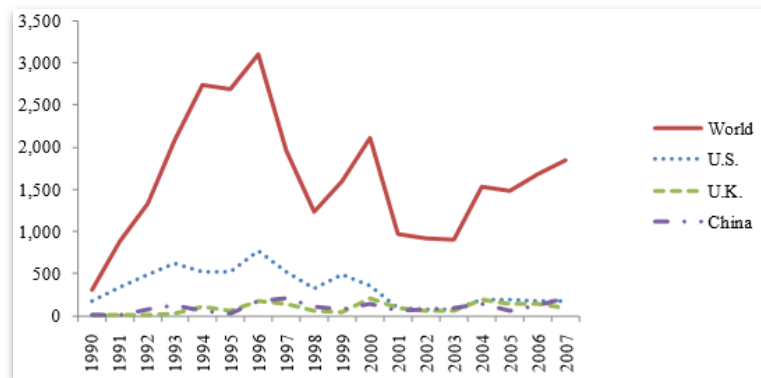


# APPENDICES

## Appendix A: Evolution of IPOs

Counts:

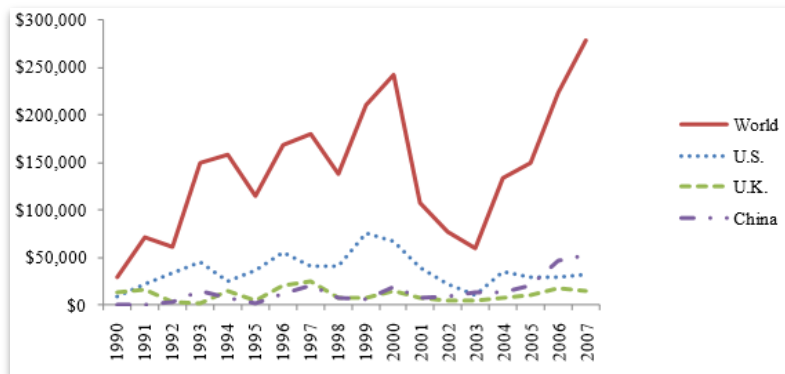
**Figure 1: Evolution of the number of IPOs around the world**



*Doidge et al., 2013, p.555*

Proceeds:

**Figure 2: Evolution of IPOs proceeds around the world**



*Doidge et al., 2013, p.555*

# Appendix B: Introduction method – Auction

The following example is based on the article of Tom Taulli on investorplace.com (2012) and is simplified. Calculations are normally more complicated and investors more numerous.

Company X is willing to go public in the following months and is willing to raise \$1.6m in capital. After discussing with the underwriting bank, it is decided to use an auction to decide the price and the number of shares. The underwriter will therefore organize an online auction for all interested investors to place their bids (a single investor can place several bids). The results are the following:

**Table 1: Auction process - Example**

Investor	Price	# of Shares
Investor A	\$85	5,000
Investor A	\$78	10,000
Investor B	\$87	2,000
Investor C	\$80	5,000
Investor D	\$84	7,000
Investor E	\$81	1,000
Investor F	\$75	3,000

In order to raise \$1.6m, it is possible for company A to issue 20,000 shares at \$80. Therefore, each investor having submitted a bid at \$80 or more will get shares. This means that investors A, B, C, D and E will receive the number of shares they asked for at \$80. However, Investor F won't receive anything.

In case there are more shares requested compared to the offer, each investor will receive a pro rata share of stock.

Google used such a methodology for its IPO and more information can be found about it in the article of Li (2007), "A better understanding of the initial public offering process: Evidence from Google".

# Appendix C: Underpricing in different countries

Data collected from Dai, Banerjee and Shrestha (2012) on the period 2000-2006.

**Table 2: Underpricing around the world**

Country	Average underpricing (%)	# of IPOs
<b>Australia</b>	16.59	696
<b>Austria</b>	23.76	34
<b>Belgium</b>	10.36	32
<b>Brazil</b>	18.37	46
<b>Canada</b>	39.13	784
<b>China</b>	57.14	590
<b>Denmark</b>	13.48	27
<b>Finland</b>	14.61	25
<b>France</b>	11.30	353
<b>Germany</b>	43.13	333
<b>Greece</b>	14.44	53
<b>Hong Kong</b>	22.21	479
<b>India</b>	25.01	9
<b>Indonesia</b>	52.25	48
<b>Ireland</b>	10.29	25
<b>Israel</b>	23.34	42
<b>Italy</b>	7.87	215
<b>Japan</b>	45.14	890
<b>Luxembourg</b>	26.68	15
<b>Malaysia</b>	31.18	295
<b>The Netherlands</b>	20.00	44
<b>New Zealand</b>	20.66	38
<b>Norway</b>	4.33	45
<b>Philippines</b>	17.27	19
<b>Poland</b>	45.50	23
<b>Russia</b>	8.82	10
<b>Singapore</b>	24.88	296
<b>South Africa</b>	12.94	18
<b>South Korea</b>	54.57	192
<b>Spain</b>	10.98	45
<b>Sweden</b>	21.79	73
<b>Switzerland</b>	14.41	39
<b>Taiwan</b>	17.25	260
<b>Thailand</b>	19.15	143
<b>United Kingdom</b>	23.29	840
<b>United States</b>	24.00	1,700
<b>All</b>	29.11	8,776

