Factors Affecting Debt Decisions: Syndicated Loans vs. Corporate Bonds

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A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Science Program in Finance
Department of Banking and Finance
Faculty of Commerce and Accountancy
Chulalongkorn University
Academic Year 2017

ปัจจัยที่ส่งผลต่อการตัดสินใจก่อหนี้: เงินกู้ร่วมเทียบกับการออกหุ้นกู้

นายธีรุตม์ วินัยโกศล

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิทยาศาสตรมหาบัณฑิต
สาขาวิชาการเงิน ภาควิชาการธนาคารและการเงิน
คณะพาณิชยศาสตร์และการบัญชี จุฬาลงกรณ์มหาวิทยาลัย
ปีการศึกษา 2560

Thesis Title	Factors Affecting Debt Decisions: Syndicated Loans vs. Corporate Bonds
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Field of Study	Finance
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ธีรุตม์ วินัยโกศล : ปัจจัยที่ส่งผลต่อการตัดสินใจก่อหนี้: เงินกู้ร่วมเทียบกับการออกหุ้นกู้ (Factors Affecting Debt Decisions: Syndicated Loans vs. Corporate Bonds) อ.ที่ปรึกษาวิทยานิพนธ์หลัก: อ. ดร.ธนวิต แซ่ซือ, 36 หน้า.

การพัฒนาและการขยายตัวอย่างต่อเนื่องในช่วงหลายปีที่ผ่านมาของตลาดเงินกู้ร่วมส่งผลเงินกู้ร่วมมีสัดส่วนประมาณหนึ่งในสามของการระดมทุนทั้งหมด กลายเป็นหนึ่งในทางเลือกหลักในการระดมทุนของบริษัท ซึ่งโดยพื้นฐานแล้วเงินกู้ร่วมคือการกู้เงินผ่านธนาคาร แต่เงินกู้ร่วมก็ยังมีคุณสมบัติหลายประการของหุ้นกู้ คุณสมบัติทั้งหลายเหล่านี้ทำให้เงินกู้ร่วมกลายเป็นตราสารหนี้แบบผสมผสาน ซึ่งรวมเอาคุณสมบัติต่างๆ ของทั้งเงินกู้ธนาคารและหุ้นกู้เข้าไว้ด้วยกัน งานวิจัยฉบับนี้ศึกษาปัจจัยทางการเงินที่ส่งผลต่อการออกเงินกู้ร่วมสำหรับตัวอย่างของบริษัทที่ไม่ใช่สถาบันการเงินในประเทศสหรัฐอเมริกา โดยเป็นบริษัทที่จดทะเบียนในตลาดหลักทรัพย์นิวยอร์ก (NYSE) และ NASDAQ ครอบคลุมตั้งแต่ปี 2000 ถึง 2016 ด้วยการนำเงินกู้ร่วมมาเปรียบเทียบกับหุ้นกู้โดยตรง ปัจจัยทางการเงินต่างๆของบริษัทจึงถูกนำมาใช้ในการวิเคราะห์การตัดสินใจเลือกวิธีการระดมทุนของบริษัท ผลการศึกษาจากสมการถดถอยแบบโลจิสติกพหุกลุ่มแสดงให้เห็นว่าบริษัทที่มีขนาดใหญ่มีความเป็นไปได้สูงที่จะระดมทุนจากทั้งตลาดเงินกู้ร่วมและตลาดหุ้นกู้พร้อมๆกัน ขัดกับมูลค่าการชำระบัญชีของบริษัท ซึ่งจะลดความเป็นไปได้ในการระดมทุนจากทั้งสองตลาด ผลจากสมการถดถอยแบบโลจิสติกพหุกลุ่มยังแสดงให้เห็นว่าความเป็นไปได้ในการระดมทุนผ่านตลาดใดตลาดหนึ่งจะสูงกว่าการระดมทุนจากทั้งสองตลาดพร้อมๆกันในช่วงของวิกฤตเศรษฐกิจ การศึกษาครั้งนี้ยังแสดงถึงหลักฐานบางส่วนว่าการพัฒนาและการขยายตัวในช่วงหลายปีที่ผ่านมาของตลาดเงินกู้ร่วมทำให้ความแตกต่างระหว่างสองตลาดตลดลง

ภาควิชา การธนาคารและการเงิน ลายมือชื่อนิสิต .....

สาขาวิชา การเงิน ลายมือชื่อ อ.ที่ปรึกษาหลัก .....

ปีการศึกษา 2560

5882940526 : MAJOR FINANCE
KEYWORDS: DEBT FINANCING / SYNDICATED LOANS / CORPORATE BONDS

THEERUT WINAIKOSOL: Factors Affecting Debt Decisions: Syndicated Loans vs. Corporate Bonds. ADVISOR: TANAWIT SAE-SUE, Ph.D., 36 pp.

Following the recent developments and expansions in syndicated loans market, syndicate loans are currently accounted for around one-third of borrowers' total public debt and equity financing. It is one of the main alternative debt instruments for corporations. Syndicated loans are bank loans by their settings but also have many of the corporate bonds' characteristics. These characteristics have made syndicated loans hybrid debt instruments which combining features of both bank loans and bonds. This study investigates the financial factors behind syndicated loans issuance for a comprehensive sample from 2000 to 2016 of United States non-financial companies which are listed in New York Stock Exchange (NYSE) and NASDAQ. By directly comparing syndicated loans to corporate bonds, the specific firms' financial characteristics that reflect transaction costs, debt renegotiation, inefficient liquidation concerns, and information asymmetries are linked to the firms' debt decisions. The study of multinomial logistic regressions shows that larger firms have a higher likelihood to borrow debt from both markets simultaneously. In contrast with firms' liquidation value, it limits the power firms' size which led to lower likelihood to issue joint issuance. The multinomial results also show that the likelihood of raising funds through only one market at a time is higher than joint issuance in a period of crisis. This study also provides some evidences that the recent expansions and developments in syndicated loan market have blurred the distinctions and caused the convergence between two alternative debt markets, syndicated loan and corporate bond markets.

Department:	Banking and Finance	Student's Signature	.....
Field of Study:	Finance	Advisor's Signature	.....
Academic Year:	2017		

ACKNOWLEDGEMENTS

The completion of this thesis would not have been possible without the kind support and help from many persons. I would like to acknowledge and extent my gratitude to the following persons.

