

## Financial Performance of Listed SMEs: A Comparative Analysis between China and America

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### Abstract

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In this paper, we mainly study the financial performance of listed Small and Medium-Scale Enterprises (SMEs) on Shenzhen Stock Exchange (SZSE) Small Business Board in China and New York Stock Exchange MKT (NYSE MKT) in America. We institute unit root test, co-integration and Granger causality tests to analyze our panel data. Through unit root, we found that, the financial performance of SMEs listed on NYSE MKT in US and on SZSE SME Board in China were all not stationary. Our co-integration analysis showed that, the financial performance of SMEs on these stock markets had long-run relationship. In addition, financial performance of SMEs listed on SZSE SME Board does not differ statistically significant from SMEs listed on NYSE MKT and vice versa. On the whole, our results give us cause to reject the null hypothesis that financial performance of listed SMEs in developed stock market does not influence the financial performance of listed SMEs in developing market and vice versa.

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**Key Words:** Financial Performance, Listed SMEs, China, America

**JEL Classification:** G15 G23 G32

### 1. Introduction

Governments, researchers and other stakeholders across the world have developed great research interest in Small and Medium-Scale Enterprise (SME) financing because of the significant role these small firms play in GDP growth of various countries such as China (Du et al. 2015). For instance, National Bureau of Statistics of China states that 99% of firms in China are made up of SMEs and they contribute 60% of GDP growth. The story is similar in the US as 67% of private sector employments are created by SMEs and contributes 99.7% of US employer firms (Small Business Administration, 2015). SMEs can thus be said as job creation engines. However, (Alsaaty 2017) finds that newly established entrepreneurial firms – companies with fewer than 20 employees – have fallen from 558,500 in 1990 to 515,100 in 2011, representing 8 percent decrease. On the other hand, the death of young firms shot-up by 11 percent during the same time. This calls for new more dynamic way to save SMEs. Unfortunately, according to Newman et al. (2012) SMEs around the world, especially those in developing countries such as China are unable to access the needed external fund for growth. This hinders SMEs' job creation and significant GDP contribution agenda. In their contribution to this topic, Newman et al. (2012) again postulate that, feeble institutional setting is what has deprived emerging economies like China of capital market. To this end, unlike developed economies like the US and UK whose SMEs use stock exchange to raise the needed funds and also get credibility, SMEs in developing economies like China resort to funding from personal savings, family funding, household income and at best high interest bank loans (Elston et al. 2016).

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Also in their contribution, W. Huang et al. (2016) postulate that compared to non-listed firms, firms (including SMEs) who are listed on the stock exchange have higher checks and balances in the form of listing requirement and shareholders reward or penalize directors to ensure good corporate governance. In addition, Pastusiak, et al. (2016) opines that stock market is usually seen as a new source of funding and a step forward in the growth of a firm. About two decades earlier, Roell (1996) had listed the merits of listing on the stock which include a source of new finance, refinancing current loans, among others.

Given the above-mentioned reasons, Pastusiak et al. (2016) state that, in recent times, a lot of companies including SMEs desire to list on the stock exchange, but is that the panacea to SMEs financial performance and will that solve SMEs' access to fund challenge? Both promoters of companies and management are often oblivious of all the associated costs of listing on stock exchange. Jensen & Meckling (1976) say one of such costs is the substantial drop in financial performance. This is because, according to the Agency Cost Theory, there is better financial efficiency when owners are involved in management. Further to this, Adam Smith (1776) said the directors a company cannot be expected to watch over the company with same anxious alertness as partners of the company will watch especially when owners are widely dispersed as in the case of a listed company. It is therefore instructive for owners and managers to abreast themselves with the potential risk of listing on stock exchange and take steps to mitigate the impact on financial performance of their firm. However, other researchers such as Cai and Wai (1997) studying Japanese stock market, find indifference financial performance between 'low' and 'high' levels of managerial ownership. This refutes the above claims.