*Dai, Banerjee and Shrestha, 2011, p.1297*

# Appendix D: Cultural variables interpretation

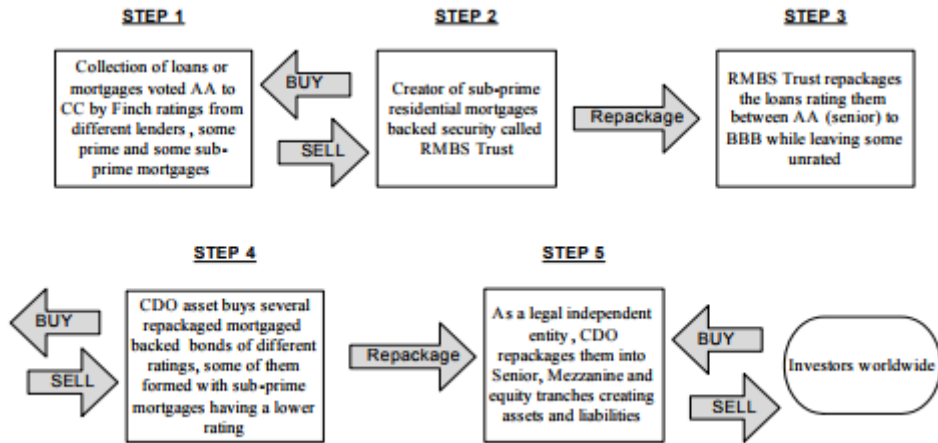
**Table 3: Interpretation of significant variables**

Variable	Coefficient	Interpretation
PDI	Positive	More acceptance of inequality leads to higher underpricing
UAI	Negative	More uncertainty avoidance leads to lower underpricing
LTO	Positive	Long term oriented country leads to lower underpricing
Anti-director rights	Negative	More protection of minority shareholders leads to lower underpricing
Stock Market Cap./GDP	Negative	Having a bigger stock market leads to lower underpricing

*Costa, Crawford and Jakob, 2013*

# Appendix E: Creation of CDOs

Figure 3: Creation process of CDOs



Jaiswal-Dale, 2008, p.131

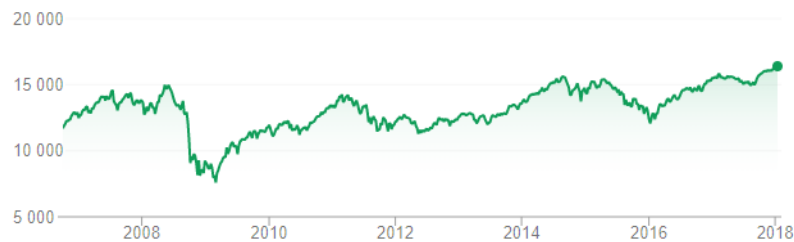
# Appendix F: Impact of the GFC on major stock exchanges

Data retrieved from Google Finance.

**Figure 4: USA - S&P 500**



**Figure 5: Canada - S&P/TSX**



**Figure 6: France - CAC 40**



**Figure 7: United Kingdom - FTSE 100**



**Figure 8: Japan - NIKKEI 225**



**Figure 9: Australia - S&P/ASX 200**



**Figure 10: India - BSE Sensex**



**Figure 11: Hong-Kong - Hang Seng Index**



# Appendix G: Underpricing in Thailand

**Table 4: Thai underpricing across time**

<b>Year</b>	<b>Underpricing (%)</b>
<b>2000</b>	-1.44
<b>2001</b>	36.78
<b>2002</b>	15.55
<b>2003</b>	46.95
<b>2004</b>	14.05
<b>2005</b>	10.09
<b>2006</b>	1.44
<b>2007</b>	22.50
<b>2008</b>	1.16
<b>2009</b>	0.90
<b>2010</b>	17.63
<b>2011</b>	8.80
<b>2012</b>	69.38