I would first like to thank my thesis advisor Tanawit Sae-Sue, Ph.D., for his continuous support, motivation, and good guidance. The door to Prof. Tanawit office was always open whenever I ran into a trouble spot or had a question about my research or writing. He consistently allowed this paper to be my own work, but steered me in the right the direction whenever he thought I needed it.

Besides my advisor, I would like to thank Asst. Prof. Ruttachai Seelajaroen, Ph.D., and Asst. Prof. Anirut Pisedtasalasai, Ph.D., who give me good guidances since the early stage of my thesis. I would also like to thank my committees, Jananya Sthienchoak, Ph.D., Thitithep Sitthiyot, Ph.D., and Asst. Prof. Nattawut Jenwittayaroje, Ph.D., who give me insightful suggestions.

Finally, I must express my very profound gratitude to my beloved family and to my friends in MSF program for providing me with unfailing support and continuous encouragement throughout my years of study and through the process of researching and writing this thesis. This accomplishment would not have been possible without them. Thank you.

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Chapter 1

Introduction

Debt is one of the main external financing sources for corporations. Corporations may choose to use debt financing over equity financing by issuing corporate bonds and/or entering into the loan agreements with banks. Based on the book value, the average Debt-to-Equity ratio in the United States in 2016 is 56.06. This ratio has been quite stable over the past seven years after the global financial crisis in 2008.

The bank loans are commonly divided into two types, the bilateral bank loans and the syndicated loans. Bilateral bank loans are funds that provided by a single lender to a single borrower, while syndicated loans are funds that offered by a group of lenders to provide funds for a single borrower through the syndication process. The syndicated loan market has developed progressively in the recent years to be one of the main alternative debt instruments for corporations(Altunbaş, Gadanecz, & Kara, 2006; Gadanecz, 2004). According to Altunbaş, Kara, and Marques-Ibanez(2010, p. 437), "the syndicated loan market has also developed, albeit more progressively, currently accounting for around one-third of borrowers' total public debt and equity financing". Armstrong (2003) argues that it is globally one of the largest and most flexible sources of funds. The developments in the syndicated loan market in the past decades including the formation of Loan Syndications and Trading Association (LSTA), growth in the standardized secondary market, and increasing in syndicated loans rated by rating agencies have made a clearer difference between bilateral bank loans and syndicated loans. These developments also have provided momentous amounts of liquidity to

syndicated loan market(Marsh & Basta, 2017). Correspondingly, institutional investors have recognized syndicated loan as an alternative investment to corporate bonds.

Figure 1 below shows the Global Syndicated loans volume from 2013 to the first quarter of 2017. It can be seen that the syndicated loans volumes are higher than US$4 trillion annually. During the first quarter of 2017, the syndicated lending has experienced the strongest opening quarter since 2014. The total amount of syndicated loans has reached US$942.3 billion, increased by 16% compared to the first quarter of 2016. The United States contain the biggest syndicated loan market in the world. The syndicated loan market in the U.S. has experienced solid growing, going from US$137 million in 1987 to over US$2.1 trillion in 2016, which represents 52% of global syndicated loans volume. During the first quarter of 2017, the U.S. syndicated loans volume has increased 48% compared to the same period of 2016, totaled US$565 billion and represents 60% of global syndicated loans volume as shown in Figure 2.

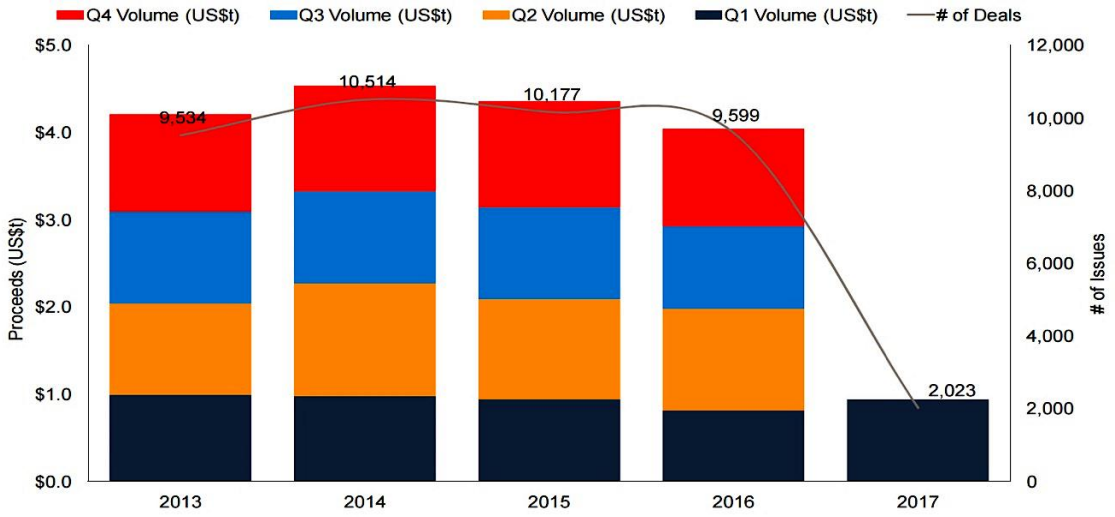

Figure 1. Global Syndicated Loans Volume (*GLOBAL SYNDICATED LOANS REVIEW*, First Quarter 2017, p. 3)

