

Disclosure Standardization and Textual Sentiment in Equity Crowdfunding: New Zealand Evidence

Abstract

Public equity crowdfunding involves the sale of shares to ordinary investors without mandatory disclosures so compliance costs can be kept low. In New Zealand this has been legal since April 2014. There is a limit on the amount of funds that can be raised but no limit on the number of investors, provided the firm raises funds through a licenced crowdfunding platform. Eight platforms have gained equity crowdfunding licences, supporting fundraising campaigns for over sixty firms so far.

By analysing website and investment memorandum texts provided by crowdfunding companies this paper aims to detect signs of informal disclosure standardisation in the crowdfunding market. It also examines the role of disclosure quantity and sentiment in determining the success or failure of the campaign. Results show that the disclosures companies provide through platform websites are clearly grouped by the host platform. Companies using the PledgeMe, Equitise and Crowdcube platforms provide less disclosure and make less use of uncertainty terms than those using the Snowball Effect, AlphaCrowd, Liftoff and My Angel Investment Platforms. Textual sentiment does not appear to have a meaningful role in determining fundraising success, but providing more disclosure and including an investment memorandum does help.

This paper makes a number of contributions to the small, but growing, literature on equity crowdfunding and financial disclosure. To the best of our knowledge this is the first research to identify factors relevant to success rates for New Zealand equity crowdfunding firms. Its comparison of different disclosure channels is also rarely undertaken in disclosure research, as is the analysis of text to measure the degree of similarity in disclosures made by firms seeking public funds.

Keywords:

Equity Crowdfunding, Disclosure, Textual Sentiment, New Zealand, Disclosure Channels.

Disclosure Standardization and Textual Sentiment in Equity Crowdfunding: New Zealand Evidence

1. Introduction

This study presents an exploratory analysis of the disclosure texts provided online by New Zealand companies seeking equity capital from public investors using licensed crowdfunding platforms. The first objective is to determine whether disclosure text is standardised across or within equity crowdfunding platforms. The second objective is to determine whether textual sentiment is related to equity crowdfunding success.

1.1. New Zealand's Equity Crowdfunding Market

Equity crowdfunding involves the sale of shares to investors without the mandatory disclosures normally required in public offers. The intention is to provide small companies with a low cost source of finance by minimising compliance costs. So called "private equity crowdfunding" makes use of finance law's normal exemptions allowing equity sales to professional or sophisticated investors, family members or employees. In comparison "public equity crowdfunding", involves sales to the general public. Public equity crowdfunding has been legal in New Zealand since the relevant sections of the Financial Markets Conduct Act 2013 (FMCA 2013) took effect in April 2014. This was a very significant law change as equity placements had previously been restricted to small groups of qualified investors. Under the previous laws a private offer accidentally made to an unqualified investor would invalidate the entire issue.

The FMCA 2013 provides two alternative approaches to equity crowdfunding. One approach allows companies to raise funds directly from investors, provided no promotion of the offer takes place.¹ Using this approach shares may be sold to the general public if they have approached the company, but the company cannot approach members of the public. The other approach, and the subject of this research, allows companies to raise funds through licensed crowdfunding platforms; these offers can be advertised and offered to the general public.²

At the time of writing eight equity crowdfunding platforms had been licensed in New Zealand. Of these, five are active, one has yet to promote an offer, and two have ceased operations after each unsuccessfully promoting one campaign.³ The two most active platforms are The Snowball Effect and PledgeMe. During the first twelve months companies using The Snowball Effect were older, larger and sought more funds than those using PledgeMe, Murray (2015). During the thirty months, to 30 September 2016, sixty-nine public equity crowdfunding campaigns have been undertaken. Of these, forty were funded, twenty-one were unsuccessful, five were on-going and three withdrawn.⁴ Over \$30

¹ FMCA 2013, Schedule 1 section 12: Small offers. These direct issues are limited to \$2 million raised within any twelve month period from no more than 20 investors, similar to Australian Small Scale offers.

² FMCA 2013, Schedule 1 section 5: Offers of financial products through licenced intermediaries. Issues through crowdfunding platforms are also limited to \$2 million within any twelve month period, but there is no limit on the number of investors.

³ My Angel Investment surrendered its crowdfunding licence in June 2016. Liftoff announced it would be leaving the equity crowdfunding business in September 2016. At the time of writing Liftoff's license is suspended and it is possible that the company, renamed as Equity crowdfunding Limited, may be sold to a new operator.

⁴ These counts differ from those reported by the platforms. Two platforms classify campaigns as successful due to private investments made after the completion of unsuccessful public campaigns. Of the three

million has been invested through successful campaigns. Table 1 summarises public offers under each platform.⁵

Table 1. Public Equity Crowdfunding Campaigns at 30 September 2016

Platform:	Successful	Unsuccessful	Withdrawn	On-Going	Total
AlphaCrowd	0	1	0	2	3
Crowdcube/Crowdsphere	1	2	0	0	3
Equitise	10	5	1	0	16
Liftoff	0	1	0	0	1
My Angel Investment	0	0	1	0	1
PledgeMe	13	9	1	2	25
Propeller/Crowd88	0	0	0	0	0
The Snowball Effect	16	3	0	1	20
	40	21	3	5	69

Some platforms also host private and wholesale offers. Private offers are only open to invited investors, wholesale offers are only open to qualified wholesale investors. Given the nature of private offers, their number, and details, are not public information. A limited amount of information is available about wholesale offers and this suggests specific circumstances in each case prevented the company from extending investment to the general public. Some companies have avoided public offers for regulatory reasons. For example one company had used up its full \$2 million allowance in a public campaign so was restricted to wholesale investors in a second round of fundraising. Another company wanted to issue hybrid securities which were not covered by the platform's license but a wholesale offer was permissible. Equitise has also hosted two offers to New Zealand investors of shares in companies undertaking an initial public offer on the Australian Stock Exchange. The Snowball Effect has also hosted a crowdfunding campaign for a company listed on the New Zealand Exchange's NXT second board. These offers are not part of the population of interest.

