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Financial Development and the Liquidity of Cross-Listed Stocks; The Case of ADR's

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FINANCIAL DEVELOPMENT AND THE LIQUIDITY OF CROSS-LISTED STOCKS: THE CASE OF ADR'S

by

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Abstract:
This study examines the relationship between financial development in a particular country and the volatility and illiquidity of ADR's cross-listed on American exchanges, that correspond to the particular home country. Tests show that financial development and illiquidity are inversely related, thus, financial development improves liquidity and reduces volatility. The results have important implications for individual investors, firms seeking to lower their cost of capital, and the economic well-being of countries in general.

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1. INTRODUCTION

Much research has sought to identify variables that influence the volatility and illiquidity of assets. As these two factors decrease, market efficiency improves, uncertainty in prices decrease and overall risk is reduced. Its implications are also relevant to economic growth generally and the study of poverty and income inequality, as it has been shown that financial development disproportionality helps the poor relative to the rich (Levine and Zervos (1998), Blau (2017), Clarke, Xu, and Zou (2006) and Beck, Demirguc-Kunt, and Levine (2007)).

In this study, we are interested in how the characteristics of various economic and stock exchange variables in a particular country affect the liquidity and volatility of ADR's traded on U.S. exchanges which represent stocks traded in the home country.

We begin by gathering data on ADR's that are traded on U.S. stock exchanges, which are based out of various countries around the world. This data includes liquidity and volatility measures that will be discussed below. Characteristics of the stock exchanges and financial systems of the home countries are observed. Using regression analysis, we observe how these characteristics are related to liquidity and volatility measures in the ADR's. Results show that, after controlling for a number of ADR-specific and country-specific variables, various measures of financial development in the home country lead to more liquidity and less volatile ADRs. These results are robust to different measures of liquidity and volatility and different measures of home country financial development, such as trading volume, trade volume conditioned on GDP and turnover respectively, and the dollar amount of credit issued by banks and financial institutions respectively. In short, we see how financial development in the home country is

related to the liquidity and volatility of the ADR's, whose underlying stock is traded in that country.

The results of this study have important implications for three groups. The first group is investors seeking to diversify their portfolio by holding internationally based stocks. Investors can gain this exposure by purchasing American depositary receipts, traded on American exchanges, which represent shares of an international company based elsewhere. In addition to the fundamentals of the firm, and other risks inherent in the stock, the variables discussed in this paper appear to be a key driver in the volatility and liquidity of the corresponding ADR. Investors can anticipate a portion of their volatility and liquidity risk by observing the variables discussed below.

Second, the findings in this study may have important implications for publically traded firms as well. Firms desiring to maximize shareholder value do this in part by seeking a lower cost of capital. As volatility and illiquidity of a firm's shares are key risk factors, they in part, affect a firm's cost of capital. This study seeks to identify what characteristics affect the volatility and illiquidity of ADR's, and thus can provide valuable information to firms. Our results show that the level of financial development in a particular country will influence the liquidity and volatility of cross-listed securities.

Finally, this study has important implications for those interested in how financial development can affect economies as a whole. As mentioned above, other studies have shown that financial development leads to economic growth and disproportionately helps the poor, relative to the rich. While this study does not look directly at these issues, it may provide a mechanism through which growth can occur. More stable and more liquid securities are likely

to create a financial market that can more efficiently allocate capital, which can lead to stronger economic growth and lower rates of poverty.

2. DATA DESCRIPTION

For this analysis, the data was gathered from two sources; The Center for Research on Securities Prices (CRSP), and The World Bank (World development Indicators). The following data on ADR's were gathered from CRSP: the closing share price for each ADR in each year (PRICE), the closing ask price minus the closing bid price divided by the spread midpoint (%SPRD), the price times the shares outstanding for each ADR in each year (MKT CAP), the absolute value of daily returns for each ADR in each year divided by trading volume in millions (ILLIQ), the standard deviation of daily returns for each ADR in each year (VOLT), the conditional estimated volatility after fitting daily returns to a Garch (1,1) model for each ADR in each year (GARCH), the trading volume of ADR's divided by shares outstanding (TURN), and whether or not each ADR is traded on the New York Stock Exchange, represented by a dummy variable equal to one indicating that the ADR is traded on the NYSE and zero otherwise (NYSE). The closing ask price minus the closing bid price for each ADR was taken to find the dollar spread ($SPRD).

