

EXAMINING THE STRUCTURE OF CORPORATE HYBRID BONDS AND THE  
STOCK MARKET REACTION TO THEIR ANNOUNCEMENT IN FINLAND

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### **Objectives**

Hybrid bonds are a product that combines features of both equity financing and debt financing including tax deductibility of interest, coupon deferral and equity credit. The impact of a hybrid bond issue on share price has not been researched in the past in academia. The first objective of this research is to identify how Finnish hybrid bonds are structured and how they compare to other European hybrid bonds. The second objective is to identify whether a relationship between a hybrid bond issue announcement and share performance exists. The last objective is to understand what factors correlate with the market reactions to announcements.

### **Summary**

This study reviewed academic literature and conducted an interview of a debt capital markets professional. This study looks at 36 publicly listed Finnish hybrid bond issues made during the 2008 - 2018 time period and examines the performance of the underlying companies' shares around the announcement date of each issue.

### **Conclusions**

Finnish hybrid bonds have a few notable differences including that they tend to have perpetual maturities, earlier first call dates, higher coupon step-ups, absence of replacement language and lower regard for credit rating agency equity credit compared to commonly issued hybrid bonds in other European countries. A negative stock market reaction of -0.6% on average exists that is statistically significant and in line with academic research regarding similar securities in other markets. The market reaction to a hybrid bond announcement seems to be negatively correlated with the coupon-% and have no correlation with bankruptcy risk (Altman Z-score) and effective maturity, although, the regressions were not statistically significant.

**Keywords:** hybrid bond, capital structure, financing options, market reaction

**Number of pages:** 77

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COVER PAGE

ABSTRACT

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## **1. INTRODUCTION**

### **1.1. Background**

A hybrid bond (in Finnish “hybridilaina”) is defined by Bloomberg (2019) as:

*“A class of securities that have the characteristics of both debt and equity. A portion of the proceeds are considered equity by rating agencies, such as Moody’s Investors Service or Standard & Poor’s. The bonds typically have maturities of more than 30 years, allow borrowers to skip payments without defaulting, and rank behind traditional bonds in a company’s capital structure. They are paid before stocks and interest is paid pre-tax.”*

The hybrid bond is, therefore, a debt security, and thus benefits from the corporate tax shield, while simultaneously not increasing a company’s risk of financial distress as the borrower can skip payments without going bankrupt.

Firstly, the thesis examines the typical terms and features of hybrid bonds in Finland and internationally. This thesis then explores relevant existing academic theory regarding optimal capital structure of corporations. The thesis then empirically analyses the market reactions to hybrid bond issue announcements in Finland. It analyses the stock market returns for publicly listed companies in Finland surrounding the announcement of a hybrid bond issue in order to identify a relationship between stock market returns and hybrid bond announcements. Lastly, the thesis draws conclusions about the market reaction to a hybrid bond announcement as well as factors that correlate or do not correlate with positive and negative market reactions.

### **1.2. Research problem**

As identified earlier, hybrid bonds have the potential to allow firms to access the tax shield benefits of increased leverage while simultaneously not increasing a company’s present value of costs of financial distress to the same extent that normal loans do. Therefore, it is interesting whether markets currently view the instrument as relatively ‘cheap’ equity (cheaper cost of capital than a traditional equity issue) or

as 'expensive' debt (debt with a relatively high interest). In addition, information asymmetry between company management and investors can play a role in hybrid bond viability.

As the relationship between hybrid bond issues and company stock price has not been examined in the academic setting, this research contributes by shedding light on the current market sentiment for the financial instrument.

### **1.3. Research objectives and questions**

The first goal of this thesis is to provide a solid understanding of hybrid bonds in the Finnish market, including the most typical terms and the main differences regarding how the hybrid bonds differ from hybrid bond issues in other foreign markets. The first research question examined is:

- 1. How are Finnish hybrid bonds typically structured and how do they differ from hybrid bonds in other markets?*

A second goal of this thesis is to examine how the market reacts to a company deciding to issue hybrid bonds. The second research question is:

- 2. What is the impact of a hybrid bond announcement on company share price?*

In discussions with Finnish investment bankers, negative connotations surround the hybrid bond instrument due to their use in financing companies that are close to insolvency and the product seems to mostly be used as a last resort debt financing product in the pecking order. Therefore, the hypothesis is that the market reacts negatively to a company announcing the issuance of a hybrid bond. It is interesting to test this hypothesis because the opposite reaction could also theoretically hold true in practice that a positive impact on share price is witnessed e.g. due to standard trade-off theory and the tax benefits of leverage.

Furthermore, the third goal of the thesis is to identify potential factors that influence the market reaction to a hybrid bond issue. The third research question is:

*3. What factors correlate with the market reactions to hybrid bond announcements?*

This research objective is important as it seeks to identify some of the independent variables that correlate with a successful hybrid bond announcement. For instance, the coupon or other terms of the hybrid bond or the solvency position of the issuing company could influence the market reaction.

**1.4. Structure of the thesis**

This thesis is based on both qualitative and quantitative data collected from primary and secondary sources. Section 2, the Literature Review, uses secondary qualitative sources to analyse company usage of different financing methods. Furthermore, it uses primary sources such as an interview of a Finnish debt capital market professional in order to identify market trends and typical terms of hybrid bonds in the Finnish market. Section 3 consists mostly of the quantitative analysis of information regarding hybrid bonds and financial markets.

## **2. LITERATURE REVIEW**

The first section of the literature review reviews the existing literature regarding hybrid bonds and similar mezzanine financing products. It identifies the typical terms that are set in hybrid bonds, agency and moral hazard issues regarding hybrid bonds, the existing regulations regarding hybrid bonds and other relevant items.

The second section of the literature review focuses on the prevailing academic frameworks and theories regarding corporate capital structure. These include: 1) the trade-off theory, 2) the pecking order theory, 3) market timing theory and 4) credit rating capital structure hypothesis.

### **2.1. Defining hybrid bonds**

This section of the literature review, seeks to identify the existing information and academic research regarding hybrid bonds in Finland and internationally. Additionally, since only a portion of hybrid bonds are traded publicly, much of the details on terms may not be public. Due to the insufficient level of detail in a majority of public sources on typical terms of Finnish hybrid bonds, an interview of a Debt Capital Markets professional was conducted for the purposes of this research (Suolanen, 2019: pers. comm., 15 May). This section explores what information is publicly available regarding past hybrid bond issues, more specifically, on key terms in order to understand what hybrid bonds are, how they vary from one another, and any other information regarding hybrid bonds deemed of importance to answering the research questions.

#### **2.1.1. Structures and terms of hybrid bonds**

As explained earlier, hybrid bonds are a mezzanine financing instrument with characteristics of both equity and debt. This section of the thesis explores the European market for hybrid bonds and afterward the Finnish market to identify how hybrid bonds are structured, and whether there are any significant differences in

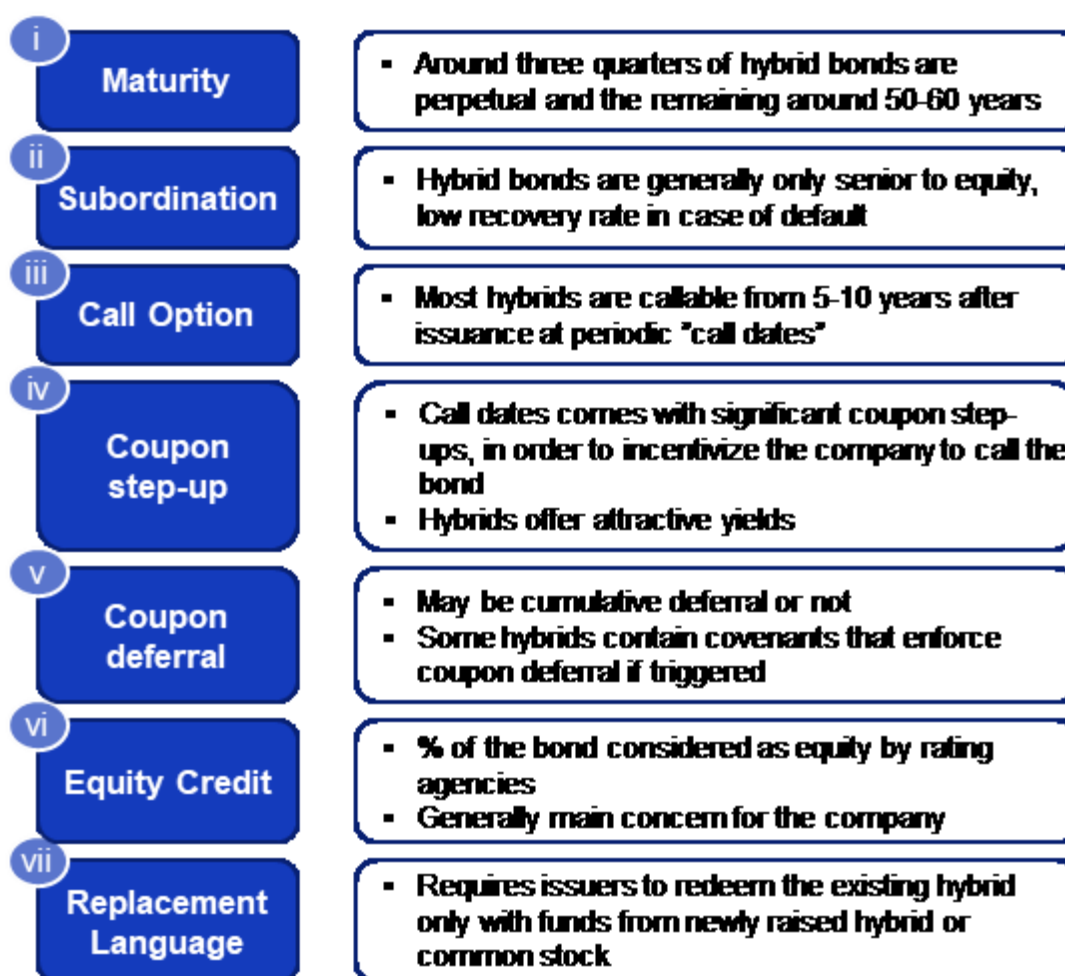
Finnish hybrid bonds compared to other European markets as they might operate in different regulatory environments.

### 2.1.1.1 Typical structures and terms in Europe

Lafontaine (2014) has created a rather comprehensive review of the European hybrid bond market on a high level so this section draws to a significant extent from his analysis, and also seeks to identify whether there are any significant changes that have happened after the time period. The hybrid bond market is a rather new market that began developing in 2005 as a response to additional capital requirements for financial institutions issued in the Basel agreements.

Lafontaine (2014) uses the overview presented in Figure 1 to highlight the key terms present in a typical hybrid bond:

Figure 1: Key features of hybrid bonds - framework



Source: Lafontaine (2014)

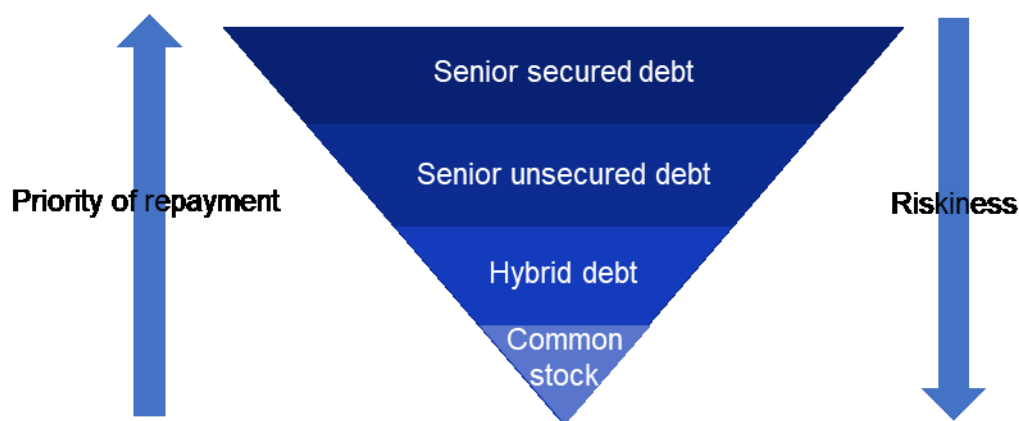
### i) Maturity

Lafontaine (2014) indicates that approximately 75% of hybrid bonds are perpetual in maturity while the rest have significantly long maturities of approximately 50 - 60 years. The research also notes that due to the coupon step-up(s) present in most hybrid bonds, hybrid bonds are normally called at call dates rather than at their maturity.

### ii) Subordination

Hybrid bonds are senior to equity and junior to all other forms of debt. They typically do not place limitation on future debt issuance. It should be noted that recovery rates for hybrid bonds in the case of insolvency are low (Lafontaine, 2014). Figure 2 can be used to illustrate the subordination of hybrid bonds relative to other capital structure items:

Figure 2: Subordination of capital structure items



Source: Ahlberg & Jansson (2016: 13)

### iii) Call option

Hybrid bonds typically have a non-callable period and after this, have callability after 5-10 years of the issue at periodic timeframes (typically quarterly) at an agreed price point. The callability of bonds is incentivized by coupon step-ups (Lafontaine, 2014). Callability can also be triggered by other events. These events are typically ones that result in significant changes to the viability or function of the product for the

issuer. According to Morgan Stanley (2017) the following are typical special event calls where an issuer can redeem a hybrid bond earlier:

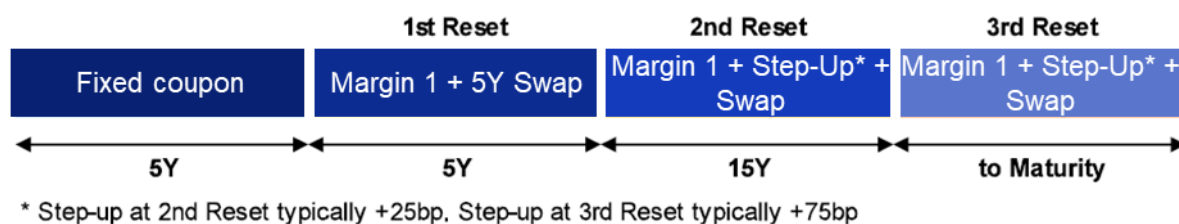
- Rating event call / capital event call: gives issuer the right to redeem a hybrid bond earlier if the equity benefit classification of the instrument worsens under the classifications of the rating agencies.
- Accounting event call: gives issuer the right to redeem a hybrid bond early if the instrument is no longer classified as equity or financial liability under IFRS accounting principles.
- Change of control call: gives issuer the right to redeem the hybrid bond earlier if there is a change in ownership of the issuer. Typically, if the hybrid bond is not called earlier, it results in a coupon step-up.
- Tax event call: gives the issuer the right to redeem a hybrid bond early if they need to pay additional taxes to hybrid bond holders due to changes in tax legislation. Also, another type of tax event is if the cost of the hybrid is no longer tax deductible due to changes in tax regulations.
- Clean-up call: allow the issuer to redeem a hybrid when the amount of outstanding hybrid debts drops below a specified amount.

Lafontaine (2014) notes that the most common special event call is an event where a credit rating agency no longer provides equity credit for the bond (i.e. a rating event call). It is also noted that these trigger event may force investors to sell at lower than market prices. In these cases, several issuer companies in the past have called the bonds at slightly higher rates than what the legal documentation would otherwise entail due to differences in the bonds' trading prices and the call price in the legal documentation. This has mainly been done to limit losses for the investors.

#### **iv) Coupon step-ups**

According to Morgan Stanley (2017), Hybrid bonds that have been issued since 2012 typically have a fixed rate coupon for the initial period until the first call date. After the first call date, if the bonds are not called, the bond would change to a variable or a swaps-linked coupon. The second and third call dates typically come with additional step-ups. These step-ups incentivize calling the bond when it is possible to refinance the hybrid bond at a lower rate. Figure 3 details the typical structure of a European hybrid bond.

Figure 3: Typical hybrid bond structure after 2012



Source: Morgan Stanley (2017)

#### v) Coupon deferral

According to Lafontaine (2014), the vast majority of hybrid bonds have optional coupon deferral at the sole discretion of the issuer. The company can defer coupon payments without being in default and therefore have no obligation to make the payments (fully or partly). Usually, the upper limit for coupon deferral is set at 5 years. The deferral criteria is typically set in such a way that the issuer is not allowed to pay dividends or engage in share buybacks if they defer interest payments.

Some hybrid bonds come with mandatory coupon deferrals which are set into force automatically when certain ratios are not reached. These are typically set in such a way that they protect senior lenders in financial distress situations.

For most hybrid bonds, cumulative deferral of interest is a normal feature, where deferred interests are due when the company begins paying interests again. Only a minority of hybrid bonds have a non-cumulative feature where any interest not paid is forfeited and no longer payable by the issuer.

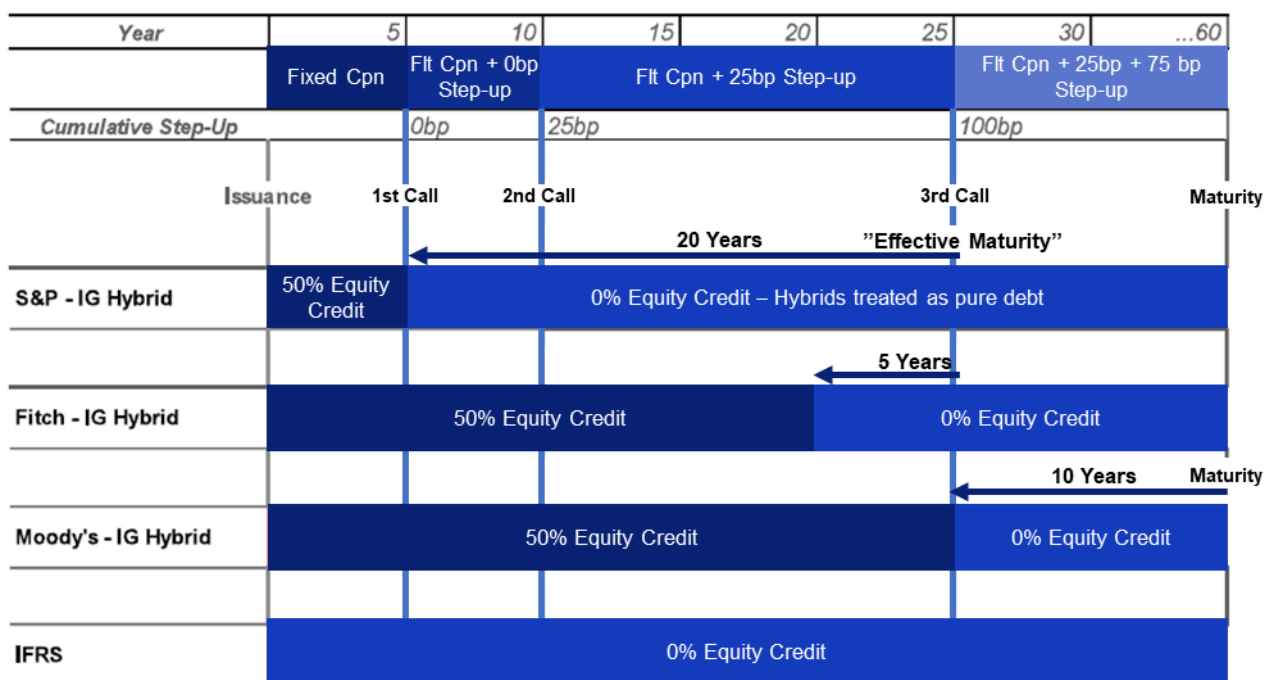
According to De Spiegeleer et al. (2014), a coupon pusher can force hybrid payments when dividend payments have been made. These are sometimes coupled with a lookback period where coupon payments are required if a dividend payment has been made during a lookback horizon. An alternative term that is often used is a dividend stopper which stops the payment of dividend if a coupon is deferred.