*Vithessonthi, 2014, p.96*

# Appendix H: Main Market vs AIM

**Table 5: LSE listing requirements**

	Main Market Premium	Main Market Standard	AIM
<b>Sponsor</b>	Required	No Requirements	Nominated advisor (NOMAD) required at all times
<b>Admission Document</b>	Prospectus vetted and approved by the UKLA		Not vetted by the Exchange. The FSA will vet an AIM admission document where it is also a prospectus under the Prospectus Directive
<b>FTSE index inclusion</b>	Subject to eligibility if not a UK plc	Not permitted	
<b>Minimum % free float</b>	25% of shares in public hands	25% of GDR's (not underlying shares) in public hands	No requirements
<b>Minimum market capitalization</b>	£700,000	No requirements	
<b>Control of assets</b>	Control over the majority of assets for 3 year period	No requirements	
<b>Revenue track record</b>	At least 75% of the business must be supported by a revenue earning	No requirements	

	track record for 3 year period		
	Some exceptions apply to mineral and scientific research based companies		
<b>Financial track record</b>	3 years of audited accounts with unqualified audit opinions  No more than 6 months old audited financial information (including interim information if appropriate)	3 years of audited accounts (or shorter period since incorporation)  No more than 9 months old audited accounts, otherwise interim financial information (which may be unaudited) required	
<b>Accounting standards</b>	EU IFRS or other approved GAAPs for non-EEA issuers  At a minimum, the last 2 years financial information must be restated on the basis to be applied in the issuer's next annual accounts		EU IFRS or other approved GAAPs for non-EEA and Channel Island issuers or national GAAP with reconciliation to one of the approved standards
<b>Other eligibility requirements</b>	Confirmation that adequate financial reporting procedures are in place	No requirements	Confirmation that adequate financial reporting procedures are in place
	Statement that the issuer has sufficient working capital for at least the next 12 months from the	No requirements	Statement that the issuer has sufficient

	date of prospectus		working capital for at least the next 12 months from the date of admission
	Pro forma information, reported by an accountant, required if there has been a significant change	Pro forma financial information is not required, but generally is presented if there has been a significant change. If presented voluntarily, must be reported on by an accountant	Pro forma information not required, but generally presented if there has been a significant change
<b>Financial due diligence work streams</b>	Normally required by the sponsor:  • Long form report • Financial reporting procedures report • Working capital report	Depends on the requirements of underwriters	Normally required by the NOMAD: • Long form report • Financial reporting procedures report • Working capital report
<b>Corporate governance</b>	Compliance with the UK Corporate Governance Code or explanation of non-compliance	Corporate governance statement required in annual report in accordance with Disclosure and Transparency Rules Statement regarding the degree of compliance with the UK Corporate Governance Code	No specific requirements, however appropriate level of corporate governance is expected
<b>Significant transactions</b>	Inside information must be disclosed to the market without delay  Announcement required for significant transactions such as	No specific requirements for significant transactions	No specific requirements for significant transactions  Announcement required for significant transactions exceeding 10%

	<p>acquisitions and disposals, exceeding 5% of any class tests</p> <p>Shareholder approval, a circular and appointment of a sponsor required for significant transactions exceeding 25% of any class tests</p> <p>Shareholder approval, a circular and appointment of a sponsor required for related party transactions exceeding 5% of any class tests</p> <p>Reverse takeovers, where any class test exceeds 100%, require readmission including publication of a prospectus and shareholder approval</p>	<p>Reverse takeovers require re-admission including publication of a prospectus and shareholder approval</p>	<p>of any class tests</p> <p>Announcement required for related party transactions exceeding 5% of any class tests</p> <p>Disposals in a 12 month period exceeding 75% in any class tests require publication of a circular and shareholder approval</p> <p>Reverse takeovers where any class test exceeds 100% require re-admission to AIM including publication of an admission document and shareholder approval</p>
<b>Further equity issue</b>	Prospectus required to be issued when offering exceeds 10% of existing shares over 12 month period	Normally prospectus required for issues up to the total limit of the	Admission document required where a prospectus is required under

		block listing	the Prospectus Rules, a new class of securities is to be admitted, or the transaction qualifies as a reverse takeover
<b>Financial reporting obligations</b>	Annual financial reports published within 4 months of the year end		Annual financial reports are published within 6 months of the year end
	Half-year financial reports published within 2 months of the reporting period end	Half-year financial reports not required, but generally issued	Half-year financial reports published within 3 months of the reporting period end
	Interim management statements published twice a year	Interim management statements not required	

