

SASIN Graduate Institute of Business Administration of Chulalongkorn University

**Sasin**

## “Int’l Diversification with American Depository Receipts (ADRs)”

by  
**M H Kabir, N Maroney and M K Hassan**

Discussed by  
Pongsak Hoontrakul  
Sasin of Chulalongkorn Univ., Bangkok  
Email: Pongsak@Hoontrakul.com  
For AsFA Conference, KL in July 2005

we are "Chief of the Rabbits"

SASIN Graduate Institute of Business Administration of Chulalongkorn University

**Sasin**

## Disclaimer / Safe Harbor

The view expressed here is solely the author’s personal view, not Sasin, Bank of Asia, UOB Group and/or any institution in which the author may be associated with.

The data, information, fact and opinion presented here are reasonably reliable and accurate at the time of presentation to the best of the author’s knowledge.

The viewers and audience are advised to use their own judgment on all matters related to this presentation.

All rights are reserved 2005.

we are "Chief of the Rabbits"

SASIN Graduate Institute of Business Administration of Chulalongkorn University

**Sasin**

## Discussion Agenda

1. Paper Review – Quick Check List
2. Paper Insights
3. Int’l Diversification Risks and Benefits
4. ADRs in General
5. Hansen-Jagannathan (HJ) Bound and Its related issues
6. Specific Comments

we are "Chief of the Rabbits"

SASIN Graduate Institute of Business Administration of Chulalongkorn University

**Sasin** Checklist: “Int’l Diversification with ADRs’

	Excellent	good	Ave	Below Ave	Poor
The paper is		X			
The topic is			X		
The contribution to literature is		X			
Reader’s interest would be			X		
Methodology		X			
Literature Review			X		
Writing Style is			X		

we are "Chief of the Rabbits"

SASIN Graduate Institute of Business Administration of Chulalongkorn University

**Sasin**

## Kabir et al (2005) Insights

- Using monthly country-level portfolios of returns (equally-weighted) of those ADR for the period 1981 to 2001 onto Hansen and Jagannathan variation test, the paper concludes that

1. US Investors can achieve the diversification benefits by investing ADRs along with US market index in Asia.
2. US Investors need to hold both ADRs and country portfolios in most of the Asian countries to achieve diversification benefit.
3. As more and more ADRs are enlisted in the US market over time, the ADRs become substitutes to country.

we are "Chief of the Rabbits"

SASIN Graduate Institute of Business Administration of Chulalongkorn University

**Sasin**

## Discussion Agenda

1. Paper Review – Quick Check List
2. Paper Insights
3. Int’l Diversification Risks and Benefits
4. ADRs in General
5. Hansen-Jagannathan (HJ) Bound and Its related issues
6. Specific Comments

we are "Chief of the Rabbits"

Sasin Graduate Institute of Business Administration of Chulalongkorn University

## Definition

- **Volatility:** Magnitude of price variation
  - A measure of uncertainty in the intrinsic value of the stock
  - The fear of being wrong
  - Measures one component of risk
- **Correlation:** Degree to which two stocks prices move in sync.
  - Portfolio holdings moving out of sync reduce overall volatility
  - Long-term upward trends preserved

we are "Chief of the Rabbits"

Sasin Graduate Institute of Business Administration of Chulalongkorn University

## Correlation Coefficient between Countries

- Solnik, Boucrelle & Fur (1996) [AFJ] analyzed over 30 years of data from 4 countries and conclude
  - Correlations across countries are not stable over time
  - Correlations seem to be tending upward
    - World's financial markets are becoming more integrated
  - Standard deviations are also somewhat unstable
  - When financial markets' volatility increases, correlations between countries tends to increase temporarily >>> As more ADRs are enlisted in US.

we are "Chief of the Rabbits"

Sasin Graduate Institute of Business Administration of Chulalongkorn University

## Public Offering of ADRs

DR Capital Raised

Year	U.S. \$ billions
1997	18.6
1998	10.2
1999	22.0
2000	30.1
2001	8.5
2002	6.8
2003	10.3

we are "Chief of the Rabbits"

Sasin Graduate Institute of Business Administration of Chulalongkorn University

## Int'l Diversification Risk & Benefit

- International investors face additional risks compared to domestic investors
  - Country (or sovereign) risk
  - Liquidity risk
    - Especially in emerging markets
  - Foreign exchange risk
  - Lack of information
- Buying shares in iShares MSCI or international mutual funds allows investors to passively diversify internationally
- ADRs, GDRs and international mutual funds allow investors to invest internationally without dealing with foreign exchange transactions

we are "Chief of the Rabbits"