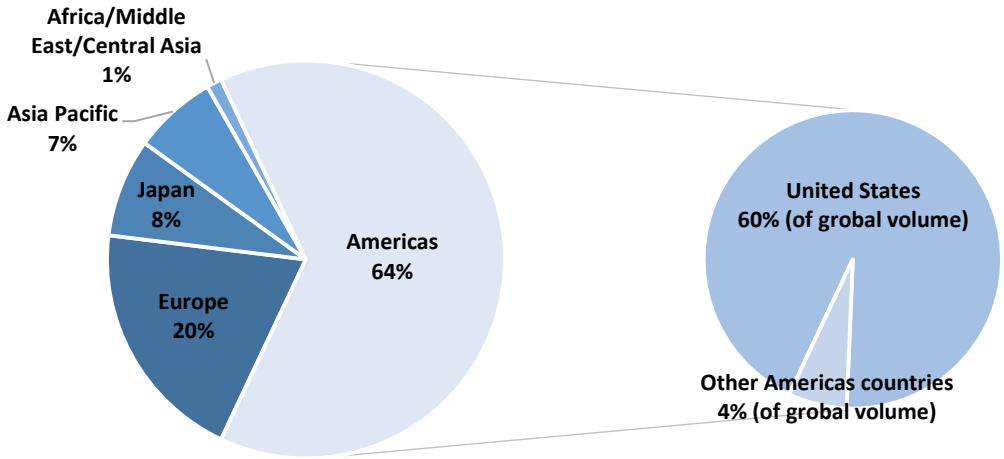

Figure 2. Global Syndicated Loans Volume by Regions; First Quarter 2017

The developments in syndicated loan market, in terms of both regulation and market practices, have moved the syndicated loan market further away from bilateral bank lending and closer to the corporate bond market(Altunbaş et al., 2010). Interestingly, syndicated loans are bank loans by their settings but also have many of the corporate bonds' characteristics. Their bond-like characteristics including the funds' size and maturity and their liquid market together with their loan-like characteristics including flexible documentations, relatively quick and easy process, and generally cheaper transaction cost have made syndicated loans *hybrid debt instruments* which combining features of both bank loans and bonds.

Although the syndicated loan market has grown tremendously, it has attracted far less research attention compared to other debt instruments. Depending on firm's financial conditions, firms may choose to raise funds from a particular market in a certain time. This study aims to identify which firm's financial factors have a significant effect on firm's decision when deciding between two instruments, syndicated loans and corporate bonds. Several prior studies on how firms make their debt choice had mostly compared corporate bonds with bilateral bank loans, and rarely directly compare with syndicated loans. For example, Houston and James (1996) and Denis and Mihov (2003) studied firms' choice of debt between bank debt, non-bank debt and public debt. Krishnaswami, Spindt, and Subramaniam (1999) and Cantillo and Wright (2000) defined only two choices of debt and the authors did not report that they have included syndicated loans in their samples or not. These studies' results may not be applied to the syndicated loans since syndicated loans are hybrid debt instruments featuring many characteristics of bank loans and corporate bonds.

Prior studies on syndicated loans are mainly focus on the lenders' incentives to participate on syndicated loans (Altunbaş, Gadanecz, & Kara, 2005; Dennis & Mullineaux, 2000) and the impact of asymmetric information on the syndication(Esty & Megginson, 2003; Lee & Mullineaux, 2004; Sufi, 2007). This study also aims to investigate whether recent expansions and developments in syndicated loan market has blurred the line and caused the convergence between two alternatives debt markets, syndicated loan and corporate bond market. By focusing on incremental financing decisions, the financial characteristics of firms that reflect factors like transaction costs, renegotiation, inefficient liquidation concerns, and asymmetric information will be linked to the firms' debt choice.

Chapter 2

Literature review

Since syndicated loans are combining characteristics of both bank loans and corporate bonds, existing literatures on firm's financing decisions may not be applied. The coexistence of bank lending and bond financing are being concerned by an extensive theoretical literature(Besanko, 1993; Bolton & Freixas, 2000; Boot & Thakor, 2000; Chemmanur & Fulghieri, 1994; Holmstrom & Tirole, 1997). The traditional financial intermediations theory suggested that banks and markets compete(Allen & Gale, 1997; Boot & Thakor, 2008). There are also potential complementarities analyses between bank lending and bond financing in recent literatures (Diamond, 1991; Song & Thakor, 2010)

2.1) Empirical Evidence on Financing Choice (Bank loans vs. Bonds)

Literatures on firms' debt decisions when choosing between public and private debt are commonly used to explain by three main arguments: floatation costs, renegotiation and liquidation, and asymmetric information.

The *floatation costs* argument hypothesized that borrowing through public debt involves significant costs of issuance with a great fixed-cost part(Bhagat & Frost, 1986; Blackwell & Kidwell, 1988). Correspondingly, firms will get benefits of economies of scale in public debt market only when issuing relatively large debt. This positive relationship between firm's size and the use of public debt financing was documented by some empirical studies(Denis & Mihov, 2003; Esho, Lam, & Sharpe, 2001; Houston & James, 1996; Krishnaswami et al., 1999).

The *renegotiation and liquidation* hypothesis argues that borrowers are less likely to borrow through public debt market when they have high probability of financial stress because of the terms of debt agreements are more difficult to renegotiate with a large number of bondholders than with a bank(Berlin & Loeys, 1988; Chemmanur & Fulghieri, 1994). Moreover, public debt lenders are not able to decide between liquidating and continuing the project. Empirical studies had documented a negative relationship between borrowers' financial stress proxies and the use of public debt(Cantillo & Wright, 2000; Denis & Mihov, 2003; Esho et al., 2001).

The *asymmetric information* hypothesis suggests that there is a relationship between the degrees of firm's asymmetric information and the firm's choice of debt, which resulted in moral hazard problems between debtholders and shareholders(Jensen & Meckling, 1976). Due to these moral hazard problems, the public lenders will demand higher returns to compensate the risk generated by information asymmetries because they are incapable of monitoring all the firm's activities. The private lenders are treated as more efficient and effective in monitoring the firm's activities than the markets(Boyd & Prescott, 1986; Diamond, 1984; Fama, 1985). Consequently, firms with higher incentive problems starting with asymmetric information are expected to borrow from private lender(s), given banks' monitoring ability to mitigate moral hazard(Diamond, 1984, 1991). Some empirical studies documented that monitoring is generally achieved in private debt because of agreements and its restrictive covenants(Smith & Warner, 1979), and firms with higher proportions of private debt in their financing choices are potentially more exposed to moral hazard problems(Denis & Mihov, 2003; Krishnaswami et al., 1999).

There are some empirical studies defining the firms' incentives to choose to borrow from private debt markets while others rely on public debt. Moreover, these studies barely include syndicated loans in their analysis as one of debt choices. Houston and James (1996) and Denis and Mihov (2003) study firms' debt choices between bank debt, non-bank debt, and public debt. Krishnaswami, Spindt, and Subramaniam (1999) and Cantillo and Wright (2000) define only two choices of debt and the authors did not report whether they have included syndicated loans samples or not.