The macroeconomic data used, came from The World Bank. This data includes: Gross Domestic Product for each country divided by the population of the country (GDP), the total amount of trading volume on the home country stock exchanges (TRADEVOL), the amount of trading volume on the home country stock exchanges divided by GDP (TRADE/GDP), the total trading volume on the home country stock exchange divided by the total shares outstanding for

all publicly traded stocks (TRADETURN), the total consumer expenditures for each country (CONS), the unemployment rate in each country (UNEMPL), the dollar amount of credit offered by banking institutions in each country (BANKLOANS), and the dollar amount of credit offered by all financial institutions in each country (FINLOANS). The data ranges from 2001 to 2012. Prior to 2001, major exchanges such as the NYSE and Nasdaq did not trade on $0.01. Moving from trading on 1/8ths or 1/16ths of a dollar to decimalization is likely to affect both volatility and bid-ask spreads (Bessembinder (2003) and He and Wu (2005)). Data before 2001 has, therefore, been omitted in order to avoid the effects of regime change. In total, the dataset includes data for 3,425 ADR's in 37 different countries.

Table 1 lists the number of ADR's in each country as well as the means for the following variables, by country; %SPRD, $SPRD, ILLIQ, VOLT and GARCH. We would expect that countries with more ADR's traded on U.S. exchanges have lower spreads, lower illiquidity and lower volatility. From this data, we see that this is the case with most countries. However, this is not the case with every country. Variations in this aspect may be due to other factors affecting these variables, which will be discussed below. Table 2 lists the number of ADR's in each country as well as the means for the following variables, by country; TRADEVOL, TRADE/GDP, TRADETURN, BANKLOANS and FINLOANS. From this data, it appears that countries with a greater number of ADR's traded on U.S. stock exchanges, typically have higher means for each of the variables of interest. This is intuitive, as countries with more ADR's traded on U.S. stock exchanges typically have a higher population, and a higher population contributes to higher economic output, higher trade volume and so forth.

3. EMPIRICAL RESULTS

Our first regression looks at how the total amount of trading volume on the home country stock exchange (TRADEVOL) is related to the bid ask spread of the ADR (%SPRD). A number of control variables are included in the regression, and the natural log of each variable is taken. We estimate the equation as follows:

$$Ln(\%SPRD) = \beta o + \beta 1 Ln(TRADEVOL) + \beta 2 Ln(GDP) + \beta 3 Ln(CONS) + \beta 4 Ln(UNEMPL) + \beta 5 Ln(PRICE) + \beta 6 Ln(MKT\ CAP) + \beta 7 Ln(TURN) + \beta 8(NYSE) + \varepsilon$$

The dependent variable is the natural log of the ratio of the difference between the ask price and the bid price scaled by the spread midpoint, *Ln(%SPRD).* The independent variables include the following: *Ln(TRADEVOL)* is the natural log of the total amount of trading volume on the home country stock exchanges, which is the independent variable of interest; *Ln(GDP)* is the natural log of the gross domestic product per capita of the country; *Ln(CONS)* is the natural log of the total consumer expenditures for each country; *Ln(UNEMPL)* is the natural log of the unemployment rate in each country; *Ln(PRICE)* is the natural log of the closing share price for each ADR in each year; *Ln(MKT CAP)* is the natural log of market capitalization or the price times the shares outstanding for each ADR in each year; *Ln(TURN)* is the natural log of share turnover or the trading volume of each ADR divided by shares outstanding; and *NYSE* is dummy variable equal to one indicating that the ADR is traded on the NYSE and zero otherwise.

In addition to these independent variables, we also include dummy variables for n-1 years, to control for year fixed effects. The t-statistics reported are robust to heteroskedasticity and multi-dimensional clustering. In order to control for the potential collinearity of the

independent variables, we have estimated variance inflation factors, which are relative low and indicate that multicollinearity does not seem to affect the conclusions that we draw.

The coefficients from these tests can be interpreted as "elasticities" as this is a *log-log* model. Results in Table 3 show that a 1% increase in TRADEVOL, is associated with a 1.97% decrease in %SPRD, holding all else constant. Thus, as the total amount of trading volume on the home country stock exchange increases by 1%, this is associated with a 1.97% decrease in the percentage bid-ask spread. This coefficient is statistically significant at the .01 confidence level, with a t-statistic of -3.75. From this test, we conclude that TRADEVOL has a statistically significant effect on %SPRD.