1.2. New Zealand's Equity Crowdfunding Disclosure Rules

To minimise compliance costs, crowdfunding disclosure rules apply to the crowdfunding platforms, not the companies using their service. Mandatory disclosures by the platforms include a warning statement, disclosure statement, and client agreement. The disclosure statement informs potential investors how equity crowdfunding works, what fees are charged by the platform, and lists the checks the platform has performed on the company and its directors. A client agreement establishes the contractual relationship between investor and platform.

There is no mandatory disclosure requirement for companies using equity crowdfunding, the Financial Markets Authority describes the situation as providing 'basic information' only, although some companies will have prescribed accounting disclosures under the Financial Reporting Act 2013. Many companies using equity crowdfunding are small and closely held so they can avoid the financial reporting and audit requirements of public companies, at least until they have completed their public offer. Most New Zealand companies using equity crowdfunding only report short summary financial

withdrawn campaigns one is still classified as suspended by its host platform with no update to its status for over five months.

⁵ In September 2016 Crowdcube was renamed Crowdsphere, Liftoff renamed Equity Crowdfunding Limited and Propellar New Zealand Limited renamed Crowd88 Limited. As the sample offers were made under the earlier platform names they will be used in this paper.

accounts; usually with very few, if any, notes to the accounts and with no indication that accounts are audited.

The FMCA 2013, and associated regulations, also reduced disclosure requirements for regulated offers. These changes are aimed at providing investors with simpler and more relevant disclosures. Under the new rules a product disclosure statement for regulated equity issues should be no longer than sixty pages or 30,000 words. It should allow investors to understand the business, assess asset values and growth prospects and outline the use of any funds raised. Although these requirements do not apply to crowdfunding companies the rules establish guidelines as to what disclosures the market normally expects.

The aim of this paper is to seek evidence of disclosure standardisation in equity crowdfunding. Although regulators are not imposing formal disclosure requirements on crowdfunding companies it is possible informal disclosure standards have formed, either through the actions of promoters or through market pressure from investors.⁶ Each platform provides a website template, which companies need to follow, this standardises the disclosure format and may in turn standardise disclosure content. Investors can directly signal their interest in specific disclosures through the question-and-answer section featured on most platform websites.⁷ Alternately, investors could signal dissatisfaction with the disclosure provided by withholding investment. As withholding investment is a less direct signal it would take longer for promoters to learn the market's expectations. Nevertheless, companies could be influenced by prior successful campaigns, and by imitating them, create disclosure norms.

To investigate disclosure text from crowdfunding firms we use a range of automated textual analysis tools. Two slightly different disclosure channels are investigated; website text hosted by the crowdfunding platforms and investment memorandums provided by the company through the website. By creating lists and counts of the individual terms used it is possible to measure the degree of similarity across the set of disclosure texts and thereby apply a clustering algorithm to determine how firms are grouped. Then, by cross referencing the word lists with an established financial dictionary textual sentiment scores can be calculated. Combining the sentiment scores with company and offer details finally allows statistical modelling of the role such variable play in determining the success or failure of each crowdfunding campaign.

Results show that website disclosures fit into two main groups and those groups are heavily influenced by the host crowdfunding platforms. Splitting the groups by platform is less pronounced when investment memorandum texts are used. The main differences between the groups are in the amount of text provided and in the proportion of uncertainty terms used. Providing more text and including an investment memorandum both increase the likelihood of the crowdfunding campaign's success. However, there is little evidence that textual sentiment, such as the use of uncertainty terms, will help.

2. Literature Review

The two main forms of financial crowdfunding are equity crowdfunding and peer-to-peer (P2P) lending. P2P lending platforms create a market for personal and business debt. P2P markets vary in design but the main approaches are to either fix the interest rate then allow investors to pledge funds if they think the rate is appropriate, or to use a competitive bidding process to determine the rate.

⁶ Promoters is broadly defined to include both fundraising companies and crowdfunding platforms.

⁷ For example, one offer featured multiple posts discussing whether the fundraising company or an associated company owned the key intellectual property.

The use of disclosure in P2P lending has been researched with the aim of connecting disclosure narratives and funding outcomes for personal borrowers. By examining funding requests on a single P2P platform Herzenstein, Sonenshein, & Dholakia (2011) identified six types of identity claim: trustworthy, economic hardship, successful, moral and religious. They found borrowers with bad credit scores tended to claim more identities, and claiming more identities positively affected loan funding. However, as claiming more identities had negative effect on loan performance the results indicate that investors could be misled. Similarly Michels (2012) looked at unverified personal information provided by personal borrowers, again just for a single P2P platform, finding that borrowers who provide more disclosure receive greater bidding activity which lowers the final interest rate.

Recent research on disclosure in equity crowdfunding has identified reducing information asymmetry, along with concerns about impression management and intellectual property, as important factors. Moritz, Block, & Lutz (2015) undertook interviews with various market participants in the German equity crowdfunding market. They found that communication was important for reducing information asymmetry but the large number of investors involved in a crowdfunding campaign, unlike private equity or venture capital funding, meant personal connection was not viable. Instead management needed to use pseudo-personal forms of communication such as video and social media.

Equity crowdfunding involves reputational and information risks and will not suit every company. Turan (2015) observed that crowdfunding firms do not have the benefit of non-disclosure agreements, so must ensure they have adequate intellectual property protection in place before going public. This is supported by Gleasure (2015) who examined entrepreneurs' decisions not to use crowdfunding, finding entrepreneurs expressed concerns regarding the risk of giving away trade secrets and the reputational risks that follow from seeking alternative finance or publically failing to obtain it.

There is also a trade-off between transparency and disclosure, Gleasure (2015) argued that standardised disclosure should be encouraged by platforms if beneficial, but when the disclosures are risky or potentially costly to the firm then platforms needed to take steps to restrict access to information during the campaign and remove information after the campaign.

This interpretation of impression management differs from that normally used in discretionary disclosure literature. Merkl-Davies & Brennan (2007) contend that research on discretionary disclosure can be grouped into two approaches; impression management and information asymmetry. Impression management effectively assumes markets are weak form efficient which allows management to present positive discretionary text contrary to other information, such as the audited accounts, to produce a better overall impression of the firm. Information asymmetry, in contrast, assumes a semi-strong form of market efficiency where impression management is worthless as investors would see through it, but where discretionary disclosure still has value in complementing and adding to other data.