Sasin Graduate Institute of Business Administration of Chulalongkorn University

## Discussion Agenda

1. Paper Review – Quick Check List
2. Paper Insights
3. Int'l Diversification Risks and Benefits
4. ADRs in General
5. Hansen-Jagannathan (HJ) Bound and Its related issues
6. Specific Comments

we are "Chief of the Rabbits"

Sasin Graduate Institute of Business Administration of Chulalongkorn University

## Comparison Between Different Types of ADRs

See Table 1 for more details

```

graph TD
    Issuers[Issuers] --> Existing[Existing Shares]
    Issuers --> Offering[Offering of Shares]
    Existing --> Level1[Level I - Over-the-counter]
    Existing --> Level2[Level II - Exchange Listed]
    Offering --> Level3[Level III - Exchange Listed Public Offering]
    Offering --> Level4[144A/Reg S - Private Placement Offering]
  
```

Level	Requirements
Level I - Over-the-counter	• Does not require U.S. GAAP • Same disclosure as home country (Rule 12 g)
Level II - Exchange Listed	• Requires U.S. GAAP (Form 20-F) • Ext. disclosure required by SEC • Steps to increase visibility Listed on Exchange (NYSE, Nasdaq)
Level III - Exchange Listed Public Offering	• Requires U.S. GAAP (Form 20-F) & Offering Memorandum • Extensive disclosure required by SEC • Listed on a U.S. Exchange (NYSE, Nasdaq)
144A/Reg S - Private Placement Offering	• Restricted to QIB's (Qualified Institutional Buyers) • Disclosure as required by QIBs • Not registered with the SEC

we are "Chief of the Rabbits"

SASIN Graduate Institute of Business Administration of Chulalongkorn University

**Sasin** 144A – Private Placement of ADRs

- **Advantages**
  - Short lead-in time
  - No SEC registration
  - Cost
- **Disadvantages**
  - Limits investor base, liquidity and visibility
  - Potential flowback
  - Complex structures
  - Possible discount-to-market

we are "Chief of the Rabbits"

SASIN Graduate Institute of Business Administration of Chulalongkorn University

**Sasin** Problems with ADRs (1)

- Some ADRs are highly liquid
  - If issued by well known international corporations
  - Sponsored by the issuer
    - Pay the ADR fees
  - Listed on an organized U.S. stock exchange
- If the stock issuer does not sponsor the ADR
  - Investors must pay the ADR fees
  - May not provide financial statements in English
  - If trade OTC may not be very liquid
- Some corporations purposely have their ADRs trade OTC
  - Avoids costly disclosure requirements and stringent U.S. accounting conventions

we are "Chief of the Rabbits"

SASIN Graduate Institute of Business Administration of Chulalongkorn University

**Sasin** Problems with ADRs (2)

- Corporate control can be an issue
  - Some depository banks are allowed to vote on behalf of ADR shareholders
- Price volatility may be high in the ADR issuer's domestic country
- Foreign income is typically subject to more complicated tax regulations
- May be more difficult to follow foreign news
- Still subject to exchange rate risk
  - Risk is hidden since the investor does not have to deal with it directly

we are "Chief of the Rabbits"

SASIN Graduate Institute of Business Administration of Chulalongkorn University

**Sasin** Tax Problems with ADRs (3)

- If an ADR pays dividends, find out whether any local/foreign taxes are withheld. If yes, do not hold these shares in yr IRA account.
- In a regular account, you can reclaim the withheld taxes via either an itemized deduction on Schedule B or through claiming a foreign tax credit on Form 1116. If you hold the shares in an IRA, however, you generally cannot reclaim the taxes.

See [www.adrbny.com](http://www.adrbny.com)

we are "Chief of the Rabbits"

SASIN Graduate Institute of Business Administration of Chulalongkorn University

**Sasin** Discussion Agenda

1. Paper Review – Quick Check List
2. Paper Insights
3. Int'l Diversification Risks and Benefits
4. ADRs in General
5. Hansen-Jagannathan (HJ) Bound and Its related issues
6. Specific Comments

we are "Chief of the Rabbits"

SASIN Graduate Institute of Business Administration of Chulalongkorn University

**Sasin** No arbitrage/Law of One Price

- “deviations from the model must be accompanied by a common component in the residual variance to prevent the formation of a portfolio with a positive deviation and a residual variance that decreases to zero as the number of securities in the portfolio grows, which presents an asymptotic arbitrage opportunity”

we are "Chief of the Rabbits"