This test is repeated 4 times with a different dependent variable each time. Our second regression is as follows: $Ln(\$SPRD) = \beta o + \beta 1Ln(TRADEVOL) + \beta 2Ln(GDP) + \beta 3Ln(CONS) + \beta 4Ln(UNEMPL) + \beta 5Ln(PRICE) + \beta 6Ln(MKT\ CAP) + \beta 7Ln(TURN) + \beta 8(NYSE) + \varepsilon$

The coefficient of our independent variable of interest is -0.133. In economic terms, a 1% increase in TRADEVOL is associated with a 1.33% decrease in $SPRD. This is not surprising, given that we found a similar relationship between %SPRD and TRADEVOL. The t-statistic for this variable is -2.48, which suggests that the coefficient on Ln(TRADEVOL) is statistically significant at the .05 level.

Next, we look at the relationship between TRADEVOL and variables representative of volatility. Our next equation is as follows:

$Ln(ILLIQ) = \beta o + \beta 1Ln(TRADEVOL) + \beta 2Ln(GDP) + \beta 3Ln(CONS) + \beta 4Ln(UNEMPL) + \beta 5Ln(PRICE) + \beta 6Ln(MKT\ CAP) + \beta 7Ln(TURN) + \beta 8(NYSE) + \varepsilon$

The coefficient on *Ln(ILLIQ)* is -0.0207 with a t-statistic of -2.84. Thus, a 1% increase in TRADEVOL is associated with a 2.07% decrease of *ILLIQ* holding all else constant. Here, "*ILLIQ"* is the absolute value of daily returns for each ADR in each year divided by trading volume in millions. As the coefficient is statistically significant at the .01 confidence level, we conclude that as the trading volume of the home country stock exchange increases, the illiquidity, as measured by Amihud (2002), of the ADR trading on U.S. exchanges decreases.

This regression is repeated two more times, using two more dependent variables. *Ln(VOLT)* and *Ln(GARCH). Ln(VOLT)* is the standard deviation of daily returns for each ADR in each year and *Ln(GARCH)* is the conditional estimated volatility after fitting daily returns to a Garch (1,1) model for each ADR in each year. The respective coefficients and t-statistics for these variables are -0.0007 (-0.19) and -0.0016 (-0.53). Neither of these coefficients are statistically significant at the 90% level.

We now move to our second independent variable of interest, and regress it on each of the 5 dependent variables used previously. Our new independent variable of interest is the natural log of the amount of trading volume on the home country stock exchanges divided by GDP. We estimate the following equation:

$$Ln(\%SPRD) = \beta o + \beta 1 Ln(TRADE/GDP) + \beta 2 Ln(GDP) + \beta 3 Ln(CONS) + \beta 4 Ln(UNEMPL) + \beta 5 Ln(PRICE) + \beta 6 Ln(MKT\ CAP) + \beta 7 Ln(TURN) + \beta 8(NYSE) + \varepsilon.$$

For this test, we use the same control variables used in our previous regressions, robust standard errors are used, and year fixed effects are controlled for. By dividing the total amount of trading volume on the home country stock exchange by GDP, we are essentially equalizing countries with varying GDP. This can be viewed as a control for differing GDP across countries.

The results of regressing the five dependent variables used in the previous regressions on our new independent variable of interest produce similar results. Again, our 5 dependent variables are as follows: *Ln(%SPRD), Ln($SPRD), Ln(ILLIQ), Ln(VOLT), and Ln(GARCH).* The following are the respective coefficients and t-statistics for these 5 variables regressed on our independent variable of interest: (Ln(TRADE/GDP): -0.0481 (-5.56), -0.0447 (-4.98), -0.0444 (-3.65), -0.0075 (-1.27) and -0.0070 (-1.39). Again, the coefficients for the first 3 regressions are statistically significant at the 99% confidence level, and the last 2 are not significant at the 90% confidence level.

The third independent variable that we regress our five dependent variables on is *Ln(TRADETURN).* This is the natural log of the total trading volume on the home country stock exchange divided by the total shares outstanding for all publicly traded stocks. Dividing total trading volume of the exchange by total shares outstanding equalizes countries, whose stock exchanges experience more trade volume simply because there are more total shares outstanding on the exchange. The following is an example of one of the five regressions we run, with our new independent variable of choice:

$$Ln(\%SPRD) = \beta o + \beta 1 Ln(TRADETURN) + \beta 2 Ln(GDP) + \beta 3 Ln(CONS) + \beta 4 Ln(UNEMPL) + \beta 5 Ln(PRICE) + \beta 6 Ln(MKT\ CAP) + \beta 7 Ln(TURN) + \beta 8(NYSE) + \varepsilon.$$

As before, robust standard errors are used and year fixed effects are controlled for. For the five dependent variables used in our regressions, the following are the coefficients and t-statistics for the independent variable of interest, *Ln(TRADETURN):* -0.0434 (-3.73), -0.0381 (-3.13), -0.0787 (-5.15), -0.0042 (-0.49) AND -0.0052 (-0.77). Results from these regressions are similar to

the 2 previous regression sets. We find that as *Ln(TRADETURN)* increases, *Ln(%SPRD), Ln($SPRD) and Ln(ILLIQ)* all decrease substantially at a 99% confidence level.