2.2) Empirical Evidence on Syndicated Loans

Literature on syndicated loans is increasing but it is generally limited concerning its volume and its importance as one of the main corporate financing sources. Gadanecz (2004) and Altunbaş, Gadanecz and Kara (2006) study the evolution and a historical perspective on the development of syndicated loan market including its structure and its implications. Studies in this area mainly focus on the incentives of the lenders to participate on syndicated loans (Altunbaş et al., 2005; Dennis & Mullineaux, 2000) and the impact of asymmetric information on the syndication(Esty & Megginson, 2003; Lee & Mullineaux, 2004; Sufi, 2007). Only Esho, Lam, and Sharpe (2001) and Altunbaş, Kara, and Marques-Ibanez (2010) include syndicated loans in their studies. Esho, Lam, and Sharpe (2001) use the data of large Asian firms in bond and syndicated loan markets to examine their incremental debt financing decisions. Altunbaş, Kara, and Marques-Ibanez (2010) study firm's choices of large debt financing between syndicated loans and corporate bonds in Europe. However, their analyses were focused only in Japan, emerging Asian countries, and European countries in which syndicated loans are not a main financing source for corporations.

2.3) Hypothesis Development

- ***Financial Leverage***

Prior empirical studies have documented a positive relationship between financial leverage and the use of corporate bonds since high financial leverage can be a proxy for firm's reputation(Cantillo & Wright, 2000; Denis & Mihov, 2003; Houston & James, 1996; Johnson, 1997; Krishnaswami et al., 1999). On contrary, high financial leverage can be a signal for financial distress and would imply a negative relationship(Esho et al., 2001). If financial leverage is a financial distress proxy, firms with high leverage will be less likely to get loans from bank since the lending bank are facing with high risk and concentration. Further bond investors will less likely buy bond due to their inability to control firm's activities. Hence, syndicated loans could be a solution because the lenders' risk exposures are spreading among different lenders in the syndication.

Hypothesis 1: Positive relationship between leverage and the use of syndicated loans.

- ***Renegotiation and Liquidation concerns***

Fixed assets can be used as a proxy for liquidation value(Esho et al., 2001; Johnson, 1997). Corporate bonds involve a significant number of investors than syndicated loans, which make the renegotiation more difficult. Bond investors are not able to distinguish between liquidating and continuing the project(Berlin & Loeys, 1988). In case of syndicated loans, stricter monitoring by lenders helps to lower inefficient liquidation. As the value of project liquidation falls, the benefits of efficient liquidation decrease, and firms are more likely to use publicly placed debt.

Hypothesis 2: Positive relationship between liquidation value and the use of syndicated loans.

- ***Firm's size and Floatation cost***

Firm's size has a positive relationship with probability of issuing syndicated loans(Altunbaş et al., 2010). Syndicated loans seem to be the preferred debt choice for very large firms because of its size, flexibility, time span, and cheaper cost of borrowing. Large firms can also exploit the benefits of economies of scale in floatation costs of public debt(Krishnaswami et al., 1999). Hence, this study hypothesizes that large firms prefer to issue joint issuance since they can easily access to both market simultaneously.

Hypothesis 3: Positive relationship between firm's size and the use of joint issuance.

- ***Global Financial Crises***

Economic theory suggested that the bank's special ability of monitoring is particular important when borrower's credit risk is high (i.e. in a financial crisis)(Boyd & Prescott, 1986; Diamond, 1984; Fama, 1985). This study hypothesizes that bank's ability of monitoring and its advantages in information will make syndicated loans the preferred debt choice during the business downturns.

Hypothesis 4: Positive relationship between financial crises and the use of syndicated loans.

Chapter 3

Methodology

3.1) Data

The samples include information from 2000 to 2016 of United States' listed non-financial firms which raise funds through syndicated loans and/or issued corporate bonds. Only the firms that listed on either New York Stock Exchange (NYSE) or NASDAQ are considered.

This study constructs the data set by collecting data from Bloomberg Terminal and Thomson Reuters Datastream. In constructing, firstly, only new corporate bond issuances and/or syndicated loan borrowings in the study period are included. Outstanding loans or bonds that issued prior the study period are not considered. Bloomberg Terminal provides all deal-by-deal information on new syndicated loans borrowings and corporate bonds issuances. There are 49,144 bonds issued and 18,542 borrowing through syndicated loans during the study period with the total of 67,686 deals. Number of deals that issued by listed firms in New York Stock Exchange (NYSE) and NASDAQ are 25,633 deals. Duplicated issuances of corporate bonds or duplicated syndicated loans borrowing within the same year are removed by treating them as a 1 decision. The borrowers' financial characteristics is obtained through Thomson Reuters Datastream to reflect the focus of this study, that is, how firms make financing choice for new funds. Firms in the samples from these two data providers are matched by using the identification indicators such as ISIN codes and Sedol. The hand-matched method is also used to match the firms that lack of identification indicators. The total of 8,109 deals are used as a study samples. Lastly, to obtain the official macroeconomics data,

the U.S. Bureau of Economic Analysis (BEA) and the Federal Reserve System are used to collect the data on real GDPs and the interest rates, respectively.

Firms in the samples are subdivided into four categories according to their borrowing decisions within the study period. The allocations are based on whether they issued: (I) only syndicated loans, (II) only bonds, (III) both syndicated loans and bonds in different years, and (IV) both syndicated loans and bonds at least once within the same year (joint issuance). For example, firm A issued corporate bonds in 2000, 2001, 2006 and 2010, and also borrowed through syndicated loans in 2006, firm A will be treated as a firm in Category IV.