According to literature, one other instructive factor that affects financial performance is the size of a firm. Moballeggi & Moghaddam (2013) agree that the size of a firm can significantly influence its financial performance. Unlike small firms, large firms have the capacity to withstand post Initial Public Offer (IPO) shocks which usually lead to a decline in financial performance. These views are however countered by other authors like (Kim et al. 2004). These authors find that the size of a firm does not significantly affect its post IPO financial performance. This view is also shared by Nofsinger (2004) that the size of a firm does not influence the post IPO performance of a firm.

Our study aims at assessing the financial performance of listed SMEs on stock markets of developing and advanced economies. First, we establish statistical significance of the difference between before IPO financial performance and after IPO financial performance and draw conclusions. We then conduct a comparative analysis on after IPO financial performance of SMEs in developing and advanced economies and draw conclusions. The variables we use to measure SME financial performance are Return on Assets (ROA), Return on Equity (ROE) and Return on Sales (ROS) indicators. To the best of our knowledge, there are no comparative studies that assess financial performance of publicly traded SMEs in developed and developing economies and analyze before and after IPO financial performance of SMEs. Most of the studies are usually based on large listed firms with few studies testing the size effect of listed firms. As a result, there is a literature gap as far as the assessment of publicly traded SMEs on SZSE and NYSE MKT are concerned. This study aims at filling this gap.

## 2. Literature Review

SMEs across the world have made colossal contributions to various economies. According to (Ayyagari et al., 2011), they employ most of the labor of every economy and meaningfully contribute to the GDP growth of their respective economies. This phenomenal job of SMEs is done not without their major access to funds challenge Beck et al., (2006) especially after the 2008 recession (OECD, 2015). Several firms including SMEs therefore desire to seek refuge by listing on the stock exchange to mitigate the harshness of their access to funds challenge (Pastusiak et al. 2016). In this organized market, firms are able to raise the needed capital from both private and public sources. Roell (1996) lists the merits of listing on the stock market as a source of new finance, refinancing existing loans, among others and Pastusiak et al., (2016) opine that stock market is usually seen as a new source of funds and a step forward in the growth of a firm. Wang, Xu and Zhu (2004) find that average debt to asset ratio drops from 0.34 to 0.28 after IPO in China. This gives listed firms more fiscal space to operate as compared to their non-listed counterparts. However, listing on the stock exchange has inherent costs such as legal fees and other demerits such as under pricing, information disclosure obligations, business restrictions, dilution of ownership base, duties or tax obligation etc. (Roell, 1996: Pastusiak et al., 2016). There are two schools of thought about the financial performance listed firms. One school of thought is that, financial performance deteriorates after IPO. Several authors including Pastusiak et al. (2016) are in firm support of this position. They studied the financial performance of listed firms including SMEs on the Warsaw Stock Exchange (WSE) in Poland.

They employed Return on Assets (ROA) and Return on Equity (ROE) as indicators to measure financial performance before and after IPO. They found that profitability of companies in a year before IPO was better than one year after IPO. Similarly, Ahmad (2011) studied firms that issued IPOs on the Malaysian stock exchange. The author also measured performance by ROA. His findings corroborated the view that financial performance undoubtedly falls after IPO. In addition, Wang (2005) studied Chinese firms and also concluded that, ROA falls after IPO. The author pointed out that ROA was 9.3% in the third year before IPO as compared to 6.4% in the third year after IPO. In their study titled *company profitability before and after IPO. Is it a window dressing or equity dilution effect?* Pastusiak, et al. (2016) equally conclude that profitability falls after IPO but attribute the reason to window dressing. However, this school of thought is discounted by other authors like Cai and Wai (1997). These authors researched on Japanese stock market and find that, there is no difference in the financial performance between 'low' and 'high' levels of managerial ownership.

Literature is replete with the reasons for the fall in financial performance after IPO. Jain and Kini (1994) postulate that the fall in financial performance after IPO can be attributed to wide spread of shareholders and its attendant cost that result in the decrease in incentives for management (Jain & Kini, 1994). Also, Mikkelson et al. (1997) find that post IPO financial performance declines because it results in the drop of management's interest in the company as ownership base broadens. In other words, management is more separated from owners after IPO. According to Agency Cost Theory, both management and owner seek to maximize their gain. So it will cost owners more to align management interest to theirs and vice versa. The theory therefore suggest that agency cost and conflict between owners and management will be less in private firms where owners and management are not widely dispersed and even far less when owners are in charge of management and this will affect financial performance (Mikkelson et al., 1997). The Agency Cost Theory is backed by the Property Rights Hypothesis Sarkar, et al. (1998). In accordance with this theory, Kim et al. (2004) find ownership structure to be influential in financial performance on Tai stock market. They find that firms whose owners are in charge of management perform better.