The fourth independent variable of choice now looks at macroeconomic conditions in the home country, rather than the characteristics of the home country exchange. Our independent variable of interest is *Ln(BANKLOANS),* which is the natural log of the dollar amount of credit offered by banking institutions in each country. The implications of the results of this regression are of interest in that firms seeking to reduce volatility and illiquidity by cross-listing their shares on U.S. exchanges can estimate the effect of doing so, based on the amount of credit offered by banks in their home country. We again, regress the same five dependent variables representing liquidity and volatility measures of the ADR's used previously, on our new independent variable of choice. The following is an example of first of five regressions:

$$Ln(\%SPRD) = \beta o + \beta 1 Ln(BANKLOANS) + \beta 2 Ln(GDP) + \beta 3 Ln(CONS) + \beta 4 Ln(UNEMPL) + \beta 5 Ln(PRICE) + \beta 6 Ln(MKT\ CAP) + \beta 7 Ln(TURN) + \beta 8(NYSE) + \varepsilon.$$

In the previous regression, where the independent variables of choice represented characteristics of the home country stock exchange, we see statistical significance in only three of the five regression. Now, as we regress our five variable representing volatility and illiquidity on *Ln(BANKLOANS),* we see statistical significance in all five regressions. The coefficients and t-statistics of *Ln(BANKLOANS)* for all five regressions are as follows; -0.1458 (-8.95), -0.1348 (-7.95), -0.0973 (-4.29), -0.0446 (-4.26) and -0.0354 (-35.48). From the results, we observe that as the dollar amount of credit offered by banking institutions in a particular country increases by 1%, our two spread measures, *Ln(%SPRD) and Ln($SPRD)* on average see a reduction by roughly 14% at the .01 confidence level. The variables *Ln(ILLIQ), Ln(VOLT) and Ln(GARCH)* see a

decrease of 9.73%, 4.46% and 3.54% respectively, as the dollar amount of credit offered by banking institutions increase by 1% holding all else constant, at the .01 confidence level. These results indicate that while trading volume in the home country is associated with an improvement in ADR liquidity, financial development – as measured by credit offered by banks – is associated with both an improvement in liquidity and a reduction in volatility.

The final independent variable of interest is *Ln(FINLOANS),* which is the natural log of the dollar amount of credit offered by all financial institutions in each country. We regress all five variables representing liquidity and volatility measures of the ADR's on *Ln(FINLOANS*). The following is an example of the first of five regressions:

$$Ln(\%SPRD) = \beta o + \beta 1 Ln(FINLOANS) + \beta 2 Ln(GDP) + \beta 3 Ln(CONS) + \beta 4 Ln(UNEMPL) + \beta 5 Ln(PRICE) + \beta 6 Ln(MKT\ CAP) + \beta 7 Ln(TURN) + \beta 8(NYSE) + \varepsilon.$$

Again, robust standard errors are used and year fixed effects are controlled for. The following are the coefficients and t-statistics for *Ln(FINLOANS)* from all five regressions; -0.1179 (-6.44), -0.1144 (-5.77), -0.1015 (-3.89), -0.0307 (-2.55) and -0.0267 (-2.49). The results are similar to those found in the previous regression set, where *Ln(BANKLOANS)* is the independent variable of choice. Again, all coefficients are statistically significant at (at least) the .05 confidence level. As the dollar amount of credit offered by all financial institutions in a country increases, the illiquidity and volatility of ADR's based out of that country decrease. Thus, firms seeking to have more stable and more liquid cross-listed securities on U.S. exchanges can look at the level of financial development in their home country.

4. CONCLUSION

In this study, we look at the effects that the financial development in a particular home country has on the volatility and liquidity of ADR's, cross-listed on American exchanges. From the results, we find that, in the home country, variables such as total trading volume, trading volume conditioned on GDP and turnover, as well as other macroeconomic variables, such as the amount of bank and financial institution loans, have statistically significant effects on various measures of volatility and illiquidity in cross-listed ADR's, after controlling for stock-specific characteristics and other macroeconomic conditions.