Table 1. All decisions summary

	Syndicated Loans	**Corporate Bonds**
Deals		
Number of samples	2,831	5,278
Amount (*million USD*)		
Sum	3,783,576	7,462,726
Minimum	1.97	1.00
Maximum	66,300	53,410
Average	1,336	1,414

Table 2. Number of decisions summarized by sector (BICS* Level 1)

	All Deals	**Syndicated Loans**	**Corporate Bonds**
Sector			
Communications	541	164	377
Consumer Discretionary	1,492	525	967
Consumer Staples	709	234	475
Energy	1,019	316	703
Health Care	817	299	518
Industrials	1,263	504	759
Materials	704	249	455
Technology	771	296	475
Utilities	793	244	549

*Bloomberg Industry Classification Systems

Table 3. Number of decisions summarized by issue year

	All Deals	Syndicated Loans	Corporate Bonds
Issue Year			
2000	184	17	167
2001	281	23	258
2002	298	34	264
2003	338	41	297
2004	387	114	273
2005	420	183	237
2006	420	160	260
2007	469	170	299
2008	393	153	240
2009	495	145	350
2010	607	242	365
2011	709	369	340
2012	668	270	398
2013	589	193	396
2014	625	238	387
2015	632	253	379
2016	594	226	368

Table 4. Number of decisions summarized by category

	Syndicated Loans	Corporate Bonds
Category		
I: issued only syndicated loans	364	
II: issued only corporate bonds		542
III: issue both syndicated loans and bonds in different years	553	838
IV: issued both syndicated loans and bonds at least once within the same year (*joint issuance*)	1,914	3,898

3.2) Methodology

To investigate how U.S. firms choose their financing between issuing corporate bonds and loans through syndication, the firm's debt choice is linked to firm's attributes observed prior to the new issue.

Logistic regression models are employed to estimate *Debt Choice*, the discrete dependent variable representing the firm's choice of debt. Both binomial and multinomial logistic regression models are used to examine the factors of firm's debt financing decisions.

Model 1: *Binomial Specification*

Debt Choice in these models is a binary variable that takes the value of 0 if the firm issues a corporate bond and 1 if the firm borrows through a syndicated loan. Binomial logistic regression model is employed twice by applying different sample sets. Debt Choice in Model 1 is as follows:

$$\text{Debt Choice}_{i,t} = \beta_0 + \sum_{c=1}^{C} \beta_c \cdot \text{Borrower's Financial Charateristics}_{i,c,t-1} + \sum_{s=1}^{S-1} \beta_s \cdot \text{Sector Dummies}_s + \sum_{y=1}^{Y-1} \beta_y \cdot \text{Year Dummies}_y + \sum_{m=1}^{M} \beta_m \cdot \text{Macroeconomics Indicators}_{m,t} + e_{i,t}$$

This model focuses on all the listed firms that use only one debt instrument, either syndicated loan or corporate bond, during the study period. Starting with the simplest specification, only firms that only raise funds by using one type of debt are considered (sample set from Category I and II firms). The same estimation method is extended by including the firms that borrow through both syndicated loan and corporate bond markets but not in the same year. The second regression uses the data of all firms (sample sets from Categories I-IV) but exclude those observations of joint issuance within the same year in Category IV.

Model 2: *Multinomial Specification*

This model employs a multinomial logistic specification. Using the same model as Model 1 but the dependent variable, Debt Choice, in this model is taking the value of 0 if the firm issues a corporate bond, 1 if the firm issues a syndicated loan, and 2 if the firm issues both syndicated loans and bonds at least once within the same year (joint issuance).

This model includes those observations in Category IV firms where a firm issue both syndicated loans and bonds at within the same year (joint issuance) which was omitted in the Model 1. By using multinomial logistic regression model, the joint issuance is treated as a reference outcome (base outcome) to capture firms' behaviors when facing with specific financial conditions. Depending on their financial conditions, firms may choose to raise funds only from a particular market in a certain time since they can easily access both syndicated loans and corporate bonds market.

Model 3 and Model 4: *Business cycle on firm's debt choice*

Model 3 and Model 4 are used to carry the analysis on the business cycle further. In these models, the *Year Dummies* which was used to be a proxy for business cycle in Model 1 and Model 2 are replaced by *Crisis Dummy*, a proxy variable for crisis periods. It takes the value of 1 for years 2000-2002 (Dot-Com bubble) and 2008-2009 (Global Financial Crisis), and 0 otherwise.

Model 3 uses the same estimate method and sample sets as in Model 1, as follows

$$\text{Debt Choice}_{i,t} = \beta_0 + \sum_{c=1}^{C} \beta_c \cdot \text{Borrower's Financial Charateristics}_{i,c,t-1} + \sum_{s=1}^{S-1} \beta_s \cdot \text{Sector Dummies}_s + \beta_k \cdot \text{Crisis Dummy}_k + \sum_{m=1}^{M} \beta_m \cdot \text{Macroeconomics Indicators}_{m,t} + e_{i,t}$$

Model 4 includes those observations in Category IV firms where a firm issues joint issuance which was omitted in the Model 3 and use the same multinomial regression method and same sample sets as Model 2. By using multinomial logistic regression models, the joint issuance is treated as a reference outcome.

Model 3 and Model 4 mainly focus on the coefficients of the independent variable *Crisis Dummy* to analyze the impact of the financial crises period on firm's debt decision.

Model 5 and Model 6: *Structural break test*

Model 5 and Model 6 are used to analyze the impact of the global financial crisis. Unlike the Model 3 and Model 4, these models mainly focus on structural break test by treating the global financial crisis as the breaking point. The *Post Crisis Dummy* is used to replace the *Crisis Dummy*. It takes the value of 1 for year 2008 onwards, and 0 otherwise.

Model 5 uses the same estimate method and sample sets as in Model 1 and Model 3, as follows

$$\text{Debt Choice}_{i,t} = \beta_0 + \sum_{c=1}^{C} \beta_c \cdot \text{Borrower's Financial Charateristics}_{i,c,t-1} + \sum_{s=1}^{S-1} \beta_s \cdot \text{Sector Dummies}_s + \beta_k \cdot \text{Post Crisis Dummy}_k + \sum_{m=1}^{M} \beta_m \cdot \text{Macroeconomics Indicators}_{m,t} + e_{i,t}$$

Model 6 includes those observations in Category IV firms where a firm issues joint issuance which was omitted in the Model 5 and use the same multinomial regression method and same sample sets as Model 2 and Model 4. By using multinomial logistic regression models, the joint issuance is treated as a reference outcome.

Model 5 and Model 6 mainly focus on the coefficients of the independent variable *Post Crisis Dummy* to analyze the impact of the global financial crisis 2007-2009 on firm's debt decision after the crisis.