## vi) Equity credit

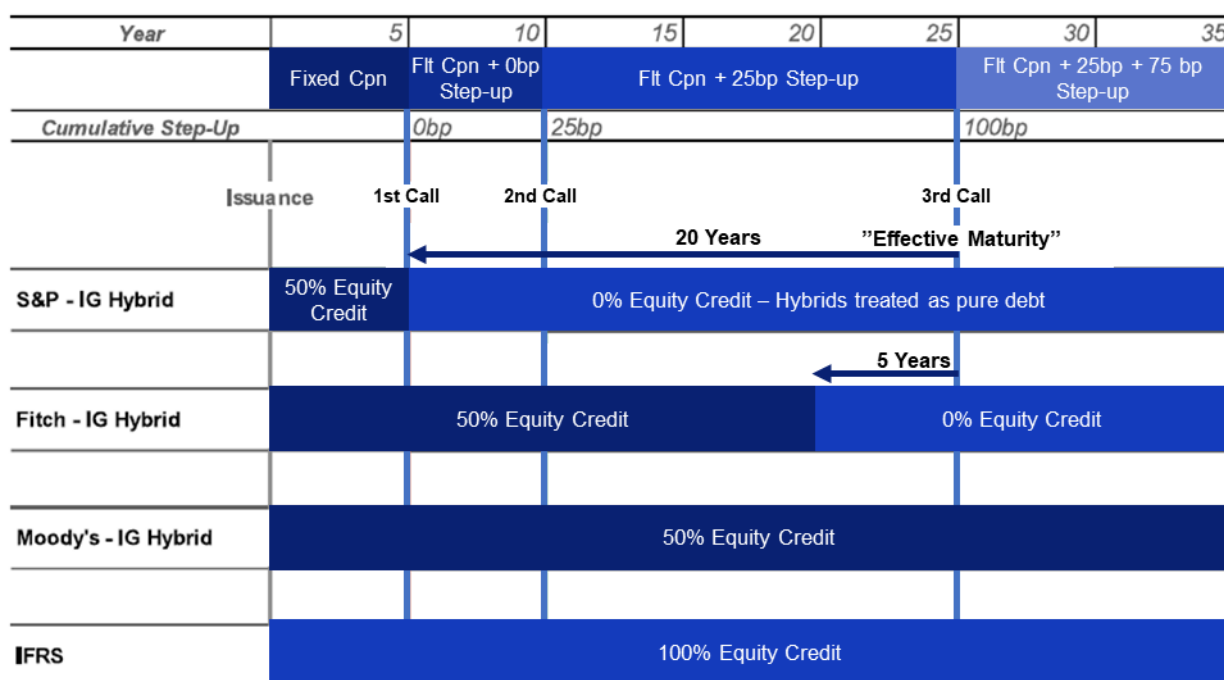
According to Lafontaine (2014), one of the main reasons why corporates issue hybrid bonds is because they are at least partially considered as equity by credit rating agencies. Credit rating agencies typically give between 25%-100% equity credit to hybrid bonds. Figure 4 displays the equity credit for most corporate hybrid bonds that are dated and Figure 5 displays the equity credit for most corporate hybrid bonds that are perpetual.

Figure 4: Equity credit throughout the lifecycle of a dated hybrid



Source: Morgan Stanley (2017: 33)

Figure 5: Equity credit throughout the lifecycle of a perpetual hybrid



Source: Morgan Stanley (2017: 33)

### S&P equity credit for hybrids

According to Morgan Stanley (2017), S&P's rating methodology is such that hybrids have 50% equity credit until 20 years before the bond's effective maturity regardless whether the hybrid bonds are dated or perpetual. Effective maturity means the call date where the cumulative step-up has reached 100 basis points.

According to UniCredit (2018), S&P revised its rating criteria regarding the assigning of equity content to hybrid bonds in early 2018. Now, only mandatory convertible hybrids as well as government-owned hybrid bonds will be assigned 100% equity content. S&P also adjusted their methodology regarding the refinancing possibilities of hybrids. They had earlier indicated that all outstanding hybrid bonds lost their equity credit if an issuer called one of their hybrid bonds within 5 years. Now their methodology is such that if the repurchase is funded by instruments that are at least as equity like as hybrids, they do not materially weaken the creditworthiness of the company. If S&P's view of the management's long-term intention regarding the hybrid bonds also do not weaken, the equity credit will continue to be assigned to the issuer.

### **Fitch equity credit for hybrids**

According to Morgan Stanley (2017), corporate hybrid bonds are considered 50% equity under Fitch's guidelines until 5 years before the effective maturity for both dated hybrid bonds as well as perpetual hybrid bonds.

### **Moody's equity credit for hybrids**

According to Morgan Stanley (2017), the Moody's rating methodology is such that if the corporate hybrid bond is dated, it retains a 50% equity credit until 10 years before the stated maturity of the bond, after that, it has 0% equity credit. If the hybrid bond is perpetual, it retains a 50% equity credit for the entire life of the bond

### **IFRS equity credit for hybrids**

According to Morgan Stanley (2017), the IFRS methodology considers dated hybrids as 100% debt. However, the IFRS methodology considers perpetual hybrid bonds as 100% equity for the entire life of the bond. Figure 6 displays the most important criteria for equity classification under IFRS

*Figure 6: Criteria for equity credit under IFRS*

<b>Criteria for equity accounting under IFRS:</b>	
✓	No fixed maturity
✓	No contractual obligation to deliver cash
✓	Equity interest in the residual total assets after deduction of all liabilities
<b>Unnecessary criteria for equity eligibility:</b>	
✗	Voting right
✗	Influence on corporate management

Source: Lafontaine, 2014

### **vii) Replacement language**

According to Lafontaine (2014), replacement language typically means that the bonds have an obligation to be refinanced by similar hybrid bonds or by the issuance of more subordinated instruments such as equity. This is typically done in the form

of a Replacement Capital Covenant (RCC). When the RCC is enforced throughout the entire lifecycle of the hybrid bond, it is typically done in order to protect the interests of the senior creditors. The RCC would require that additional junior capital would be issued in order to maintain the solvency cushion of the company.

However, Lafontaine (2014) also notes the case where the RCC is only applicable after the first call date. This would be done to incentivize the timely repayment of the hybrid bond, similarly to a coupon step-up.

#### **viii) Other typical features**

European and Finnish hybrid bonds do not dilute equity holders' ownerships and do not entail control or voting rights in the company. Notice, the voting right is not a mandatory criterion to be classified as equity under IFRS according to Lafontaine (2014).

#### **2.1.1.2 Typical terms in Finland**

In many cases, details of specific terms of the Finnish hybrid bonds under review are not released to the public. Typically, the press releases and the financial statements of companies display only broad level of terms regarding the hybrid bond issues. This section utilizes publicly available information regarding hybrid bonds. Additionally, due to the insufficient level of detail in a majority of public sources, an interview of a Debt Capital Markets professional was conducted for the purposes of this research (Suolanen, 2019: pers. comm., 15 May).

The following terms are typically present in Finnish hybrid bonds:

#### **i) Maturity**

All of the Finnish hybrid bonds that were included in this study were perpetual in maturity rather than dated hybrid bonds (Bloomberg, 2019). One hybrid bond issue, referring to the Trainer's House 2010 issue was indicated by Bloomberg to be dated, however from press releases it was determined that this hybrid bond was in fact perpetual.

In other European countries, such as Italy, regulations may force a hybrid bond to be dated in order to receive tax deductibility of interest payments (Lafontaine, 2014). Therefore, the exact structures of the hybrids may vary from one country to another.

## **ii) Subordination**

According to press releases, similar subordination principles were typically present in Finnish hybrid bonds as elsewhere in Europe. That is, hybrid bonds are typically subordinated to all other forms of debt and senior to almost all other forms of equity.

## **iii) Call option**

Companies have the right to call the hybrid bonds at the first call date which has varied from 2 – 5 years after issuance of the bond. This is significantly lower than in other European countries that typically have first call dates between 5 - 10 years after the issue. Event calls such as for taxation events, accounting events, corporate restructuring, withholding tax event, replacing capital event and change of control events purposes were witnessed in e.g. the 2017 Caverion Oyj hybrid bond issue (Caverion, 2017).

## **iv) Coupon step-ups**

Coupon step-ups in Finland are typically rather large compared to other European call options with 500 basis point step-ups being common in the most recent Finnish hybrid bonds (Suolanen, 2019: pers. comm., 15 May). For instance, in the 2017 Caverion Oyj hybrid bond terms indicate a minimum of 500 basis point step-up after the first call date and a 500 basis point step-up in the event of a change of control. Note, according to some of the equity credit criteria for credit rating agencies, this would constitute an effective maturity at the first call date for hybrid bonds with higher than 100 basis point step-ups and therefore may have implications on equity credit received by rating agencies. According to Suolanen (2019: pers. comm., 15 May), these comparatively high (compared to European rated hybrid bonds) coupon step-ups are normal in Finland. This is because Finnish companies issuing hybrid bonds have not had credit ratings by rating agencies and therefore do not place emphasis on the credit rating agency equity credit for hybrids. This is interesting as the equity credit of the hybrid bonds was indicated by Lafontaine as one of the most important features of a hybrid bond. The higher significant coupon step-ups place

higher emphasis on the refinancing of hybrid bonds at call dates and effectively mature the bond.

**v) Coupon deferral**

According to press releases and company financial reports, Finnish hybrid bonds typically have coupon deferral terms that are in line with other European countries and are cash cumulative. That is, issuers can defer coupon payments at their sole discretion.

**vi) Equity credit**

Equity credit under IFRS and by rating agencies are international standards. According to Suolanen (2019: pers. comm., 15 May), the Finnish Accounting Standards does not have strict guidelines regarding the equity credit of hybrid bonds, however, it is currently market standard to classify hybrid bonds as equity in a similar way as IFRS.

Finnish companies do not place significant emphasis on the equity credit provided by the Big Three credit rating agencies (S&P, Moody's and Fitch) as there has yet to be a single credit rated company in Finland to issue a hybrid bond.

**vii) Replacement language**

According to Suolanen (2019: pers. comm., 15 May), replacement language is not very common. Replacement language was also not witnessed in the hybrid bond issues of Finnish hybrid bonds that had publicly available terms. This may be due to the similar reason why the Finnish hybrid bonds have higher coupon step-ups than in the European reports. That is, replacement language covenants are typically required by credit rating agencies whereas most Finnish bond issuers do not place as much emphasis on the equity credit criterion of credit rating agencies as they are not rated.

Rather than the typical replacement language feature of European hybrid bonds, another feature that was witnessed in a minority of Finnish hybrid bonds was convertibility to equity. Out of the sample of hybrid issues, the Suominen Oyj hybrid bond issue of 2014 and the SSH Communications Security Oyj hybrid bond issue

of 2015 gave bondholders had the right to convert the bonds to equity at an agreed upon price level (Bloomberg, 2019).

### viii) Other typical features

According to press releases, hybrid bonds do not dilute equity holders' ownership, nor do they entail voting rights in the company. Additionally, according to De Spiegeleer et al (2014), hybrid bonds have a significant range of structuring possibilities when designing an optimal bond for a specific scenario.

### The updated framework

In order to summarize the findings in this section, the framework for understanding the terms and features of hybrid bonds proposed by Lafontaine (2014) was updated and is presented below in Figure 7.

Figure 7: Key features of hybrid bonds: an updated framework

	European hybrid bonds	Finnish hybrid bonds
i Maturity	<ul style="list-style-type: none"> <li>▪ Around three quarters of hybrid bonds are perpetual and the remaining around 50-60 years</li> </ul>	<ul style="list-style-type: none"> <li>▪ All hybrid bond issues between 2008-2018 have been perpetual</li> </ul>
ii Subordination	<ul style="list-style-type: none"> <li>▪ Hybrid bonds are generally only senior to equity, low recovery rate in case of default</li> </ul>	<ul style="list-style-type: none"> <li>▪ Similar subordination principles as in other European countries</li> </ul>
iii Call Option	<ul style="list-style-type: none"> <li>▪ Most hybrids are callable from 5-10 years after issuance at periodic "call dates"</li> </ul>	<ul style="list-style-type: none"> <li>▪ Hybrids are callable from 2-5 years after issuance</li> </ul>
iv Coupon step-up	<ul style="list-style-type: none"> <li>▪ Call dates comes with significant coupon step-ups (ranging from 25-100 bps being typical), in order to incentivize the company to call the bond</li> </ul>	<ul style="list-style-type: none"> <li>▪ Coupon step-ups are more significant (typically 500 bps) as Finnish hybrid issuers have not needed to focus on credit rating agency equity credit criteria</li> </ul>
v Coupon deferral	<ul style="list-style-type: none"> <li>▪ May be cumulative deferral or not</li> <li>▪ Some hybrids contain covenants that enforce coupon deferral if triggered</li> </ul>	<ul style="list-style-type: none"> <li>▪ Cumulative deferral is typical</li> </ul>
vi Equity Credit	<ul style="list-style-type: none"> <li>▪ % of the bond considered as equity by rating agencies</li> <li>▪ Generally main concern for the company</li> </ul>	<ul style="list-style-type: none"> <li>▪ Equity credit under IFRS and FAS</li> <li>▪ Credit rating agency criteria have not needed to be in focus</li> </ul>
vii Replacement Language	<ul style="list-style-type: none"> <li>▪ Requires issuers to redeem the existing hybrid only with funds from newly raised hybrid or common stock</li> </ul>	<ul style="list-style-type: none"> <li>▪ Replacement language is not common</li> </ul>
viii Other features	<ul style="list-style-type: none"> <li>▪ Do not dilute equity ownership nor entail voting rights</li> <li>▪ Significant range of structuring possibilities</li> </ul>	<ul style="list-style-type: none"> <li>▪ Do not dilute equity ownership nor entail voting rights</li> <li>▪ Significant range of structuring possibilities</li> </ul>

Source: European hybrids bonds column parts i-vii by Lafontaine (2014)

### **2.1.2. Similar products, other hybrid securities and their market reactions**

Hybrid securities are a much broader definition than hybrid bonds (Lafontaine, 2014). Hybrid securities consist of securities which have features of both equity and debt financing. This includes both convertible bonds and preference shares.

Convertible bonds have a fixed term and the right to convert the bonds into shares according to the conditions set out in the prospectus. Convertible bonds typically have lower interest payments than similar debt securities as they additionally have the option to convert to equity. It can also be noted that convertible bonds often end up becoming shareholders (Lafontaine, 2014).

De Roon and Veld (1998) aggregated much of the underlying data regarding market reactions to convertible bonds and other security announcements. They note that issuance of new vanilla debt is not typically associated with significant stock price reactions with the exception of junk bonds resulting in a negative reaction. Secondly, they note that the issuance of new equity is associated with significant negative stock price reactions. Lastly, the issuance of convertible debt is associated with negative stock price reactions which are smaller than those for traditional equity issuance. They conducted an additional analysis with focus on the Dutch market where positive but insignificant abnormal returns for convertible bond issues and significant positive abnormal returns for warrant-bonds were identified. They conclude that the Dutch market therefore behaves similar to the other academic research regarding similar products in the Japanese market.

Another type of bond worth examining is a typical callable bond. While hybrid bonds can be considered callable bonds as they contain the call option feature, not all callable bonds can be considered as hybrid bonds. The reason for this is that the nature of the callability feature in a traditional callable bond and a hybrid bond are inherently different. Traditional callable bonds are similar to dated normal bonds, however, they offer the option to the issuer to call the bond before maturity. This would be optimal for the issuer in cases, for instance, where interest rates decrease and the issuer could refinance the bonds early. However, the callability feature in a hybrid bond acts more similarly to a maturity feature than a traditional callability feature. This is because it is used in combination with the coupon step-up feature.



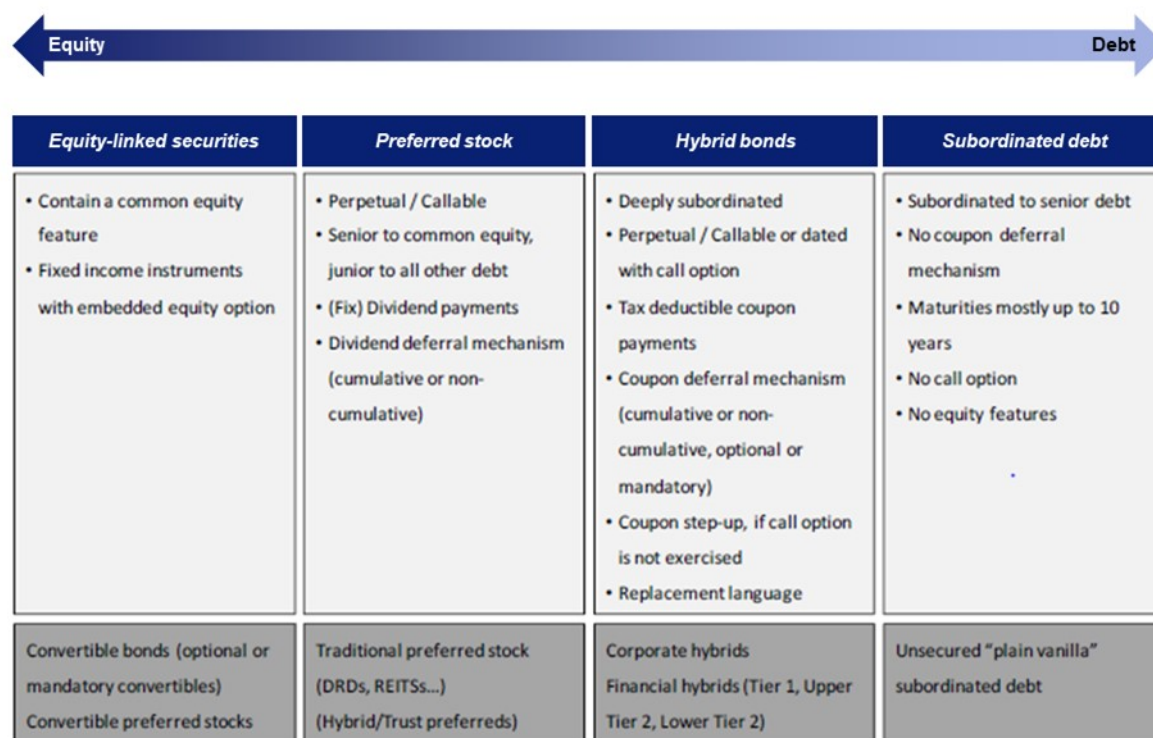
This is especially true in the case of Finnish hybrid bonds as the step-ups are typically 500 basis points compared to the original coupons ranging from 4.6% to 12.5% in hybrid bonds issued between 2008-2018. The step-ups are, therefore, so significant that failure to call the hybrid at the step-up date would result in significantly higher coupons. As was noted in section 2.1.1.1, credit rating agencies consider the point where the step-ups exceed 100 basis points to be the bond's "effective maturity".

Preferred shares are similar to hybrid bonds in that they pay out a fixed payment (in this case a dividend payment) which is prioritized compared to common shareholders. However, typical preferred shares do not have tax deductible interest payments. Kallberg et al. (2013) made an analysis on 427 preferred share announcements, and found that on average a negative equity reaction of -0.65% is witnessed during the announcement of a preferred share issue. Further, they find that the equity market reaction is negatively influenced by convertibility and if the firm's accounting classifies the issue as equity. However, they also find that in the aggregate, the decrease in the equity value is smaller than the increase in the value of the issuer's debt.

Trust preferreds, however are a financial instrument that was engineered in 1993, in the USA to act as preferred shares in financial statements (thereby allowing for equity credit), however, considered as debt for taxation purposes (Engel et al., 1999). Trust preferreds also have lengthy maturities, are subordinated, and allow the deferral of dividends for up to five years. However, 5 years of non-repayment of trust preferred's obligations would result in default. Engel et al., 1999 also notes several studies examining the rationale for issuing trust preferreds over other hybrid securities in the USA such as preferred shares and the tax and regulatory factors were often the most common reasons.

