a higher likelihood of suffering post-merger involuntary delisting. The results have the implications that acquirers be extra careful in dealing with targets whose financial reports and other assertions do not match their performance as failure to deal with such information disparity may not augur well for the post-merger survival of the acquirer firm.

The results are limited to the extent that they focus on the US market. Thus, other studies may test our hypotheses in other markets, probably using cross-border samples. We envisage that cross-border mergers may suffer more from information asymmetry problems, exacerbated by the distance between acquirers and targets. Future research may also investigate the effect of information asymmetry for other decisions related to deals other than the method of payment such as the value of the deal transaction, deal negotiation period, type of deal brokers or advisors selected, etc. Finally, as most research have focused on IPOs with respect to forced delistings, more in-depth analyses of the determinants of and firm behaviour surrounding forced delistings employing the M&A setting are future research directions that will garner interest in the literature.

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Appendix A. Definition of Variables

Dependent variables	Definition
Involuntary delisting	This represents involuntary delisting due to performance failure. Defined as a dummy variable which equal one if the acquirer has a delisting code between 400 and 600 except 501, 502, 503 and 573.
Stock payment	A dummy variable equal to one if the deal is financed by all or majority stock, and zero otherwise.
Independent variables	
Target accruals quality	Accruals quality calculated following Dechow and Dichev (2002); Kim and Qi (2010).
Target Tobin's Q	The Tobin's q of the target firm. Tobin's q is defined as the ratio of total assets plus market capitalization minus common equity minus deferred taxes and investment tax credit to total assets.
Stock payment	A dummy variable equal to one if the deal is financed by all or majority stock, and zero otherwise.
Control Variables	
Difference in industry	A dummy variable that equals one if the acquirer and target firms belong to different industries and zero otherwise.
Value of transaction	The log of the total value of the consideration paid by the acquirer, excluding fees and expenses.
Ownership percentage	The percentage ownership of the acquirer after the deal.
Target size	The log of total assets of the target firm.
Acquirer size	The log of total assets of the acquirer firm.
Cash flow	The cash flow of the acquirer firm divided by its total assets.
Leverage	The total liabilities of the acquirer firm divided by its total assets.
Acquirer Tobin's Q	The Tobin's q of the acquirer firm. Tobin's q is defined as the ratio of total assets plus market capitalization minus common equity minus deferred taxes and investment tax credit to total assets.
GDP growth	The annual GDP growth rate.
Total stock traded growth	The calculated annual growth of the total stock market value.
Financial crisis dummy	A dummy variable which equals 1 if a deal becomes effective within the global financial crisis period (2007-2009)