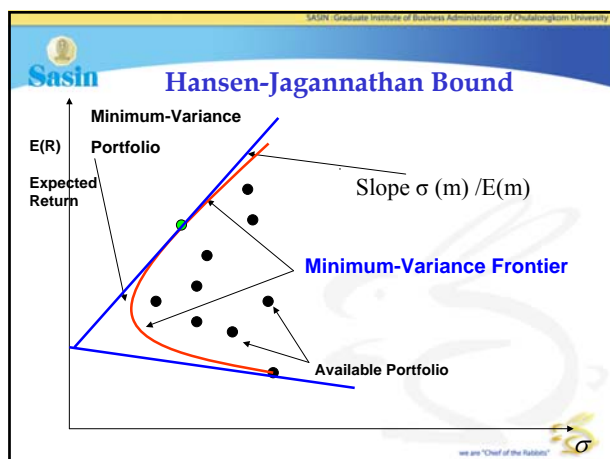
Sasin Graduate Institute of Business Administration of Chulalongkorn University

**Sasin**

## Hansen-Jagannathan (HJ) Bound

- Theorem (HJ Bound):  
The ratio of the standard deviation of a stochastic discount factor to its mean exceeds the Sharpe Ratio attained by any portfolio.
- Can be used to easily check the “viability” of a proposed discount factor
- Given a discount factor, this inequality bounds the available risk-return possibilities
- The result also holds conditional on date t info

we are “Chief of the Rabbits”



Sasin Graduate Institute of Business Administration of Chulalongkorn University

**Sasin**

## Squared Sharpe Ratios

- We bring squared Sharpe ratios into the analysis to establish a useful boundary  
$$s_q^2 = s_h^2 + s_k^2$$
- Intuitively, the squared Sharpe ratio of the k-factor portfolio (k), due to its non optimality, is not as high as it could be, the orthogonal portfolio (h) fills this gap and the two together reach the squared Sharpe ratio of the tangency portfolio (q)

we are “Chief of the Rabbits”

Sasin Graduate Institute of Business Administration of Chulalongkorn University

**Sasin**

## An Important Boundary

- Empirical tests employ a subset of all the available assets. Within a subset, the above identity holds, however the tangency portfolio of the assets in this subset will produce a lower Sharpe ratio than the tangency portfolio of all the available assets (unrestricted optimum). This gives us an important boundary  
$$s_{h-subset}^2 \leq s_h^2$$

we are “Chief of the Rabbits”

Sasin Graduate Institute of Business Administration of Chulalongkorn University

**Sasin**

## Why is that boundary important?

- For the null hypothesis of the  $a=0$ , we use the  $J_1$ -Statistic  
$$J_1 = \frac{(T - N - K)}{N} [1 + s_k^2]^{-1} s_{h-subset}^2$$
- This looks like an F-test of the Sharpe ratios, and guess what, it is, if we can't conceive of a reason why deviations would even exist.

we are “Chief of the Rabbits”

Sasin Graduate Institute of Business Administration of Chulalongkorn University

**Sasin**

## Non-Centrality

- F loses centrality if we have reason to believe that the sum of chi-squared random variables in the numerator are not standard normal; their means are non-zero. >> LR and GRS test results may be doubtful ?? Table 5 ?
- We have two reasons for this, we are either missing risk-based factors, and the  $a$  term is capturing them, effectively acting as the orthogonal portfolio.
- Or we have a non-risk based reason, such as data snooping, market inefficiencies or investor irrationality.

we are “Chief of the Rabbits”

SASIN Graduate Institute of Business Administration of Chulalongkorn University

**Sasin**

## Bounded Non-Centrality

$$\delta = T[1 + s_k^2]^{-1} s_h^2$$

- This is the non-centrality parameter
- If the deviations in the model are risk-based then our non-centrality parameter is bounded. The squared sharpe ratio of the orthogonal is bounded above and the remaining terms are finite.

we are "Chief of the Rabbits"

SASIN Graduate Institute of Business Administration of Chulalongkorn University

**Sasin**

## Unbounded Non-Centrality

- When the deviations in the model are non-risk-based, then a chain reaction occurs. Firstly, an orthogonal portfolio no longer really exists, you cannot optimally hold something like "data snooping bias".
- Secondly, the a term acts as the orthogonal portfolio, which is now fictional.
- Finally, this destroys our defense against asymptotic arbitrage. Looping back, the sharpe ratio for our tangency portfolio could now become arbitrarily large as we can now have risk-free returns.