Figure 8 presents the debt to equity continuum which shows some of the differences between different forms of hybrid securities:

Figure 8: Equity debt continuum



Source: Schaffner (2010)

### 2.1.3. Agency between majority and minority shareholders

One factor that is not often noted in prior academic studies is the agency problem related to majority and minority shareholders regarding hybrid bond issues. This could be because hybrid bonds in the Finnish market seem to have substantially higher yields than in other European markets. As noted in Talouselämä (2009), there was public discussion regarding the hybrid debt issued by Amer and Cramo. In these discussions minority shareholders have displayed their worry about the relatively high interest payments charged on hybrid debt and whether these issues are for the benefit of the shareholders.

When hybrid bonds are marketed, they are often marketed as private placement and typically marketed towards large, institutional investors. For instance, in the case of the 2009 Cramo Oyj hybrid bond issue, the minimum investment accepted was 50 thousand euros and in the case of the Ponsse 2009 issue, the minimum

investment was several hundred thousand euros (Talouselämä, 2009). According to Suolanen (2019: pers. comm., 15 May), 100 thousand euros is a very typical minimum investment required in hybrid bonds, as otherwise there are added regulatory filings that would be required when approaching investors. Private placement can therefore price out small scale, minority shareholders for example from participating in hybrid bond issues.

Due to these reasons, it can be argued that there could exist a principal-agent dynamic that may result in a moral hazard problem between majority and minority shareholders in fund raising. A hypothetical example scenario could be where an institutional, or high net worth investor controls a majority share in the company and knows that the remaining shareholders are private persons with limited available funds for further investment into the company. The majority shareholder could therefore theoretically use its influence in the company to issue hybrid debt at an unreasonably high interest rate. The majority shareholder could then purchase these debt securities, knowing that the smaller minority shareholders are majorly priced out of the issue if the issue had a high enough minimum investment requirement. Therefore, the institutional investor could profit from the unreasonably high interest that is being paid to the hybrid debt by the company and ultimately by its shareholders. A minority shareholder could therefore argue that the company was not acting in the best interest of its shareholders equally, rather it was acting in the best interest of the majority shareholder in this hypothetical scenario.

According to Suolanen (2019: pers. comm., 15 May), this potential agency issue is not typically very significant because if an owner wanted to participate in the hybrid bond financing round, extra attention would be placed on the pricing of the hybrid bond in order to ensure that the bond has a coupon that reflects its market value to outside investors.

#### **2.1.4. Regulations regarding hybrid bonds in Finland**

Myllymäki (2013) conducted research on the Finnish regulatory view of hybrid loans. He found that the benefits of the hybrid loan stem from the way the product is handled differently in different regulatory frameworks. The loan is seen as debt from

the perspective of corporate law and subordination as well as taxation, however in accounting, the product is seen as equity. Therefore, the benefits are due to the asymmetry between the different frameworks.

From the corporate law perspective, hybrid bonds are a flexible form of financing compared to equity financing in that the terms are negotiable and they do not grant control rights. However, Myllymäki (2013) remains sceptical that hybrid loans would be used to replace senior debt or equity on a wide scale due to the significantly higher coupons compared to senior debt and the coupons are even in some cases higher than the dividend payments typically made to shareholders (therefore resulting in more cash outflows from the company).

Kurtio (2016) also examined a Finnish Supreme Administrative Court decision regarding an alleged tax evasion judicial case where hybrid loans were issued cross-border from Luxembourg. The Finnish Supreme Administrative Court ruled that hybrid bonds are classified as a debt obligation and only in a minority of cases can be viewed as equity. The Finnish Supreme Administrative Court also reviewed whether the product could be reclassified as equity through transfer pricing regulation “VML 31.1 §”, however, they determined that this was not possible.

## **2.2. Capital structure theories**

### **2.2.1. The trade-off theory**

#### **2.2.1.1. The trade-off theory explained**

Trade-off theory suggests that the optimal leverage level is the one where the marginal benefit of added debt is equal to its marginal cost (Abeywardhana, 2017). The static trade-off framework implies that companies have an optimal debt structure that maximizes the combination of tax benefits of leverage and the present value of the costs of financial distress associated with too much leverage. Miller (1977), shows that the gain due to taxes from leverage,  $G_L$ , can be displayed by the formula:

$$G_L = \left(1 - \frac{(1 - t_C)(1 - t_{PS})}{(1 - t_{PB})}\right) B_L$$

Where:

- $t_C$  is the corporate tax rate
- $t_{PS}$  is the personal income tax on income from common shares
- $t_{PB}$  is the personal income tax on debt income and
- $B_L$  is the market value of the debt outstanding in a levered firm

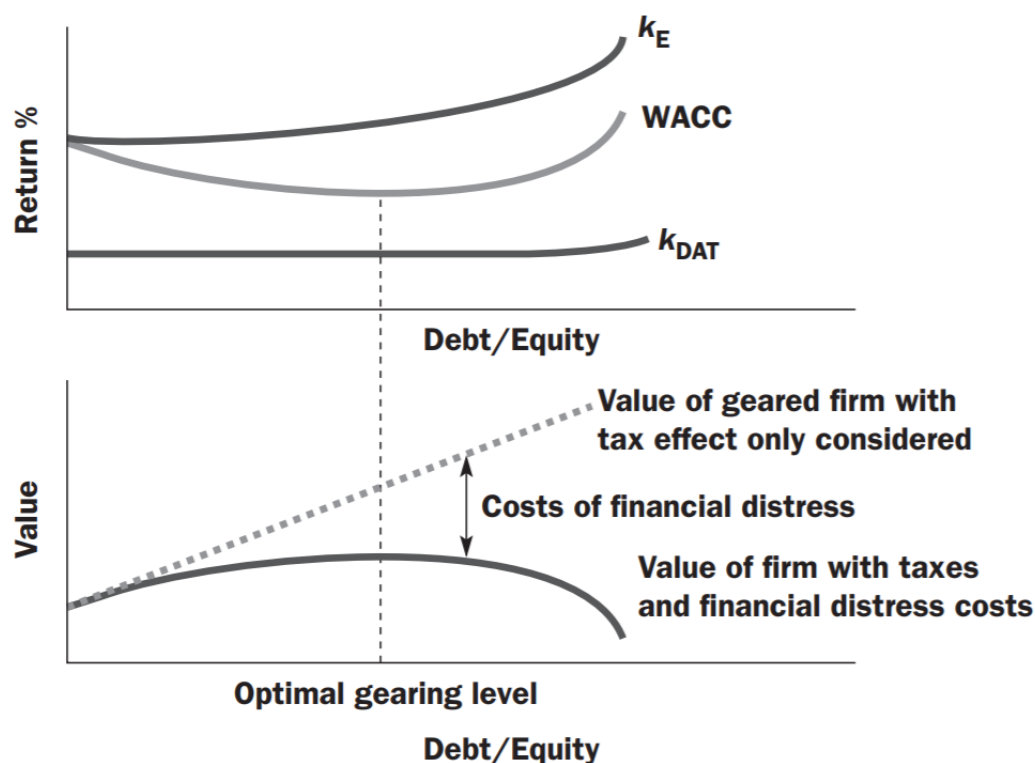
In markets where personal income tax from debt is the same as the personal income tax on shares, the gain from leverage is equal to  $t_C B_L$ .

In addition to this, there are costs associated with financial distress of companies if they become too levered. Financial distress is defined by Arnold (2005) as:

*“Financial distress: where obligations to creditors are not met or are met with difficulty”*

These can include numerous direct examples such as legal fees in the case of insolvency and management time allocation toward liquidity issues as well as indirect examples such as uncertainties with suppliers and clients regarding meeting the company’s obligations, liquidation of otherwise healthy business in order to raise cash, etc. (Arnold, 2005). The present value of these costs diminishes with lower leverage as there is a lower risk of financial distress. Figure 9 shows the relationship between gearing (increased leverage) and firm (enterprise) value.

Figure 9: Cost of capital and enterprise value with taxes and financial distress



Source: Arnold (2005: 532)

The static trade-off theory as described above implies that there would be an optimal debt/equity ratio that maximizes company value that companies would seek to readjust to as their companies develop. The classic static trade-off theory therefore does not consider adjustment costs, market expectations and uncertainty. More recently, an alternative dynamic trade-off theory has been discussed, which also considers these aspects, more specifically, how these factors develop continuously and therefore, the optimal leverage would develop consequently (Laisi, 2016).

Relating to trade-off theory, Miller (1977) briefly mentions the case of income bonds which need to pay dividends only when earned but have no right to foreclose. Thereby, the income bonds have the tax advantages of debt, but do not have the cost of financial distress disadvantages. These bonds developed a negative connotation to them due to their use in bankruptcies. Thereby Miller (1977) also noted that the bonds were rarely issued due to the negative undertones of the instrument. The negative connotations can be tied in with the pecking order theory. Firms in stable conditions likely issue cheaper, more senior debt and as such the

securities might be seen as a negative market signal or only as a security that is only used by weaker companies.

In the case of hybrid bonds, the present value of the costs of financial distress wouldn't increase as significantly as with traditional debt as firms can defer interest payments without going bankrupt when needing internal cash for other creditor obligations during bad time. According to this version of the trade-off theorem where only the tax effect and the above-mentioned costs of financial distress are considered, companies would theoretically seek to leverage themselves with hybrid bonds if the gain from the tax shield is greater than the transaction costs of issuing the hybrid bonds.

#### **2.2.1.2. Agency costs of equity and debt**

Jensen and Meckling (1976) explain the principal agent problem as the following:

*"We define an agency relationship as a contract under which one or more persons (the principal(s)) engage another person (the agent) to perform some service on their behalf which involves delegating some decision making authority to the agent. If both parties to the relationship are utility maximizers there is good reason to believe that the agent will not always act in the best interests of the principal."*

Jensen and Mecklin (1976) show that the agency costs can include the monitoring expenditures by the principal, bonding costs of the agent (i.e. costs relating to guarantees that the agent will not take certain principal harming actions) and residual losses from any divergence of the agent acting in the best interest of the principal.

Agency costs of equity stem from the principal agent problem between managers (the agent) and shareholders (the principal) in cases where management are not shareholders. The agency cost of equity has been detailed in Jensen (1986). Jensen argues that management has incentives to not pay out free cash flows (that is cash flow in excess of that which is required to fund all positive NPV projects) as these reduce the resources under their control and makes them more likely to be monitored by capital markets when obtaining new capital. Also, larger companies

are associated with increased management compensation. Jensen (1986) concludes that debt can reduce the agency costs of equity regarding free cash flows as it reduces the amount of free cash flows available to be spent at the discretion of managers.

Jensen and Meckling (1976) detail the agency costs of debt. Firstly, companies that are highly leveraged and whose managers are acting in the interest of shareholders would have significant incentives to engage in risky projects that would result in high payoffs for shareholders when successful as shareholders would capture most of the gains, whereas, if they turn out badly, creditors would bear most of the costs. This would hold true even in cases where such projects may not have the optimal NPV. Secondly, bondholders could limit the behaviour of management through covenants to reduce this conflict of interest. These would incur bonding costs (such as writing and enforcing the provisions, as well as potentially limiting managements freedom to make optimal actions) as well as monitoring costs. Finally, the third agency cost detailed by Jensen and Meckling (1976) are costs of financial distress including bankruptcy and reorganization costs.

Bradley et al. (1984) present a model of the trade-off theory which accounts for corporate taxes, personal taxes, non-debt tax shields (that is tax shields due to depreciation and amortization, financial distress and agency costs). They argue that agency costs of debt only become economically significant when a firm is in financial distress, therefore, they have included agency costs within their model for financial distress. They conclude that the debt ratios of companies are inversely related to the costs of financial distress (incl. agency costs) and inversely related to the variability of the firm value, if the costs of financial distress (incl. agency costs) are significant.

For the purposes of this research, it is important to differentiate actual financial distress costs as presented in section 2.2.1.1 from the Bradley et al. (1984) model which combines both the financial distress costs and agency costs of debt. While these two costs are somewhat similar in nature as pointed out by Bradley et al. (1984), hybrid bonds can lower a company's traditional costs of financial distress compared to senior debt as companies can forego interest payments when they need to allocate this internal cash to satisfy other potential creditors in times of



difficulty. Thereby hybrid bonds can lower traditional financial distress costs, however, the agency costs related to debt as presented above would remain in theory.

### 2.2.1.3. Hybrid bonds impact on cost of capital

As noted earlier, interest costs in hybrid bonds are typically tax deductible across European countries (Morgan Stanley, 2017). Morgan Stanley (2017) show the hypothetical impact in practice of a hybrid bond issue on weighted average cost of capital (WACC) as well as leverage in the scenarios where a hybrid bond is used to replace debt and replace equity in Figure 10.

Figure 10: Hybrid bond impact on WACC and leverage

<b>Hypothetical Issuer Cap structure</b>			
<b>Original Hypothetical Structure &amp; WACC</b>			
	Debt	Hybrids	Equity
Share of Structure	40 %	0 %	60 %
Tax Rate	35 %	35 %	0 %
Cost of	4.0 %	6.0 %	10.0 %
Post-Tax Cost	2.6 %	3.9 %	10.0 %
WACC	7.0 %		
Debt/ Equity	0.7x		

<b>When Hybrids Replace Debt, Leverage Is Lowered</b>			
<b>A: Replacing Debt</b>			
	Debt	Hybrids	Equity
Share of Structure	25 %	15 %	60 %
Tax Rate	35 %	35 %	0 %
Cost of	4.0 %	6.0 %	10.0 %
Post-Tax Cost	2.6 %	3.9 %	10.0 %
WACC	7.2 %		
Debt/ Equity	0.3x		

<b>When Hybrids Replace Equity, WACC Improves</b>			
<b>B: Replacing Equity</b>			
	Debt	Hybrids	Equity
Share of Structure	40 %	15 %	45 %
Tax Rate	35 %	35 %	0 %
Cost of	4.0 %	6.0 %	10.0 %
Post-Tax Cost	2.6 %	3.9 %	10.0 %
WACC	6.1 %		
Debt/ Equity	0.7x		

Source: Morgan Stanley (2017)

Morgan Stanley (2017) incorporates a tax rate assumption of 35% and the approach relies on the following assumptions:

- a static cost of debt, cost of hybrid and cost of equity regardless of leverage

- a hybrid is classified as equity in the debt/equity ratio

In the approach, if the issuer replaces a portion of their debt with hybrids, the WACC slightly increases from 7.0% to 7.2%, however, the debt to equity ratio decreases considerably from 0.7x to 0.3x. However, in the scenario where a hybrid is used to replace equity, WACC decreases from 7.0% to 6.1% while the debt/equity ratio remains the same at 0.7x.

This approach displays to some extent the value of the tax shield. However, the two important considerations that the approach doesn't account for are:

- 1) The assumption concerning the static cost of debt, hybrids and equity. Based on the model, the costs of the financing items remain the same regardless of leverage. For example, post-tax cost of debt is 2.6% regardless of the scenario where debt is financing 40% of the enterprise and where it is financing 25% of the enterprise. In the scenario where traditional debt is financing 25% of the enterprise, the hybrids serve as an additional buffer regarding default of the traditional debt, therefore it should be argued that the cost of the debt in the scenario where traditional debt finances 25% of operations should be significantly lower. Similar argumentation can be used regarding the cost of hybrids and the cost of equity
- 2) The debt/equity ratio classifies hybrids as 100% equity. However, the leverage is rather subjective depending on the perspective of the individual financier and whether leverage is regarding returns or financial solvency. For example, from the perspective of a traditional debt holder, the hybrid bond would act as an additional buffer from default of the debt. Therefore, in this scenario from the perspective of the debt holder, the hybrid acts in a way that it lowers leverage and the risk position of the debt.

However, from the perspective of an equity holder, hybrid financing would leverage the returns of the enterprise as the debt has a static cost associated to it. Therefore, from the perspective of the equity holder, the bond would leverage returns over time. Additionally, as noted by Lafontaine (2014), the hybrid bond could be used to absorb losses and allow a company to avoid

bankruptcy, and therefore from the financial distress point of view, the equity holder would consider the hybrid as equity. Therefore, it should be noted that the leverage is a subjective measure depending on the financier as well as whether returns or financial solvency are in question.

Lafontaine (2014), however, seeks to prove that hybrid bonds can be used to lower the cost of capital of a company accounting for the inter-dependence of different financing methods. The paper applies the trade-off theorem framework and assumes that a hybrid bond is equivalent to 50% “vanilla” debt and 50% equity. With logic-based argumentation and mathematical models derived from the Modigliani Miller theorem of capital irrelevance and Miller (1977) incorporation of both personal taxes and corporate taxes, they arrive to the conclusion that adding hybrids to the corporate structure of companies, does lower WACC.

As a critique of the approach of Lafontaine (2014), the approach uses a very simplistic trade-off theorem considering only tax shield (including personal and corporate) and financial distress costs. Therefore, the end conclusion is that in all cases, the addition of hybrid capital to the corporate structure will result in a decrease in WACC. However, the approach does not consider the impact of agency costs of debt outlined in section 2.2.1.2. We can apply here the reasoning of Jensen and Meckling (1976) to conclude that this is not a feasible end result:

*“Potential creditors will not loan \$100,000,000 to a firm in which the entrepreneur has an investment of \$10,000. With that financial structure the owner-manager will have a strong incentive to engage in activities (investments) which promise very high payoffs if successful even if they have a very low probability of success. If they turn out well, he captures most of the gains, if they turn out badly, the creditors bear most of the costs.”*

If we consider the argument of Bradley et al. (1984), that the agency costs of debt only become economically significant when a company approaches financial distress, we can apply this to the approach of Lafontaine (2014) and conclude with logic that there should be an optimal corporate structure, where the marginal benefits of financing with tax-deductible hybrid bonds and the marginal agency costs of hybrid bonds are at equilibrium.

#### 2.2.1.4. Quantifying the tax shield in Finland

In Finland, the corporate tax rate is set at 20% (Ministry of Finance - Finland, 2019). The personal taxation of capital income, such as that from common shares, and interest income, such as from bonds, are classified separately by the laws regarding taxation of capital income and the laws regarding taxation at source on interest. The Finnish laws regarding taxation of capital income apply for:

- “dividend income
- capital income from entrepreneurial income
- rental income
- profit-share and capital gains
- income from extractable land resources
- income from sales of timber
- certain interest income” (Ministry of Finance - Finland, 2019)

The capital tax rate for capital income is progressive and is set at 30% for taxable capital income below €30 thousand and 34% for taxable capital income exceeding €34 thousand euros (Ministry of Finance - Finland, 2019).

The taxation of interest income is classified in most cases by the Finnish laws regarding taxation at source on interest. This applies to domestic interest accrued by:

- “deposits held in accounts created for the receipt of public deposits located in banks or corresponding co-operative savings and loan associations or financial service offices
- bonds that are open to public subscription” (Ministry of Finance - Finland, 2019)

The tax at source on interest is set at a rate of 30% of the interest accrued. The deposits and bonds that fall under the taxation at source on interest are exempt from income taxes (Ministry of Finance - Finland, 2019).

Thereby, in the formula proposed by Miller (1977), we can set the following values to the variables in order to determine the gain due to taxes from leverage in Finland:

- $t_c$  is the corporate tax rate of 20%

- $t_{PS}$  is the personal income tax on income from common shares of min 30% and max 34%
- $t_{PB}$  is the personal income tax on interest income of 30%

When applying these tax rates to Miller's formula, we can conclude that the gain due to taxes from additional leverage in Finland during 2019 for a publicly listed company that does not pay dividends can be estimated at approximately 20.0%-24.6% of the market value of the issued debt:

*Min:*

$$G_L = \left(1 - \frac{(1 - t_C)(1 - t_{PS})}{(1 - t_{PB})}\right) B_L = \left(1 - \frac{(1 - 20\%)(1 - 30\%)}{(1 - 30\%)}\right) B_L = (20.0\%) B_L$$

*Max:*

$$G_L = \left(1 - \frac{(1 - t_C)(1 - t_{PS})}{(1 - t_{PB})}\right) B_L = \left(1 - \frac{(1 - 20\%)(1 - 34\%)}{(1 - 30\%)}\right) B_L = (24.6\%) B_L$$

It should be noted that the above calculation is made purely on the basis of the tax rates listed above and they do not account for all personal tax deductions available in the Finnish law. For instance, according to the Tax Administration of Finland (2017), 15% of dividend income received from publicly listed entities is tax free. There are other deductions present for private companies as well which take into account the value of the shares, the value of the paid-out dividend and their proportion to one another.