This paper is largely agnostic towards this distinction. As exploratory research we accept either approach may be applicable, but we do not yet have the evidence to choose between them. However, we do recognize that in an ideal crowdfunding scenario funding starts with people close to the company who are relatively well informed, their investment provides a signal or assurance to later, less informed, investors. If this ideal describes actual practice then impression management is unlikely to help and could even discourage the initial investors who have better information which enables them to see through any impression management, making the chance of overall funding success much less likely.

Increasing the amount of disclosure should reduce information asymmetry between investors and company promoters, in turn leading to financial benefits such as a lower cost of capital. Botosan (1997) found voluntary disclosure lowered the cost of capital in firms that did not have a strong analyst following, but increased disclosure was less valuable when other sources of company information were readily available. Similarly Orens et al. (2010) found such relationships when examining online disclosures, which allowed more direct communication between company and investors. These studies looked at situations where firms voluntarily provided disclosure additional to required disclosures. Taking a different approach Carpentier et al. (2009) found a similar relationship between cost of capital and disclosure when comparing firms undertaking IPOs, where disclosure was required, to firms undertaking reverse mergers, where much less disclosure was required.

Other researchers have concentrated on specific disclosures. For example Boujelbene & Affes (2013) found that disclosure of intellectual capital information lowered the cost of capital. Content analysis undertaken by Flöstrand & Ström (2006) connected types of annual report disclosure to analyst report contents, finding the typical annual report contained only five or six of the seventy possible disclosures analysts looked for. This suggests that companies should identify more value relevant information and forms of disclosure to ensure they are made public. While increased disclosure is beneficial, mandating or standardising these valuable disclosures is difficult due to the variety of possible value-relevant disclosures, it also increases costs for all issuers when regulators require specific disclosures.

Another approach to disclosure research is to examine whether firms deliberately obfuscate to conceal negative information, Brennan et al. (2009). For example Hrasky et al. (2009) examined the complexity of annual report narratives contained in the chairman's letter of Australian corporate annual reports. They found significant differences between textual complexity measures of high and low performing companies, even after controlling for company size and complexity. In contrast, Rutherford (2003) found that data from United Kingdom companies' operating and financial review reporting did not support the obfuscation hypothesis. Although they identified some disclosures as long and complex they accepted this was in part due to the underlying complexity of the organisation.

Financial reporting text has been subject to a range of research methodologies, the main approaches being content analysis, readability scoring and linguistic analyses such as narrative analysis. Traditional content analysis and linguistic approaches rely on the researcher directly reading, identifying and classifying elements of the text. Li (2010) provides a review of various techniques used in the textual analysis of financial disclosures. Manual approaches allow more detailed analysis which can be tailored to a specific research problem, however they are limited by small sample sizes. In comparison computerised approaches allow the fast analysis of large samples and are more reliable in that they are easier to replicate and rely less on the researcher's subjective judgement.

The two main approaches to computerised text analysis are dictionary-based and statistical methods. Dictionary-based methods compare the text with a standard list of categorised terms; for example positive and negative terms. Statistical approaches quantify terms used in the text in order to calculate correlations between documents or use the text variables as part of a statistical model. The three main quantitative measures of interest researchers can generate from text are the amount of disclosure, disclosure tone and disclosure transparency or readability.

Readability is most commonly measured using the Flesch readability score or similar methods based on measuring factors such as sentence length and the use of polysyllabic terms, (Hrasky et al., 2009). Although originally performed manually readability scores are now computer generated. However, automated approaches are still rather undeveloped and are not able to measure or determine the finer points of a text's structure or narrative. Although automated approaches allow the analysis of

much greater quantities of text the tools available are rather blunt. Stone & Parker (2013) argue that the Flesch formula is too simple as it uses sentence length, measured as the number of words, and word length, measured in syllables, as proxies for word and sentence complexity. This approach fails to recognise that for texts written for professional users polysyllabic words can allow more efficient communication of complex concepts than a series of shorter words. Loughran & McDonald (2014) examined the readability of financial disclosures using the Fog index, but found it to be of limited use. Instead they suggest that simply using file size was a viable proxy for readability.

Readability is also affected by the institutional environment. Loughran & McDonald (2013b) examined the impact of the SEC's 1998 plain English rule where issuers were instructed to avoid use of the passive voice, avoid legalese and make greater use of personal pronouns. They found that the change had a positive effect on disclosure style. However, the fact that the effect was stronger in firms with strong corporate governance policies indicates that some obfuscation remained.

The validity of dictionary approaches to text analysis depends on suitable classifications being used. Loughran & McDonald (2011b) found common word lists were originally developed for use in psychology and sociology research and will often misclassify words commonly found in financial texts. Although dictionary approaches are usually limited by their analysis of single terms, removing each term from its context, some multi-term research has been undertaken. Loughran & McDonald (2011a) search financial disclosures for phrases Barron's magazine had identified as indicators of questionable activities. They found some phrases were associated with negative announcement returns and other phrases associated with greater analyst forecast dispersion and others with increased stock volatility. By associating phrases with market reactions Loughran & McDonald (2011a) combined dictionary and statistical approaches.

A similar combination of dictionary and statistical analysis has been used by Loughran & McDonald (2013a) and Ferris, Hao, & Liao (2013) to examine the tone of S-1 documents.⁸ Loughran & McDonald (2013a) found greater use of uncertainty terms was associated with: higher first day returns, greater offer price revisions and greater volatility in the market after listing. Ferris et al. (2013) similarly find conservatism, measured by the use of negative terms, is inversely related to operating performance and stock returns for non-technology IPOs.

Statistical approaches have also been used to identify similarities and differences between the disclosures firms use when capital raising. Hanley & Hoberg (2010) distinguish between standard and informative content where standard content is content that has been in other, recent, prospectuses and the residual is informative content. They found increasing the proportion of informative content lowered the chance of a change in offer price between the initial filing and final prospectus and lower mispricing after the issue. Issue documents were more likely to be similar when firms were brought to the market by same participants, IPOs were by firms in same industry and offers were within 90 days of each other.