3.3) Variables

Building on existing literatures, borrower's financial characteristics (*c*) that being focused in logistic regression models are those that reflect factors like transaction costs, debt renegotiation, inefficient liquidation concerns, and asymmetric information. The borrower's characteristics that being focused can be alphabetically defined as follows:

- *Corporate leverage* can be defined as total debt to total assets ratio. Corporate leverage measures the impact of current debt on the new debt issuance. Firms with higher leverage have a higher likelihood to issue public debt because of their positive reputations in the market(Denis & Mihov, 2003).
- *Current ratio* is the ratio of current assets to current liabilities. Current ratio offers a proxy for firm's ability to satisfy its current liabilities with current assets and also shows ability to pay its short-term debt.
- *Financial stress* can be defined by using the ratio of short-term debt (debt maturing in less than 1 year) to total debt as an immediate proxy(Diamond, 1991; Esho et al., 2001). Firms with higher leverage may have to face a higher financial risk and complicated renegotiation when using public debt(Berlin & Loeys, 1988; Chemmanur & Fulghieri, 1994).
- *Liquidation value* is proxy by using fixed-to-total assets ratio(Johnson, 1997). The likelihood of public debt issuance is much higher if the firm has a lower proportion of fixed assets, which tends to be tangible and can act as collateral(Houston & James, 1996). Since the fixed assets are more visible

for outside creditors, the probability of recovering the debt will be higher in case of default for creditors.

- *Market-to-book value* is used to measure growth potential of the firms(Barclay & Smith, 1995; Smith & Watts, 1992). The firm's market value reflects its value in the market while the book value does not take intangible assets such as growth potential and expectations of future profits into account. Firms with higher growth options in their investment get more benefits in privately placed debt from better monitoring and restrictive covenants to mitigate moral hazard problems(Boot & Thakor, 2008; Denis & Mihov, 2003).
- *Profitability* is measured as the return on assets ratio (ROA; the ratio of earnings before interests, taxes and depreciation to total assets). From lender's perspective, firm's visible ability to generate income can also be shown as its ability to pay back its debt. Hence, profitable firms tend issue public debt rather than loans by taking the advantage of their visible signal of ability to generate income(Denis & Mihov, 2003).
- *Sales growth* can be defined as the annual percentage change in sales in respect of the previous year. Sales growth is being used to expect future growth of the firm along with *Market-to-book value*. It measures the firm's past growth performance, while market-to-book value is a forward-looking measure reflecting market's expectations for the firm.
- *Size of firm* can be defined as natural log of firm's book value of total assets. Larger firms tend to exploit the economies of scale in floatation costs of public debt(Krishnaswami et al., 1999).

The models also account for two Macroeconomics Indicators (*m*), which use to be a proxy for business cycle as follows:

- *GDP growth* is used to be the control indicator for business cycle. GDP growth can be defined as a change in GDP from previous year.
- *Interest rate* is taken into account by using one-year money market rate.

In Model 3 and Model 4, an additional dummy variable will replace *Year Dummies* variable in Model 1 and Model 2:

- *Crisis Dummy*, a proxy variable for crisis periods which takes the value of 1 for years 2000-2002 (Dot-Com bubble) and 2008-2009 (Global Financial Crisis), and 0 otherwise. It is used in the Model 3 and 4.

In Model 5 and Model 6, an additional dummy variable will replace *Crisis Dummy* variable in Model 3 and Model 4:

- *Post Crisis Dummy* is a proxy for structural breaking point. It takes the value of 1 for year 2008 onwards, and 0 otherwise. It is used in the Model 5 and 6.

Table 5. Variables Summary

Variable		Proxy	Brief explanation
Corporate leverage	Testing (H1)	Debt ratio (Total Debt/Total Assets)	Impact of current debt on the new debt issuance
Current Ratio	Control	Current Ratio (Current Assets/Current Liabilities)	Firm's ability to satisfy its current liabilities with current assets
Financial Stress	Control	Short-term Debt/Total Debt	Financial risk and complicated renegotiation
Liquidation value	Testing (H2)	Fixed-Assets/Total Assets	Tends to be tangible and can act as collateral
Market-to-book value	Control	Market-to-book ratio	Reflects its value in the market
Profitability	Control	Return on Assets (ROA)	Firm's ability to generate income which also shows ability to pay back its debt
Sales growth	Testing (H3)	Annual percentage change in sales	Expect future growth of the firm
Size of firm	Control	Natural log of firm's total assets	Firm's reputations
GDP growth	Control	A change in GDP	Control indicator for business cycle
Interest rate	Control	One-year money market rate	Interest rate development
*Crisis Dummy**	Testing (H4)	Take value of 1 for years 2000-2002 and 2008-2009, and 0 otherwise	Dummies for business cycle indicate the economic slowdown
*Post Crisis Dummy***	Testing (H4)	Take value of 1 for years after 2008, and 0 otherwise	Impact of global financial crisis on post crisis's debt choice

* in Model 3 and 4
** in Model 5 and 6

Chapter 4
Results

4.1) Descriptive Results

Borrowers that used the debt financing by borrowing in the syndicated loan market are, on average, smaller than through bond market. These firms also have lower total debt to total assets ratio and higher short-term debt to total debt ratio. As expected, firms with lower corporate leverage and higher financial stress tend to tap into privately placed debt market due to a higher financial risk and complicated renegotiation they are facing when using public debt. These results are consistent with the studies of Berlin & Loeys(1988), and Chemmanur & Fulghieri(1994), and Denis & Mihov(2003). However, in contrast with the theory and some studies(Boot & Thakor, 2008; Denis & Mihov, 2003), firms that issued only corporate bonds in this study have lower market-to-book value, lower return on assets and higher sales growth. Firms that used the debt financing through *joint issuance* (issued bonds and borrowed through syndicated loans at least once within the same year) are much larger than firms that used only one debt instruments at a time. The average size of firms that issue joint issuances (Category IV) is more than eleven times larger than firms that borrow only through syndicated loans (Category I), and almost four times larger than firms that issue only corporate bonds (Category II). This result is consistent with the study of Altunbaş, Kara, and Marques-Ibanez (2010) which stated that firms that issue joint issuances are, on average, much larger than firms that issue only corporate bonds and firms that only borrow through syndicated loan market. With the borrowing needs and their large size, firms in Category IV are able to use their debt financing through both bond and syndicated loan

markets simultaneously. Between 2000 and 2016, these 611 firms issued 2,762 bonds and used 611 syndicated loans in different years, and there were 2,272 instances that firms simultaneously borrow through these two debt markets within the same year (Table 6). Table 6 below shows the statistical summary of firms in the samples and means reported of the firms' financial characteristics which are categorized according to their choice of debt.