In an ideal scenario, in order to make a more precise calculation of the tax gain due to leverage, the tax-free portion of the dividend payments should be considered as lessening the tax burden on income from common shares. However, the amount of dividend paid out in proportion to the capital gains received from common shares is dependent on how often and what portion of earnings a company pays out. Additionally, it is share trade timing specific i.e. if shares are traded prior to a dividend pay-out thereby realizing more capital gains than in an optimal scenario where most of returns are paid out in dividends. Therefore, due to the complexities of the Finnish tax codes, the above-mentioned calculated range of the tax benefit from leverage assumes a listed company that does not pay dividend.

### **2.2.2. Pecking order theory**

The second framework in capital structure is the pecking order theory which considers the information asymmetry issues between managers and investors in the raising of debt versus the raising of equity in the financing of positive net present value projects.

The problem of information asymmetry is introduced in the Akerlof (1970) paper about the market for lemons with regards to new and used cars. The paper shows with an example of the car market, how markets can break down due to information asymmetry between sellers and buyers. With the premise that only the seller of the car knows the intrinsic value of the car and whether it is a good car or a “lemon” (i.e. a bad car). It explains how the risk of a buyer purchasing a lemon results in purchasers demanding a discount for the uncertainty. This demanded discount then discourages and drives sellers of good cars away from the market as the prices offered for good cars would be lower than their intrinsic worth, thereby creating an adverse selection problem in the market for cars.

The lemons problem is examined in the context of securities issuance by the Myers and Majluf (1984) paper which examines information asymmetry problems as they relate to the issuance of financing for investment decisions. It presents a model that shows that in environments where managers have superior information, debt is better than equity financing and that the raising of equity should result in a fall in share price (other things being equal).

The traditional pecking order framework implies that companies should preliminarily finance projects with lower information asymmetry financial instruments and then with higher ones. The pecking order rates the costs of financing in the following order: internal funds, then debt, then possible hybrid securities, and finally with equity as a last resort (Myers, 1984).

According to Brealey, Myers, and Allen (2012), the Pecking order theory implies that there is no well-defined target debt-equity ratio for companies, mainly due to the fact that there are two types of equity financing, internal and external, both at differing ends of the pecking order. The interest tax shield benefits of leverage are second order according to the pecking order theory and highly profitable firms with limited

investment opportunities seek to lower their debt ratios while less profitable firms requiring external funds typically borrow more.

Since hybrid bonds are lower than traditional senior debt in terms of the pecking order, theoretically, firms with a more stable financial condition would issue senior debt before issuing hybrid forms of financing such as hybrid bonds. Thereby, theoretically, a hybrid bond issue could be implied by markets as meaning that more senior, cheaper forms of financing aren't available to the company issuing the security and as such, a hybrid bond issue might signal a less financially stable company compared to a traditional senior debt issue.

### **2.2.3. Market timing theory**

The market timing theory suggests that the capital structures of companies are to some extent representative of their past efforts to time the market (Baker and Wurgler, 2002). It argues that companies are more inclined to issue equity when the management believes that their share price is overvalued and buy back shares when the companies believe that their shares are undervalued (Baker and Wurgler, 2002). Thereby, the variation in the share price affects the financing decisions made by the companies and therefore impact the capital structure of them (Abeywardhana, 2017). The capital structure of companies therefore is influenced more by stock market conditions rather than optimal leverage as equity transactions are timed to the stock markets. These can create long lasting capital structure changes (Abeywardhana, 2017).

Abeywardhana (2017) notes several studies that affirm market timing theory including findings that suggest gearing ratios are negatively related to past stock returns. Of these, Welch (2004) is significant in that it finds that stock returns are the most important determinant of capital structure. Nevertheless, Abeywardhana (2017), also does note that some studies have also found contrary evidence to the claim that market timing significantly influences capital structure in the long run.

Frank and Goyal (2004), examine the empirical evidence in order to have a better understanding for whether the market timing theory or the trade-off theory apply

better in practice. They find that the empirical evidence from the United States of America stock market during 1952-2000 suggest that in the short run, they found that deviations from the long-run relationship between equity and debt are adjusted through the debt market, however, not from the equity market. This provides justification for the trade-off theory as a mean reverting leverage ratio would imply that in the long run, companies would seek to find their optimal leverage (Frank and Goyal, 2004).

As hybrid bonds could be considered a short-term financial instrument that has many of the benefits of equity, the findings of Frank and Goyal (2004) and market timing theory could have implications on the attractiveness and the viability of issuing hybrid bonds. For instance, if a company did not want to dilute equity or their share price was undervalued in the management's perspective, but the company needed to strengthen their balance sheet with additional buffer in the short-term, hybrid bonds could be a rather viable alternative.

#### **2.2.4. Credit rating capital structure hypothesis**

The credit rating capital structure (CR-CS) hypothesis, originally proposed by Kisgen (2006), finds that credit ratings directly affect capital structure decisions by managers. The hypothesis proposes that companies closer to a rating upgrade or downgrade are less inclined to issue debt relative to equity than companies not close to a rating change. This hypothesis can be seen as an extension to traditional capital structure theories such as trade-off theory and pecking order theory. In terms of the pecking order, CR-CS implies for instance that when companies are close to a rating to a rating upgrade, they may deviate from the pecking order in order to capitalize on the benefits of the potential change in credit rating.

The CR-CS hypothesis would not have had a significant influence in the case of Finnish hybrid bond issues thus far as the companies that have listed hybrid bonds in Finland have not been rated by credit rating agencies. However, the CR-CS hypothesis could play a critical role in the rationale for issuing hybrid bonds for rated companies, for instance, if the study was expanded elsewhere to Europe.



### **2.2.5. Rationale for issuing hybrid bonds**

After reviewing typical hybrid bond security features, terms and academic articles on corporate financing structure, hybrid bonds can provide certain benefits to both financially healthy companies and financially unhealthy companies. By financial health, this refers to a company's solvency position, that is, their ability to satisfy their payment obligations.

A financially healthy company could benefit from a hybrid bond issue as it could be used to refinance more "expensive" financing options in its capital structure such as common shares. From the perspective of senior debt holders, hybrid bonds act as a buffer from bankruptcy risk. From equity holder's perspective, hybrid bonds are a rather "cheap" alternative to more expensive equity. When considering the information asymmetry issues between shareholders and management, a financially healthy company issuing hybrid bonds in order to refinance their equity should theoretically be a powerful signal that the company expects to be able to pay back the "relatively" high interest payments (relatively high compared to senior debt interest) and create value for shareholders through the refinancing measure.

A financially unhealthy company could also benefit from a hybrid bond issue in certain scenarios. Consider a company that is on the brink of insolvency and therefore bankruptcy. Senior debt holders would benefit from the hybrid bond issue as it would increase the buffer from potential bankruptcy losses. As the hybrid bonds provide additional liquidity to a company, shareholders would benefit when the required return for hybrid bonds is lower than the required return of other financing options such as an equity issue.

While researching press releases the following uses of the proceeds from hybrid bond funds were witnessed:

#### Financial rationale

- refinancing existing, more senior debt obligations or refinancing of previous hybrid bond issues
- buying back of shares

- strengthening the balance sheet by increasing the equity position of the company
- improving the cash position of the company
- creating possibilities to take on additional senior loans

Operational rationale:

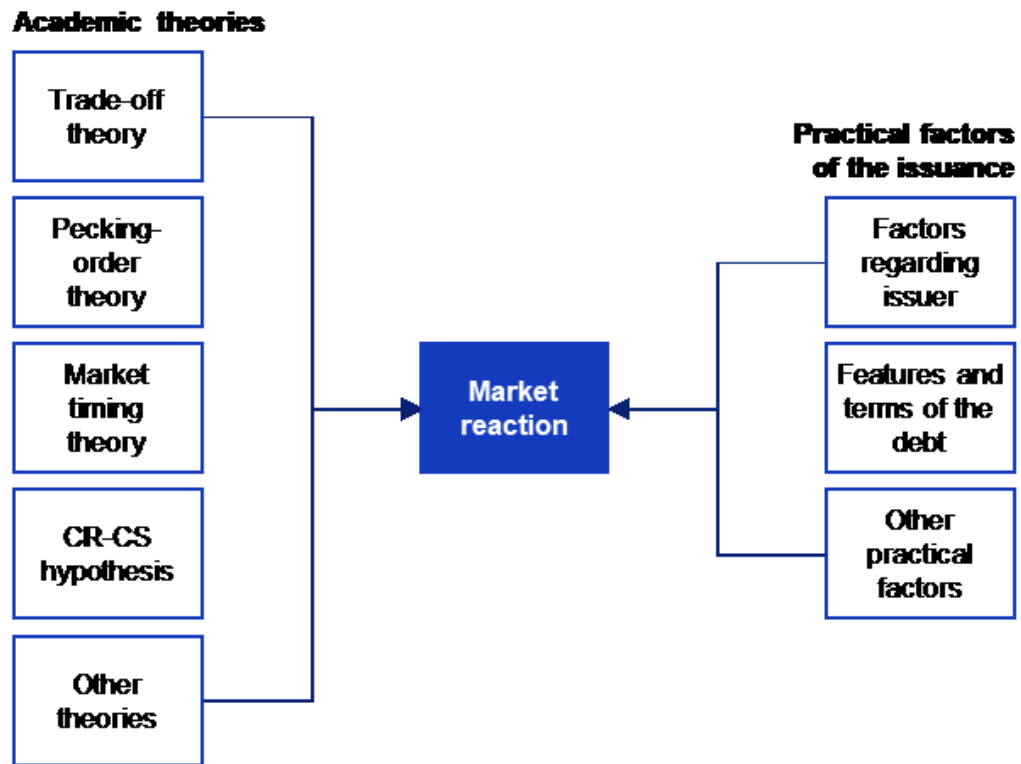
- funding general corporate operations
- financing capital expenditure

### **2.3 Conceptual Framework**

In Figure 11, the conceptual framework of this thesis is presented. The goal of this thesis is to examine the market reaction of a hybrid bond announcement. This thesis analyses the market reaction through two different ways: 1) the academic theories regarding corporate capital structure and 2) the practical factors regarding the issuance in question. In the Literature review, the major aspects regarding the academic theories were explored. These included the tax shield benefits of hybrid bonds mentioned in trade-off theory, the information asymmetry issues outlined in pecking order theory in addition to market timing and credit rating hypotheses.

In the Literature review, the common features and terms present in hybrid bond issues were additionally explored. In the analysis section, both the market reaction to a hybrid bond announcement and some of the features of hybrid bonds and factors regarding the issuer of the debt are tested to determine potential relationships between certain factors and the market reaction.

Figure 11: Conceptual framework



### 3. ANALYSIS

#### 3.1. DATA

As terms of different hybrid bond issues can vary considerably within Europe, as identified in section 2.1.1, the scope of this study was limited to Finnish hybrid bonds in order to maintain homogeneity in the dataset. The possibility of adding other Nordic markets including Sweden, Norway and Denmark to the scope of this study was also considered. During 2008-2018, this would have added an additional 18 listed company hybrid bond announcements to the Finnish dataset of 36 listed hybrid bond transactions. However, the other Nordic markets varied considerably in terms of key terms in hybrid bonds. Therefore, due to the following reasons only Finnish hybrid bond issues were considered and other Nordic markets were excluded from the scope for the purposes of this research:

- Homogeneity within Finnish dataset was present, however not within Nordic dataset. For instance, out of the Finnish listed company hybrid bond issues during the time period only 3% (1 out of 36) of hybrid bond issues had a coupon payment which was less than 5% of face value whereas in the other Nordic markets 44% (8 out of 18) of hybrid bond issues had coupon rates below 5% of face value
- Finland has vastly the largest market for hybrid bonds in the Nordic markets regarding the amount of hybrid bonds issued and, therefore, adding all of the other Nordic markets only provides a limited 18 additional data points
- Lack of availability of local debt capital market expert in the foreign markets
- Additional factors such as currencies and interest rates may impact the analysis when considering other international markets

The total Finnish dataset consists of 41 hybrid bond transactions of listed and non-listed companies. The five non-listed companies at the time of announcement were not included in this study as they do not have a stock market reaction that can be analysed. The dataset used for this research, therefore, consists of a total pool of 36 hybrid bond issues where the issuing company has been listed at the time of the announcement to analyse for the market reaction to the announcement.

Data for Finnish hybrid bond issues including announcement dates, issue amounts and coupons are compiled from Bloomberg (2019).

This thesis is focused on the hybrid bond issues of publicly listed companies between the years 2008-2018. The following hybrid bond transactions (issues) presented in Table 1 were extracted from the Bloomberg (2019) databases. Also, the CapMan Oyj hybrid bond issue in 2008 was not included in the Bloomberg 2019 dataset, however, was included in the context of this study.

*Table 1: Hybrid bond transactions*

Issuer name (Company, Bloomberg dataset)	Coupon %	Amount issued (€)	Announcement date	Issue date	Years until first call	Company listed
HKScan OYJ	8	40 000 000	30.8.2018	17.9.2018	5.0	listed
Caverion OYJ	4.625	100 000 000	9.6.2017	16.6.2017	3.0	listed
Rapala VMC OYJ	5.375	25 000 000	24.5.2017	31.5.2017	2.0	listed
Normet Group Oy	7.625	30 000 000	15.3.2017	22.3.2017	4.0	not listed
Versowood Oy	11	22 000 000	23.1.2017	30.1.2017	3.0	not listed
Vapo Oy	6.5	50 000 000	31.10.2016	8.11.2016	5.0	not listed
Aspo OYJ	6.75	25 000 000	17.5.2016	27.5.2016	4.0	listed
Outotec OYJ	7.375	150 000 000	14.3.2016	24.3.2016	5.0	listed
SRV Group OYJ	8.75	45 000 000	9.3.2016	22.3.2016	4.0	listed
Stockmann OYJ Abp	7.75	85 000 000	10.12.2015	17.12.2015	4.1	listed
Myllyn Paras OyKonserni	8.5	15 000 000	24.11.2015	8.12.2015	4.0	not listed
Poyry OYJ	7.5	30 000 000	17.11.2015	25.11.2015	4.0	listed
Finnair OYJ	7.875	200 000 000	28.9.2015	13.10.2015	5.0	listed
SSH Communications Security Oyj	7.5	12 000 000	19.3.2015	30.3.2015	5.0	listed
Lemminkäinen OYJ	8.75	70 000 000	4.3.2014	11.3.2014	4.1	listed
Oriola-KD OYJ	7	40 000 000	13.2.2014	20.2.2014	3.0	listed
Suominen OYJ	5.95	17 500 000	31.1.2014	10.2.2014	4.0	listed
Innofactor Oyj	9	3 200 000	17.12.2013	20.12.2013	2.2	listed
Sanoma OYJ	7.25	100 000 000	2.12.2013	12.12.2013	3.0	listed
Aspo OYJ	7	20 000 000	11.11.2013	18.11.2013	3.0	listed
Ahlstrom OYJ	7.875	100 000 000	19.9.2013	2.10.2013	4.0	listed
Componenta OYJ	12.2	33 702 000	28.8.2013	2.9.2013	2.6	listed
Panostaja OYJ	9.75	7 500 000	16.5.2013	27.5.2013	4.0	listed
Technopolis OYJ	7.5	75 000 000	19.3.2013	26.3.2013	5.0	listed
SRV Group OYJ	9.5	45 000 000	18.12.2012	28.12.2012	4.0	listed
Sponda OYJ	6.75	95 000 000	21.11.2012	5.12.2012	5.0	listed
Finnair OYJ	8.875	120 000 000	13.11.2012	26.11.2012	4.0	listed
Componenta OYJ	12	20 716 000	29.3.2012	29.3.2012	4.0	listed
Lemminkäinen OYJ	10	70 000 000	23.3.2012	30.3.2012	4.0	listed
Myllyn Paras OyKonserni	8	15 000 000	3.5.2011	10.5.2011	5.0	not listed
Trainers House Oyj	10	5 000 000	12.1.2010	15.1.2010	3.3	listed
Etteplan OYJ	12.5	10 000 000	18.11.2009	1.12.2009	2.0	listed
Ahlstrom OYJ	9.5	80 000 000	9.11.2009	25.11.2009	4.0	listed
Finnair OYJ	9	120 000 000	18.9.2009	7.10.2009	4.0	listed
Cramo OYJ	12	50 000 000	15.4.2009	29.4.2009	4.0	listed
Ponsse Oy	12	19 000 000	27.3.2009	31.3.2009	4.0	listed
Finnlines OYJ	12	21 000 000	23.3.2009	26.3.2009	3.0	listed
Amer Sports Oyj	12	60 000 000	25.2.2009	12.3.2009	3.0	listed
Huhtamäki OYJ	10.5	75 000 000	19.11.2008	28.11.2008	3.0	listed
Sponda OYJ	8.75	130 000 000	17.6.2008	27.6.2008	5.0	listed

Issuer name (Company, Bloomberg dataset)	Coupon %	Amount issued (€)	Announcement date	Issue date	Years until first call	Company listed
CapMan Oyj	11.25	29 000 000	5.12.2008	18.12.2008	5.0	listed

*Source: Bloomberg (2019) first 5 columns, Thomson Reuters (2019) for listed status data.*

*Note: The listed status of the company (issuer) was checked from the moment of announcement of issue. The years until first call is from the moment of issue.*

Comparing the Bloomberg (2019) dataset to company press releases and information on their financial statements, a few discrepancies were identified and corrected. After analysis, the following corrections were made to the Bloomberg data:

- The Finnlines 2009 hybrid bond issue was announced on 23.3.2009
- The Ponsse Oyj 2009 hybrid bond issue had a 12% coupon according to Myllymäki (2013)
- The Cramo Oyj 2009 hybrid bond issue had a 12% coupon according to Myllymäki (2013)
- The Etteplan Oyj 2009 hybrid bond issue was announced on 18.11.2009
- The Trainers House Oyj 2010 hybrid bond issue was announced on 12.1.2010 and it was perpetual in maturity rather than dated
- The Componenta 2013 hybrid bond issue had a 12.2% coupon
- The Innofactor 2013 hybrid bond issue was announced on 17.12.2013 and had a coupon of 9%
- The Suominen Oyj 2014 hybrid bond issue was announced on 31.1.2014
- The Finnair 2015 hybrid bond was announced on 28.9.2015
- The Outotec 2016 hybrid bond was announced on 14.3.2016