3. Sample and Methodology

The population of interest consists of sixty-nine public equity crowdfunding campaigns launched through licensed crowdfunding platforms in New Zealand. The population includes all public campaigns launched during the thirty months between April 2014, when equity crowdfunding became legal, and the end of September 2016. Of these sixty-nine campaigns six are excluded from the final

⁸ In the United States the IPO process formally begins with the filing of an S-1 document (or F-1 for foreign firms), this may go through multiple amendments before a final version is released as the prospectus.

sample as the companies were foreign registered and subject to different disclosure regulations in their home country.

The campaigns are not all independent. One company is an investment fund which includes other crowdfunded companies in its portfolio and two other companies have run multiple campaigns during the sample period.

Companies use multiple disclosure channels in an equity crowdfunding campaign. The primary channel is the campaign page on the crowdfunding platform's website. This page will usually include a link to a short introductory video and may include links to downloadable documents such as an investment memorandum or company constitution.⁹ Prior research on disclosure texts tends to concentrate on a single disclosure channel, Li (2010), so research comparing different channels provides a clear contribution to the literature. The main sources of data are the disclosure texts provided by each company on the platform website and in the investment memorandum. To facilitate its examination all available machine-readable text was extracted from each source into a text file.

As platform websites provide the primary means of communication with potential investors all sample companies provide this information, but only fifty-four companies provided an investment memorandum. All companies using PledgeMe, Equitise and Crowdcube provided an investment memorandum but neither of the sample companies using My Angel Investment or Liftoff provided an investment memorandum. Some text is excluded. Tables of contents and accounting tables were deleted as they would affect readability statistics. Standard platform warning statements and disclosures were also removed from the text files as this is not discretionary disclosure from the company.

To allow quantitative analysis the text files were used to create overall word counts, readability statistics and a term-document-matrix (TDM) which contains counts of each term used in the texts. Basic word counts and the Flesch reading ease measure were generated in Microsoft Word. The reading ease measure provides a figure from 0 to 100. A 0 means the text is unreadable, 100 means the text is easily read by a literate person. The Text Mining (TM) package in R was used to construct a TDM for use in the clustering and sentiment analysis. The TM package provides a range of data transformations to ensure correct and efficient identification of identical terms. The following transformations were used; all text was converted to lower case, numbers and stopwords (common words with little informational value) were removed, punctuation and excess white spaces (gaps) were also removed.

The transformed text files were used to construct TDMs for the website and offer document texts. The TDMs used for sentiment analysis contained all terms used in the source files except stopwords. This resulted in a 63 document by 13,983 term matrix for website text and a 54 document by 14,840 term matrix for investment memorandum text.

TDMs contain word counts for all terms used in at least one document source file, except stopwords. However the majority of word counts are zero as many terms are used by few companies. Before undertaking the clustering analysis the TDMs were further modified by removing infrequently occurring terms. Apart from concentrating the analysis on more common terms, removing infrequently used terms ensured that terms referring to the crowdfunding platforms were removed. Leaving the platform names in the TDMs would increase the appearance of clustering within, but not

⁹ Companies have referred to their investment memorandum as a business plan, guidebook, investor memorandum, investor information pack, share offer document or not given it a specific title.

across, platforms. The resulting matrix sizes were; 63 documents by 360 terms for website text, 54 documents by 522 terms for investment memorandum text.

The cluster analysis has some similarities with the approach used by (Hanley & Hoberg, 2010). In both, TDMs were constructed to enable measurement of the degree of similarity between offer documents. However, there are differences in the specific details used such as Hanley and Hoberg using stemming to reduce terms to their roots and normalising the vectors in the TDM so different word counts did not result in greater differences measured between documents.

Table 2. Descriptive Statistics for Word Counts and Reading Ease by Platform

Website Text:							
Platform:	N	WORD COUNTS			FLESCH READING EASE		
		Minimum	Average	Maximum	Minimum	Average	Maximum
AlphaCrowd	3	3,871	3,929	4,035	34.5	38.9	41.2
Crowdcube/Crowdsphere	3	1,010	2,311	3,232	36.6	41.9	47.4
Equitise	10	950	2,558	4,307	17.4	32.7	45.9
Liftoff	1	9,854	9,854	9,854	32.7	32.7	32.7
My Angel Investment	1	5,847	5,847	5,847	29.8	29.8	29.8
PledgeMe	25	948	2,257	3,850	31.3	43.7	56.6
The Snowball Effect	20	4,097	9,252	15,486	25.3	39.1	47.9

Offer Document Text:							
Platform:	N	WORD COUNTS			FLESCH READING EASE		
		Minimum	Average	Maximum	Minimum	Average	Maximum
AlphaCrowd	3	4,848	5,139	5,292	33.4	37.0	39.5
Crowdcube/Crowdsphere	3	3,068	5,389	6,780	41.2	43.4	44.9
Equitise	10	1,836	3,936	6,012	20.9	32.6	44.7
Liftoff	0	-	-	-	-	-	-
My Angel Investment	0	-	-	-	-	-	-
PledgeMe	25	2,170	5,306	10,132	29.9	47.4	60.5
The Snowball Effect	13	5,342	10,430	21,738	29.4	41.5	54.2

Sentiment statistics were generated using Loughran and McDonald's 2014 Master Dictionary, available at http://www3.nd.edu/~mcdonald/Word_Lists.html. The full TDMs were cross referenced with the dictionary lists for negative, positive, uncertainty and litigious terms to calculate the percentage of terms used in each category for each source file.

4. Results and Analysis

4.1. Clustering

Results from the cluster analysis are presented in Figures 1 and 2. Figure 1 was constructed using the TDMs containing website text and Figure 2 using investment memorandum text. Irrespective of the disclosure channel both figures show clustering by host crowdfunding platform, but not by chronological sequence.