The results of this study have important implications for individual investors interested in diversifying their portfolio by holding international stocks, for firms seeking to maximize shareholder value by decreasing volatility and illiquidity in their own stock, and finally, for those interested in the effects that financial development has on the economy as a whole.

Individual investors can benefit from these findings by including in their analysis, their projection of the exogenous variables at hand, and thereby, anticipate volatility and liquidity in potential holdings. Firms may benefit from these findings by observing conditions in their home country, and thereby, lower their cost of capital by seeking exposure to American based investors through depositary receipts. This study does not go in depth about how financial development effects the macro-economy, but it adds to previous literature on this topic, and shows that financial development does improve liquidity and reduce risk for investors. Perhaps these findings can direct further research in this field.

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Table 1

	No. of ADR Yearly Obs.	*%SPRD*	*$SPRD*	*ILLIQ*	*VOLT*	*GARCH(1,1)*
	[1]	[2]	[3]	[4]	[5]	[6]
Argentina	116	0.0251	0.1924	3.3209	0.0368	0.0366
Australia	109	0.0174	0.1974	1.7823	0.0328	0.0330
Austria	7	0.0118	0.3045	0.8989	0.0182	0.0185
Belgium	12	0.0035	0.1904	0.0679	0.0206	0.0206
Brazil	98	0.0161	0.3368	0.5069	0.0289	0.0278
Chile	185	0.0115	0.3154	0.5069	0.0214	0.0213
China	300	0.0115	0.08658	0.2395	0.0335	0.0341
Denmark	30	0.0212	0.2321	1.4414	0.0364	0.0370
Finland	35	0.0045	0.0781	0.1164	0.0230	0.0230
France	222	0.0125	0.1444	0.9904	0.0314	0.0314
Germany	159	0.0111	0.1961	2.6787	0.0256	0.0253
Greece	34	0.0112	0.0861	0.2431	0.0290	0.0289
HongKong	81	0.0112	0.1055	2.5479	0.0463	0.0469
Hungary	10	0.0054	0.1060	0.0960	0.0229	0.0223
India	123	0.0068	0.0657	0.0627	0.0380	0.0375
Indonesia	24	0.0059	0.0950	0.1176	0.0259	0.0255
Ireland	118	0.0105	0.0939	0.4737	0.0383	0.0388
Israel	50	0.0144	0.1494	2.7891	0.0263	0.0258
Italy	88	0.0093	0.2612	0.6837	0.0216	0.0213
Japan	294	0.0109	0.3151	1.3764	0.0257	0.0253
Luxemberg	26	0.0081	0.1012	0.1730	0.0282	0.0284
Mexico	190	0.0149	0.1552	0.7316	0.0276	0.0274
Netherlands	152	0.0082	0.1065	0.5965	0.0258	0.0256
NewZealand	10	0.0038	0.0698	0.0165	0.0190	0.0187
Norway	21	0.0105	0.2026	0.8437	0.0206	0.0215
Peru	12	0.0029	0.0725	0.0060	0.0282	0.0276
Phillipines	20	0.0393	0.0954	2.2322	0.0467	0.0469
Portugal	19	0.0056	0.0864	0.1256	0.0181	0.0181
Russia	53	0.0036	0.0940	0.0183	0.0342	0.0329
Singapore	16	0.0085	0.0679	0.3382	0.0355	0.0347
South Africa	92	0.0045	0.1204	0.2981	0.0307	0.0302
South Korea	100	0.0180	0.1270	2.4136	0.0329	0.0319
Spain	50	0.0045	0.0760	0.0057	0.0205	0.0199
Sweden	19	0.0023	0.0414	0.0141	0.0275	0.0273
Switzerland	84	0.0045	0.0909	0.0697	0.0214	0.0215
United Kingdom	460	0.0074	0.1397	0.6023	0.0249	0.0247
Venezuela	6	0.0062	0.1019	0.0094	0.0240	0.0243