Figure 12: Annual hybrid bond issues by amount of issues

### Hybrid bond issues by amount of issues

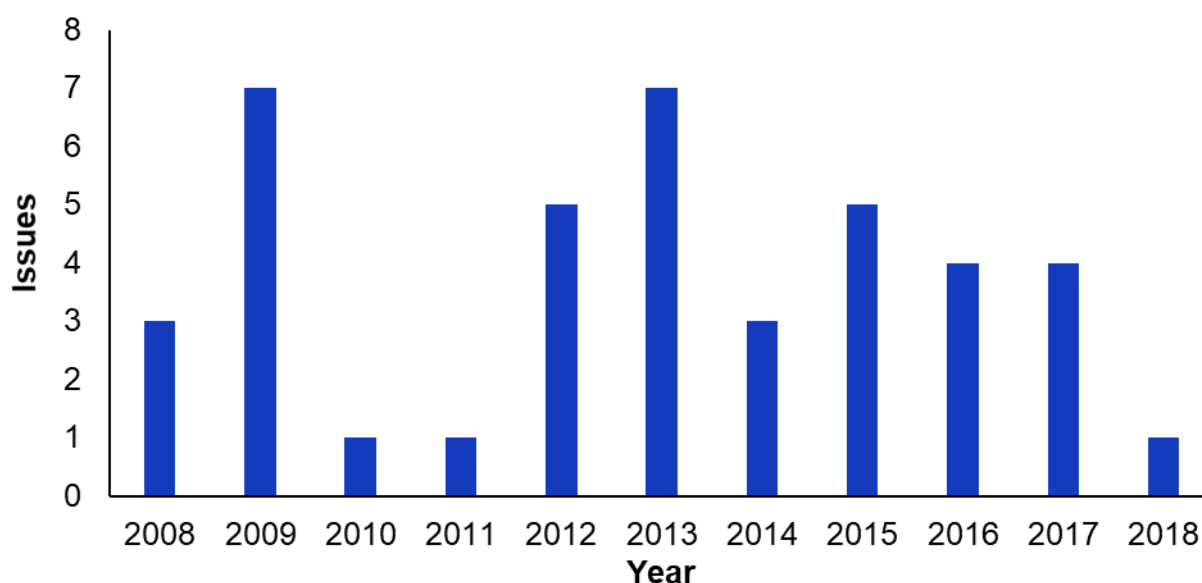
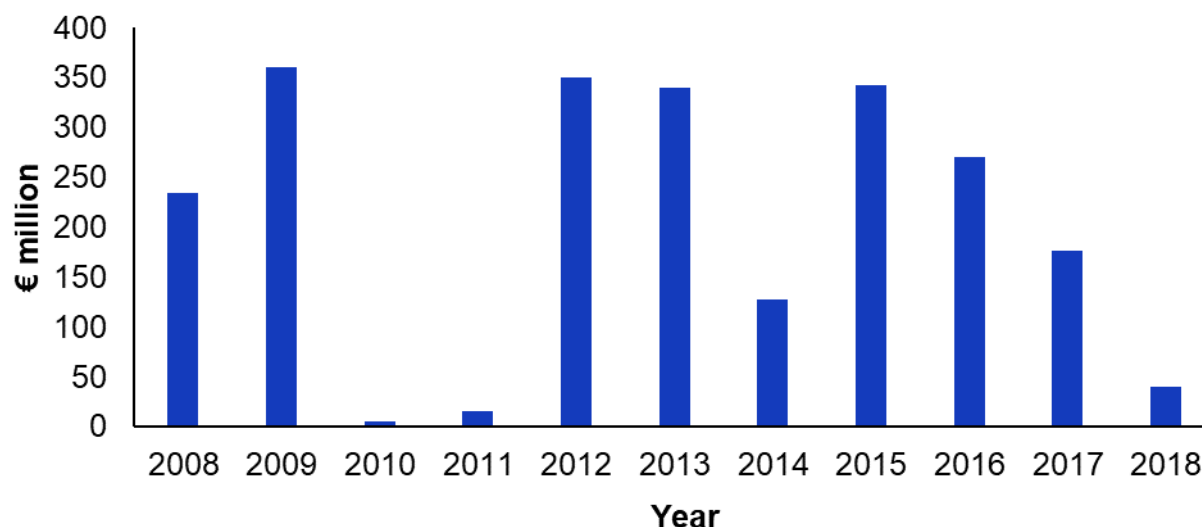


Figure 13: Annual hybrid bond issues by amount of capital raised

### Hybrid bond issues by amount of capital raised



There is volatility in the amount of hybrid bonds issued annually in Finland. There seems to be three major waves when the hybrid bonds have been relatively popular: 2008-2009, 2012-2013 and 2015-2016. The amount of hybrid bonds issued has peaked in 2009 and 2013 with 7 hybrid bond issues in each of the years. However, when considering issue amount, 2012 and 2015 were also rather active in terms of hybrid bonds issued.

Data on historical closing stock prices, daily stock returns including dividends and index prices was compiled from financial market data available from the Thomson Reuters (2019) database.

### **3.2. METHODOLOGY AND ANALYSIS**

This thesis utilizes a similar method as that used by Masulis & Korwar (1986) in examining common stock price adjustments to announcements of underwritten common stock offerings.

In order to identify the raw returns of individual stocks, the closing stock prices and the daily dividend adjusted stock returns were used to calculate “adjusted closing prices” which account for potential returns from dividends paid out under the assumption that dividends would be reinvested beginning from the 1<sup>st</sup> of January 2007.

The announcement period used includes both returns for the announcement date (“AD” or “event day”) as well as the trading day following the announcement because the announcement could have happened after trading has closed, thereby, the compounded daily return between the following two variables is used as the daily announcement return:

1. The adjusted closing stock price the trading day before the announcement day (Closing price, EUR, AD-1)
2. The adjusted closing stock price for the trading day following the announcement (Closing price, EUR, AD+1)

The reference period is considered as the daily returns during the 60 trading days immediately prior to the announcement period and seeks to identify the ‘normal’ rate of return of the stock. Robustness checks for 120 day and 252 day reference periods were also conducted. The compounded daily return between the following two variables was calculated to get the daily reference return:

1. The adjusted closing stock price 62 trading days prior to the announcement day (Adjusted closing price at beginning of reference period). For the



robustness checks, this was adjusted to correspond with the relevant reference period.

2. The adjusted closing stock price the trading day before the announcement day (Closing price, EUR, AD-1)

A daily return for each stock for each event day is calculated by using the stock's individual returns for the time periods in question. The difference between the daily returns over the announcement period and the reference period shows the estimated impact of a hybrid bond announcement to the share price.

**Table 2: Daily return calculations for the reference and announcement periods**

Reference period (days)

60

Issuer Name	Announcement Date (AD)	Issue Date	Adjusted closing price (EUR, AD - 1)	Adjusted closing price (EUR, AD + 1)	Adjusted closing price at beginning of reference period	Daily reference return (%)	Daily announcement return (%)	Market reaction (Ann. return - Ref. return)
HKScan OYJ	30.8.2018	17.9.2018	4.18	4.16	4.78	-0.2 %	-0.3 %	-0.1 %
Caverion OYJ	9.6.2017	16.6.2017	8.03	7.96	7.72	0.1 %	-0.4 %	-0.5 %
Rapala VMC OYJ	24.5.2017	31.5.2017	5.85	5.86	6.39	-0.1 %	0.1 %	0.3 %
Aspo OYJ	17.5.2016	27.5.2016	11.87	11.80	11.57	0.0 %	-0.3 %	-0.3 %
Outotec OYJ	14.3.2016	24.3.2016	4.43	4.30	4.84	-0.1 %	-1.5 %	-1.4 %
SRV Group OYJ	9.3.2016	22.3.2016	3.90	3.96	3.88	0.0 %	0.8 %	0.8 %
Stockmann OYJ Abp	10.12.2015	17.12.2015	9.73	9.15	10.45	-0.1 %	-3.0 %	-2.9 %
Poyry OYJ	17.11.2015	25.11.2015	4.66	4.71	4.62	0.0 %	0.5 %	0.5 %
Finnair OYJ	28.9.2015	13.10.2015	3.25	3.17	3.06	0.1 %	-1.2 %	-1.3 %
SSH Communications Security Oyj	19.3.2015	30.3.2015	4.34	4.26	2.92	0.7 %	-0.9 %	-1.5 %
Lemminkäinen OYJ	4.3.2014	11.3.2014	16.31	16.57	16.96	-0.1 %	0.8 %	0.9 %
Oriola-KD OYJ	13.2.2014	20.2.2014	2.66	2.68	2.68	0.0 %	0.2 %	0.2 %
Suominen OYJ	31.1.2014	10.2.2014	2.53	2.43	2.43	0.1 %	-2.0 %	-2.0 %
Innofactor Oyj	17.12.2013	20.12.2013	1.13	1.11	1.60	-0.6 %	-0.9 %	-0.3 %
Sanoma OYJ	2.12.2013	12.12.2013	11.51	11.33	9.14	0.4 %	-0.8 %	-1.2 %
Aspo OYJ	11.11.2013	18.11.2013	8.42	8.72	8.58	0.0 %	1.7 %	1.8 %
Ahlstrom OYJ	19.9.2013	2.10.2013	11.61	11.40	12.74	-0.2 %	-0.9 %	-0.7 %
Componenta OYJ	28.8.2013	2.9.2013	1.86	1.84	1.86	0.0 %	-0.3 %	-0.3 %
Panostaja OYJ	16.5.2013	27.5.2013	1.01	0.92	1.01	0.0 %	-4.5 %	-4.5 %
Technopolis OYJ	19.3.2013	26.3.2013	3.86	3.89	3.57	0.1 %	0.4 %	0.2 %
SRV Group OYJ	18.12.2012	28.12.2012	3.08	3.05	3.42	-0.2 %	-0.5 %	-0.3 %
Sponda OYJ	21.11.2012	5.12.2012	4.02	4.17	4.13	0.0 %	1.9 %	1.9 %
Finnair OYJ	13.11.2012	26.11.2012	2.31	2.30	2.16	0.1 %	-0.2 %	-0.3 %
Componenta OYJ	29.3.2012	29.3.2012	3.75	3.68	3.86	-0.1 %	-0.9 %	-0.9 %
Lemminkäinen OYJ	23.3.2012	30.3.2012	21.94	21.29	20.64	0.1 %	-1.5 %	-1.6 %
Trainers House Oyj	12.1.2010	15.1.2010	0.57	0.50	0.62	-0.1 %	-6.1 %	-5.9 %
Etteplan OYJ	18.11.2009	1.12.2009	3.08	3.04	3.23	-0.1 %	-0.7 %	-0.6 %
Ahlstrom OYJ	9.11.2009	25.11.2009	8.28	8.46	7.24	0.2 %	1.1 %	0.8 %
Finnair OYJ	18.9.2009	7.10.2009	4.64	4.64	3.97	0.3 %	0.0 %	-0.3 %
Cramo OYJ	15.4.2009	29.4.2009	5.29	5.51	5.10	0.1 %	2.1 %	2.1 %
Ponsse Oy	27.3.2009	31.3.2009	3.67	3.55	4.59	-0.4 %	-1.8 %	-1.4 %
Finnlines OYJ	23.3.2009	26.3.2009	5.43	4.96	5.80	-0.1 %	-4.5 %	-4.4 %
Amer Sports Oyj	25.2.2009	12.3.2009	4.24	4.36	4.53	-0.1 %	1.4 %	1.5 %
CapMan Oyj	5.12.2008	5.12.2008	1.33	1.30	2.47	-1.0 %	-1.2 %	-0.2 %
Huhtamäki OYJ	19.11.2008	28.11.2008	5.71	5.15	7.22	-0.4 %	-5.0 %	-4.6 %
Sponda OYJ	17.6.2008	27.6.2008	4.04	4.06	5.30	-0.5 %	0.3 %	0.8 %
<b>Min</b>						<b>-1.0 %</b>	<b>-6.1 %</b>	<b>-5.9 %</b>
<b>Lower quartile</b>						<b>-0.1 %</b>	<b>-1.3 %</b>	<b>-1.4 %</b>
<b>Median</b>						<b>0.0 %</b>	<b>-0.4 %</b>	<b>-0.3 %</b>
<b>Average</b>						<b>-0.1 %</b>	<b>-0.8 %</b>	<b>-0.7 %</b>
<b>Upper quartile</b>						<b>0.1 %</b>	<b>0.3 %</b>	<b>0.3 %</b>
<b>Max</b>						<b>0.7 %</b>	<b>2.1 %</b>	<b>2.1 %</b>
<b>Standard deviation</b>						<b>0.3 %</b>	<b>1.9 %</b>	<b>1.9 %</b>

Furthermore, as market movements may affect the returns of a share on a specific day, the impact of market movements was adjusted in order to identify more accurately the stock price reaction to the hybrid bond announcement. As all of the companies under review were Finnish listed companies, the OMX Helsinki 25 index was used to benchmark market returns. The compounded daily OMX Helsinki 25 index returns for each of the applicable time periods (both the reference and announcement periods of each hybrid bond issue) were calculated and then deducted from the absolute return in order to get the market adjusted returns.

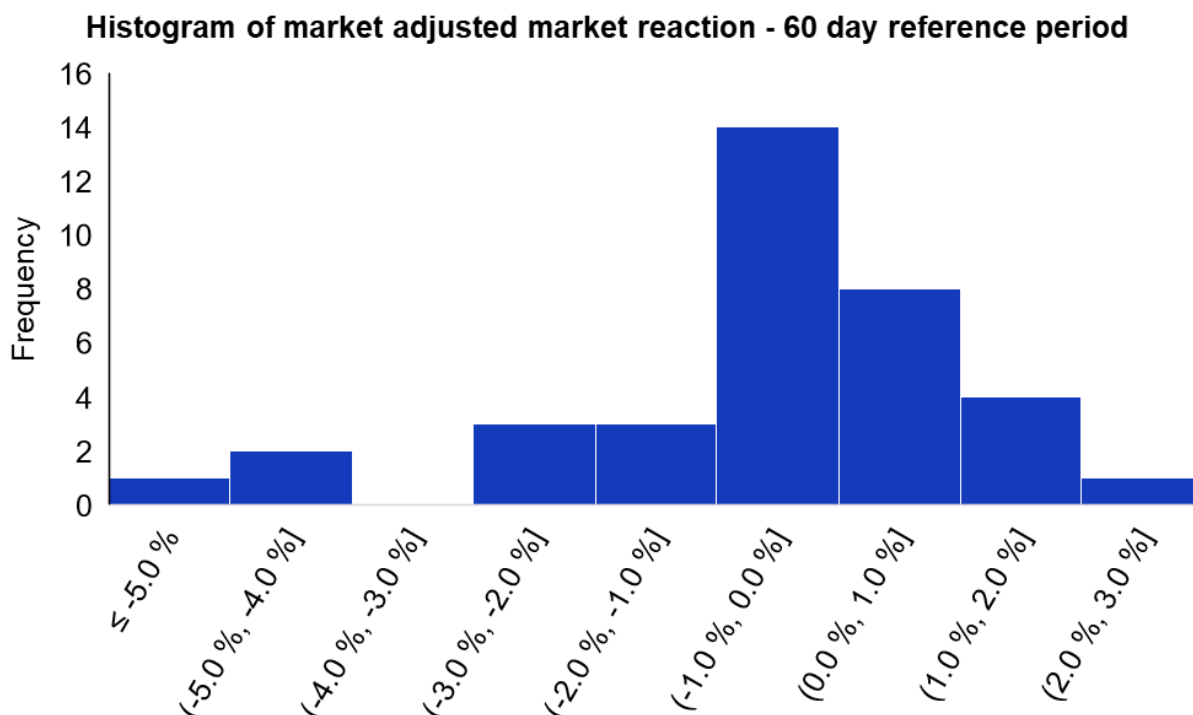
Table 3: Market adjustments

Reference period (days)

60

Issuer Name	Announcement Date (AD)	Daily reference return (%)	Daily announcement return (%)	Daily reference market return	Daily announcement market return	Market adjusted reference return	Market adjusted announcement return	Market adjusted market reaction (Ann. return - Ref. return)
HKScan OYJ	30.8.2018	-0.2 %	-0.3 %	0.0 %	-0.4 %	-0.3 %	0.1 %	0.3 %
Caverion OYJ	9.6.2017	0.1 %	-0.4 %	0.1 %	0.0 %	-0.1 %	-0.4 %	-0.3 %
Rapala VMC OYJ	24.5.2017	-0.1 %	0.1 %	0.1 %	0.2 %	-0.3 %	0.0 %	0.2 %
Aspo OYJ	17.5.2016	0.0 %	-0.3 %	0.1 %	0.2 %	0.0 %	-0.5 %	-0.5 %
Outotec OYJ	14.3.2016	-0.1 %	-1.5 %	-0.1 %	0.5 %	-0.1 %	-2.1 %	-2.0 %
SRV Group OYJ	9.3.2016	0.0 %	0.8 %	-0.1 %	-0.4 %	0.2 %	1.2 %	1.0 %
Stockmann OYJ Abp	10.12.2015	-0.1 %	-3.0 %	0.1 %	-0.8 %	-0.2 %	-2.2 %	-1.9 %
Poyry OYJ	17.11.2015	0.0 %	0.5 %	0.1 %	1.0 %	-0.1 %	-0.5 %	-0.4 %
Finnair OYJ	28.9.2015	0.1 %	-1.2 %	-0.2 %	-0.9 %	0.3 %	-0.2 %	-0.5 %
SSH Communications Security Oyj	19.3.2015	0.7 %	-0.9 %	0.4 %	0.7 %	0.3 %	-1.6 %	-1.9 %
Lemminkäinen OYJ	4.3.2014	-0.1 %	0.8 %	0.0 %	1.3 %	-0.1 %	-0.5 %	-0.4 %
Oriola-KD OYJ	13.2.2014	0.0 %	0.2 %	0.0 %	0.0 %	-0.1 %	0.2 %	0.2 %
Suominen OYJ	31.1.2014	0.1 %	-2.0 %	0.1 %	-1.3 %	0.0 %	-0.7 %	-0.7 %
Innofactor Oyj	17.12.2013	-0.6 %	-0.9 %	0.0 %	0.2 %	-0.6 %	-1.1 %	-0.5 %
Sanoma OYJ	2.12.2013	0.4 %	-0.8 %	0.2 %	-1.4 %	0.2 %	0.6 %	0.4 %
Aspo OYJ	11.11.2013	0.0 %	1.7 %	0.2 %	-0.4 %	-0.3 %	2.1 %	2.4 %
Ahlstrom OYJ	19.9.2013	-0.2 %	-0.9 %	0.3 %	0.3 %	-0.5 %	-1.2 %	-0.7 %
Componenta OYJ	28.8.2013	0.0 %	-0.3 %	0.0 %	0.0 %	0.0 %	-0.3 %	-0.3 %
Panostaja OYJ	16.5.2013	0.0 %	-4.5 %	0.0 %	-0.2 %	0.0 %	-4.2 %	-4.2 %
Technopolis OYJ	19.3.2013	0.1 %	0.4 %	0.1 %	0.3 %	0.0 %	0.1 %	0.1 %
SRV Group OYJ	18.12.2012	-0.2 %	-0.5 %	0.1 %	0.7 %	-0.3 %	-1.1 %	-0.8 %
Sponda OYJ	21.11.2012	0.0 %	1.9 %	0.0 %	1.1 %	-0.1 %	0.7 %	0.8 %
Finnair OYJ	13.11.2012	0.1 %	-0.2 %	0.0 %	-0.3 %	0.1 %	0.1 %	-0.1 %
Componenta OYJ	29.3.2012	-0.1 %	-0.9 %	0.2 %	0.2 %	-0.2 %	-1.2 %	-1.0 %
Lemminkäinen OYJ	23.3.2012	0.1 %	-1.5 %	0.2 %	1.1 %	-0.1 %	-2.6 %	-2.5 %
Trainers House Oyj	12.1.2010	-0.1 %	-6.1 %	0.1 %	-0.7 %	-0.3 %	-5.4 %	-5.1 %
Etteplan OYJ	18.11.2009	-0.1 %	-0.7 %	0.1 %	-0.4 %	-0.1 %	-0.2 %	-0.1 %
Ahlstrom OYJ	9.11.2009	0.2 %	1.1 %	0.1 %	1.0 %	0.2 %	0.1 %	-0.1 %
Finnair OYJ	18.9.2009	0.3 %	0.0 %	0.4 %	-0.8 %	-0.1 %	0.8 %	0.9 %
Cramo OYJ	15.4.2009	0.1 %	2.1 %	0.0 %	1.4 %	0.1 %	0.7 %	0.6 %
Ponsse Oy	27.3.2009	-0.4 %	-1.8 %	-0.2 %	-3.0 %	-0.2 %	1.3 %	1.5 %
Finnlines OYJ	23.3.2009	-0.1 %	-4.5 %	-0.2 %	-0.1 %	0.1 %	-4.4 %	-4.5 %
Amer Sports Oyj	25.2.2009	-0.1 %	1.4 %	-0.2 %	0.1 %	0.1 %	1.3 %	1.2 %
CapMan Oyj	5.12.2008	-1.0 %	-1.2 %	-0.6 %	0.2 %	-0.4 %	-1.4 %	-1.0 %
Huhtamäki OYJ	19.11.2008	-0.4 %	-5.0 %	-0.7 %	-3.2 %	0.3 %	-1.9 %	-2.2 %
Sponda OYJ	17.6.2008	-0.5 %	0.3 %	0.0 %	-1.0 %	-0.5 %	1.3 %	1.8 %
<b>Min</b>		<b>-1.0 %</b>	<b>-6.1 %</b>			<b>-0.6 %</b>	<b>-5.4 %</b>	<b>-5.1 %</b>
<b>Lower quartile</b>		<b>-0.1 %</b>	<b>-1.3 %</b>			<b>-0.2 %</b>	<b>-1.2 %</b>	<b>-1.0 %</b>
<b>Median</b>		<b>0.0 %</b>	<b>-0.4 %</b>			<b>-0.1 %</b>	<b>-0.4 %</b>	<b>-0.4 %</b>
<b>Average</b>		<b>-0.1 %</b>	<b>-0.8 %</b>			<b>-0.1 %</b>	<b>-0.6 %</b>	<b>-0.6 %</b>
<b>Upper quartile</b>		<b>0.1 %</b>	<b>0.3 %</b>			<b>0.1 %</b>	<b>0.3 %</b>	<b>0.4 %</b>
<b>Max</b>		<b>0.7 %</b>	<b>2.1 %</b>			<b>0.3 %</b>	<b>2.1 %</b>	<b>2.4 %</b>
<b>Standard deviation</b>		<b>0.3 %</b>	<b>1.9 %</b>			<b>0.2 %</b>	<b>1.6 %</b>	<b>1.7 %</b>

Figure 14: Histogram of market adjusted market reaction



The results indicate that on average the announcement of a hybrid bond issue is expected to underperform the market by an average of -0.6% with an interquartile range of -1.0%-0.4%. The data seems to be distributed normally. The majority of hybrid bond issues have resulted in a negative market reaction, however, certain companies' have witnessed positive reactions around the event day relative to the market.