Figure 1 shows very strong clustering in two groups based on the host crowdfunding platforms. The upper group (cluster A1) contains all PledgeMe, Equitise and Crowdcube campaigns as well as the first Snowball Effect campaign. The lower group (cluster B1) contains all other Snowball Effect campaigns, all three from AlphaCrowd and the sole Liftoff and My Angel Investment offers. Differences between

individual campaign texts are greater in cluster B1 than A1. There is no apparent clustering by sequence.

Figure 2 shows less well defined groups. At the top is a stand alone cluster (C2) of two Snowball effect campaigns, #25 is Punakaiki Fund and #45 is Powerhouse Ventures, both are small venture capital style investment funds so separation into their own cluster is logical. The cluster A2 contains around half the PledgeMe and Equitise campaigns and one from Crowdcube. All Snowball Effect, AlphaCrowd and the remaining PledgeMe, Equitise and Crowdcube campaigns are in the large lower cluster (B2). Again there is no apparent clustering by sequence.

Apart from the two investment funds splitting off into their own cluster the main difference between Figures 1 and 2 is the movement of around half of the firms in cluster A1 moving into cluster B2. Although there is a lot of overlap in the text used in the two disclosure channels, investment memorandums are generally longer and are less likely to be influenced by the crowdfunding platform.

To gain additional insight into the differences between clusters logit models were estimated, these are reported in Table 3. The logit models exclude the word count variable as the model cannot be estimated with it. Inspection of the raw data shows word counts are almost a perfect predictor of the differences between clusters with higher word counts in clusters B1 and B2 than in A1 and A2 respectively. The only other variable distinguishing between cluster membership is the proportion of uncertainty terms, with higher proportions in clusters B1 and B2 than in A1 and A2 respectively. Interestingly this result holds for both disclosure channels, indicating that the extra managerial discretion available in writing investment memorandums increases the use of uncertainty terms for some PledgeMe, Equitise and Crowdcube firms, moving them closer to the disclosure tone used by Snowball Effect and Alphacrowd firms. We now need to consider whether the type of disclosure offered helps firms achieve their funding goals.

4.2. Sentiment and Offer Characteristics

Having determined that there are differences between disclosures made by firms we turn to look at the impact of offer characteristics, disclosures and textual sentiment on the success, or failure, of the crowdfunding campaign. Four measures of success are modeled: firstly a simple binary model of whether the firm achieved its minimum funding target, secondly a model of the amount of funds pledged, thirdly a model of the number of investments pledged to each campaign, and finally a hazard model of the time required to achieve funding.

The logit models, in Table 4, does not find much evidence of offer characteristics, disclosures or textual sentiment changing the likelihood of a crowdfunding campaign reaching its minimum target. The only statistically significant variable is the investment memorandum dummy, which indicates that providing an investment memorandum increases the likelihood of success.

The ordinary least squares (OLS) models of the amount pledged, in Table 5, is more successful with reasonable r-squares and significant F-scores. Again we find that including an investment memorandum helps. The results appear to show that increasing the amount of disclosure text allows the firm to raise more funds, but we need to be mindful of the possibility that disclosure quantity and firms seeking more funds are both related to another, confounding variable, such as company size. The positive coefficient on the minimum amount raised variable is consistent with firms getting more funding if they ask for more funding.

Negative binomial models were used to estimate the number of pledged investments because a Poisson model is not appropriate when the mean and variance of the dependent variable are very different. Presented in Table 6, all statistically significant coefficients in these models are positive,

indicating factors that help attract more investors. Again, including an investment memorandum and providing more disclosure helps. There is some evidence that more readable disclosure also helps attract investors, as does company age, but only from the models using website text. Again we should be careful about confounding variables, in this case older companies needing more funds and therefore more investors.

The proportional hazard models, in Table 7, incorporate both time and outcome in the dependent variable. In these models positive coefficients mean the event, in this case successful funding, is more likely to occur on any given day and therefore likely to occur sooner. In this context positive coefficients indicate more of that variable is desirable. As found in most of the other models providing an investment memorandum and greater quantities of disclosure text are more likely to succeed, more readable text also helps.

The hazard models provide the only results where sentiment variables are significant with any consistency across the different model specifications. Negative language means funding takes longer to achieve, which is the expected relationship, but positive language does not help. Interestingly, the use of uncertainty terms helps accelerate funding. As has already been established, uncertainty language is more likely to be used by firms using Snowball Effect and AlphaCrowd, while firms using PledgeMe, Equitise and Crowdcube/Crowdsphere may use uncertainty terms in an investment memorandum they are less likely to use these terms on the crowdfunding website.