*PWC, 2012, pp.9-10*

# Appendix I: Listing processes on LSE and SGX

## LSE

### 1. Private phase

- a. Select the sponsor: the sponsor is responsible for leading the team of professional advisers and make sure the company goes well through the listing process
- b. Appointment of other professional advisers: these advisers will be under the direction of the sponsor.
- c. Kick-off meeting: meeting of the advisers and the sponsor in order to make sure everything is clear (normally in person).
- d. Weekly meetings: video calls to make sure everything is going well.
- e. Prospectus – UKLA process: validation of the prospectus by the UKLA, usually six to eight weeks.
- f. Due diligence: the goal is to assess the accuracy, truthfulness and completeness of the UKLA's validated prospectus. It also allows highlighting any issues with the firm.
- g. Legal restructuring, documentation and agreements: the goal is to certificate that any potential legal issue has been corrected by the company.
- h. Continue to prepare a company to become a public company.
- i. Marketing strategy: setting up a marketing plan to attract investors.
- j. Analyst presentation

### 2. Public phase

- a. Announcement of Intention to Float (AIF): confirming the willingness to go for an IPO
- b. Pathfinder prospectus: making the almost final prospectus available to potential investors
- c. Investors education: marketing of the IPO to investors
- d. Management roadshow presentation: meetings of the management with prospective investors.

- e. Completion and pricing meeting: directors and advisers look a final time at all necessary documents for the IPO.
- f. Impact Day: official announcement of the listing.
- g. UKLA final approval.
- h. Application for listing and trading: formal applications to UKLA and LSE.
- i. Admission: admission to listing and trading of shares on the Main Market.

## **SGX**

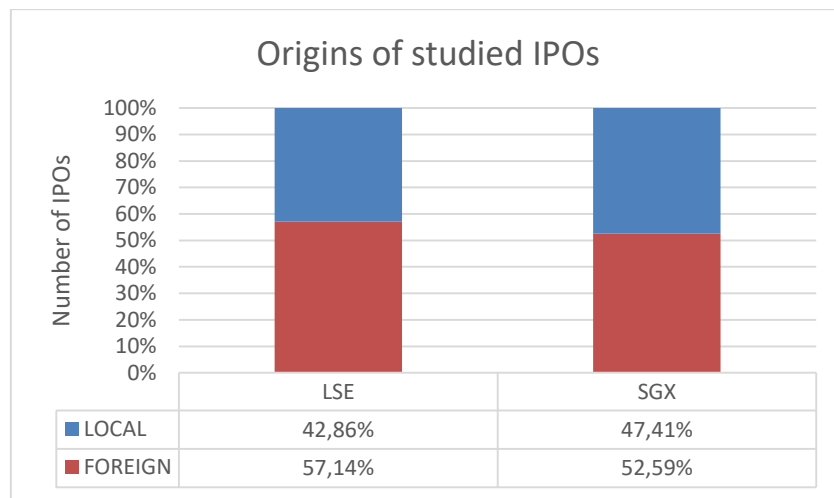
1. Meet with accredited issue managers: understand how listing works. An accredited issue manager is mandatory for listings on the Mainboard
2. Appoint an accredited issue manager: the Issue Manager has the same role as the Sponsor for LSE IPOs.
3. Assessment period: setting up of the structure and method of the IPO.
4. Stage 1 – Submission of section (A) of the listing admissions pack: namely information on the company and resolve key issues for listings according to SGX.
5. Stage 2 – Submission of section (B) of the listing admissions pack: the full application is done and the Singapore Exchange has four weeks to give its answer back.
6. Approval: issuance of an eligibility-to-list (ETL) letter with a three months validity.
7. Lodgement of documents & public exposure: application of the preliminary prospectus to the Monetary Authority of Singapore (MAS) for public feedback, preparation of marketing of the IPO to prospective investors, etc.
8. Registration of documents & launch of offer (IPO): registration of the final prospectus and beginning of subscriptions.
9. Confirmation of allotment & trading commences: allocation of shares and start of trading.

# Appendix J: Presentation of the data

## Origin of companies

The companies we have identified in both markets have been separated into two categories: local and foreign firms. The following figure represents the proportion of local/foreign companies in both markets.