The data was also checked with 120 and 252 trading day reference periods in order to identify whether altering the reference period would alter the end results. Table 4 displays the results of the robustness check. The average is the same with each of the reference periods and the median and standard deviation of the data vary by  $\pm 0.1\%$  in the robustness check and are therefore rather close to the 60 day reference period calculations. The calculations behind the robustness checks are presented in Appendix I.

Table 4: Robustness check

Robustness check				
Reference period	60 days	120 days	252 days	Average
Min	-5.1 %	-5.0 %	-5.3 %	-5.1 %
Lower quartile	-1.0 %	-1.3 %	-1.3 %	-1.2 %
Median	-0.4 %	-0.3 %	-0.3 %	-0.3 %
Average	-0.6 %	-0.6 %	-0.6 %	-0.6 %
Upper quartile	0.4 %	0.4 %	0.4 %	0.4 %
Max	2.4 %	2.2 %	2.2 %	2.3 %
Standard deviation	1.7 %	1.6 %	1.6 %	1.6 %

### 3.2.1. Significance testing

In order to test for significance of the data, a one sample t-test was conducted. The median and averages suggest a negative market reaction to the news of a hybrid bond issue. However, as there is a theoretical possibility that the announcement of a hybrid bond issue might have a positive impact on the market reaction, a two-tailed t-test can be used to identify the significance of either a positive or a negative market reaction to the announcement of a hybrid bond issue. The null hypothesis for the test is that the mean of the sample is equal to zero:

$$H_0: \text{mean} = 0$$

The alternative hypothesis is that the mean is less than zero if the t Stat is negative or that the mean is greater than 0 if the t Stat is positive:

$$H_1: \text{mean} <> 0$$

The results of the two-tailed test are displayed on Table 5.

Table 5: Two tailed t-test

Two tailed t-test				
Reference period	60 days	120 days	252 days	Average
Observations	36	36	36	36
Hypothesized Mean	0	0	0	0
df	35	35	35	35
t Stat	-2.042	-2.126	-2.142	-2.104
P(T<=t) two-tail	0.049	0.041	0.039	0.043
t Critical two-tail	2.030	2.030	2.030	2.030

As can be seen, the null hypothesis can be rejected at a 5% significance level for all reference periods in the robustness check. The average of the p-values is 0.043, which means that in general the null hypothesis can be rejected and we can accept the alternative hypothesis. As the t Stat is negative for all of the reference periods, it can be concluded that the market reacts negatively to a hybrid bond announcement at a statistically significant level.

Another test for significance was conducted in the form of a non-parametric sign test. This test is insensitive to outliers as it only analyses the signs (whether positive or negative) of the individual sample set of market reactions. The test does not take into account how positive or negative the reaction is. The null hypothesis of the test is that the probability of a negative market reaction is 50%:

$$p = \Pr(X < 0); H_0: p \leq 0.5$$

The alternative hypothesis is that the probability of a negative reaction is greater than 50%:

$$p = \Pr(X < 0); H_0: p > 0.5$$

The sign test results are outlined in Table 6.

Table 6: Sign test results

Sign test				
Reference period	60 days	120 days	252 days	Average
# of positive reactions	13	14	15	<i>n.a.</i>
# of negative reactions	23	22	21	<i>n.a.</i>
Total	36	36	36	<i>n.a.</i>
<b>p-value</b>	<b>0.07</b>	<b>0.12</b>	<b>0.20</b>	<b>0.13</b>

As can be seen from the data, there are only two additional negative reactions that can be witnessed in the 60 day reference period sign test compared to the 252 day reference period. These two reactions result in different conclusions based on the sign test. The sign test is statistically significant at a 10% significance level for only the 60 day reference period. The null hypothesis cannot be rejected in the robustness checks with reference periods of 120 or 252 days at the same level of significance. The average p-value the three reference periods is 0.13. This means that the null hypothesis fails to be rejected at a statistically significant level even at 10% significance if considering all three reference period lengths with equal weighting.

Due to the resulting p-value of the test being sensitive to the reference period in question, it is difficult to make meaningful conclusions from this sign test alone. If a larger dataset was present, it might result in added significance to this testing method.

### **3.2.2. Regression analysis**

After testing the significance of the sample set, the next research goal is to explore potential factors that correlate with successful (and unsuccessful) market reactions to hybrid bond announcements. This is done by utilizing several regression analyses where the dependent variable is the market adjusted market reaction.

#### Regressing market reaction with coupon percentage

As the coupon is a measure of how expensive debt is, regressing the market adjusted market reaction to the coupon percentage is interesting to identify whether this has impact on the announcement return. The hypothesis is that the higher the coupon payment, the more negative the market reaction to the announcement of the hybrid bond. It should be noted, however, that the exact coupon may not be publicly known yet on the announcement day for all hybrid bond announcements as

the announcement date is the date when the company has expressed its plans to issue the hybrid bond. In some cases, the yield and size of the issue were indicated at a later date from the initial announcement date. Table 7 shows the results when regressing the market-adjusted market reaction (dependent variable) with the coupon of the issue (independent variable):

*Table 7: Regression of market reaction with the coupon of the issue*

Coupon regression - Robustness check				
Reference period	60 days	120 days	252 days	Average
Multiple R	17.0 %	16.0 %	14.9 %	16.0 %
R Square	2.9 %	2.6 %	2.2 %	2.6 %
Adjusted R Square	0.0 %	-0.3 %	-0.7 %	-0.3 %
Standard Error	1.7 %	1.6 %	1.7 %	1.6 %

Coupon regression					
Reference period	Coefficient	Estimate	Std. Error	t stat	p value
60 days	Intercept	0.006	0.012	0.514	0.611
	Coupon	-0.001	0.001	-1.004	0.323
120 days	Intercept	0.005	0.012	0.440	0.663
	Coupon	-0.001	0.001	-0.947	0.350
252 days	Intercept	0.004	0.012	0.369	0.715
	Coupon	-0.001	0.001	-0.876	0.387

As the market reaction happens during the announcement of the intention to issue hybrid bonds, some companies may not have the exact terms locked down yet when they publicly announce the issue, while other companies issue a press release after the terms are set. The slope of the regression is negative and the p value ranges for the coupon coefficient ranges from 0.32-0.39. The result is therefore not statistically significant. However, the negative slope of the regression could imply the following about the relationship between coupons and market reactions:

- 1) A higher coupon would lead to a decreased market reaction. This seems logical as a higher than expected coupon payment has implications on the earnings potential of the equity.
- 2) A negative market reaction would lead to an increase in the coupon percentage. If there is a negative market reaction, this could mean that there is low interest in the issuance of the hybrid debt and could impact the pricing point through less competitive interest in financing the debt.



The R-square is on average 2.6% between the robustness checks. The adjusted R-square is positive for only the 60 day reference period. The R-square implies that the coupon percentage of the hybrid bond issue may explain a rather small amount of the variation in the adjusted market returns.

### Regressing market reaction with the Altman Z-Score

The Altman Z-Score is a measure of the bankruptcy risk of a company where a higher score implies lower bankruptcy risk for a given entity (Altman, 1968). This tests goal is to identify whether companies that are likelier to go bankrupt according to the Altman Z-Score model would have a differing market reaction to a hybrid bond announcement compared to a company that is otherwise not at large risk for bankruptcy according to the model. The hypothesis for this is that companies with a lower Altman Z-Score would have lower market reactions compared to hybrid bond announcements of companies with a higher Altman Z-Score.

The Altman Z-Score that this study uses is the original proposed in 1968 for publicly listed companies (Altman et al., 2014):

$$Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 0.99X_5$$

Where:

- $X_1$  = Working capital / Total assets
- $X_2$  = Retained earnings / Total assets
- $X_3$  = Earnings before interest and taxes ("EBIT") / Total assets
- $X_4$  = Market value of equity / Book value of total liabilities
- $X_5$  = Sales / Total assets

Table 8 displays the raw data for the Altman Z-Score calculations, compiled from the Thomson Reuters (2019) database:

Table 8: Financials for Altman Z-Score calculations

Financials from Thomson Reuters Eikon (2019, €m)											
Issuer name (Company)	Announcement date	Date of financials	Current assets	Current liabilities	Working capital	Total assets	Total liabilities	Retained earnings	Sales	EBIT	Market value of equity
HKScan OYJ	30.8.2018	Q2 2018	268.3	278.8	-10.5	918.9	624.0	18.0	1772.3	-58.6	155.4
Caverion OYJ	9.6.2017	Q1 2017	665.9	725.5	-59.6	1110.4	955.8	163.0	2378.1	-55.3	923.1
Rapala VMC OYJ	24.5.2017	Q4 2016	192.7	126.9	65.8	316.1	188.6	106.4	260.6	7.2	158.3
Aspo OYJ	17.5.2016	Q1 2016	124.6	72.5	52.1	296.3	193.6	75.0	442.3	20.9	227.2
Outotec OYJ	14.3.2016	Q4 2015	942.6	711.5	231.1	1531.4	1129.6	319.6	1201.2	-12.3	615.7
SRV Group OYJ	9.3.2016	Q4 2015	490.8	309.6	181.2	762.6	486.2	95.7	719.1	24.3	183.9
Stockmann OYJ Abp	10.12.2015	Q3 2015	349.2	596.0	-246.8	2337.5	1315.0	53.7	1324.3	-78.7	501.8
Poyry OYJ	17.11.2015	Q3 2015	258.2	249.5	8.7	427.8	335.4	32.8	567.2	-8.2	213.3
Finnair OYJ	28.9.2015	Q3 2015	979.0	992.6	-13.6	1955.8	1398.8	9.9	2239.6	-4.7	392.4
SSH Communications Security Oyj	19.3.2015	Q4 2014	13.6	9.7	3.9	17.6	9.7	-1.0	16.2	0.2	77.7
Lemminkäinen OYJ	4.3.2014	Q4 2013	980.2	920.3	59.9	1342.7	1019.2	247.8	2020.1	-89.3	298.2
Oriola-KD OYJ	13.2.2014	Q4 2013	938.3	1020.3	-82.0	1500.1	1222.0	221.5	1619.7	29.3	385.4
Suominen OYJ	31.1.2014	Q4 2013	105.1	81.6	23.5	238.9	160.4	-51.1	373.7	18.9	113.8
Innofactor Oyj	17.12.2013	Q3 2013	12.2	11.7	0.5	42.2	23.4	3.2	27.9	2.1	50.5
Sanoma OYJ	2.12.2013	Q3 2013	592.2	1252.2	-660.0	3459.0	2639.0	548.9	2152.8	-229.2	1004.6
Aspo OYJ	11.11.2013	Q3 2013	139.6	128.2	11.4	308.8	229.5	50.9	486.1	10.7	163.2
Ahlstrom OYJ	19.9.2013	Q2 2013	371.2	475.6	-104.4	1157.9	817.6	91.8	1009.2	22.0	409.7
Componenta OYJ	28.8.2013	Q2 2013	147.4	265.9	-118.5	486.9	417.9	-25.7	506.0	-3.6	32.9
Panostaja OYJ	16.5.2013	Q1 2013	58.3	47.0	11.3	148.5	123.9	-0.1	137.5	1.3	39.0
Technopolis OYJ	19.3.2013	Q4 2012	34.1	143.5	-109.4	1082.7	709.2	121.7	107.3	48.0	278.9
SRV Group OYJ	18.12.2012	Q3 2012	568.1	297.4	270.7	625.8	463.4	67.2	733.9	17.4	122.1
Sponda OYJ	21.11.2012	Q3 2012	53.3	392.1	-338.8	3446.9	2099.6	545.4	263.1	196.2	903.0
Finnair OYJ	13.11.2012	Q3 2012	743.7	909.2	-165.5	2304.4	1552.8	125.7	2413.9	-2.8	264.4
Componenta OYJ	29.3.2012	Q4 2011	145.2	268.7	-123.5	436.8	403.0	3.4	576.4	22.5	59.0
Lemminkäinen OYJ	23.3.2012	Q4 2011	891.8	662.7	229.1	1242.8	894.1	210.6	2183.9	44.1	367.8
Trainers House Oyj	12.1.2010	Q4 2009	6.7	6.7	0.0	77.2	25.9	4.9	20.5	-2.1	29.9
Etteplan OYJ	18.11.2009	Q3 2009	27.7	37.2	-9.5	61.3	47.6	18.2	107.1	-0.8	60.1
Ahlstrom OYJ	9.11.2009	Q3 2009	551.6	492.1	59.5	1588.7	964.4	364.9	1594.7	-23.5	325.2
Finnair OYJ	18.9.2009	Q2 2009	525.5	953.7	-428.2	2218.0	1497.1	291.8	2080.8	-161.0	480.3
Cramo OYJ	15.4.2009	Q1 2009	134.5	146.0	-11.5	973.7	664.0	119.9	576.1	75.4	71.4
Ponsse Oy	27.3.2009	Q4 2008	130.5	80.1	50.4	174.8	107.7	62.5	293.0	13.6	125.8
Finnlines OYJ	23.3.2009	Q4 2008	89.3	202.2	-112.9	1534.4	1097.9	332.9	738.2	35.4	262.5
Amer Sports Oyj	25.2.2009	Q4 2008	973.9	682.9	291.0	1661.9	1156.4	275.6	1576.6	78.9	368.7
CapMan Oyj	5.12.2008	Q3 2008	16.8	31.9	-15.1	129.4	70.8	13.7	35.1	1.7	144.1
Huhtamäki OYJ	19.11.2008	Q3 2008	833.9	767.3	66.6	2196.9	1434.9	467.5	2269.0	-5.3	873.7
Sponda OYJ	17.6.2008	Q1 2008	155.5	677.3	-521.8	3009.3	2119.8	409.2	198.8	199.8	470.8

Source: Thomson Reuters (2019)

Next, Table 9 shows the calculation of the Altman Z-Score:

Table 9: Altman Z-Score Calculations

Altman Z-Score Calculations							
Issuer name (Company)	Announcement date	Working capital / total assets	Retained earnings / total assets	EBIT / total assets	Equity market value / total liabilities	Sales / total assets	Altman Z-Score
HKScan OYJ	30.8.2018	0.0	0.0	-0.1	0.2	1.9	1.9
Caverion OYJ	9.6.2017	-0.1	0.1	0.0	1.0	2.1	2.7
Rapala VMC OYJ	24.5.2017	0.2	0.3	0.0	0.8	0.8	2.1
Aspo OYJ	17.5.2016	0.2	0.3	0.1	1.2	1.5	3.0
Outotec OYJ	14.3.2016	0.2	0.2	0.0	0.5	0.8	1.6
SRV Group OYJ	9.3.2016	0.2	0.1	0.0	0.4	0.9	1.7
Stockmann OYJ Abp	10.12.2015	-0.1	0.0	0.0	0.4	0.6	0.6
Poyry OYJ	17.11.2015	0.0	0.1	0.0	0.6	1.3	1.8
Finnair OYJ	28.9.2015	0.0	0.0	0.0	0.3	1.1	1.3
SSH Communications Security Oyj	19.3.2015	0.2	-0.1	0.0	8.0	0.9	6.0
Lemminkäinen OYJ	4.3.2014	0.0	0.2	-0.1	0.3	1.5	1.8
Oriola-KD OYJ	13.2.2014	-0.1	0.1	0.0	0.3	1.1	1.5
Suominen OYJ	31.1.2014	0.1	-0.2	0.1	0.7	1.6	2.1
Innofactor Oyj	17.12.2013	0.0	0.1	0.1	2.2	0.7	2.2
Sanoma OYJ	2.12.2013	-0.2	0.2	-0.1	0.4	0.6	0.6
Aspo OYJ	11.11.2013	0.0	0.2	0.0	0.7	1.6	2.4
Ahlstrom OYJ	19.9.2013	-0.1	0.1	0.0	0.5	0.9	1.2
Componenta OYJ	28.8.2013	-0.2	-0.1	0.0	0.1	1.0	0.7
Panostaja OYJ	16.5.2013	0.1	0.0	0.0	0.3	0.9	1.2
Technopolis OYJ	19.3.2013	-0.1	0.1	0.0	0.4	0.1	0.5
SRV Group OYJ	18.12.2012	0.4	0.1	0.0	0.3	1.2	2.1
Sponda OYJ	21.11.2012	-0.1	0.2	0.1	0.4	0.1	0.6
Finnair OYJ	13.11.2012	-0.1	0.1	0.0	0.2	1.0	1.1
Componenta OYJ	29.3.2012	-0.3	0.0	0.1	0.1	1.3	1.2
Lemminkäinen OYJ	23.3.2012	0.2	0.2	0.0	0.4	1.8	2.6
Trainers House Oyj	12.1.2010	0.0	0.1	0.0	1.2	0.3	1.0
Etteplan OYJ	18.11.2009	-0.2	0.3	0.0	1.3	1.7	2.7
Ahlstrom OYJ	9.11.2009	0.0	0.2	0.0	0.3	1.0	1.5
Finnair OYJ	18.9.2009	-0.2	0.1	-0.1	0.3	0.9	0.8
Cramo OYJ	15.4.2009	0.0	0.1	0.1	0.1	0.6	1.1
Ponsse Oy	27.3.2009	0.3	0.4	0.1	1.2	1.7	3.5
Finnlines OYJ	23.3.2009	-0.1	0.2	0.0	0.2	0.5	0.9
Amer Sports Oyj	25.2.2009	0.2	0.2	0.0	0.3	0.9	1.7
CapMan Oyj	5.12.2008	-0.1	0.1	0.0	2.0	0.3	1.5
Huhtamäki OYJ	19.11.2008	0.0	0.2	0.0	0.6	1.0	1.7
Sponda OYJ	17.6.2008	-0.2	0.1	0.1	0.2	0.1	0.4

Table 10 then shows the results of the regression analysis:

Table 10: Regression with Altman Z-Score

Altman regression - Robustness check				
Reference period	60 days	120 days	252 days	Average
Multiple R	1.1 %	1.3 %	1.8 %	1.4 %
R Square	0.0 %	0.0 %	0.0 %	0.0 %
Adjusted R Square	-2.9 %	-2.9 %	-2.9 %	-2.9 %
Standard Error	1.7 %	1.7 %	1.7 %	1.7 %

Altman Z-Score regression						
Reference period	Coefficient	Estimate	Std. Error	t stat	p value	
60 days	Intercept	-0.0059	0.005	-1.098	0.280	
	Altman z-score	0.0002	0.003	0.063	0.950	
120 days	Intercept	-0.0061	0.005	-1.151	0.258	
	Altman z-score	0.0002	0.003	0.075	0.940	
252 days	Intercept	-0.0064	0.005	-1.185	0.244	
	Altman z-score	0.0003	0.003	0.104	0.917	

The slope of the regression is slightly positive and the p value ranges for the Altman Z-Score coefficient ranges from 0.92-0.95. The result is therefore not statistically significant. The R-square is on average 0.0% between the robustness checks. The adjusted R-square is negative for all the reference periods. The R-square implies that the Altman Z-Score does not explain almost any of the variation in the market reaction to a hybrid bond announcement. The conclusion that can be drawn from this is that potential bankruptcy risk of an issuer does not correlate significantly with how successful the market reaction to a hybrid bond announcement would be.

