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**Systematic Liquidity Risk and Stock Price Reaction  
to Large One-Day Price Changes: Evidence from  
London Stock Exchange**

**Dima Waleed Hanna Alrabadi**

**Submitted for the degree of Doctor of Philosophy**

**School of Management**

**University of Bradford**

**2009**

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## ABSTRACT

**Dima Waleed Hanna ALRABADI**

### **Systematic Liquidity Risk and Stock Price Reaction to Large One-Day Price Changes: Evidence from London Stock Exchange**

**Keywords:** *Systematic liquidity risk, asset pricing, large one-day price changes, time-varying risk, S-GARCH, efficient market hypothesis, overreaction, underreaction.*

This thesis investigates systematic liquidity risk and short-term stock price reaction to large one-day price changes. We study 642 constituents of the FTSE100 share index over the period from 1<sup>st</sup> July 1992 to 29<sup>th</sup> June 2007. We show that the US evidence of a priced systematic liquidity risk of Pastor and Stambaugh (2003) and Liu (2006) is not country-specific. Particularly, systematic liquidity risk is priced in the London Stock Exchange when Amihud's (2002) illiquidity ratio is used as a liquidity proxy. Given the importance of systematic liquidity risk in the asset pricing literature, we are interested in testing whether the different levels of systematic liquidity risk across stocks can explain the anomaly following large one-day price changes. Specifically, we expect that the stocks with high sensitivity to the fluctuations in aggregate market liquidity to be more affected by price shocks. We find that most liquid stocks react efficiently to price shocks, while the reactions of the least liquid stocks support the uncertain information hypothesis. However, we show that time-varying risk is more important than systematic liquidity risk in explaining the price reaction of stocks in different liquidity portfolios. Indeed, the time varying risk explains nearly all of the documented overreaction and underreaction following large one-day price changes. Our evidence suggests that the observed anomalies following large one-day price shocks are caused by the pricing errors arising from the use of static asset pricing models. In particular, the conditional asset pricing model of Harris et al. (2007), which allow both risk and return to vary systematically over time, explain most of the observed anomalies. This evidence supports the Brown et al. (1988) findings that both risk and return increase in a systematic fashion following price shocks.

## **Declaration**

No portion of the work referred to in the thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institution of learning.

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## **Dedication**

***TO MY GORGEOUS FAMILY***

## الاهداء

الى الخالد الذي لن يموت في قلوبنا ابدا  
الى رمز الطيب و الصبر و الرجولة  
الى من لا اتمنى ان ارى نفسي الا تجسيدا لذاته  
ال من ظلمته الدنيا فرحل قبل ان يحصد ثمار ما زرع  
قم يا حبيبي فقد اينعت ازهارك و نضجت ثمارها  
الى روحك الطاهرة  
والدي

الى الدمشقية الطيبة التي تحمل في عروقها كل اصالة الشام  
الى حبيبتي التي لطالما شاركتني حلو الايام ومرها  
الى من تحملت الكثير الكثير لاجلنا  
الى نبع العطاء الذي لا ينتهي  
الى الدافئة الرقيقة صديقة عمري  
والدتي

الى توام روحي  
الى من يفرح لفرحي قبل ان افرح و يحزن لحزني قبل ان احزن  
الى ضحكة ملؤها البراءة و عينان سمران ملؤهما الطيب  
الى من افتخر بخلقه العظيم و نجاحه الدائم  
الى الاخ و الصديق و الحبيب و السند  
الى من افيده بعمرى  
اخي حنا

اليكم يا من عشتم معي لحظة بلحظة لاتمام هذا العمل

الى كل من احب



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## List of abbreviations

|            |  |
|------------|--|
| AIC        | Akaike information criteria  |
| AM         | Mimicking aggregate liquidity factor of Amihud's (2002) illiquidity ratio                |
| AM1        | Illiquidity ratio augmented Capital Asset Pricing Model                                  |
| AM2        | Illiquidity ratio augmented Fama and French (1993) model                                 |
| AM3        | Illiquidity ratio augmented Carhart (1997) model   |
| AS-GARCH   | Asymmetric Simplified Multivariate GARCH model   |
| CAAR       | Average Cumulative Abnormal Returns  |
| CAPM       | Capital Asset Pricing Model  |
| C-F&F      | Carhart (1997) four-factor model   |
| Diff(10-1) | Portfolios whose returns are difference between returns of least and most Liquid stocks. |
| EGARCH     | Exponential GARCH model of Nelson (1991)   |
| F&F        | Fama and French (1993) three-factor model  |
| GARCH      | Generalised Autoregressive Conditional Heteroskedasticity                                |
| GJR-GARCH  | Glosten-Jagannathan-Runkle GARCH model of Glosten et al. (1993)                          |
| GRS        | Gibbons et al. (1989) test   |
| HML        | High Minus Low factor of Fama and French (1993)  |
| LM         | Lagrange Multiplier test   |
| LSE        | London Stock Exchange  |
| MKT        | Market excess return   |
| MOM        | Momentum factor of Carhart (1997)  |
| OLS        | Ordinary Least Squares   |
| Port       | Portfolio  |
| PSPR       | Mimicking aggregate liquidity factor of proportional bid-ask spread                      |

|         |  |
|---------|--|
| PSPR1   | Proportional spread augmented Capital Asset Pricing Model  |
| PSPR2   | Proportional spread augmented Fama and French (1993) model |
| PSPR3   | Proportional spread augmented Carhart (1997) model         |
| S-GARCH | Simplified Multivariate GARCH model                        |
| SMB     | Small Minus Big Factor of Fama and French (1993)           |
| TO      | Mimicking aggregate liquidity factor of turnover rate      |
| TO1     | Turnover rate augmented Capital Asset Pricing Model        |
| TO2     | Turnover rate augmented Fama and French (1993) model       |
| TO3     | Turnover rate augmented Carhart (1997) model               |
| WSRT    | Wilcoxon Signed Rank test                                  |