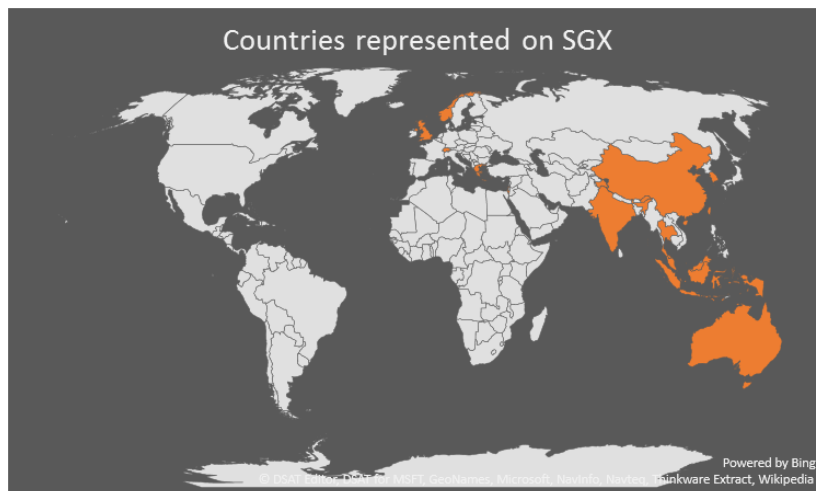
**Figure 12: Origin of IPOs**



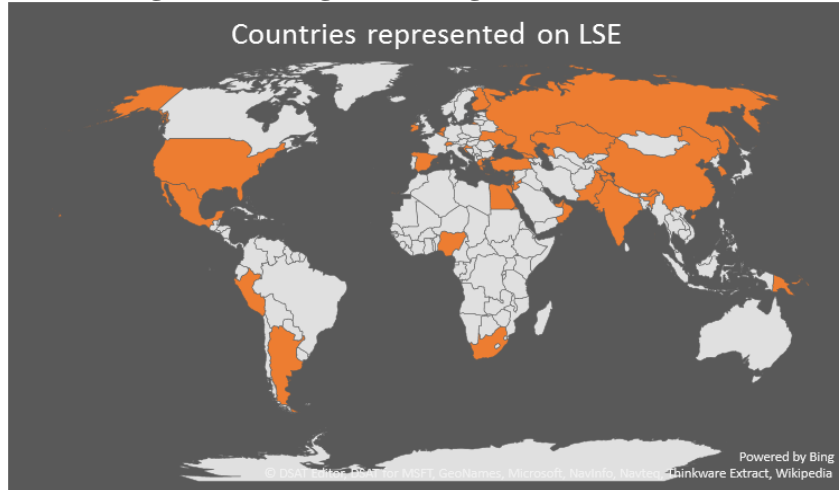
On that point LSE and SGX are quite similar. Both exchanges have more than 50% foreign listings during the study period (given the data we selected). The proportion is slightly higher for LSE than for SGX (57.14% vs 52.59%).

The main difference between foreign listings in the two markets is their origin. The two maps show countries having had at least one company listed on the stock exchange.

**Figure 13: Origin of foreign IPOs on SGX (1)**

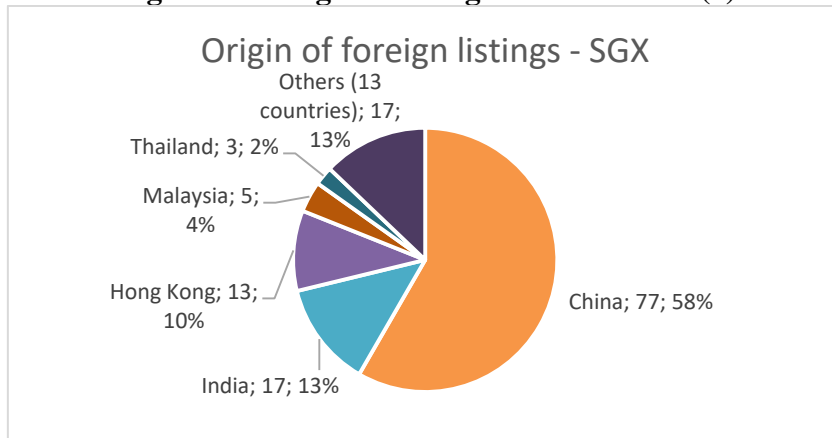


**Figure 14: Origin of foreign IPOs on LSE (1)**

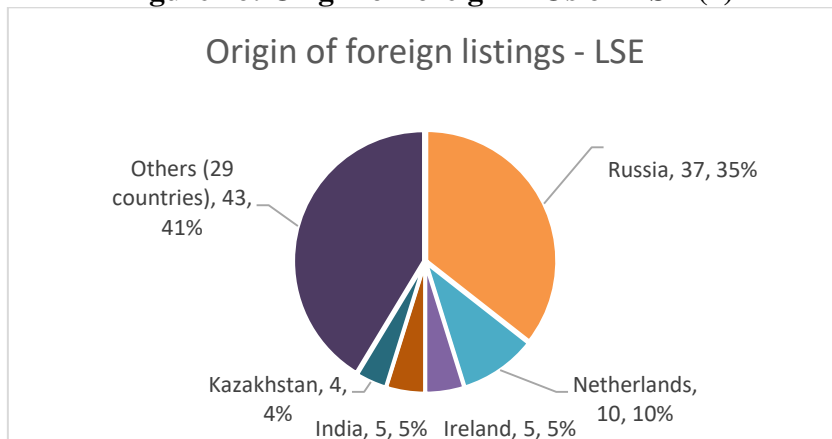


While LSE hosts companies from all over the globe (all continents except Australia are represented), SGX is more limited to APAC countries (with a few exceptions). This diversity in foreign listings for LSE can also be observed when looking at countries having the most listings on each exchange. The following graphs indicate the five countries with most listings, their number and percentage of total foreign listings.