### Regressing market reaction with the years until first call

The years until first call of the hybrid bond is an interesting independent variable to test. An earlier first call date might show that the company is using the hybrid bonds as a short-term financing option. The hypothesis is that the earlier the first call date, the more negative the market reaction to the announcement.

*Table 11: Regression with years until first call*

First call date regression - Robustness check				
Reference period	60 days	120 days	252 days	Average
Multiple R	1.6 %	2.7 %	2.5 %	2.3 %
R Square	0.0 %	0.1 %	0.1 %	0.1 %
Adjusted R Square	-2.9 %	-2.9 %	-2.9 %	-2.9 %
Standard Error	1.7 %	1.7 %	1.7 %	1.7 %

Years until first call regression					
Reference period	Coefficient	Estimate	Std. Error	t stat	p value
60 days	Intercept	-0.0068	0.012	-0.542	0.592
	Years until first call	0.0003	0.003	0.094	0.926
120 days	Intercept	-0.0077	0.012	-0.622	0.538
	Years until first call	0.0005	0.003	0.157	0.876
252 days	Intercept	-0.0077	0.012	-0.615	0.543
	Years until first call	0.0005	0.003	0.146	0.885

The slope of the regression is slightly positive and the p value ranges for the years until first call coefficient ranges from 0.89-0.93. The result is therefore not statistically significant. The R-square is on average 0.1% between the robustness checks. The adjusted R-square is negative for all the reference periods. The R-square implies that years until first call does not explain much of the variation in the

market reaction to a hybrid bond announcement. The conclusion that can be drawn from this is that regardless of how long-term or short-term the hybrid bond is created to be, this does not correlate significantly with how positive or negative the market reaction to a hybrid bond announcement would be.

### **3.3. Analysis of findings**

The first research question of this thesis is:

- 1. How are Finnish hybrid bonds typically structured and how do they differ from hybrid bonds in other markets?*

In the Literature Review, the typical structure, terms and features of hybrid bonds were explored both on an international level and on a Finnish level through academic literature and an interview of a debt capital markets professional. It was identified that while Finnish hybrid bonds are similar to hybrid bonds in other European countries, there are a few notable differences. Finnish hybrid bonds are typically perpetual in maturity in almost all cases, have a first call date ranging from 2 years to 5 years from issuance, have significantly higher coupon step-ups at the call dates, do not typically include replacement language and do not place significant emphasis on the credit rating agency equity credit classifications for hybrid bonds as none of the companies issuing hybrid bonds in Finland have had credit ratings.

The second research question of this thesis is:

- 2. What is the impact of a hybrid bond announcement on company share price?*

In the Literature Review, it was hypothesized that the announcement effect would be negative due to the signalling effects of pecking order theory, however, there is also some justification for a potentially positive market reaction. It was also found that past academic research on similar products such as preferred shares resulted in negative abnormal returns upon announcement.

The raw data was analysed for three different reference periods. When analysing the robustness checks between 60 day, 120 day and 252 trading day reference periods, the tests utilizing the 60 day reference period tended to be more statistically

significant in most of the tests. It could be argued in this case, that a shorter reference period would be more applicable as a half year or full trading year time frame may result in broader market reactions influencing the reference period return. For instance, considering that the financial crisis began around 2007-2008, if we utilize a 252 trading day reference period, major negative market movements happening in, for instance, early 2008 could negatively influence the reference returns of companies issuing hybrid bonds in late 2008 or early 2009, thereby leading to more positive market reactions to hybrid bond announcements compared to reference returns in these cases. The findings therefore mainly draw conclusions based on the shorter 60 day reference period as it seems to be more applicable and relevant in this case.

Based on the analysis of the data, a negative market-adjusted stock price reaction of -0.6% on average is observed during the issuance of a hybrid bond. This is a finding that is in line with academic research on preferred shares in other markets as identified in section 2.1.2. If considering the possibility of a positive market-adjusted reaction due to the numerous benefits of hybrid bonds, a two-tailed t-test suggests at a 5% significance level that the market reacts negatively to a hybrid bond announcement. A sign test was also conducted in order to identify whether the signs of the market-adjusted reactions provide any insights as to the nature of the reaction. The sign test shows that a negative stock price reaction is statistically significant at a 10% significance level. However, it should be noted that the robustness check for the sign test indicated that there is significant volatility in the result, dependent on the length of the reference period. A statistically significant negative market reaction provides supporting evidence that equity investors would view the hybrid bond issue as a negative signal on the company's condition.

The third research question of this thesis is:

*3. What factors correlate with the market reactions to hybrid bond announcements?*

This research question was tested for three different factors. The first factor was the coupon of the hybrid bond issue. The test did not identify a statistically significant relationship between the hybrid bond coupon and the market-adjusted stock price reaction to a hybrid bond announcement. Nevertheless, there was indication that

the coupon of the hybrid bond issue and the market reaction may be negatively correlated. This seems logical as this could imply that a higher coupon could lead to a lower market reaction (less earnings for equity than otherwise anticipated) or it could display to some extent the demand level for the hybrid bond issue.

The Altman Z-Score at the time of the announcement was also calculated to serve as a measure for the bankruptcy risk of a company. It was regressed with the market reaction to test whether the bankruptcy risk of a company has influence on market reaction to a hybrid bond announcement. The regression analysis indicated that there is no statistically significant correlation between these two variables. This is an interesting insight as it would imply that markets view the hybrid bond as being just as viable of a financing option in companies with higher bankruptcy risk as companies that are otherwise solvent. As the hybrid bonds currently suffer from some negative connotations due to their use in insolvency cases, this insight would imply that the negative connotation might be unjustified.

The final regression analysis conducted was regarding the time to first call. This would provide an indication on whether markets prefer if the hybrid bonds are utilized as a short-term or long-term financing option. This regression analysis did not identify any statistically significant relationship between the market reaction and the years until first call. This would suggest that the markets are rather indifferent towards the use of hybrid bonds to satisfy short-term liquidity or balance sheet strengthening needs or long-term needs such as financing the company over the long run.

## **4. Conclusion**

### **4.1. Summary**

The first hybrid bonds in Europe were originated in 2005 as a response to Basel frameworks. Hybrid bonds have seen significant demand over the years in separate waves in Finland after 2008. Hybrid bonds offer flexible and attractive benefits through the combination of features from debt financing and equity financing for issuers and relatively high coupons for financiers. However, market reactions to hybrid bond announcements have not been tested in academia in the past. This thesis explores the typical terms of hybrid bonds in the Finnish and European markets.

In the Literature Review, the structure of Finnish hybrid bonds was compared to the structures of other European hybrid bonds. Finnish hybrid bonds have a few notable differences including entirely perpetual maturities, earlier first call dates, higher coupon step-ups, absence of replacement language and less regard for credit rating agency equity credit than European hybrid bonds.

In the second part of the thesis, market adjusted announcement returns were calculated, and it was found that on average a hybrid bond announcement decreases share price by -0.6%. The result is statistically significant according to a one tailed t-test. The negative relationship provides supporting evidence that pecking order theory might outweigh the tax benefits of trade-off theory in the Finnish hybrid bond market. The finding is in line with academic research regarding stock price reactions to preferred share announcements in other markets.

Finally, a regression analysis of coupons suggests a negative correlation between market reaction and coupons, although, a statistically significant correlation was not identified between the variables. Regression on other factors including bankruptcy risk and years until first call indicate that there is no clear relationship between the factors and the stock price reaction. This could imply that markets in Finland perceive hybrid bonds as being just as viable of an alternative for companies regardless of solvency position or planned length of the financing arrangement.



## 4.2. Ideas for future research

This research could be expanded to other regions within Europe. This includes both research on the regulations and structural differences of hybrid bonds between countries. It would be interesting to identify whether different markets and regions have significantly different market reactions to hybrid bond announcements.

Another area of interest is whether the credit rating agency equity credit influences the market reactions. For this, the study would need to be expanded to other countries where companies with credit ratings have issued hybrid bonds.

Also, hybrid bonds may be an interesting topic to further expand research on the CR-CS hypothesis and market timing theories. Regarding CR-CS hypothesis, for instance, if companies closer to credit rating changes are less inclined to issue senior debt, would they be more inclined to issue hybrid bonds to further strengthen their balance sheet and participate in profitable projects? Regarding market timing, if companies' management consider their shares to be undervalued, would the management be more inclined to issue hybrid bonds rather than issue new shares? Also, would companies be more inclined to time the market for perpetual, or long-term hybrid bonds when interest rates are low?

Also, it would be interesting if an analysis was conducted on whether the company's use of funds would have an impact on the market reaction to a hybrid bond announcement. A notable outlier was witnessed in the Finnish dataset regarding the Innofactor 2013 hybrid bond issue (Globenewswire, 2013). In their press release, Innofactor announced that they would use the proceeds to repurchase a portion of their own shares used to finance a previous acquisition. This is interesting because Innofactor witnessed a -0.5% market adjusted stock price reaction to this announcement, which would be contradictory to both trade-off theory and pecking order theory as the issuance of debt to buy back shares should be a strong signal to investors unless significant agency costs are witnessed. With a wider dataset, some analysis regarding the use of funds may be possible.

### **4.3. Limitations of this research**

This thesis contributes to the understanding of how Finnish hybrid bonds are structured, how the stock market reacts to the announcement of a hybrid bond issue, and what factors can influence the market reaction.

Since the data set was limited to 36 analysable data points, this may have resulted in a lower significance of results of especially the regression analyses. More data points, such as a future study considering a larger amount of hybrid bond issues could thus improve the robustness of the conclusions from this study.

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## APPENDICES

### Appendix I: Robustness check calculations

120 day reference period calculations:

Reference period (days)

120

Issuer Name	Announcement Date (AD)	Issue Date	Adjusted closing price (EUR, AD - 1)	Adjusted closing price (EUR, AD + 1)	Adjusted closing price at beginning of reference period	Daily reference return (%)	Daily announcement return (%)	Market reaction (Ann. return - Ref. return)
HKScan OYJ	30.8.2018	17.9.2018	4.18	4.16	4.80	-0.1 %	-0.3 %	-0.2 %
Caverion OYJ	9.6.2017	16.6.2017	8.03	7.96	7.78	0.0 %	-0.4 %	-0.4 %
Rapala VMC OYJ	24.5.2017	31.5.2017	5.85	5.86	6.07	0.0 %	0.1 %	0.2 %
Aspo OYJ	17.5.2016	27.5.2016	11.87	11.80	12.01	0.0 %	-0.3 %	-0.3 %
Outotec OYJ	14.3.2016	24.3.2016	4.43	4.30	5.88	-0.2 %	-1.5 %	-1.3 %
SRV Group OYJ	9.3.2016	22.3.2016	3.90	3.96	3.30	0.1 %	0.8 %	0.6 %
Stockmann OYJ Abp	10.12.2015	17.12.2015	9.73	9.15	9.09	0.1 %	-3.0 %	-3.0 %
Poyry OYJ	17.11.2015	25.11.2015	4.66	4.71	4.65	0.0 %	0.5 %	0.5 %
Finnair OYJ	28.9.2015	13.10.2015	3.25	3.17	3.45	-0.1 %	-1.2 %	-1.1 %
SSH Communications Security Oyj	19.3.2015	30.3.2015	4.34	4.26	2.78	0.4 %	-0.9 %	-1.2 %
Lemminkainen OYJ	4.3.2014	11.3.2014	16.31	16.57	17.60	-0.1 %	0.8 %	0.9 %
Oriola-KD OYJ	13.2.2014	20.2.2014	2.66	2.68	2.65	0.0 %	0.2 %	0.2 %
Suominen OYJ	31.1.2014	10.2.2014	2.53	2.43	2.78	-0.1 %	-2.0 %	-1.9 %
Innofactor Oyj	17.12.2013	20.12.2013	1.13	1.11	0.71	0.4 %	-0.9 %	-1.3 %
Sanoma OYJ	2.12.2013	12.12.2013	11.51	11.33	9.67	0.1 %	-0.8 %	-0.9 %
Aspo OYJ	11.11.2013	18.11.2013	8.42	8.72	8.61	0.0 %	1.7 %	1.7 %
Ahlstrom OYJ	19.9.2013	2.10.2013	11.61	11.40	13.64	-0.1 %	-0.9 %	-0.7 %
Componenta OYJ	28.8.2013	2.9.2013	1.86	1.84	2.11	-0.1 %	-0.3 %	-0.2 %
Panostaja OYJ	16.5.2013	27.5.2013	1.01	0.92	0.90	0.1 %	-4.5 %	-4.6 %
Technopolis OYJ	19.3.2013	26.3.2013	3.86	3.89	3.33	0.1 %	0.4 %	0.3 %
SRV Group OYJ	18.12.2012	28.12.2012	3.08	3.05	3.04	0.0 %	-0.5 %	-0.5 %
Sponda OYJ	21.11.2012	5.12.2012	4.02	4.17	3.63	0.1 %	1.9 %	1.8 %
Finnair OYJ	13.11.2012	26.11.2012	2.31	2.30	2.11	0.1 %	-0.2 %	-0.3 %
Componenta OYJ	29.3.2012	29.3.2012	3.75	3.68	4.51	-0.2 %	-0.9 %	-0.8 %
Lemminkainen OYJ	23.3.2012	30.3.2012	21.94	21.29	22.27	0.0 %	-1.5 %	-1.5 %
Trainers House Oyj	12.1.2010	15.1.2010	0.57	0.50	0.66	-0.1 %	-6.1 %	-5.9 %
Etteplan OYJ	18.11.2009	1.12.2009	3.08	3.04	3.09	0.0 %	-0.7 %	-0.7 %
Ahlstrom OYJ	9.11.2009	25.11.2009	8.28	8.46	6.41	0.2 %	1.1 %	0.9 %
Finnair OYJ	18.9.2009	7.10.2009	4.64	4.64	4.19	0.1 %	0.0 %	-0.1 %
Cramo OYJ	15.4.2009	29.4.2009	5.29	5.51	5.39	0.0 %	2.1 %	2.1 %
Ponsse Oy	27.3.2009	31.3.2009	3.67	3.55	9.05	-0.7 %	-1.8 %	-1.0 %
Finnlines OYJ	23.3.2009	26.3.2009	5.43	4.96	11.59	-0.6 %	-4.5 %	-3.9 %
Amer Sports Oyj	25.2.2009	12.3.2009	4.24	4.36	7.29	-0.5 %	1.4 %	1.8 %
CapMan Oyj	5.12.2008	5.12.2008	1.33	1.30	2.65	-0.6 %	-1.2 %	-0.6 %
Huhtamaki OYJ	19.11.2008	28.11.2008	5.71	5.15	7.55	-0.2 %	-5.0 %	-4.8 %
Sponda OYJ	17.6.2008	27.6.2008	4.04	4.06	4.97	-0.2 %	0.3 %	0.5 %
<b>Min</b>						<b>-0.7 %</b>	<b>-6.1 %</b>	<b>-5.9 %</b>
<b>Lower quartile</b>						<b>-0.1 %</b>	<b>-1.3 %</b>	<b>-1.2 %</b>
<b>Median</b>						<b>0.0 %</b>	<b>-0.4 %</b>	<b>-0.5 %</b>
<b>Average</b>						<b>-0.1 %</b>	<b>-0.8 %</b>	<b>-0.7 %</b>
<b>Upper quartile</b>						<b>0.1 %</b>	<b>0.3 %</b>	<b>0.3 %</b>
<b>Max</b>						<b>0.4 %</b>	<b>2.1 %</b>	<b>2.1 %</b>
<b>Standard deviation</b>						<b>0.2 %</b>	<b>1.9 %</b>	<b>1.8 %</b>



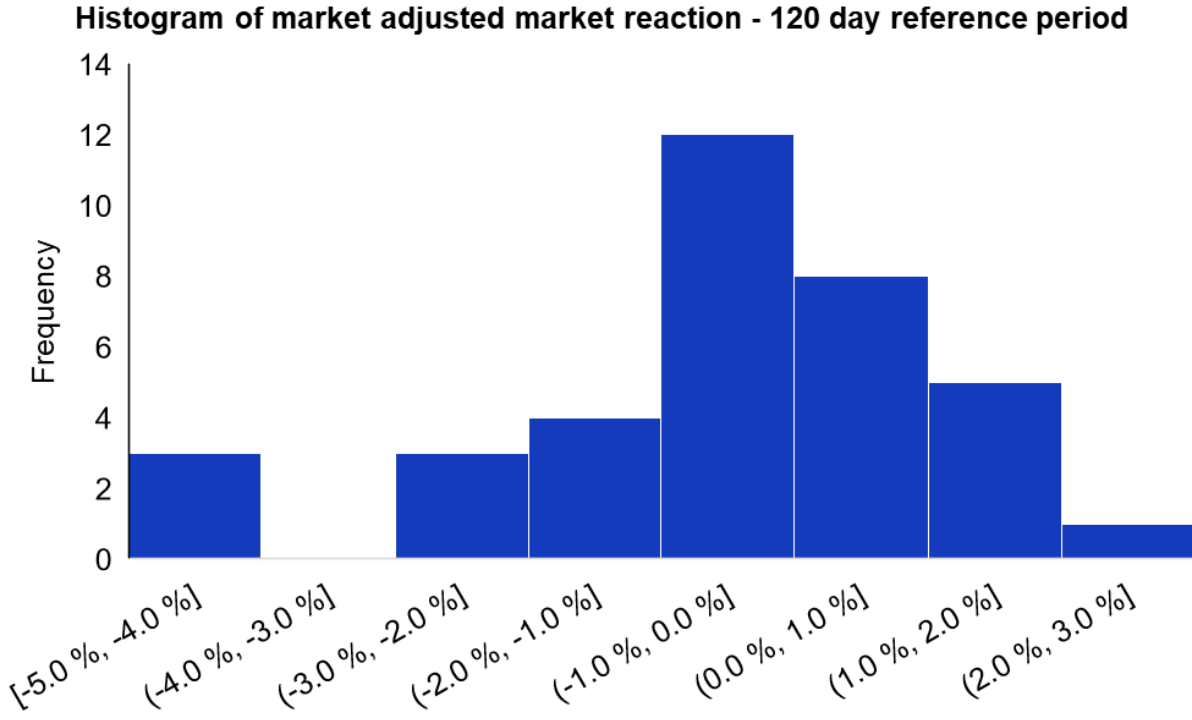
## 120 day reference period market adjustments:

Reference period (days)