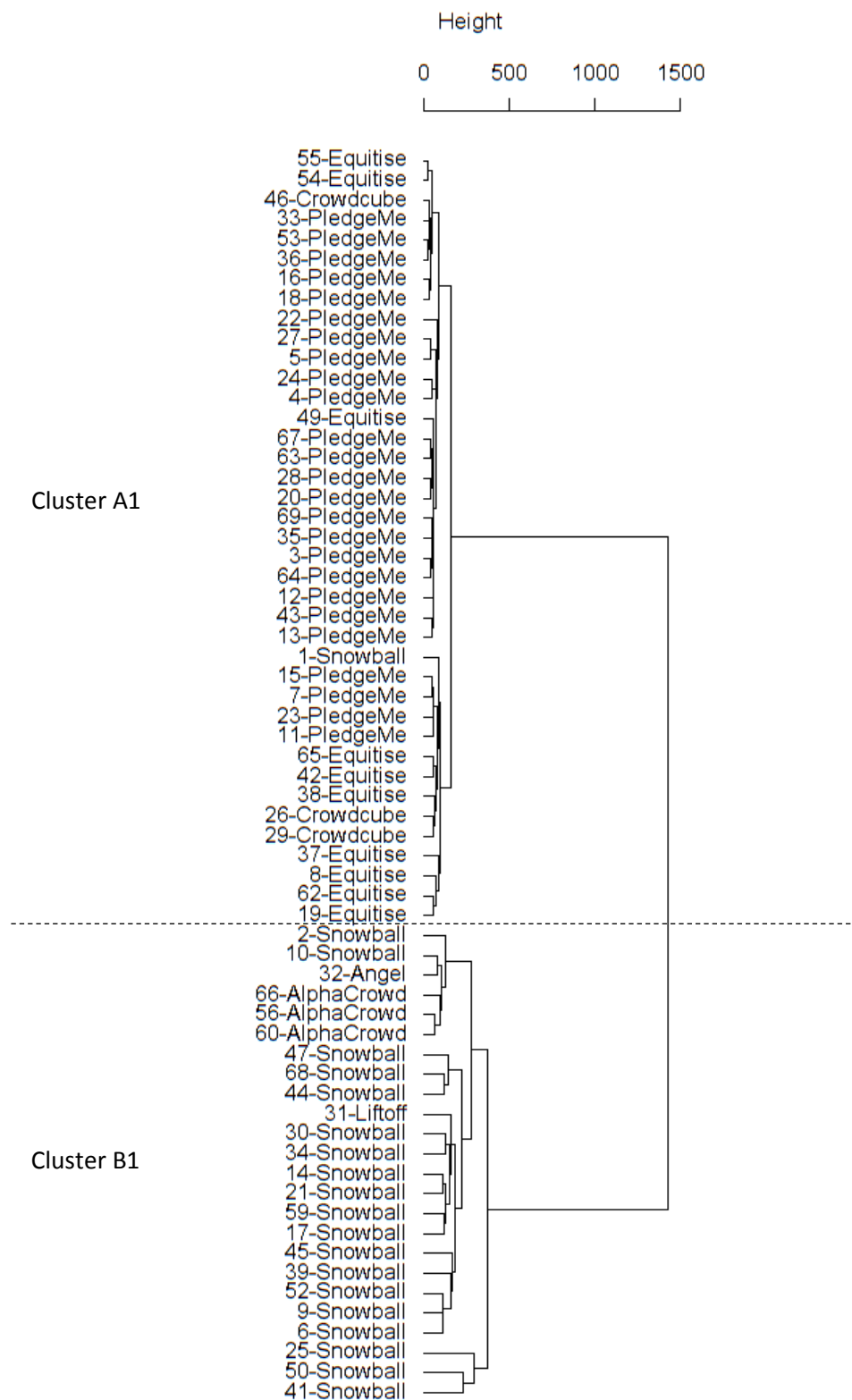
5. Summary

New Zealand's equity crowdfunding laws allow firms to raise a limited amount of equity from an unlimited number of investors without imposing any formal disclosure requirements. Instead, firms wanting to use these exemptions from the usual financial disclosure law must raise funds through a licenced crowdfunding platform. In the absence of formal disclosure rules it is possible that other institutions or market forces will impose informal disclosure expectations. This paper is an exploratory study of the impact crowdfunding platforms and the imitation of other offers has on disclosure.

Although the data, market and aspects of the methodology differ, the clustering results have some similarities with Hanley & Hoberg (2010). When firms seek public investment for the first time the issue documentation is more likely to be similar for firms which are brought to the market by the same participants. When the financing method is equity crowdfunding it is the platforms that impose some structure on what information is disclosed.

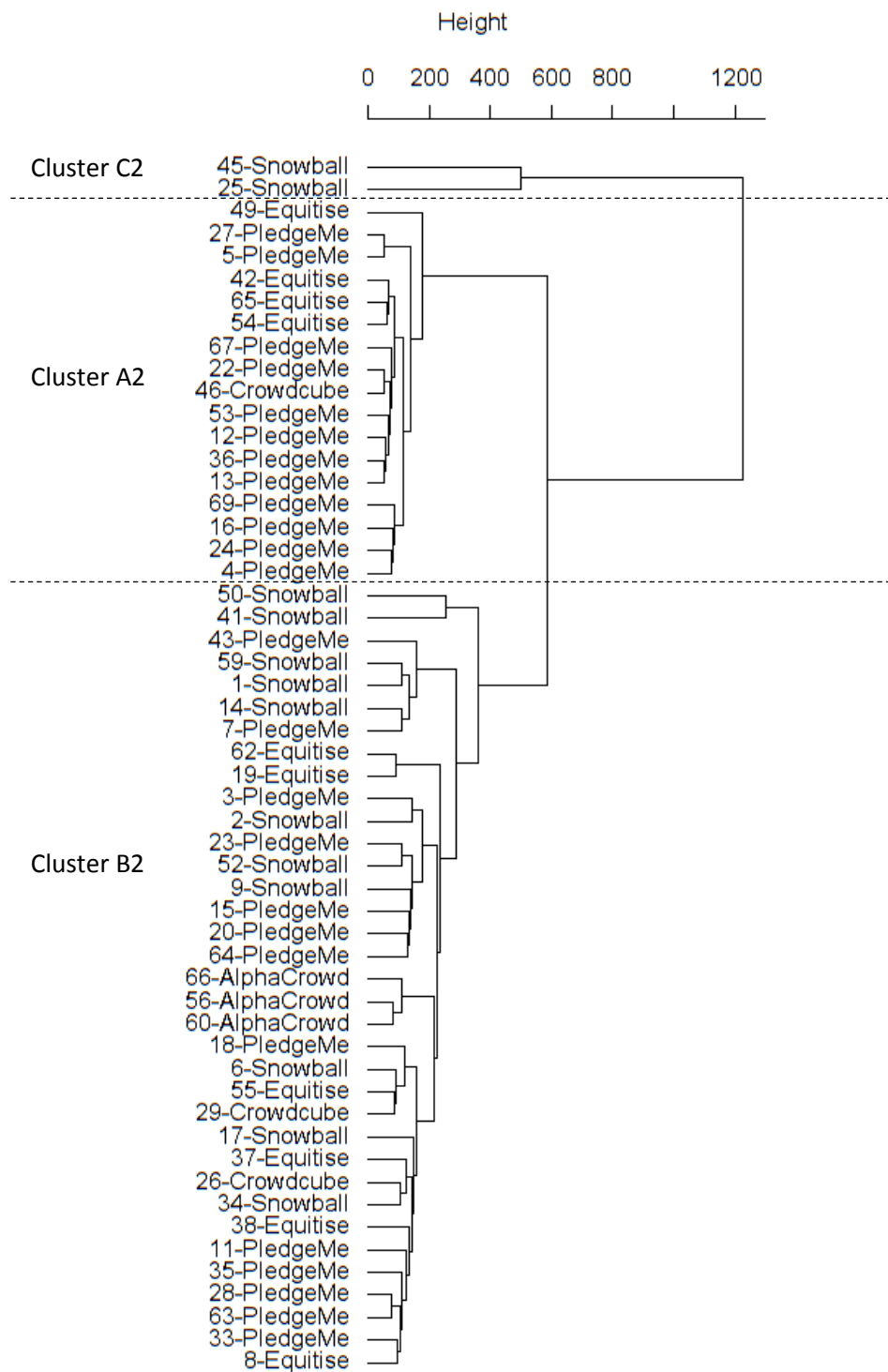
Overall, the results do not provide strong support for the idea that textual sentiment has a meaningful role in the success or failure of public equity crowdfunding. Although both Loughran & McDonald (2013a) and Ferris, Hao, & Liao (2013) found the tone of S-1 documents was related to a range of factors determining the success of initial public offers in the United States, few of the crowdfunding models contain significant sentiment variables. What is important are the simple acts of providing an investment memorandum and larger quantities of disclosure text.