**Figure 15: Origin of foreign IPOs on SGX (2)**



**Figure 16: Origin of foreign IPOs on LSE (2)**



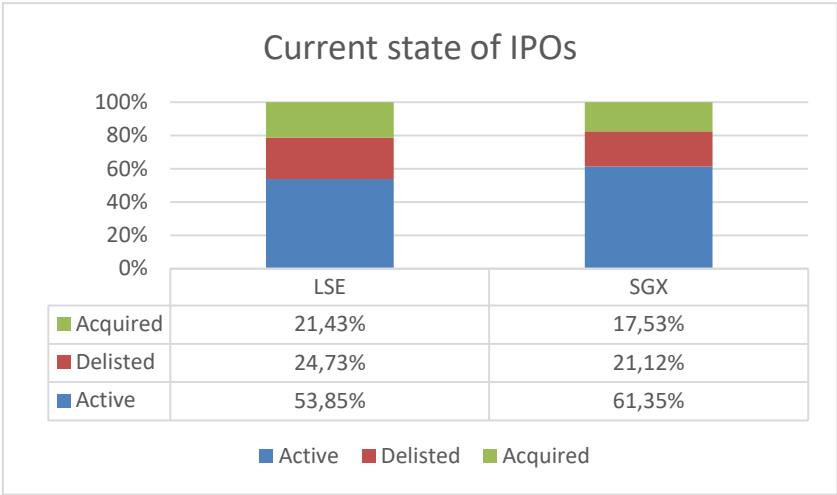
In Singapore, the five most represented countries already account for 86% of all foreign listings. China alone is representing more than half of foreign listings on SGX. In UK, Russia is the most represented country with 35% of foreign listings. The five most represented countries account here for 59% (almost the same as China for SGX) and 29 other countries make the 41% missing (against 13 for 13% in Singapore). The complete list of countries can be found hereunder.

### State of companies

When looking at the companies, we found interesting to know whether the companies were still active or not. Therefore, we separated listings into three categories: active, delisted and acquired companies. Companies whose names have changed since there listing but which are still traded under their new name are still considered as active. However, some active firms may not be traded anymore. Indeed, some are still listed but not traded because of legal issues, delisting procedure, etc. Since those firms were not yet considered as delisted or acquired at the time we retrieved them, we chose to keep them in the “Active” category.

The following graph shows the current state of companies given the exchange they are listed on.

**Figure 17: Current state of IPOs**



In both markets most of the companies are still listed. However, the percentage of active firms in Singapore is much bigger than in the UK (7.5%) while both acquired and delisted percentages are around 3.5-4% smaller.

# Appendix K: MAUP vs UP

The following table represents five companies, their year of introduction, first day return and the associated market return (data is not representative of any real company):

**Table 6: Example data**

Company	Year	First day return	Market return
A	2008	5%	-3%
B	2010	-2%	2%
C	2006	10%	4%
D	2009	-1%	-1%
E	2004	-3%	1%

This data is sufficient to calculate MAUP and UP (simply first day return). The table hereunder represents for each company the UP, the MAUP and the difference between them:

**Table 7: Comparison of MAUP and UP (1)**

Company	UP	MAUP	Difference
A	5%	8.24%	3.24%
B	-2%	-3.92%	-1,92%
C	10%	5.77%	-4.23%
D	-1%	0%	1%
E	-3%	-3.96	-0.96%

Finally, in order to observe the impact market return can have on underpricing measures, the values were sorted for each measure.

**Table 8: Comparison of MAUP and UP (2)**

UP	MAUP
C (10%)	A (8.24%)
A (5%)	C (5.77%)
D (-1%)	D (0%)
B (-2%)	B (-3.92)
E (-3%)	E (-3.96)

It can be observed that the ranking is not the same. When using UP, company A was seen as outperforming the market but when taking into account the bad state of the market, this outperformance turned to be even stronger. On the opposite, company C showed a strong performance but similarly was the market. Its performance was therefore relatively lower than company A when using MAUP.