we are "Chief of the Rabbits"

SASIN Graduate Institute of Business Administration of Chulalongkorn University

**Sasin**

## So How Does this Span Out?

- An arbitrarily large tangency portfolio makes for an unbounded orthogonal portfolio, which subsequently makes for an unbounded non-centrality parameter
- The Non-Centrality parameter pushes the null F-distribution to the right.

we are "Chief of the Rabbits"

SASIN Graduate Institute of Business Administration of Chulalongkorn University

**Sasin**

## NonCentrality, a portrait

- MacKinlay produces an example and plots out the F-distribution for four hypotheses.
  - (1) null distribution
  - (2) risk-based deviation
  - (3) non-risk based deviation
  - (4) non-risk based deviation with greater standard deviation of the a term

See Campbell, Lo and Mac Kinlay (1997)

we are "Chief of the Rabbits"

SASIN Graduate Institute of Business Administration of Chulalongkorn University

**Sasin**

## Conjectures and Suggestions

- (1) may be to the left of (2); (2) may be to the left of (3); and (3) may be to the left of (4).
- By looking at the distribution of the test statistics we may observe that higher sharpe ratios are more likely.
- Fama-French's risk-based study may produce a test statistic which may be high for the null distribution and still high for the risk-based alternative distribution.
- Mac Kinlay suggests that something more may be boosting the deviations.
- Kan and Zhou (2004) for a new HJ bound.

we are "Chief of the Rabbits"

SASIN Graduate Institute of Business Administration of Chulalongkorn University

**Sasin**

## Discussion Agenda

1. Paper Review – Quick Check List
2. Paper Insights
3. Int'l Diversification Risks and Benefits
4. ADRs in General
5. Hansen-Jagannathan (HJ) Bound and Its related issues
6. **Specific Comments**

we are "Chief of the Rabbits"

Sasin Graduate Institute of Business Administration of Chulalongkorn University

**Sasin**

## Some Specific Comments

- From Table 2, ADRs from Asia started only in 1996 and from Table 3 nearly all are statistically significant. Why ?  
Is this a result of financial liberalization?
- Note that ADRs from Latin America started in 1991, while developed countries commenced a decade earlier.  
- Is ADRs issuance correlated with the development of the country market ? Why ?

we are "Chief of the Rabbits"

Sasin Graduate Institute of Business Administration of Chulalongkorn University

**Sasin**

## Some Specific Comments

- From Table 4, it appears that own correlation between ADR and Country indices portfolio returns are very high except for Germany, Swiss and perhaps Singapore. Any explanations?
- Is this paper subjected to the country market growing sophisticated as market being liberalized and ADRs being enlisted in US market? [e.g. 1980's for developed market, 1990 to 6 for Latin American and 1996 to 2001 for Asian] Why or Why not ?

we are "Chief of the Rabbits"

Sasin Graduate Institute of Business Administration of Chulalongkorn University

**Sasin**

## Some Specific Comments

- Portfolio rebalancing effect should be considered as implied by Batten, Fetherston and Hoontrakul [2005].
- Future studies on **Substitutability** between ADR and country index and **Independence** of diversification benefits between the two need should explore more rigorously. [e.g. weighted average port., efficient across (industrial) frontier, market microstructure..]

we are "Chief of the Rabbits"

Sasin Graduate Institute of Business Administration of Chulalongkorn University

**Sasin**

## Reference

Batten, J., T. Fetherston and P. Hoontrakul [2005\*] "Factor Affecting the Yield of Emerging Market Issuers in Int'l Bond Market: Evidence from the Asia Pacific Region", working paper, Sasin of Chulalongkorn Univ., Thailand.

Campbell, John Y., A. W. Lo and C. Mackinlay [1997] "The Econometrics of Financial Markets", Princeton, NJ: Princeton Univ. Press

Kan, R. and G. Zhou [2004] 'A new variance bound on the stochastic discount factor', Univ. of Toronto

**Solnik, Boucelle and Le Fur (1996)**, "International market correlation and volatility", Financial Analysts Journal, 52 (5).

\*You can download freely at [www.Pongsak.Hoontrakul.com](http://www.Pongsak.Hoontrakul.com)

we are "Chief of the Rabbits"

Sasin Graduate Institute of Business Administration of Chulalongkorn University

**Sasin**

# END

I love emails.  
Any comments are welcome  
At Email : [pongsak@hoontrakul.com](mailto:pongsak@hoontrakul.com)

we are "Chief of the Rabbits"