Table 2

	No. of ADR Yearly Obs.	*TRADE VOL*	*TRADE/GDP*	*TRADE TURN*	*BANKLOANS*	*FINLOANS*
	[1]	[2]	[3]	[4]	[5]	[6]
Argentina	116	5969592292	2.3775	9.5628	11.9823	32.4198
Australia	109	722172073394	93.2603	84.1590	109.0640	123.0068
Austria	7	42086422985	12.6165	36.8006	90.7647	121.9602
Belgium	12	117210680740	26.9565	44.1172	61.3851	109.4054
Brazil	98	458165617653	27.6610	52.4804	41.3005	85.2140
Chile	185	28062017186	16.1972	15.5736	66.1345	91.6511
China	300	4.297883e+12	91.8491	136.0876	117.5231	137.0511
Denmark	30	117210680740	47.5144	78.4382	167.1854	197.6330
Finland	35	252422501528	125.0053	121.1971	69.3143	96.5419
France	222	1.761663e+12	78.5390	100.3506	83.0140	118.5184
Germany	159	1.840063e+12	63.0963	141.6534	102.4530	135.3405
Greece	34	56290291042	21.8477	48.2554	79.2540	113.2507
HongKong	81	586098888889	285.8779	67.5585	147.9374	142.6990
Hungary	10	21786816210	18.3315	77.2556	47.0152	66.4978
India	123	656928804878	58.8873	106.0844	41.6824	63.4455
Indonesia	24	71288595879	14.1432	49.3403	24.1912	43.2808
Ireland	118	46125587801	22.6236	45.1624	121.0978	173.4840
Israel	50	69247782326	44.0296	61.3485	85.2580	77.9892
Italy	88	923324375000	50.6474	137.8624	74.1201	116.6737
Japan	294	4.059932e+12	86.5231	110.0365	102.4730	313.7811
Luxemberg	26	370631608	0.9904	0.6919	80.2929	144.1353
Mexico	190	74850695741	7.6185	27.5715	16.1341	36.7231
Netherlands	152	875469065789	131.9941	144.7453	114.4487	172.2519
NewZealand	10	16819284449	15.3480	44.7392	124.2894	130.6291
Norway	21	154210501247	53.3717	106.2438	76.9679	79.9260
Peru	12	3299108880	3.0324	6.7401	22.7466	19.3675
Phillipines	20	13296290097	8.6575	17.9036	31.5495	51.1150
Portugal	19	49947762539	24.2978	62.6192	132.9516	157.5628
Russia	53	478332883774	37.0739	67.1252	33.4667	28.9812
Singapore	16	154838072758	107.7653	63.7553	97.3117	73.4219
South Africa	92	266081070870	94.2185	50.8897	68.9796	176.1429
South Korea	100	1.273088e+12	136.1234	214.7924	126.6065	140.0857
Spain	50	1.553977e+12	131.4698	163.3773	138.2432	174.3075
Sweden	19	471894263158	116.5927	118.7431	104.5735	123.7269
Switzerland	84	909627309524	208.8153	98.0541	150.6652	163.9181
United Kingdom	460	4.042283e+12	165.3351	137.5651	159.9073	166.5323
Venezuela	6	335946667	0.2580	5.8326	12.0472	13.8727

Table 3
Panel Regression Analysis –

	Ln(%SPRD)	*Ln($SPRD)*	*Ln(ILLIQ)*	*Ln(VOLT)*	*Ln(GARCH)*
	[1]	[2]	[3]	[4]	[5]
Ln(TRADEVOL)	-0.0197	-0.0133	-0.0207	-0.0007	-0.0016
	(-3.75)	(-2.48)	(-2.84)	(-0.19)	(-0.53)
Ln(GDP)	-0.0205	-0.0070	-0.0053	-0.0628	-0.0647
	(-2.14)	(-0.71)	(-0.39)	(-10.22)	(-12.04)
Ln(CONS)	-0.1668	-0.1506	-0.0881	0.0436	0.0382
	(-3.79)	(-3.35)	(-1.39)	(1.54)	(1.57)
Ln(UNEMPL)	0.0533	0.0488	0.0420	-0.0142	-0.0256
	(2.63)	(2.25)	(1.46)	(-1.09)	(-2.27)
Ln(PRICE)	-0.1616	0.7624	0.7498	-0.2026	-0.1949
	(-13.5)	(61.2)	(43.48)	(-29.47)	(-31.88)
Ln(MKT CAP)	-0.3578	-0.3531	-1.1511	-0.0209	-0.0235
	(-56.01)	(-53.75)	(-144.93)	(-6.47)	(-8.06)
Ln(TURN)	-0.2816	-0.2728	-0.8908	0.0906	0.0797
	(-28)	(-26.73)	(-47.01)	(14.49)	(14.69)
NYSE	-0.2365	-0.1941	-0.3652	-0.2147	-0.2300
	(-10.43)	(-8.38)	(-10.87)	(-14.37)	(-17.64)
CONSTANT	0.5538	0.2739	11.2902	-2.5260	-2.3071
	(3.22)	(1.58)	(52.96)	(-25.10)	(-26.56)
Adj. R^2	0.8492	0.7716	0.9270	0.5977	0.6160
Year Fixed Ef	Yes	Yes	Yes	Yes	Yes
Robust SEs	Yes	Yes	Yes	Yes	Yes