# Appendix L: List of removed companies

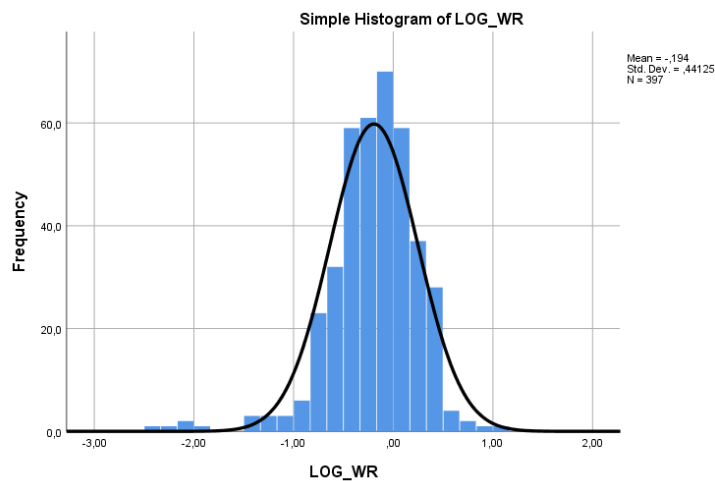
Companies removed from the study.

Name	Market	Bloomberg ticker
<b>IG SEISMIC SERVICES PLC</b>	LSE	IGSS LI EQUITY
<b>SBERBANK OF RUSSIA</b>	LSE	SBER LI EQUITY
<b>ACRON JSC</b>	LSE	AKRN LI EQUITY
<b>ACORN MINERALS PLC</b>	LSE	VOR LN EQUITY
<b>NEW WORLD RESOURCES NV</b>	LSE	NWR LN EQUITY
<b>ZHAIKMUNAI L.P.</b>	LSE	NOG LN EQUITY
<b>CENTRAL RAND GOLD LTD</b>	LSE	CRND LN EQUITY
<b>URALKALI JSC</b>	LSE	URKA LI EQUITY
<b>HRVATSKE TELEKOMUNIKACIJE D D</b>	LSE	THTC LI EQUITY
<b>PHARMSTANDARD OJSC</b>	LSE	PHST LI EQUITY
<b>BANK OF GEORGIA JSC</b>	LSE	BGEO LI EQUITY
<b>HANATOUR SERVICE INC</b>	LSE	86PB LN EQUITY
<b>KENT RELIANCE BS</b>	LSE	OSB LN EQUITY
<b>KAZMUNAIGAS EXPLORATION PRODUCTION</b>	LSE	KMG LI EQUITY
<b>SCOTT WILSON GROUP</b>	LSE	SWG LN EQUITY
<b>UTI BANK</b>	LSE	AXB LI EQUITY
<b>ZENTIVA NV</b>	LSE	ZEND LI EQUITY
<b>ASSOCIATED CEMENT CO</b>	LSE	AMCD LI EQUITY
<b>ORASCOM TELECOM MEDIA&amp;TECH HLDG SAE</b>	LSE	OTMT LI EQUITY
<b>PAN-UNITED MARINE LIMITED</b>	SGX	PANU SP EQUITY
<b>COUGAR LOGISTICS CORPN LTD</b>	SGX	MYP SP EQUITY
<b>VIRESH INFOTECNICS LIMITED</b>	SGX	VISG SP EQUITY
<b>EASUN REYROLLE LIMITED GDR</b>	SGX	ERRG SP EQUITY
<b>VYAPAR INDUSTRIES LIMITED GDR</b>	SGX	VYING SP EQUITY
<b>K. S. OILS LIMITED GDR</b>	SGX	KSOG SP EQUITY
<b>WEBEL-SL ENERGY SYS LTD GDR</b>	SGX	WSESG SP EQUITY
<b>UTTAM GALVA STEELS LIMITED GDR</b>	SGX	UTTM SP EQUITY
<b>ACCENTIA TECHNOLOGIES LTD GDR</b>	SGX	ACTLG SP EQUITY
<b>CONFIDENCE PETROL IND LTD GDR</b>	SGX	CONFG SP EQUITY
<b>BOMBAY RAYON FASHIONS LTD GDR</b>	SGX	BRFLG SP EQUITY
<b>KARUTURI GLOBAL LIMITED GDR</b>	SGX	KARG SP EQUITY
<b>PRUDENTIAL PLC</b>	SGX	PRU SP EQUITY
<b>GOLDEN OCEAN GROUP LIMITED</b>	SGX	GOGL SP EQUITY
<b>LONZA GROUP LTD</b>	SGX	LONZ SP EQUITY
<b>WELSPUN CORP LIMITED GDR</b>	SGX	WSP SP EQUITY
<b>OCI COMPANY LTD GDR A</b>	SGX	OCI SP EQUITY