Figure 1. Cluster Dendrogram Created From Website Text



Each crowdfunding company is represented by a number showing its place in the sequence of campaigns and the name of the host crowdfunding platform. Missing numbers are due to foreign registered companies being included in the sequence but excluded from the sample. Each campaign is adjacent to those least different to it, 'Height' indicates the relative difference between website texts. A dotted line separates the two main clusters.

Figure 2. Cluster Dendrogram Created From Investment Memorandum Text



Each crowdfunding company is represented by a number showing its place in the sequence of campaigns and the name of the host crowdfunding platform. Missing numbers are due to some companies not providing an investment memorandum, or similar, document and due to foreign registered companies being excluded from the sample. Each campaign is adjacent to those least different to it, 'Height' indicates the relative difference between document texts. Dotted lines separate the main clusters.

Table 3. Logit Model of Cluster Groups

	Website text				Investment memorandum text			
	Full Model		Stepwise Model		Full Model		Stepwise Model	
	Coefficient	<i>p-value</i>	Coefficient	<i>p-value</i>	Coefficient	<i>p-value</i>	Coefficient	<i>p-value</i>
(Intercept)	13.7374	0.995	13.2100	0.995	-11.8072	0.043 *	-10.9034	0.012 *
MaxOwn	8.2817	0.138	6.8740	0.130	12.6624	0.051	13.7244	0.024 *
log(Age)	0.0968	0.761			0.6819	0.077	0.7108	0.048 *
log(Minimum)	-0.1279	0.718			0.3244	0.451		
ReadingEase	-0.0194	0.704			0.0024	0.962		
Pos	-0.0508	0.916			-0.0556	0.910		
Neg	-0.3769	0.732			-0.8733	0.450		
Unc	4.0003	0.006 **	3.7430	0.002 **	4.8095	0.005 **	4.3824	0.004 **
Lit	0.4122	0.833			0.0099	0.995		
IM	-19.6008	0.992	-19.6880	0.992				
Pseudo R ² :	0.619		0.612		0.404		0.381	
LR Test:	38.25	0.000	37.65	0.000	17.78	0.023	16.63	0.001
AIC:	65.474		54.079		65.946		57.098	
N:	63		63		52		52	

MaxOwn is the maximum ownership proportion available to new investors. Age is the time, in days, between the company's registration and the start of its crowdfunding campaign. Minimum is the minimum amount of funds to be pledged, in \$1000, for the campaign to be funded. ReadingEase is the Flesch reading ease scale. Pos is the proportion of positive terms in the text. Neg is the proportion of negative terms in the text. Unc is the proportion of uncertainty terms in the text. Lit is the proportion of litigious terms in the text. IM is a dummy variable coded 1 if the firm provides an investment memorandum or similar document.

Table 4. Logit Model of Campaign Success (Meeting Minimum Funding Target)

	Website text				Investment Memorandum text			
	Full Model		Stepwise Model		Full Model		Stepwise Model	
	Coefficient	<i>p-value</i>	Coefficient	<i>p-value</i>	Coefficient	<i>p-value</i>	Coefficient	<i>p-value</i>
(Intercept)	-4.5469	0.286	-5.4746	0.041 *	3.6259	0.455	4.3908	0.016 *
MaxOwn	-0.8492	0.758			-2.4103	0.453		
log(Age)	0.4612	0.157	0.3204	0.136	-0.0320	0.923		
log(Minimum)	-0.4737	0.279			0.1064	0.789		
ReadingEase	-0.0080	0.858			-0.0035	0.936		
Words	0.0004	0.060	0.0003	0.055	0.0001	0.445		
Pos	-0.1154	0.770			-0.7875	0.129	-0.8750	0.069
Neg	-0.9197	0.289			-0.7044	0.472		
Unc	1.0909	0.245			0.7160	0.517		
Lit	1.7477	0.304			-1.7500	0.269	-2.1160	0.122
IM	3.7041	0.028 *	3.1888	0.028 *				
Pseudo R ² :	0.277		0.195		0.187		0.118	
LR Test:	12.85	0.2321	8.77	0.0326	7.05	0.6321	4.34	0.1139
AIC:	81.731		71.816		72.896		61.6	
N:	59		59		51		51	

MaxOwn is the maximum ownership proportion available to new investors. Age is the time, in days, between the company's registration and the start of its crowdfunding campaign. Minimum is the minimum amount of funds to be pledged, in \$1000, for the campaign to be funded. ReadingEase is the Flesch reading ease scale. Words is the number of words in each text. Pos is the proportion of positive terms in the text. Neg is the proportion of negative terms in the text. Unc is the proportion of uncertainty terms in the text. Lit is the proportion of litigious terms in the text. IM is a dummy variable coded 1 if the firm provides an investment memorandum or similar document.