Table 4
Panel Regression Analysis –

	Ln(%SPRD)	*Ln($SPRD)*	*Ln(ILLIQ)*	*Ln(VOLT)*	*Ln(GARCH)*
	[1]	[2]	[3]	[4]	[5]
Ln(TRADE/GDP)	-0.0481	-0.0447	-0.0444	-0.0075	-0.0070
	(-5.56)	(-4.98)	(-3.65)	(-1.27)	(-1.39)
Ln(GDP)	-0.0116	0.0008	0.0031	-0.0616	-0.0635
	(-1.23)	(0.09)	(0.23)	(-9.88)	(-11.73)
Ln(CONS)	-0.1714	-0.1379	-0.1010	0.0510	0.0419
	(-4.09)	(-3.23)	(-1.62)	(1.86)	(1.77)
Ln(UNEMPL)	0.0546	0.0424	0.0471	-0.0176	-0.0273
	(2.79)	(2.03)	(1.72)	(-1.43)	(-2.55)
Ln(PRICE)	-0.1632	0.7619	0.7478	-0.2024	-0.1949
	(-13.73)	(61.46)	(43.68)	(-29.62)	(-31.96)
Ln(MKT CAP)	-0.3570	-0.3527	-1.1503	-0.0209	-0.0235
	(-55.93)	(-53.74)	(-144.93)	(-6.48)	(-8.04)
Ln(TURN)	-0.2779	-0.2685	-0.8879	0.0916	0.0805
	(-27.67)	(-26.31)	(-46.47)	(14.62)	(14.74)
NYSE	-0.2420	-0.1994	-0.3701	-0.2157	-0.2308
	(-10.71)	(-8.65)	(-11.05)	(-14.41)	(-17.66)
CONSTANT	0.1136	-0.0298	10.8297	-2.5443	-2.3444
	(0.88)	(-0.23)	(68.70)	(-33.71)	(-35.93)
Adj. R^2	0.8499	0.7727	0.9271	0.5979	0.6162
Year Fixed Ef	Yes	Yes	Yes	Yes	Yes
Robust SEs	Yes	Yes	Yes	Yes	Yes

Table 5
Panel Regression Analysis –

	Ln(%SPRD)	*Ln($SPRD)*	*Ln(ILLIQ)*	*Ln(VOLT)*	*Ln(GARCH)*
	[1]	[2]	[3]	[4]	[5]
Ln(TRADETURN)	-0.0434	-0.0381	-0.0787	-0.0042	-0.0052
	(-3.73)	(-3.13)	(-5.15)	(-0.49)	(-0.77)
Ln(GDP)	-0.0232	-0.0097	-0.0114	-0.0631	-0.0651
	(-2.38)	(-.97)	(-0.84)	(-10.25)	(-12.04)
Ln(CONS)	-0.1545	-0.1263	-0.0152	0.0489	0.0423
	(-3.37)	(-2.69)	(-0.23)	(1.66)	(1.69)
Ln(UNEMPL)	0.0510	0.0407	-0.0151	-0.0162	-0.0271
	(2.45)	(1.85)	(0.53)	(-1.26)	(-2.46)
Ln(PRICE)	-0.1643	0.7608	0.7478	-0.2027	-0.1951
	(-13.80)	(61.20)	(43.74)	(-29.72)	(-32.05)
Ln(MKT CAP)	-0.3569	-0.3526	-1.1504	-0.0209	-0.0235
	(-55.93)	(-53.71)	(-145.32)	(-6.47)	(-8.04)
Ln(TURN)	-0.2827	-0.2731	-0.8903	0.0907	0.0797
	(-28.19)	(-26.86)	(-47.09)	(14.60)	(14.78)
NYSE	-0.2356	-0.1935	-0.3646	-0.2146	-0.2299
	(-10.42)	(-8.38)	(-10.86)	(-14.35)	(-17.62)
CONSTANT	0.1907	0.0391	10.9478	-2.5354	-2.3345
	(1.46)	(0.30)	(69.73)	(-33.91)	(-35.92)
Adj. R^2	0.8492	0.7718	0.9274	0.5978	0.6161
Year Fixed Ef	Yes	Yes	Yes	Yes	Yes
Robust SEs	Yes	Yes	Yes	Yes	Yes

Table 6
Panel Regression Analysis –

	Ln(%SPRD)	*Ln($SPRD)*	*Ln(ILLIQ)*	*Ln(VOLT)*	*Ln(GARCH)*
	[1]	[2]	[3]	[4]	[5]
Ln(BANKLOANS)	-0.1458	-0.1348	-0.0973	-0.0446	-0.0354
	(-8.95)	(-7.95)	(-4.29)	(-4.26)	(-3.86)
Ln(GDP)	0.0099	0.0207	0.0157	-0.0540	-0.0576
	(1.02)	(2.08)	(1.08)	(-8.37)	(-10.11)
Ln(CONS)	-0.1396	-0.1089	-0.0958	0.0700	0.0556
	(-3.38)	(-2.57)	(-1.55)	(2.56)	(2.38)
Ln(UNEMPL)	0.0474	0.0359	0.0496	-0.0241	-0.0319
	(2.45)	(1.75)	(1.80)	(-1.95)	(-2.96)
Ln(PRICE)	-0.1611	0.7637	0.7486	-0.2015	-0.1942
	(-13.67)	(61.88)	(43.83)	(-29.52)	(-31.81)
Ln(MKT CAP)	-0.3590	-0.3546	-1.1516	-0.0216	-0.0240
	(-56.67)	(-54.41)	(-144.62)	(-6.69)	(-8.24)
Ln(TURN)	-0.2714	-0.2626	-0.8854	0.0946	0.0828
	(-26.72)	(-25.57)	(-45.88)	(15.07)	(15.12)
NYSE	-0.2502	-0.2070	-0.3739	-0.2192	-0.2335
	(-11.10)	(-8.99)	(-11.14)	(-14.63)	(-17.74)
CONSTANT	0.3239	0.1646	10.9762	-2.4836	-2.2958
	(2.52)	(1.26)	(70.70)	(-33.16)	(-35.48)
Adj. R^2	0.8519	0.7751	0.9272	0.5998	0.6176
Year Fixed Ef	Yes	Yes	Yes	Yes	Yes
Robust SEs	Yes	Yes	Yes	Yes	Yes

Table 7
Panel Regression Analysis –

	Ln(%SPRD)	*Ln($SPRD)*	*Ln(ILLIQ)*	*Ln(VOLT)*	*Ln(GARCH)*
	[1]	[2]	[3]	[4]	[5]
Ln(FINLOANS)	-0.1179	-0.1144	-0.1015	-0.0307	-0.0267
	(-6.44)	(-5.77)	(-3.89)	(-2.55)	(-2.49)
Ln(GDP)	0.0015	0.0139	0.0140	-0.0574	-0.0600
	(0.15)	(1.36)	(0.95)	(-8.92)	(-10.59)
Ln(CONS)	-0.1654	-0.1296	-0.0998	0.0591	0.0482
	(-4.03)	(-3.07)	(-1.64)	(2.14)	(2.03)
Ln(UNEMPL)	0.0689	0.0550	0.0611	-0.0169	-0.0264
	(3.60)	(2.73)	(2.27)	(-1.36)	(-2.44)
Ln(PRICE)	-0.1603	0.7647	0.7501	-0.2015	-0.1941
	(-13.50)	(61.72)	(44.06)	(-29.42)	(-31.71)
Ln(MKT CAP)	-0.3594	-0.3551	-1.1524	-0.0216	-0.0241
	(-56.65)	(-54.55)	(-146.19)	(-6.65)	(-8.21)
Ln(TURN)	-0.2781	-0.2684	-0.8885	0.0923	0.0810
	(-27.52)	(-26.26)	(-46.64)	(14.72)	(14.84)
NYSE	-0.2438	-0.2015	-0.3712	-0.2168	-0.2318
	(-10.71)	(-8.68)	(-11.02)	(-14.48)	(-17.67)
CONSTANT	0.3776	0.2253	11.0584	-2.4780	-2.2870
	(2.86)	(1.69)	(70.06)	(-32.19)	(-34.65)
Adj. R^2	0.8502	0.7734	0.9272	0.5985	0.6167
Year Fixed Ef	Yes	Yes	Yes	Yes	Yes
Robust SEs	Yes	Yes	Yes	Yes	Yes

NOTE:
%SPRD = spread
$SPRD = dolspread
ILLIIQ = illiq1
VOLT = volt
GARCH = garchvolt
TRADEVOL = trading
TRADEGDP = tradingGDP
TRADETURN = tradingTURN
BANKLOANS = CreditbyBanks
FINLOANS = CreditbyFinance