Table 6. Summary statistics

	Decisions categorized according to their debt choice			
	Category I: only syndicated loans	**Category II**: only corporate bonds	**Category III**: syndicated loans and corporate bonds in different years	**Category IV**: both syndicated loans and bonds at least once within the same year (*joint issuance*)
Numbers				
Number of *decisions*	364	542	1,391	5,813
Number of *Firms*	149	152	307	611
Number of *syndicated loans*	364		553	779
Number of *corporate bonds*		546	838	2,762
Number of *joint issuance*				2,272
Variables (*means reported*)				
Total Debts to Total Assets (%)	19.17	45.05	30.08	34.61
Current Ratio (%)	2.27	2.20	2.08	1.69
Short-term Debt to Total Debt (%)	26.72	11.68	16.52	14.35
Fixed Assets to Total Asset (%)	26.23	40.11	31.72	35.39
Market-to-book value	3.29	1.22	2.34	2.90
Return on Assets (%)	4.36	0.24	4.43	5.55
Sales growth (%)	13.72	26.59	20.28	11.12
Firms size (million USD)	0.61	1.74	1.78	6.79

4.2) Binomial Specification Results

The financial factors behind firms' choice of debt are found to be statistically insignificant when comparing firms that borrowed through only one market, either corporate bond market or syndicated loan market. These results are contrast to previous study of Altunbaş, Kara, and Marques-Ibanez (2010) which studied how large European firms choose their debt choice between syndicated loans and corporate bonds. Their study found some statistically significant effects of financial characteristics on firms' choice of debt. They found that more leveraged firms, firms with low probability of financial stress, firms with higher level of fixed assets, lower market-to-book value firms, and larger firms tend to borrow through syndicated loan market. However, their studied were focused on only large firms in Europe in which the regulations for firms and syndicated loan market are different from the U.S regulations.

4.3) Multinomial Specification Results

To further analyze how firms choose their choice of debt, this study uses a multinomial logistic specification to comprise the *joint issuance* option. Debt Choice, in this model is taking the value of 0 if the firm issues a corporate bond, 1 if the firm borrows through syndicated loan, and 2 if the firm issues joint issuance. In this specification, those observations in Category IV which were omitted in the previous model where firm issues both corporate bonds and syndicated loans within the same year are included. Consequently, this model adds 2,272 joint issue observations from Category IV (Table 6). Due to the specific financial conditions that firms are facing,

they may choose to borrow from a specific market at certain times since they can easily access to both bond and syndicated loans markets.

The multinomial logistic regressions' results are presented in Table 7. Firms with higher corporate leverage are more likely to raise funds from these two markets simultaneously, rather than borrow only from syndicated loans market. It can be implied that the corporate leverage represents firm's credibility which gives the firms the flexibility to borrow from both bond and syndicated loan markets. The coefficient of firm's size shows that the large firms have a higher likelihood to borrow debt from both markets simultaneously which confirms the descriptive result from Table 6. This finding of the effect of firm's size on joint issuances is consistent with the result from an extensive sample of large European firms in the study of Altunbaş, Kara, and Marques-Ibanez(2010). However, firms' liquidation value decreases the effect of firms' size on firm's ability to finance from both market simultaneously, which forces larger firms to finance from only one market.

Table 7. Multinomial logistic regressions and the firms' choice of debt

	Model 2	
base outcome: Joint issuance	**Corporate Bonds**	**Syndicated Loans**
Corporate leverage	0.1601 (0.1323)	-2.4762*** (0.1979)
Current Ratio	0.0740*** (0.0243)	-0.0204 (0.0301)
Financial Stress	-0.3131** (0.1528)	-0.1889 (0.1675)
Liquidation value	0.0081*** (0.0016)	0.0061*** (0.0019)
Market-to-book value	-0.0002 (0.0010)	-0.0004 (0.0014)
Profitability	-0.0004 (0.0022)	0.0094*** (0.0029)
Sales growth	-0.0109 (0.0365)	0.0087 (0.0403)
Size of firm	-0.1243*** (0.0191)	-0.5491*** (0.0247)
GDP growth	-0.1443 (0.1519)	0.0128 (0.1907)
Interest rate	-0.7117 (0.4570)	-0.0330 (0.5746)
Sector dummies	Yes	Yes
Year dummies	Yes	Yes
Number of observations	8,109	
Number of firms	1,219	
Prob > X^2	0.0000	
Pseudo R^2	0.1218	

Notes: The magnitude of each coefficient has no economics significance since the model is Logistic Regressions. The coefficients show only the relationship between dependent and independent variables. The odd ratios, which are not presented in this study, can be used to see the effect of coefficients' magnitude.

Standard errors are given in brackets

* 10% significant level

** 5% significant level

*** 1% significant level

4.4) Business cycle on firm's debt choice

Two alternative dummy variables that represented the financial crises are introduced to capture the effect of business cycle on firms' debt choice. These two alternative dummy variables, Crisis dummy and Post Crisis dummy, are used to replace the year dummies in Model 1 and Model 2 which were the control variables for business cycle.

Crisis dummy is an independent variable that used to replace year dummies. It takes the value of 1 for years 2000-2002 (Dot-Com bubble) and 2008-2009 (Global Financial Crisis), and 0 otherwise. The results are presented Table 8. Interestingly, in Model 4 and Model 6 which include the firms that have ability to simultaneously borrow from both markets, the likelihood of raising funds through only one market at a time either issuing corporate bonds or borrowing through syndicated loans is statistically significantly higher than joint issuance in a period of crisis. This finding is partly consistent with the study of Altunbaş, Kara, and Marques-Ibanez(2010). They found that the likelihood to borrow through syndicated loan are statistically significantly higher than issuing joint issuance, but the likelihood of issuing corporate bond is found to be statistically insignificant when compare it with joint issuance.

Another alternative dummy variable that is used to replace year dummies is Post Crisis dummy, an independent variable that takes the value of 1 for year 2008 onwards, and 0 otherwise. The Post Crisis dummy is used to analyze the effect of global financial crisis 2007-2009 on borrowing structural. The results can be seen in Table 8. that after the global financial crisis in 2008, firms are more likely to issue both corporate bonds and syndicated loans simultaneously, rather than issue only corporate bonds.

Table 8. Business cycle and structural break test, and the firms' choice of debt

	Multinomial specification (Model 4 and Model 6) base outcome: Joint issuance	
	Corporate bonds	**Syndicated loans**
Model 4		
Crisis Dummy (*2000-2002, 2008-2009*)	1.9131*** (0.1277)	0.4431*** (0.1620)
Model 6		
Post Crisis Dummy (*2008 onwards*)	-1.4654*** (0.1226)	0.2253 (0.1627)
Number of samples	8,109	
Number of firms	1,219	

Notes: The magnitude of each coefficient has no economics significance since the model is Logistic Regressions. The coefficients show only the relationship between dependent and independent variables. The odd ratios, which are not presented in this study, can be used to see the effect of coefficients' magnitude.

Standard errors are given in brackets

* 10% significant level

** 5% significant level

*** 1% significant level

From the perspective of borrowers, the recent expansion, financial innovations, and developments has increased the competition between lenders and blurred the distinction between corporate bonds and syndicated loans which can implied the trigger of convergence between these two debt markets.

Chapter 5
Conclusions

The syndicated loan market has grown tremendously in the recent years to be one of the main alternative debt instruments for corporations. Especially in the United States, the progressive developments have experienced solid growing to represent 60% of global syndicated loans volume in the first quarter of 2017. This study analyzes the financial factors behind firms' choice of debt between syndicated loans and corporate bonds for a sample of the listed non-financial companies in the U.S. Unlike prior studies, syndicated loans in this study have been separated from bilateral bank loans and defined as an alternative debt choice.

The financial factors behind firms' choice of debt are found to be statistically insignificant when comparing firms that borrowed through only one market, either corporate bond market or syndicated loan market. These results are contrast to previous study of Altunbaş, Kara, and Marques-Ibanez (2010) which studied how large European firms choose their debt choice between syndicated loans and corporate bonds. However, the results from multinomial specification when normalizing the joint issuance as an alternative decision indicate that the larger firms have a higher likelihood to borrow from both markets simultaneously. In contrast with firms' liquidation value, it limits the power firms' size which led to lower likelihood to issue joint issuance. The multinomial results from Model 4 and Model 6 which are used to study the business cycle show that the likelihood of raising funds through only one market at a time is higher than joint issuance in a period of crisis. The results also show that after the global financial crisis in 2008, firms are more likely to issue both corporate bonds and syndicated loans simultaneously, rather than issue only corporate bonds.

This study also provides some evidences to the discussion of whether the recent expansions and developments in syndicated loan market, in terms of both regulation and market practices, has blurred the line and caused the convergence between two alternatives debt markets from the perspective of the firms. The result presented shows that, in the United States, the financial factors that lead to a particular debt choice are found to be statistically insignificant which means those financial characteristics that were being focused has no significant effect on firms' decision to choose the source of funds. Therefore, it may imply that the recent expansions and developments in syndicated loan market might have caused the convergence between these two alternative debt markets.

- *Financial Leverage hypothesis*

Hypothesis 1: Positive relationship between leverage and the use of syndicated loans.

Corporate leverage can be defined as total debt to total assets ratio. Corporate leverage measures the impact of current debt on the new debt issuance. The finding rejects the hypothesis. It shows that the firms with higher corporate leverage are more likely to borrow from these two markets simultaneously, rather than borrow only from syndicated loans market. It can be implied that the corporate leverage represents firm's credibility which gives the firms the flexibility to borrow from both bond and syndicated loan markets.

- *Renegotiation and Liquidation concerns hypothesis*

Hypothesis 2: Positive relationship between liquidation value and the use of syndicated loans.

Liquidation concerns can be gauged by fixed-to-total assets. Corporate bonds involve a significant number of investors relative to syndicated loans, which make the renegotiation more difficult. Bond investors are not able to distinguish between liquidating and continuing the project(Berlin & Loeys, 1988). The result shows that there is a positive relationship between liquidation value and the use of syndicated loans, but there is also a positive relationship between liquidation value and the use of corporate bonds as well. The joint issuance seems not to be favored for firms when they have higher fixed-to-total assets.

- *Firm's size and Floatation cost hypothesis*

Hypothesis 3: Positive relationship between firm's size and the use of joint issuance.

Syndicated loans seem to be the preferred debt choice for very large firms because of its size, flexibility, time span, and cheaper cost of borrowing. Large firms can also exploit the benefits of economies of scale in floatation costs of public debt(Krishnaswami et al., 1999). The finding shows that there is a positive relationship between the size of the firms and the use of joint issuance. With the borrowing needs and their large size, large firms are able to use their debt financing through both bond and syndicated loan markets simultaneously.

- *Global Financial Crises hypothesis*

Hypothesis 4: Positive relationship between financial crises and the use of syndicated loans.

Economic theory suggested that the bank's special ability of monitoring is particular important when borrower's credit risk is high (i.e. in a financial crisis)(Boyd & Prescott, 1986; Diamond, 1984; Fama, 1985). This study's finding is partly consistent with the hypothesis and study of Altunbaş, Kara, and Marques-Ibanez(2010). They found that the likelihood to borrow through syndicated loan are significantly higher than issuing joint issuance, but the likelihood of issue corporate bond is found to be insignificant when compare it with joint issuance. However, this study's finding shows that during the period of crisis, firms prefer to issue only one type of debt either corporate bonds or syndicated loans. Joint issuances seem not to be the preferred debt choice since it is too risky for firms to borrow from both markets simultaneously.

This study's findings from the regression analyses respond to the study's questions to find the financial factors behind the debt decisions by directly compare corporate bonds with syndicated loans. These findings show that syndicated loan is now one of the main alternative debt instruments for firms when raising funds. With its features including size, maturity, flexibility, and relatively easier process, syndicated loan is now moving away from bank loan and closer to corporate bonds. This study also has implications of potential complementarities between bank lending and bond market.

The firms' financial factors behind debt decisions when choosing between syndicated loan and corporate bond are found to be statistically insignificant and joint issuance is found be preferred debt choice for firms when firms are very large. These results should provide information for large firms before deciding upon the use of both syndicated loan and corporate bond market simultaneously instead of concentrating in only one type of debt. This creates complementarities between two types of debt. Unlike the traditional financial intermediations theory which suggested that banks and markets compete, the growth in one market is at the expense of another(Allen & Gale, 1997; Boot & Thakor, 2008).

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APPENDIX

VITA

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