Table 5. OLS Model of Total Amount Pledged

	Website text			Investment Memorandum text				
	Full Model		Stepwise Model	Full Model		Stepwise Model		
	Coefficient	<i>p</i> -value	Coefficient	<i>p</i> -value	Coefficient	<i>p</i> -value		
(Intercept)	4.6020	0.022 *	4.5980	0.003 **	8.1090	0.002 **	7.4390	0.000 ***
MaxOwn	-1.0910	0.486			-1.8890	0.276	-1.7580	0.150
log(Age)	0.2801	0.070	0.3048	0.008 **	-0.0409	0.812		
log(Minimum)	0.4359	0.016 *	0.4510	0.009 **	0.7611	0.000 ***	0.7506	0.000 ***
ReadingEase	0.0080	0.717			-0.0137	0.547		
Words	0.0002	0.002 **	0.0002	0.002 **	0.0002	0.000 ***	0.0002	0.000 ***
Pos	0.0041	0.985			0.0418	0.867		
Neg	-0.4478	0.335			-0.4159	0.430		
Unc	0.9308	0.062	0.8575	0.033 *	0.4218	0.451		
Lit	1.1210	0.186			0.0823	0.923		
IM	1.7040	0.006 **	1.7090	0.003 **	0.0000	0.000		
Adjusted R-sq:	0.329		0.360		0.320		0.378	
F-statistic:	3.84	0.001	7.509	0.000	3.612	0.002	11.13	0.000
N:	59		59		51		51	

MaxOwn is the maximum ownership proportion available to new investors. Age is the time, in days, between the company's registration and the start of its crowdfunding campaign. Minimum is the minimum amount of funds to be pledged, in \$1000, for the campaign to be funded. ReadingEase is the Flesch reading ease scale. Words is the number of words in each text. Pos is the proportion of positive terms in the text. Neg is the proportion of negative terms in the text. Unc is the proportion of uncertainty terms in the text. Lit is the proportion of litigious terms in the text. IM is a dummy variable coded 1 if the firm provides an investment memorandum or similar document.

Table 6. Negative Binomial Model of the Number of Pledged Investments

	Website text				Investment Memorandum text			
	Full Model		Stepwise Model		Full Model		Stepwise Model	
	Coefficient	<i>p-value</i>	Coefficient	<i>p-value</i>	Coefficient	<i>p-value</i>	Coefficient	<i>p-value</i>
(Intercept)	-2.1440	0.064	-1.1325	0.225	-0.8784	0.592	0.6254	0.528
MaxOwn	0.9584	0.298			0.8755	0.435		
log(Age)	0.2788	0.002 **	0.2001	0.004 **	0.1630	0.147		
log(Minimum)	0.0725	0.484			0.3848	0.001 **	0.3990	0.001 ***
ReadingEase	0.0427	0.001 **	0.0454	0.001 ***	0.0277	0.061	0.0229	0.082
Words	0.0001	0.008 **	0.0001	0.004 **	0.0001	0.001 **	0.0001	0.000 ***
Pos	-0.0139	0.914			-0.0570	0.726		
Neg	-0.1272	0.641			0.1066	0.756		
Unc	0.5161	0.074	0.4138	0.095	0.2469	0.498		
Lit	1.5460	0.002 **	1.6053	0.000 ***	-0.0602	0.914		
IM	1.0470	0.003 **	0.9501	0.006 **				
Pseudo R ² :	0.058		0.054		0.161		0.159	
LR Test:	38.76	0.000	36.36	0.000	108.56	0.000	106.40	0.000
AIC:	655.64		650.04		583.84		574	
N:	59		59		51		51	

MaxOwn is the maximum ownership proportion available to new investors. Age is the time, in days, between the company's registration and the start of its crowdfunding campaign. Minimum is the minimum amount of funds to be pledged, in \$1000, for the campaign to be funded. ReadingEase is the Flesch reading ease scale. Words is the number of words in each text. Pos is the proportion of positive terms in the text. Neg is the proportion of negative terms in the text. Unc is the proportion of uncertainty terms in the text. Lit is the proportion of litigious terms in the text. IM is a dummy variable coded 1 if the firm provides an investment memorandum or similar document.

Table 7. Cox Proportional Hazard Model of Time to Funding

	Website text				Investment Memorandum text			
	Full Model		Stepwise Model		Full Model		Stepwise Model	
	Coefficient	<i>p</i> -value	Coefficient	<i>p</i> -value	Coefficient	<i>p</i> -value	Coefficient	<i>p</i> -value
MaxOwn	-1.0290	0.571			-2.4920	0.259	-3.5660	0.054
log(Age)	0.3907	0.036 *	0.4442	0.004 **	0.0808	0.683		
log(Minimum)	0.0130	0.949			0.5523	0.011 *	0.5451	0.008 **
ReadingEase	0.0736	0.004 **	0.0745	0.003 **	0.0605	0.031 *	0.0507	0.040 *
Words	0.0001	0.042 *	0.0001	0.045 *	0.0002	0.003 **	0.0002	0.001 **
Pos	-0.4247	0.078	-0.4337	0.072	-0.1984	0.423		
Neg	-1.0370	0.039 *	-1.0350	0.036 *	-0.5851	0.297	-0.9120	0.044 *
Unc	1.4070	0.007 **	1.4690	0.004 **	1.3870	0.031 *	1.0770	0.045 *
Lit	1.3700	0.055	1.3650	0.055	-1.0310	0.308		
IM	1.7740	0.006 **	1.8080	0.005 **				
Pseudo R ² :	0.364		0.361		0.338		0.316	
LR test:	26.73	0.003	26.38	0.001	21.05	0.012	19.38	0.004
Wald test:	24.88	0.006	24.86	0.002	19.77	0.019	18.51	0.005
N:	59		59		51		51	
Events:	41		41		37		37	

MaxOwn is the maximum ownership proportion available to new investors. Age is the time, in days, between the company's registration and the start of its crowdfunding campaign. Minimum is the minimum amount of funds to be pledged, in \$1000, for the campaign to be funded. ReadingEase is the Flesch reading ease scale. Words is the number of words in each text. Pos is the proportion of positive terms in the text. Neg is the proportion of negative terms in the text. Unc is the proportion of uncertainty terms in the text. Lit is the proportion of litigious terms in the text. IM is a dummy variable coded 1 if the firm provides an investment memorandum or similar document.

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