Copyright is owned by the Author of the thesis. Permission is given for a copy to be downloaded by an individual for the purpose of research and private study only. The thesis may not be reproduced elsewhere without the permission of the Author.
OPACITY AND EVENT STUDY ANALYSIS

A thesis presented in partial fulfillment of the requirement for the degree of

Master of Finance

at

Massey University

Auckland, New Zealand

February 2015

Student’s name: Vu Dieu Huong
Student ID: 13025207
# TABLE OF CONTENTS

**ACKNOWLEDGEMENT** ........................................................................................................... v  
**ABSTRACT** ........................................................................................................................... vi  
**CHAPTER 1: INTRODUCTION** ............................................................................................. 1  
1.1 Background of intervalling effect and opacity factor ...................................................... 2  
1.2 Objectives of the research ................................................................................................. 3  
  1.2.1 Can opacity factor adjust beta biases? ........................................................................ 3  
  1.2.2 Does opacity factor improve the power of event study analysis? .......................... 4  
**CHAPTER 2: LITERATURE REVIEW** .................................................................................. 7  
2.1 Sampling frequency and beta estimation- intervalling effect ......................................... 7  
2.2 The cause of risk alteration with differencing data interval .......................................... 11  
  2.2.1 Market friction- nonsynchronous trading ................................................................. 14  
  2.2.2 Risk based explanation for intervalling effect .......................................................... 15  
2.3 Fixing intervallig effect for better beta estimates ............................................................. 17  
  2.3.1 Longer or shorter return interval for beta estimation? .............................................. 17  
  2.3.2 Corrective methods for beta estimated from daily returns .................................... 18  
2.3 Correction methods’ performance in asset pricing model ............................................. 21  
2.4 Correction methods’ performance in event study ........................................................... 25  
**CHAPTER 3: DATA AND METHODOLOGY** ..................................................................... 29  
3.1 Data ................................................................................................................................... 29  
3.2 Methodology ...................................................................................................................... 29  
  3.2.1 Methodology for opacity factor formation ............................................................... 29  
  3.2.2 Methodology for event study test ............................................................................. 34  
**CHAPTER 4: RESULTS AND DISCUSSION** ................................................................. 41  
4.1 Initial results- random stocks selection ......................................................................... 41  
  4.1.1 Intervalling effect correction ...................................................................................... 41
4.1.2 Properties of estimation period returns and daily excess returns ..........42
4.1.3 Test statistics properties .................................................................44
4.1.4 Specification and power test ...............................................................45
4.2 Opacity clustering ...............................................................................46
  4.2.1 Interaction between $\Delta \beta$ and value/ turnover effect ................47
  4.2.2 Intervalling effect correction ..............................................................50
  4.2.3 Estimation period returns .................................................................56
  4.2.4 Cross sectional properties for portfolios on day 0 .........................58
  4.2.5 Test statistics properties .................................................................60
  4.2.6 Specification and power test ..............................................................62
4.3 When event date is unknown ..............................................................66
4.4 Actual event- Dividend announcement ..............................................70
4.5 Discussion ............................................................................................72
CHAPTER 5: SUMMARY AND CONCLUSION .........................................76
REFERENCES .............................................................................................78
**LIST OF TABLES**

Table 1: Summary statistics of \( \Delta \beta \) portfolio constituents .......................................................... 31
Table 2: Differences in CAPM \( \beta \) across return frequencies ........................................ 33
Table 3: Descriptive statistics of Betas using alternative estimation techniques ........ 41
Table 4: Properties of estimation period returns and excess returns on day 0 ...... 42
Table 5: Properties of test statistics of portfolios of randomly chosen stocks ....... 44
Table 6: Specification and power test of portfolio of randomly chosen stocks ...... 45
Table 7: Average numbers of firms jointly belong to 2 quintiles. ......................... 49
Table 8: Descriptive statistics of Betas using alternative estimation techniques for opacity clustered portfolio ........................................................................................................ 51
Table 9: Properties of estimation period returns of opacity clustered portfolios ..... 56
Table 10: Properties of excess returns on day 0 of opacity clustered portfolio ...... 58
Table 11: Properties of test statistics of opacity clustered portfolios .................... 60
Table 12: Specification and power test of opacity clustered portfolios .................. 63
Table 13: Specification and power tests when event date is unknown ............... 66
Table 14: Rejection rates in an actual event test ......................................................... 70
Table 15: Relationship of residuals obtained from two models ......................... 74
ACKNOWLEDGEMENT

First and foremost, I would like to express my sincere gratitude towards my supervisor, Professor Nuttawat Visaltanachoti, for his generous academic support. I would also like to thank Associate Professor Nick Nguyen, who inspires me to work harder on the research during my toughest times.

I would like to acknowledge Mr. Vincent Kleinbrod for his helpful advice regarding data processing.

My sincere thanks also go to New Zealand ASEAN Scholars award for financially supporting my dream of studying abroad.

I am grateful to my friends for their support during last 2 years. It would have been impossible for me to go far both in social and academic life without support from April, Alex, Daniel, Harvey, Tracey and Aazim.

Finally, I would love to dedicate this work to my beloved family, who loves me unconditionally and stays with me through all ups and downs.
ABSTRACT

This study examines the impact of asset pricing model’s misspecification on the power of an event study analysis. Gilbert, Hrdlicka, Kalodimos, and Siegel (2014) show that asset pricing model fails to price asset accurately at high frequency. This is due to uncertainty about the effect of systematic news on firm value, which they address as firm opacity. They propose an additional factor in the market model and empirically show better performance of the augmented model. This study practically investigates the implication of this additional factor on enhanced power of event study analysis. Key findings indicate that an adjusted asset pricing model improves the power of event studies for small stock portfolio. The detection rate increases from 2.9 percent to 15.5 percent based on an induced abnormal return of 1.5 percent to 2 percent. However, there is no improvement in abnormal return detectability in portfolios of random stocks or other characteristic- sorted portfolios.