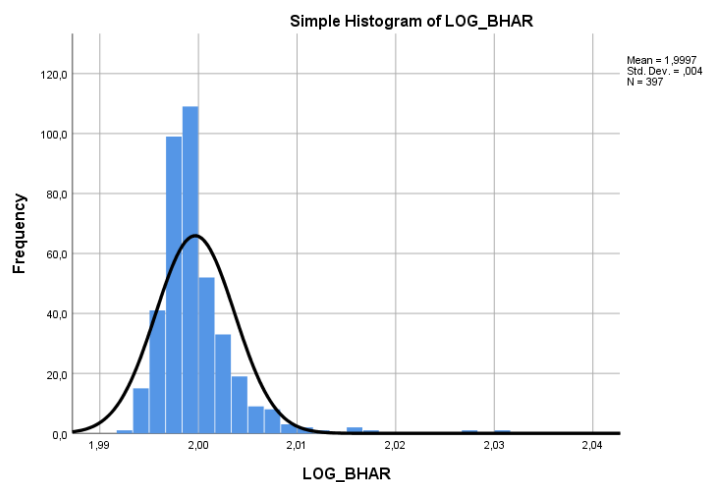
# Appendix M: LOG\_BHAR vs LOG\_WR

In order to statistically analyze the Long-Term Performance of IPOs, we needed to find a variable following (more or less) a normal distribution. Therefore, we tried to transform two variables (BHAR and WR) following lognormal distributions using a log10 transformation (as for underpricing). The results are the following:

**Figure 18: Distribution of LOG\_WR**



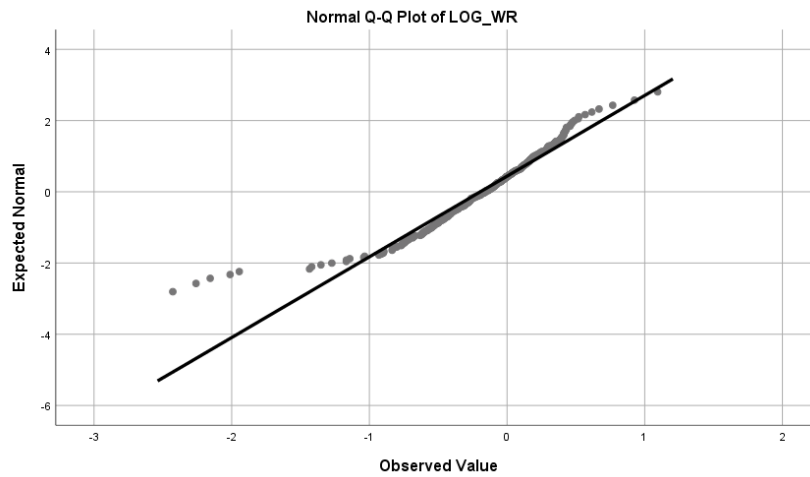
**Figure 19: Distribution of LOG\_BHAR**



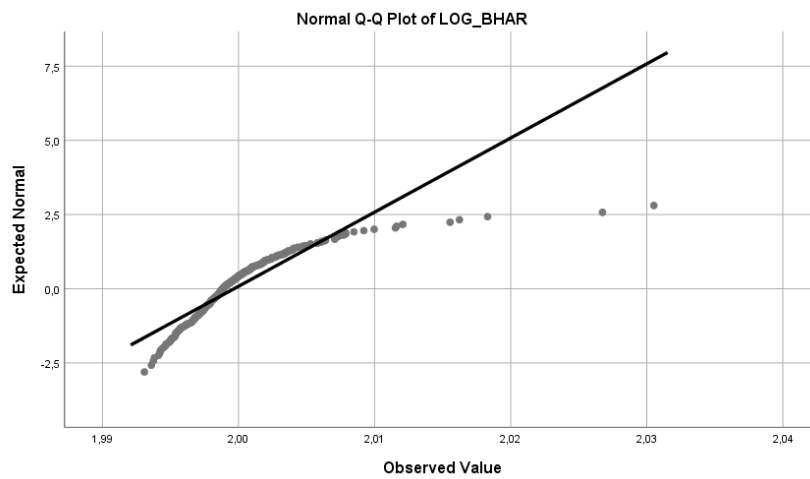
**Table 9: Normality tests**

	Tests of Normality					
	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
<b>LOG_BHAR</b>	0.141	397	0.001	0.786	397	0.001
<b>LOG_WR</b>	0.057	397	0.003	0.934	397	0.001

**Figure 20: QQ-plot of LOG\_WR**



**Figure 21: QQ-plot of LOG\_BHAR**



Given these results, we will go for LOG\_WR in the rest of the analysis. Indeed, the graphs (Histogram and QQ-plot) seem to indicate that this variable is closer to a normal distribution than LOG\_BHAR. Furthermore the normality tests (Shapiro-Wilk and Kolmogorov-Smirnov) do not really favor one or another.