120

Issuer Name	Announcement Date (AD)	Daily reference return (%)	Daily announcement return (%)	Daily reference market return	Daily announcement market return	Market adjusted reference return	Market adjusted announcement return	Market adjusted market reaction (Ann. return - Ref. return)
HKScan OYJ	30.8.2018	-0.1 %	-0.3 %	0.1 %	-0.4 %	-0.2 %	0.1 %	0.3 %
Caverion OYJ	9.6.2017	0.0 %	-0.4 %	0.1 %	0.0 %	-0.1 %	-0.4 %	-0.3 %
Rapala VMC OYJ	24.5.2017	0.0 %	0.1 %	0.1 %	0.2 %	-0.1 %	0.0 %	0.1 %
Aspo OYJ	17.5.2016	0.0 %	-0.3 %	-0.1 %	0.2 %	0.1 %	-0.5 %	-0.6 %
Outotec OYJ	14.3.2016	-0.2 %	-1.5 %	0.0 %	0.5 %	-0.3 %	-2.1 %	-1.8 %
SRV Group OYJ	9.3.2016	0.1 %	0.8 %	0.0 %	-0.4 %	0.1 %	1.2 %	1.0 %
Stockmann OYJ Abp	10.12.2015	0.1 %	-3.0 %	0.0 %	-0.8 %	0.1 %	-2.2 %	-2.2 %
Poyry OYJ	17.11.2015	0.0 %	0.5 %	0.0 %	1.0 %	0.0 %	-0.5 %	-0.5 %
Finnair OYJ	28.9.2015	-0.1 %	-1.2 %	-0.1 %	-0.9 %	0.1 %	-0.2 %	-0.3 %
SSH Communications Security Oyj	19.3.2015	0.4 %	-0.9 %	0.1 %	0.7 %	0.2 %	-1.6 %	-1.8 %
Lemminkäinen OYJ	4.3.2014	-0.1 %	0.8 %	0.1 %	1.3 %	-0.2 %	-0.5 %	-0.3 %
Oriola-KD OYJ	13.2.2014	0.0 %	0.2 %	0.1 %	0.0 %	-0.1 %	0.2 %	0.3 %
Suominen OYJ	31.1.2014	-0.1 %	-2.0 %	0.1 %	-1.3 %	-0.2 %	-0.7 %	-0.5 %
Innofactor Oyj	17.12.2013	0.4 %	-0.9 %	0.2 %	0.2 %	0.2 %	-1.1 %	-1.3 %
Sanoma OYJ	2.12.2013	0.1 %	-0.8 %	0.2 %	-1.4 %	0.0 %	0.6 %	0.6 %
Aspo OYJ	11.11.2013	0.0 %	1.7 %	0.1 %	-0.4 %	-0.1 %	2.1 %	2.2 %
Ahlistrom OYJ	19.9.2013	-0.1 %	-0.9 %	0.1 %	0.3 %	-0.2 %	-1.2 %	-0.9 %
Componenta OYJ	28.8.2013	-0.1 %	-0.3 %	0.0 %	0.0 %	-0.1 %	-0.3 %	-0.2 %
Panoslaja OYJ	16.5.2013	0.1 %	-4.5 %	0.1 %	-0.2 %	-0.1 %	-4.2 %	-4.2 %
Technopolis OYJ	19.3.2013	0.1 %	0.4 %	0.1 %	0.3 %	0.0 %	0.1 %	0.1 %
SRV Group OYJ	18.12.2012	0.0 %	-0.5 %	0.2 %	0.7 %	-0.2 %	-1.1 %	-1.0 %
Sponda OYJ	21.11.2012	0.1 %	1.9 %	0.1 %	1.1 %	0.0 %	0.7 %	0.8 %
Finnair OYJ	13.11.2012	0.1 %	-0.2 %	0.1 %	-0.3 %	0.0 %	0.1 %	0.0 %
Componenta OYJ	29.3.2012	-0.2 %	-0.9 %	0.1 %	0.2 %	-0.3 %	-1.2 %	-0.9 %
Lemminkäinen OYJ	23.3.2012	0.0 %	-1.5 %	0.1 %	1.1 %	-0.2 %	-2.6 %	-2.4 %
Trainers House Oyj	12.1.2010	-0.1 %	-6.1 %	0.2 %	-0.7 %	-0.3 %	-5.4 %	-5.0 %
Etteplan OYJ	18.11.2009	0.0 %	-0.7 %	0.1 %	-0.4 %	-0.2 %	-0.2 %	-0.1 %
Ahlistrom OYJ	9.11.2009	0.2 %	1.1 %	0.1 %	1.0 %	0.1 %	0.1 %	0.0 %
Finnair OYJ	18.9.2009	0.1 %	0.0 %	0.3 %	-0.8 %	-0.3 %	0.8 %	1.0 %
Cramo OYJ	15.4.2009	0.0 %	2.1 %	-0.1 %	1.4 %	0.1 %	0.7 %	0.6 %
Ponsse Oy	27.3.2009	-0.7 %	-1.8 %	-0.3 %	-3.0 %	-0.4 %	1.3 %	1.7 %
Finnlines OYJ	23.3.2009	-0.6 %	-4.5 %	-0.4 %	-0.1 %	-0.2 %	-4.4 %	-4.2 %
Amer Sports Oyj	25.2.2009	-0.5 %	1.4 %	-0.5 %	0.1 %	0.1 %	1.3 %	1.2 %
CapMan Oyj	5.12.2008	-0.6 %	-1.2 %	-0.5 %	0.2 %	-0.1 %	-1.4 %	-1.3 %
Huhtamäki OYJ	19.11.2008	-0.2 %	-5.0 %	-0.5 %	-3.2 %	0.3 %	-1.9 %	-2.1 %
Sponda OYJ	17.6.2008	-0.2 %	0.3 %	-0.1 %	-1.0 %	-0.1 %	1.3 %	1.4 %
<b>Min</b>		<b>-0.7 %</b>	<b>-6.1 %</b>			<b>-0.4 %</b>	<b>-5.4 %</b>	<b>-5.0 %</b>
<b>Lower quartile</b>		<b>-0.1 %</b>	<b>-1.3 %</b>			<b>-0.2 %</b>	<b>-1.2 %</b>	<b>-1.3 %</b>
<b>Median</b>		<b>0.0 %</b>	<b>-0.4 %</b>			<b>-0.1 %</b>	<b>-0.4 %</b>	<b>-0.3 %</b>
<b>Average</b>		<b>-0.1 %</b>	<b>-0.8 %</b>			<b>-0.1 %</b>	<b>-0.6 %</b>	<b>-0.6 %</b>
<b>Upper quartile</b>		<b>0.1 %</b>	<b>0.3 %</b>			<b>0.1 %</b>	<b>0.3 %</b>	<b>0.4 %</b>
<b>Max</b>		<b>0.4 %</b>	<b>2.1 %</b>			<b>0.3 %</b>	<b>2.1 %</b>	<b>2.2 %</b>
<b>Standard deviation</b>		<b>0.2 %</b>	<b>1.9 %</b>			<b>0.2 %</b>	<b>1.6 %</b>	<b>1.6 %</b>

120 day reference period market adjusted market reaction histogram:



## 252 day reference period calculations:

Reference period (days)

252

Issuer Name	Announcement Date (AD)	Issue Date	Adjusted closing price (EUR, AD - 1)	Adjusted closing price (EUR, AD + 1)	Adjusted closing price at beginning of reference period	Daily reference return (%)	Daily announcement return (%)	Market reaction (Ann. return - Ref. return)
HKScan OYJ	30.8.2018	17.9.2018	4.18	4.16	4.84	-0.1 %	-0.3 %	-0.2 %
Caverion OYJ	9.6.2017	16.6.2017	8.03	7.96	7.30	0.0 %	-0.4 %	-0.4 %
Rapala VMC OYJ	24.5.2017	31.5.2017	5.85	5.86	6.01	0.0 %	0.1 %	0.1 %
Aspo OYJ	17.5.2016	27.5.2016	11.87	11.80	12.43	0.0 %	-0.3 %	-0.3 %
Outotec OYJ	14.3.2016	24.3.2016	4.43	4.30	6.95	-0.2 %	-1.5 %	-1.4 %
SRV Group OYJ	9.3.2016	22.3.2016	3.90	3.96	3.36	0.1 %	0.8 %	0.7 %
Stockmann OYJ Abp	10.12.2015	17.12.2015	9.73	9.15	11.76	-0.1 %	-3.0 %	-2.9 %
Poyry OYJ	17.11.2015	25.11.2015	4.66	4.71	3.53	0.1 %	0.5 %	0.4 %
Finnair OYJ	28.9.2015	13.10.2015	3.25	3.17	2.66	0.1 %	-1.2 %	-1.3 %
SSH Communications Security Oyj	19.3.2015	30.3.2015	4.34	4.26	3.10	0.1 %	-0.9 %	-1.0 %
Lemminkainen OYJ	4.3.2014	11.3.2014	16.31	16.57	18.53	-0.1 %	0.8 %	0.8 %
Oriola-KD OYJ	13.2.2014	20.2.2014	2.66	2.68	2.58	0.0 %	0.2 %	0.2 %
Suominen OYJ	31.1.2014	10.2.2014	2.53	2.43	1.84	0.1 %	-2.0 %	-2.1 %
Innofactor Oyj	17.12.2013	20.12.2013	1.13	1.11	0.50	0.3 %	-0.9 %	-1.2 %
Sanoma OYJ	2.12.2013	12.12.2013	11.51	11.33	10.68	0.0 %	-0.8 %	-0.8 %
Aspo OYJ	11.11.2013	18.11.2013	8.42	8.72	8.01	0.0 %	1.7 %	1.7 %
Ahlstrom OYJ	19.9.2013	2.10.2013	11.61	11.40	14.52	-0.1 %	-0.9 %	-0.8 %
Componenta OYJ	28.8.2013	2.9.2013	1.86	1.84	3.30	-0.2 %	-0.3 %	-0.1 %
Panostaja OYJ	16.5.2013	27.5.2013	1.01	0.92	1.04	0.0 %	-4.5 %	-4.5 %
Technopolis OYJ	19.3.2013	26.3.2013	3.86	3.89	3.49	0.0 %	0.4 %	0.3 %
SRV Group OYJ	18.12.2012	28.12.2012	3.08	3.05	3.70	-0.1 %	-0.5 %	-0.4 %
Sponda OYJ	21.11.2012	5.12.2012	4.02	4.17	3.31	0.1 %	1.9 %	1.8 %
Finnair OYJ	13.11.2012	26.11.2012	2.31	2.30	2.95	-0.1 %	-0.2 %	-0.1 %
Componenta OYJ	29.3.2012	29.3.2012	3.75	3.68	6.76	-0.2 %	-0.9 %	-0.7 %
Lemminkainen OYJ	23.3.2012	30.3.2012	21.94	21.29	28.03	-0.1 %	-1.5 %	-1.4 %
Trainers House Oyj	12.1.2010	15.1.2010	0.57	0.50	0.60	0.0 %	-6.1 %	-6.0 %
Etteplan OYJ	18.11.2009	1.12.2009	3.08	3.04	3.64	-0.1 %	-0.7 %	-0.6 %
Ahlstrom OYJ	9.11.2009	25.11.2009	8.28	8.46	6.67	0.1 %	1.1 %	1.0 %
Finnair OYJ	18.9.2009	7.10.2009	4.64	4.64	4.77	0.0 %	0.0 %	0.0 %
Cramo OYJ	15.4.2009	29.4.2009	5.29	5.51	14.65	-0.4 %	2.1 %	2.5 %
Ponsse Oy	27.3.2009	31.3.2009	3.67	3.55	15.03	-0.6 %	-1.8 %	-1.2 %
Finnlines OYJ	23.3.2009	26.3.2009	5.43	4.96	12.64	-0.3 %	-4.5 %	-4.1 %
Amer Sports Oyj	25.2.2009	12.3.2009	4.24	4.36	10.45	-0.4 %	1.4 %	1.7 %
CapMan Oyj	5.12.2008	5.12.2008	1.33	1.30	3.30	-0.4 %	-1.2 %	-0.8 %
Huhtamaki OYJ	19.11.2008	28.11.2008	5.71	5.15	9.22	-0.2 %	-5.0 %	-4.9 %
Sponda OYJ	17.6.2008	27.6.2008	4.04	4.06	7.18	-0.2 %	0.3 %	0.6 %
<b>Min</b>						<b>-0.6 %</b>	<b>-6.1 %</b>	<b>-6.0 %</b>
<b>Lower quartile</b>						<b>-0.2 %</b>	<b>-1.3 %</b>	<b>-1.2 %</b>
<b>Median</b>						<b>0.0 %</b>	<b>-0.4 %</b>	<b>-0.4 %</b>
<b>Average</b>						<b>-0.1 %</b>	<b>-0.8 %</b>	<b>-0.7 %</b>
<b>Upper quartile</b>						<b>0.0 %</b>	<b>0.3 %</b>	<b>0.4 %</b>
<b>Max</b>						<b>0.3 %</b>	<b>2.1 %</b>	<b>2.5 %</b>
<b>Standard deviation</b>						<b>0.2 %</b>	<b>1.9 %</b>	<b>1.9 %</b>

## 252 day reference period market adjustments:

Reference period (days)

252

Issuer Name	Announcement Date (AD)	Daily reference return (%)	Daily announcement return (%)	Daily reference market return	Daily announcement market return	Market adjusted reference return	Market adjusted announcement return	Market adjusted market reaction (Ann. return - Ref. return)
HKScan OYJ	30.8.2018	-0.1 %	-0.3 %	0.1 %	-0.4 %	-0.1 %	0.1 %	0.2 %
Caverion OYJ	9.6.2017	0.0 %	-0.4 %	0.1 %	0.0 %	0.0 %	-0.4 %	-0.4 %
Rapala VMC OYJ	24.5.2017	0.0 %	0.1 %	0.1 %	0.2 %	-0.1 %	0.0 %	0.1 %
Aspo OYJ	17.5.2016	0.0 %	-0.3 %	0.0 %	0.2 %	0.0 %	-0.5 %	-0.5 %
Outotec OYJ	14.3.2016	-0.2 %	-1.5 %	0.0 %	0.5 %	-0.1 %	-2.1 %	-1.9 %
SRV Group OYJ	9.3.2016	0.1 %	0.8 %	0.0 %	-0.4 %	0.1 %	1.2 %	1.1 %
Stockmann OYJ Abp	10.12.2015	-0.1 %	-3.0 %	0.0 %	-0.8 %	-0.1 %	-2.2 %	-2.0 %
Poyry OYJ	17.11.2015	0.1 %	0.5 %	0.1 %	1.0 %	0.1 %	-0.5 %	-0.6 %
Finnair OYJ	28.9.2015	0.1 %	-1.2 %	0.0 %	-0.9 %	0.1 %	-0.2 %	-0.3 %
SSH Communications Security Oyj	19.3.2015	0.1 %	-0.9 %	0.1 %	0.7 %	0.0 %	-1.6 %	-1.6 %
Lemminkainen OYJ	4.3.2014	-0.1 %	0.8 %	0.1 %	1.3 %	-0.1 %	-0.5 %	-0.4 %
Oriola-KD OYJ	13.2.2014	0.0 %	0.2 %	0.1 %	0.0 %	-0.1 %	0.2 %	0.2 %
Suominen OYJ	31.1.2014	0.1 %	-2.0 %	0.1 %	-1.3 %	0.1 %	-0.7 %	-0.8 %
Innofactor Oyj	17.12.2013	0.3 %	-0.9 %	0.1 %	0.2 %	0.3 %	-1.1 %	-1.3 %
Sanoma OYJ	2.12.2013	0.0 %	-0.8 %	0.1 %	-1.4 %	-0.1 %	0.6 %	0.7 %
Aspo OYJ	11.11.2013	0.0 %	1.7 %	0.1 %	-0.4 %	-0.1 %	2.1 %	2.2 %
Ahlistrom OYJ	19.9.2013	-0.1 %	-0.9 %	0.1 %	0.3 %	-0.2 %	-1.2 %	-1.0 %
Componenta OYJ	28.8.2013	-0.2 %	-0.3 %	0.1 %	0.0 %	-0.3 %	-0.3 %	0.0 %
Panoslaja OYJ	16.5.2013	0.0 %	-4.5 %	0.1 %	-0.2 %	-0.1 %	-4.2 %	-4.2 %
Technopolis OYJ	19.3.2013	0.0 %	0.4 %	0.0 %	0.3 %	0.0 %	0.1 %	0.1 %
SRV Group OYJ	18.12.2012	-0.1 %	-0.5 %	0.1 %	0.7 %	-0.2 %	-1.1 %	-1.0 %
Sponda OYJ	21.11.2012	0.1 %	1.9 %	0.1 %	1.1 %	0.0 %	0.7 %	0.7 %
Finnair OYJ	13.11.2012	-0.1 %	-0.2 %	0.0 %	-0.3 %	-0.1 %	0.1 %	0.2 %
Componenta OYJ	29.3.2012	-0.2 %	-0.9 %	-0.1 %	0.2 %	-0.2 %	-1.2 %	-1.0 %
Lemminkainen OYJ	23.3.2012	-0.1 %	-1.5 %	-0.1 %	1.1 %	0.0 %	-2.6 %	-2.6 %
Trainers House Oyj	12.1.2010	0.0 %	-6.1 %	0.1 %	-0.7 %	-0.1 %	-5.4 %	-5.3 %
Etteplan OYJ	18.11.2009	-0.1 %	-0.7 %	0.1 %	-0.4 %	-0.1 %	-0.2 %	-0.1 %
Ahlistrom OYJ	9.11.2009	0.1 %	1.1 %	0.0 %	1.0 %	0.1 %	0.1 %	0.0 %
Finnair OYJ	18.9.2009	0.0 %	0.0 %	-0.1 %	-0.8 %	0.0 %	0.8 %	0.7 %
Cramo OYJ	15.4.2009	-0.4 %	2.1 %	-0.3 %	1.4 %	-0.1 %	0.7 %	0.9 %
Ponsse Oy	27.3.2009	-0.6 %	-1.8 %	-0.3 %	-3.0 %	-0.3 %	1.3 %	1.5 %
Finnlines OYJ	23.3.2009	-0.3 %	-4.5 %	-0.3 %	-0.1 %	-0.1 %	-4.4 %	-4.4 %
Amer Sports Oyj	25.2.2009	-0.4 %	1.4 %	-0.3 %	0.1 %	0.0 %	1.3 %	1.3 %
CapMan Oyj	5.12.2008	-0.4 %	-1.2 %	-0.3 %	0.2 %	-0.1 %	-1.4 %	-1.3 %
Huhtamaki OYJ	19.11.2008	-0.2 %	-5.0 %	-0.3 %	-3.2 %	0.1 %	-1.9 %	-2.0 %
Sponda OYJ	17.6.2008	-0.2 %	0.3 %	-0.1 %	-1.0 %	-0.2 %	1.3 %	1.5 %
<b>Min</b>		<b>-0.6 %</b>	<b>-6.1 %</b>			<b>-0.3 %</b>	<b>-5.4 %</b>	<b>-5.3 %</b>
<b>Lower quartile</b>		<b>-0.2 %</b>	<b>-1.3 %</b>			<b>-0.1 %</b>	<b>-1.2 %</b>	<b>-1.3 %</b>
<b>Median</b>		<b>0.0 %</b>	<b>-0.4 %</b>			<b>-0.1 %</b>	<b>-0.4 %</b>	<b>-0.3 %</b>
<b>Average</b>		<b>-0.1 %</b>	<b>-0.8 %</b>			<b>-0.1 %</b>	<b>-0.6 %</b>	<b>-0.6 %</b>
<b>Upper quartile</b>		<b>0.0 %</b>	<b>0.3 %</b>			<b>0.0 %</b>	<b>0.3 %</b>	<b>0.4 %</b>
<b>Max</b>		<b>0.3 %</b>	<b>2.1 %</b>			<b>0.3 %</b>	<b>2.1 %</b>	<b>2.2 %</b>
<b>Standard deviation</b>		<b>0.2 %</b>	<b>1.9 %</b>			<b>0.1 %</b>	<b>1.6 %</b>	<b>1.6 %</b>

252 day reference period market adjusted market reaction histogram:

