

# Are Financial Markets Stable? New Evidence from An Improved Test of Financial Market Stability and the U.S. Subprime Crisis

Sandy Suardi (*La Trobe University*)

Annual Finsia and Melbourne Centre for Financial Studies Banking and Finance Conference (28-29 August, 2009)

- The recent U.S. subprime crisis which leads to the global financial crisis has highlighted the importance of financial stability
  - portfolio of securities from a stable market has diversifiable risks that are constant in extreme market conditions
  - the feedback loop between financial system and real sector of the economy
- The definition of financial market stability lacks consensus
  - Baur and Schulze (2009) narrowly defines it for an equity market as one where market returns do not respond differently to systematic (or system-wide) shocks during normal and extreme market conditions

# Definitions of Financial Market Stability

- Barry Eichengreen (2002) book "Financial crises and what to do about them" does not think a definition exists.
- Financial stability requires banking system stability.
- Andrew Crockett of BIS distinguishes 2 types of financial instability: institution versus market
- Institution instability is associated with banking instability. The notion that bank failures like buses come in convoys and they have significant and immediate adverse effects on the real economy. E.g. A credit "crunch"
- For market instability the link is between volatility in asset prices and the flow on effect to the real economy.

- Refinements to their methodology in terms of the construction of systematic shocks and robustness of the test.
- Extension of Baur and Schulze (2009) work to consider the subprime crisis.
  - Are the developed economy stock markets truly as stable as they are known to be? Can they deflect the crisis?
  - How are emerging stock markets affected by the crisis?
  - Are Asian equity markets weathering the storm better than in Latin America?
  - Have the Asian economies suffered another round of blow to their equity market stability following the Asian financial crisis?

## Baur and Schulze (2009) Testable Definition

- Financial market stability is the constant (or stable) propagation of *systematic* shocks on a financial market in normal and extreme market conditions.
  - The focus is on system wide shocks NOT idiosyncratic shocks unlike the contagion literature
  - Consistent with definition laid out by the IMF (2003) on financial market instability as one where "shocks to the financial system are *amplified* and *propagated* across markets or across institutions"
  - Synonymous with definition of financial stability given by the ECB (Padoa-Schioppa, 2003): "A condition whereby the financial system is able to *withstand* shocks without giving way to *cumulative processes*, which impair the allocation of savings ... in the economy"

# Financial Market Stability Test

- Use a quantile regression framework without a need for a priori definition of normal and extreme market conditions.

$$r_{it} = a_i + b_i f_t^* + v_{it}$$

$$Q_r(\tau | f_t^*) = a_i(\tau) + b_i(\tau) f_t^*$$

- $i$  = market,  $f_t^*$  = systematic shocks,  $v_{it}$  = idiosyncratic market shocks. No specification for the distribution of  $v_{it}$  is needed.
- $Q_r(\tau | f_t^*) = \tau - th$  conditional quantile of  $r_{it}$  which is assumed to be linearly dependent on  $f_t^*$ .
- $f_t^*$  is constructed from a regional or global stock market index to capture systematic risk component or shocks that affect the financial system widely
- $f_t^*$  comprises residuals from an AR(3) regression.

## Financial Market Stability Test (Cont'd)

- The  $\tau$ -th conditional quantile ( $0 < \tau < 1$ ) of  $r_{it}$  is the solution to

$$\min_{\beta} \frac{1}{n} \left\{ \sum_{r_{it} \geq x'_t \beta} \tau |r_{it} - x'_t \beta(\tau)| + \sum_{r_{it} < x'_t \beta} (1 - \tau) |r_{it} - x'_t \beta(\tau)| \right\}$$

- where  $x'_t = (1 \quad f_t^*)$  and  $\beta' = (a_i(\tau) \quad b_i(\tau))$ .
- Variation in  $\tau$  traces the entire distribution of market returns and the effect of systematic shocks on market returns at any given percentile (or quantile).
- A market satisfies the condition of financial market stability if  $b_i(\tau)$  is stable or more or less constant over  $\tau$ .
- If  $b_i(\tau)$  is higher for lower quantiles ( $\tau = 0.01, 0.02, 0.05$ ) than it is for the 50-th quantile, market is more susceptible to shocks from financial system in bear market condition than in normal state.

## Financial Market Stability Test (Cont'd)

- Perform individual as well as joint Wald test for  $b_i(\tau) = b_i(0.5)$  for  $\tau = 0.01, 0.02, 0.05$ .
  - Koenker and Bassett (1982) provide the variance-covariance matrix for homoskedastic case
  - Tends to underestimate standard errors in the presence of heteroskedasticity (Gould, 1992).
  - Perform bootstrap resampling with replacement where pairs  $(r_{it}, f_{it}^*)$  for  $t = 1, \dots, T$  are drawn at random from original sample.
  - For each of these samples drawn,  $\beta(\tau)$  is re-computed. Repeating this N times gives a sample of N parameter vectors whose sample covariance matrix constitutes a valid estimator of the covariance matrix of the original estimator. Choose N=200.

## A Summary of Baur and Schulze (2009) Findings

- Sample April 1997 to July 2007 (focus primarily on the Asian financial crisis).
  - Larger coefficient observed in the extreme conditional lower and higher quantiles than in the middle for most Asian countries.
  - No U-shaped pattern in the  $b_i(\tau)$  locus for developed markets (G7 countries) implying stability.

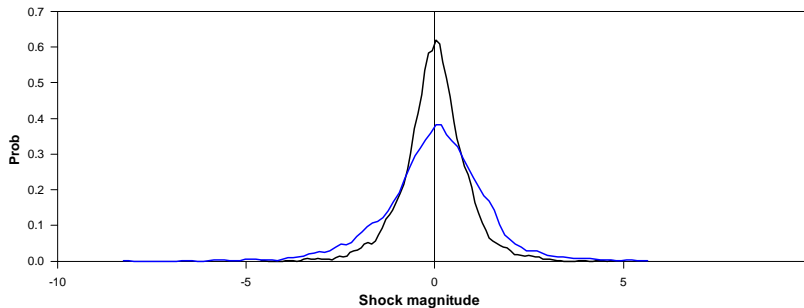
# Construction of system-wide shocks matters

- The MSCI World index is dominated by the U.S. equity index (close to 50%) because of its large market capitalisation.
- Although shocks arising from market turmoils may have impacted the other constituent indices of the MSCI World index, the magnitude of these shocks may be masked by the large U.S. index.
- Moreover, if these shocks have little effects on the U.S. stock index, the inclusion of the dominant U.S. index would further mask the presence of large negative shocks.
- $b_i(\tau)$  estimates could be biased upward or downward and the financial stability test could be erroneous for the case of MSCI World index.
- Baur and Schulze (2009) report estimates of  $b_i(\tau)$  but not the Wald test statistics.

# Construction of system-wide shocks matters

- Adjusts the MSCI World index by removing the U.S. Index and re-weighting the World index according to the constituents market cap.
- The weight varies over time and they are obtained from Morgan Stanley Capital International Inc.
- My intuition is supported by the plot of the system-wide shock distribution (Fig. 2)
  - Removing the U.S. index gives rise to a sample with more and larger negative shock (i.e. more negatively skewed).
  - These shocks have bearings on their impact on returns, i.e.  $\hat{b}_i(\tau)$ .and the joint test

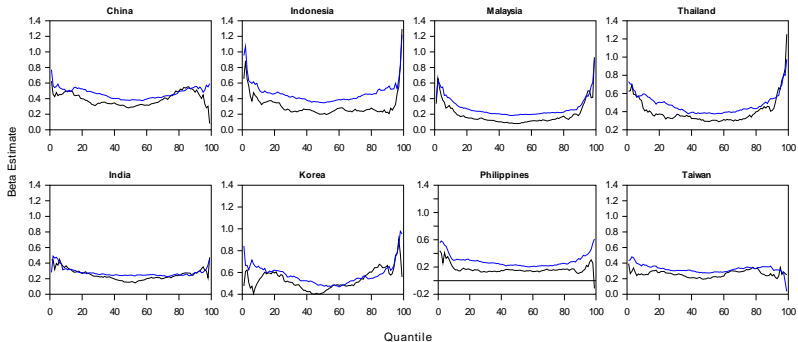
## Fig 2. Plot of system-wide shock distribution



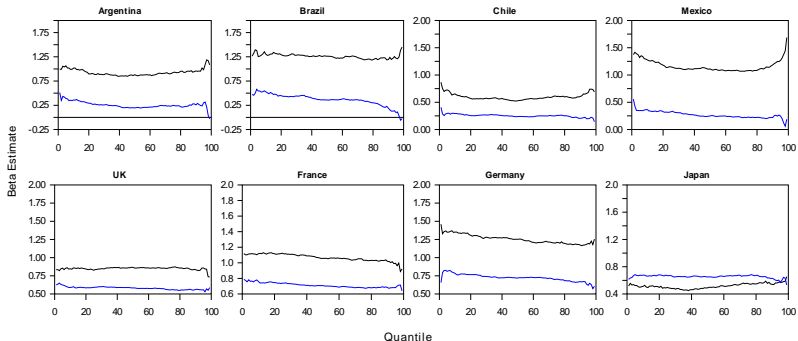
# Construction of system-wide shocks matters

- Fig. 1 and 3 show the locus of  $\hat{b}_i(\tau)$  for Asia, Latin America and developed markets.
  - Failing to adjust the World index  $\hat{b}_i(\tau)$  is under estimated in Asia markets (see Fig. 1)
  - For Latin America and the developed markets  $\hat{b}_i(\tau)$  is over estimated. (see Fig. 3)
  - Had we not adjusted the MSCI World index, the test results would be incongruent to BS findings based on regional indices. But after the adjustment, the results for the MSCI World index are consistent with the regional indices. (See Table 1)
  - Wald test statistic for joint test generally increases quite sharply in Asia markets (marked in bold).

Fig. 1 Plots of bhat for Asian markets



# Fig. 3 Plots of bhat for Latin America and developed markets



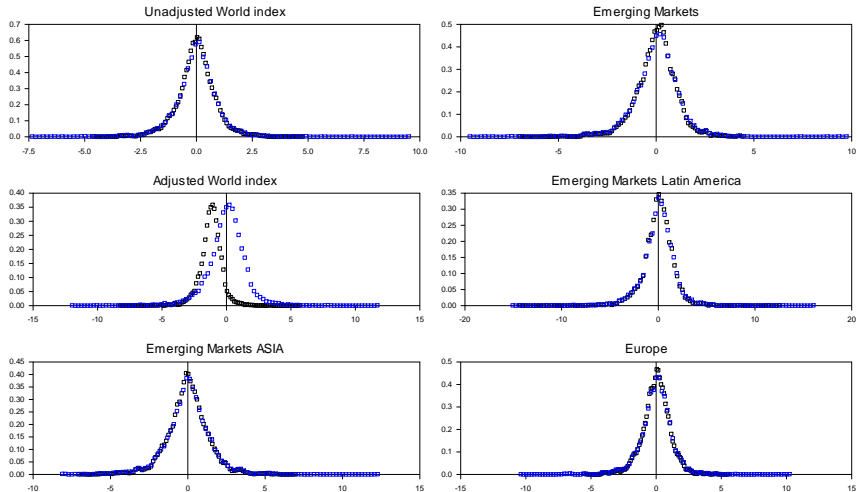
# Table 1 Comparison between the original and adjusted World index

<i>Emerging Markets</i>	Systematic shocks from the <i>unadjusted</i> MSCI World index				Stable?	Systematic shocks from the <i>adjusted</i> MSCI World index				Stable?
<i>Asia</i>	b1=b.50	b2=b.50	b.5=b.50	b1=b.2=b.5=b.50		b1=b.50	b2=b.50	b.5=b.50	b1=b.2=b.5=b.50	
China	1.55 [0.21]	1.18 [0.28]	1.56 [0.21]	0.72 [0.54]	Yes	4.36 [0.04]	3.45 [0.06]	5.71 [0.02]	<b>2.60 [0.05]</b>	Yes
Hong Kong	3.14 [0.08]	0.93 [0.34]	7.20 [0.01]	3.58 [0.01]	No	17.05 [0.00]	6.05 [0.01]	7.86 [0.00]	<b>6.63 [0.00]</b>	No
India	2.33 [0.13]	3.30 [0.07]	3.95 [0.05]	1.65 [0.18]	Yes	0.08 [0.78]	7.50 [0.00]	6.79 [0.00]	<b>5.53 [0.00]</b>	No
Indonesia	0.30 [0.58]	3.96 [0.05]	1.69 [0.19]	1.66 [0.18]	Yes	1.86 [0.17]	12.60 [0.01]	9.67 [0.00]	<b>5.28 [0.00]</b>	No
Korea	0.02 [0.89]	0.61 [0.44]	0.08 [0.78]	0.30 [0.82]	Yes	1.51 [0.22]	0.84 [0.36]	4.78 [0.03]	<b>1.94 [0.12]</b>	Yes
Malaysia	0.25 [0.62]	3.08 [0.08]	4.79 [0.03]	1.98 [0.11]	Yes	1.07 [0.30]	22.53 [0.00]	11.79 [0.00]	<b>9.22 [0.00]</b>	No
Philippines	1.31 [0.25]	1.65 [0.19]	3.88 [0.05]	1.35 [0.26]	Yes	2.82 [0.09]	7.43 [0.00]	12.35 [0.00]	<b>4.37 [0.00]</b>	No
Singapore	3.50 [0.06]	1.87 [0.17]	1.94 [0.16]	1.28 [0.28]	Yes	16.77 [0.00]	10.85 [0.00]	3.71 [0.05]	<b>5.80 [0.00]</b>	No
Taiwan	1.10 [0.29]	0.14 [0.71]	0.49 [0.48]	0.59 [0.62]	Yes	2.03 [0.15]	1.62 [0.20]	1.17 [0.28]	<b>1.51 [0.21]</b>	Yes
Thailand	0.94 [0.33]	1.74 [0.19]	7.32 [0.01]	2.51 [0.06]	Yes	3.10 [0.08]	8.49 [0.00]	8.64 [0.00]	<b>5.64 [0.00]</b>	No
<i>Latin America</i>										
<i>Argentina</i>	0.22 [0.64]	0.41 [0.52]	2.54 [0.11]	0.93 [0.43]	Yes	3.37 [0.07]	1.52 [0.22]	4.85 [0.03]	<b>2.17 [0.09]</b>	Yes
Brazil	0.00 [0.98]	0.07 [0.79]	0.00 [0.96]	0.08 [0.97]	Yes	0.34 [0.56]	0.28 [0.59]	8.56 [0.00]	<b>3.69 [0.01]</b>	No
Chile	7.12 [0.01]	5.09 [0.02]	19.34 [0.00]	7.24 [0.00]	No	2.96 [0.09]	0.43 [0.51]	3.06 [0.08]	2.18 [0.09]	Yes
Mexico	2.27 [0.13]	7.33 [0.01]	6.64 [0.01]	2.89 [0.03]	Yes	4.09 [0.04]	2.44 [0.12]	2.68 [0.10]	1.56 [0.19]	Yes
<i>Others</i>										
Russia	15.43 [0.00]	30.21 [0.00]	41.04 [0.00]	14.45 [0.00]	No	25.82 [0.00]	38.00 [0.00]	10.80 [0.00]	13.43 [0.00]	No
South Africa	5.65 [0.02]	6.86 [0.01]	15.32 [0.00]	5.34 [0.00]	No	25.59 [0.00]	46.77 [0.01]	28.53 [0.00]	<b>15.90 [0.00]</b>	No
<i>Developed Markets</i>										
Germany	2.56 [0.11]	0.98 [0.32]	0.25 [0.12]	1.26 [0.29]	Yes	0.30 [0.58]	1.06 [0.30]	5.50 [0.02]	<b>2.12 [0.09]</b>	Yes
France	0.13 [0.72]	0.33 [0.57]	2.05 [0.15]	0.77 [0.51]	Yes	0.99 [0.32]	3.11 [0.08]	2.54 [0.11]	<b>1.17 [0.32]</b>	Yes
Japan	0.06 [0.80]	0.54 [0.46]	0.36 [0.55]	0.25 [0.86]	Yes	0.14 [0.71]	0.08 [0.78]	0.50 [0.48]	<b>0.59 [0.62]</b>	Yes
US	0.88 [0.35]	2.23 [0.14]	2.38 [0.12]	0.97 [0.41]	Yes	4.22 [0.04]	1.74 [0.19]	1.85 [0.17]	<b>1.48 [0.22]</b>	Yes
UK	0.04 [0.84]	0.09 [0.77]	0.05 [0.83]	0.03 [0.99]	Yes	0.66 [0.42]	3.09 [0.08]	2.74 [0.10]	<b>1.38 [0.25]</b>	Yes

# Impact of subprime crisis

- To assess the impact of the recent subprime crisis on equity market stability we compare the results of two samples - (BS original sample) 1/4/97 - 1/7/2007 vs. (our sample) 1/4/1997-5/12/2008.
- System wide shock distributions for our sample exhibit greater kurtosis and more negatively skewed thus reflecting the severity of the subprime crisis compared with Asian crisis (Fig. 4 and Table 2)

# Fig. 4 Distribution of systematic shocks

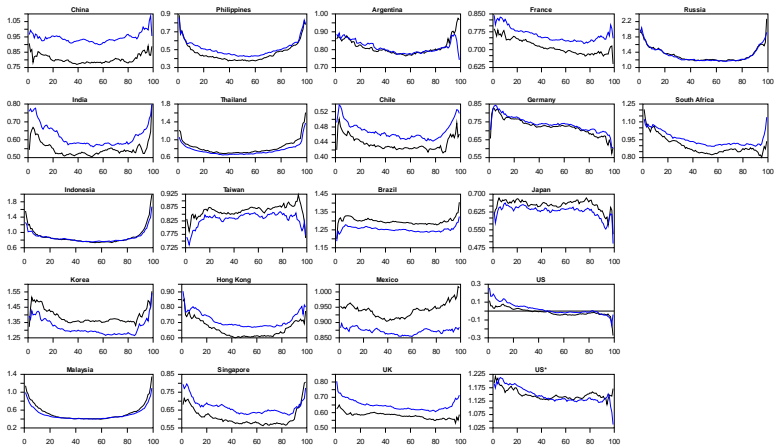


# Table 2. Descriptive statistics of systematic shocks

Sample period 1 April 1997 – 1 July 2007						
	World Index	Adjusted World Index	Emerging Markets Asia	Emerging Markets	Emerging Markets Latin America	Europe
Variance	0.74	1.81	1.81	1.10	2.54	1.22
Skewness	-0.08 [0.10]	-0.38 [0.00]	-0.13 [0.00]	-0.47 [0.00]	-0.38 [0.00]	-0.23 [0.00]
Kurtosis	2.32 [0.00]	2.30 [0.00]	2.43 [0.00]	2.81 [0.00]	7.81 [0.00]	2.14 [0.00]
Maximum	4.75	5.64	6.96	4.40	12.49	5.49
(Date)	(2002:10:15)	(2001:12:03)	(2000:04:17)	(1998:06:17)	(1998:09:15)	(2002:10:15)
Minimum	-4.59	-8.24	-7.05	-6.98	-14.28	-5.52
(Date)	(1997:10:27)	(1998:10:07)	(1998:09:07)	(1997:10:27)	(1997:10:27)	(2001:09:11)
Sample period 1 April 1997 – 5 December 2008						
Variance	1.02	2.24	2.26	1.55	3.52	1.69
Skewness	-0.29 [0.00]	-0.55 [0.00]	-0.13 [0.00]	-0.54 [0.00]	-0.46 [0.00]	-0.37 [0.00]
Kurtosis	8.77 [0.00]	6.41 [0.00]	4.61 [0.00]	8.57 [0.00]	10.83 [0.00]	8.65 [0.00]
Maximum	9.50	11.70	12.27	9.73	16.04	10.23
(Date)	(2008:10:13)	(2008:10:29)	(2008:10:30)	(2008:09:19)	(2008:10:13)	(2008:11:24)
Minimum	-7.37	-11.98	-8.12	-9.54	-15.07	-10.38
(Date)	(2008:12:01)	(2008:10:10)	(2008:11:06)	(2008:10:06)	(2008:10:15)	(2008:10:06)

- What is the impact of the subprime crisis on the stability of equity markets?
  - System wide shocks elicit a greater response on market returns over all quantiles (e.g. China, India and Singapore)
  - Effects of shocks are bigger during market turmoils (e.g. Singapore and the U.K. for  $b(1) = b(50)$  in Table 3).
  - Some of the worst hit economies during the Asian crisis (e.g. Indonesia, Malaysia, Thailand and Korea) do not appear to suffer from greater instability in their equity markets. These results are robust to the choice of index for constructing system wide shocks.
  - Overwhelming evidence of equity market instability in developed economies with the exception of Japan.
  - Knock-on effects on the U.K. market is very severe (consider the Wald test for  $b_1=b_{50}$ ) a drop from 0.42 significance level to 0.00.
  - Again, important to use the adjusted World index. Contrast in results between US\* (based on unadjusted World index) and US (with adjustment made).

# Fig 5. Effects of subprime crisis on world wide market returns



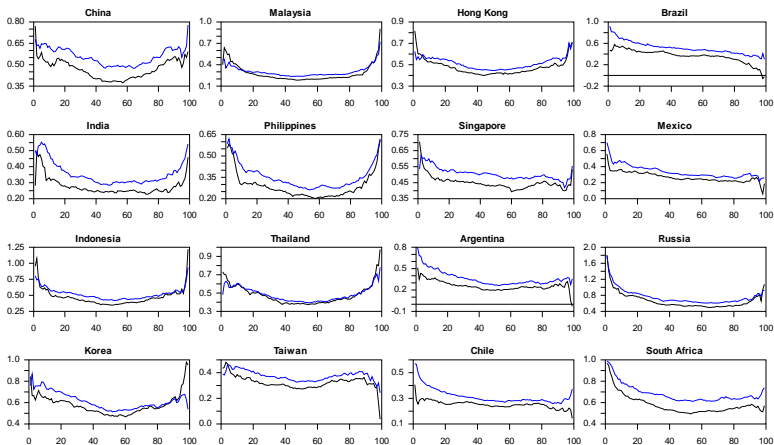
# Table 3 Wald test results for stability tests with regional index

<i>Emerging Markets</i>	Baur and Schulze (2008) Sample: 1/4/1997 – 1/7/2007				Stable?	Sample with subprime crisis: 1/4/1997 – 5/1/2008				Stable?
	b1=b50	b2=b50	b5=b50	b1=b2=b5=b50		b1=b50	b2=b50	b5=b50	b1=b2=b5=b50	
<i>Asia (EM Asia)</i>										
China	0.69 [0.41]	0.32 [0.57]	0.36 [0.55]	0.25 [0.86]	Yes	0.13 [0.72]	0.60 [0.44]	0.15 [0.70]	0.22 [0.88]	Yes
Hong Kong	1.99 [0.16]	5.26 [0.02]	8.16 [0.00]	2.83 [0.04]	No	2.56 [0.11]	4.16 [0.04]	9.43 [0.00]	<b>3.16 [0.02]</b>	No
India	0.05 [0.82]	1.92 [0.17]	7.92 [0.00]	3.02 [0.03]	No	1.48 [0.22]	4.84 [0.03]	15.77 [0.00]	<b>5.64 [0.00]</b>	No
Indonesia	6.85 [0.01]	13.88 [0.00]	8.77 [0.00]	4.74 [0.00]	No	6.97 [0.01]	10.06 [0.00]	15.50 [0.00]	<b>5.61 [0.00]</b>	No
Korea	0.03 [0.86]	0.15 [0.70]	2.69 [0.10]	1.77 [0.15]	Yes	0.39 [0.53]	0.24 [0.63]	3.25 [0.07]	1.64 [0.18]	Yes
Malaysia	48.38 [0.00]	80.28 [0.00]	43.26 [0.00]	26.93 [0.00]	No	34.99 [0.00]	55.94 [0.00]	39.05 [0.00]	19.25 [0.00]	No
Philippines	15.69 [0.00]	18.56 [0.00]	26.26 [0.00]	10.41 [0.00]	No	14.24 [0.00]	13.70 [0.00]	28.16 [0.00]	10.26 [0.00]	No
Singapore	1.72 [0.19]	5.26 [0.02]	4.94 [0.03]	1.99 [0.11]	Yes	4.08 [0.04]	7.43 [0.01]	18.29 [0.00]	<b>6.10 [0.00]</b>	No
Taiwan	0.50 [0.48]	1.08 [0.30]	0.16 [0.69]	0.38 [0.77]	Yes	1.63 [0.20]	4.73 [0.03]	4.77 [0.03]	<b>2.43 [0.08]</b>	Yes
Thailand	13.74 [0.00]	17.55 [0.00]	16.68 [0.00]	7.52 [0.00]	No	9.17 [0.00]	6.66 [0.01]	16.29 [0.00]	6.12 [0.00]	No
<i>Latin America (EM Latin)</i>										
Argentina	0.24 [0.63]	1.58 [0.21]	3.62 [0.06]	1.34 [0.26]	Yes	0.68 [0.41]	0.95 [0.32]	2.98 [0.08]	1.02 [0.38]	Yes
Brazil	1.30 [0.25]	0.03 [0.85]	0.04 [0.84]	0.83 [0.48]	Yes	0.86 [0.35]	0.03 [0.85]	0.00 [0.96]	0.69 [0.56]	Yes
Chile	0.00 [0.96]	1.61 [0.20]	2.33 [0.13]	1.55 [0.20]	Yes	0.53 [0.47]	2.28 [0.13]	3.19 [0.07]	1.17 [0.32]	Yes
Mexico	0.25 [0.62]	0.78 [0.38]	0.92 [0.34]	0.36 [0.78]	Yes	0.14 [0.71]	0.60 [0.44]	0.64 [0.42]	0.27 [0.85]	Yes
<i>Others (EM)</i>										
Russia	4.92 [0.03]	3.69 [0.05]	12.64 [0.00]	4.51 [0.00]	No	7.98 [0.00]	12.71 [0.00]	14.86 [0.00]	<b>5.54 [0.00]</b>	No
South Africa	13.19 [0.00]	5.38 [0.02]	12.80 [0.00]	6.19 [0.00]	No	4.35 [0.03]	3.23 [0.07]	8.02 [0.00]	3.05 [0.03]	No
<i>Developed Markets (Adjusted World Index)</i>										
Germany	0.39 [0.53]	1.42 [0.23]	5.33 [0.02]	3.62 [0.01]	No	0.08 [0.77]	0.34 [0.56]	7.94 [0.00]	<b>4.50 [0.00]</b>	No
France	0.99 [0.32]	3.11 [0.08]	2.54 [0.11]	1.17 [0.32]	Yes	2.46 [0.12]	1.16 [0.28]	6.72 [0.01]	<b>2.70 [0.04]</b>	No
Japan	0.14 [0.71]	0.08 [0.78]	0.30 [0.48]	0.59 [0.62]	Yes	0.01 [0.93]	0.93 [0.33]	0.07 [0.79]	<b>1.17 [0.32]</b>	Yes
US*	0.88 [0.35]	2.23 [0.14]	2.38 [0.12]	0.97 [0.41]	Yes	2.03 [0.15]	1.27 [0.26]	4.17 [0.04]	<b>1.77 [0.15]</b>	Yes
US	4.22 [0.04]	1.74 [0.19]	1.85 [0.17]	1.48 [0.22]	Yes	7.87 [0.01]	7.36 [0.01]	15.51 [0.00]	<b>5.48 [0.00]</b>	No
UK	0.66 [0.42]	3.09 [0.08]	2.74 [0.10]	1.38 [0.25]	Yes	14.74 [0.00]	7.42 [0.00]	9.72 [0.00]	<b>5.62 [0.00]</b>	No

# Impact of the subprime crisis

- Sensitivity analysis using adjusted MSCI World index
- Fig. 6 shows that most of the Latin America markets display greater propagation of shocks during market turmoils (i.e.  $\hat{b}_i(\tau)$  for  $\tau = 0.01, 0.02, 0.05$  are higher than the median quantile) than Asia markets.
- Financial stability test also confirms these findings.

Fig. 6 Results for subprime crisis using adj. world index



# Table 4 Wald test results for stability tests with world index

<i>Emerging Markets</i>	Baur and Schulze (2008) Sample: 1/4/1997 – 1/7/2007				Stable?	Sample with sub prime crisis: 1/4/1997 – 5/12/2008				Stable?
	b1=b.50	b2=b.50	b5=b.50	b1=b.2=b.5=b.50		b1=b.50	b2=b.50	b5=b.50	b1=b.2=b.5=b.50	
China	4.36 [0.04]	3.45 [0.06]	5.71 [0.02]	2.60 [0.05]	Yes	2.68 [0.10]	2.86 [0.09]	4.57 [0.03]	1.61 [0.19]	Yes
Hong Kong	17.05 [0.00]	6.05 [0.01]	7.86 [0.00]	6.63 [0.00]	No	2.75 [0.10]	1.21 [0.27]	5.06 [0.02]	2.66 [0.05]	Yes
India	0.08 [0.78]	7.30 [0.00]	6.79 [0.00]	5.53 [0.00]	No	4.96 [0.03]	3.79 [0.05]	23.58 [0.02]	<b>8.92 [0.00]</b>	No
Indonesia	1.86 [0.17]	12.60 [0.01]	9.67 [0.00]	5.28 [0.00]	No	3.02 [0.08]	4.07 [0.04]	7.72 [0.01]	2.89 [0.03]	No
Korea	1.51 [0.22]	0.84 [0.36]	4.78 [0.03]	1.94 [0.12]	Yes	1.38 [0.24]	4.45 [0.04]	5.78 [0.02]	<b>2.09 [0.10]</b>	Yes
Malaysia	1.07 [0.30]	22.53 [0.00]	11.79 [0.00]	9.22 [0.00]	No	3.01 [0.08]	5.55 [0.02]	5.53 [0.02]	4.90 [0.00]	No
Philippines	2.82 [0.09]	7.43 [0.00]	12.35 [0.00]	4.37 [0.00]	No	3.96 [0.05]	10.32 [0.00]	16.95 [0.00]	<b>6.03 [0.00]</b>	No
Singapore	16.77 [0.00]	10.85 [0.00]	3.71 [0.05]	5.80 [0.00]	No	0.11 [0.74]	4.67 [0.03]	4.92 [0.03]	3.10 [0.03]	No
Taiwan	2.03 [0.15]	3.62 [0.06]	6.17 [0.01]	2.15 [0.09]	Yes	0.90 [0.34]	0.73 [0.39]	6.30 [0.01]	<b>2.89 [0.09]</b>	Yes
Thailand	3.10 [0.08]	8.49 [0.00]	8.64 [0.00]	5.64 [0.00]	No	2.65 [0.05]	6.12 [0.00]	6.16 [0.00]	3.80 [0.01]	No
<i>Latin America</i>										
Argentina	3.37 [0.07]	1.52 [0.22]	4.85 [0.03]	2.17 [0.09]	Yes	13.78 [0.00]	8.14 [0.00]	16.39 [0.00]	<b>6.73 [0.00]</b>	No
Brazil	0.34 [0.56]	0.28 [0.59]	8.56 [0.00]	3.69 [0.01]	No	3.32 [0.07]	3.76 [0.05]	8.98 [0.00]	<b>3.74 [0.01]</b>	No
Chile	2.96 [0.09]	0.43 [0.51]	3.06 [0.08]	2.18 [0.09]	Yes	8.77 [0.00]	23.06 [0.00]	6.99 [0.01]	<b>8.03 [0.00]</b>	No
Mexico	4.09 [0.04]	2.44 [0.12]	2.68 [0.10]	1.56 [0.19]	Yes	13.48 [0.00]	15.30 [0.00]	7.08 [0.01]	<b>5.90 [0.00]</b>	No
<i>Others</i>										
Russia	25.82 [0.00]	38.00 [0.00]	10.80 [0.00]	13.43 [0.00]	No	35.20 [0.00]	38.45 [0.00]	10.32 [0.00]	<b>15.35 [0.00]</b>	No
South Africa	25.59 [0.00]	46.77 [0.01]	28.53 [0.00]	15.90 [0.00]	No	37.23 [0.00]	32.17 [0.00]	31.37 [0.00]	15.52 [0.00]	No

# Conclusion

- Using Baur and Schulze (2009) testable definition of financial market stability I refined their test by controlling for the dominant US index in the world index. The test is used to examine the stability of equity markets following the subprime crisis.
- Evidence of magnification of shock propagation in developed markets during bear market condition, notably in the U.S. and U.K. markets.
- Many of the Asia markets particularly those which were previously badly hit during the Asian crisis were not "affected" by the subprime crisis.
- The impact on Latin American markets are more pronounced than Asia counterparts.
- Possible explanation is that Asian banks and investors have limited exposure to U.S. subprime lending through special conduits, collateralised debt obligations and financial contingent facilities.