Another important factor relative to post IPO performance is the size of a firm (Mikkelson et al., 1997). Ahmad and Lim (2005) find that the size of a firm has an impact on its post IPO performance. Unlike small firms, large firms have the capacity to withstand post IPO shocks which usually lead to a decline in financial performance (Moballegghi & Moghaddam, 2013). This view is however countered by other authors like (Kim et al. 2004). These authors find that the size of a firm does not significantly affect its post IPO financial performance. This view is also shared by Nofsinger (2004) that the size of a firm does not influence post IPO performance of a firm. Banz (1981) is of the view that, the only time the size of a firm may influence post IPO performance is when the firm is overly small.

### 3. Data

We use panel data which is superior to time series data. Our study is focused on listed SMEs on New York Stock Exchange (NYSE MKT) in the US and Small Business Board of Shenzhen Stock Exchange (SZSE) in China. The NYSE MKT is the small business platform for NYSE. Its listing requirements are lower compared with that of NYSE so to be able to list small businesses. Similarly, in China, SZSE use the SMEs Board to list small firms which cannot fulfill the requirements for listing on the main exchange. To proxy the old and new stock markets for small businesses, we use the New York Stock Exchange (NYSE MKT) in the US and Small Business Board of Shenzhen Stock Exchange (SZSE) in China respectively.

We use financial data of SMEs for periods before and after IPO. Before IPO data was obtained from the annual reports of the respective SMEs whereas their after IPO data were obtained from database of financial reports and statements of New York Stock Exchange (NYSE) in the US and Shenzhen Stock Exchange (SZSE) in China. The start and end dates of our sample and sample size are governed by data availability of SMEs with similar characteristics in our sample period. In all, 50 SMEs were selected from each exchange. The study spans from 2006 to 2010 before IPO period and 2011 to 2015 after IPO period. We adopt SME definition by SZSE Small Business Board. All our data are in natural logarithm (ln).

### 4. Hypothesis

Several authors have touted pre-IPO performance to be superior to post-IPO performance (Pastusiak et al. 2016; W. Huang, et al. 2016; Roell 1996). However, other authors find different result on this same issue Cai and Wai (1997) and tout the stock market as providing funding that can solve of SMEs' access to funds challenge Roell (1996). These and other studies have been done across countries with different development levels.

The level of a country's development determines the kind of funding source used by the SME. SMEs in developed countries mainly use the stock market to raise funds whereas their counterparts in developing countries mainly use family sources and bank loans (Elston et al. 2016). On the basis of the above arguments we put underneath the following hypotheses:

H1: Public offering does not affect SMEs financial performance

H2: There is no difference in the financial performance of publicly traded SMEs in developing stock market and that of developed stock market

H3: Equity performance of SMEs on NYSE MKT in US (developed economy) does not cause equity performance of SMEs on the SME Board of SZSE in China (developing economy)

## 5. Methodology

Our study is focused on SMEs that are publicly traded on NYSE MKT in US and Small Business Board of SZSE in China. Our data is divided into two groups of SMEs listed on the NYSE MKT and their SZSE Small Business Board counterparts and each group is further divided into two subgroups of before IPO and after IPO. These groupings are aimed at aiding easy comparative analysis of financial performance between small firms listed on NYSE MKT and their SZSE Small Business Board counterparts. As stated earlier, our measuring variables for SME financial performance are Return on Asset (ROA), Return on Equity (ROE) and Return on Sales (ROS). We denote ROA, ROE and ROS after IPO on NYSE MKT by NYSEROA, NYSEROE and NYSEROS respectively. We also denote Return on Asset, Return on Equity and Return on Sales after IPO on SZSE Small Business Board by SZSEROA, SZSEROE and SZSEROS respectively. Similarly, we denote ROA, ROE and ROS before IPO on NYSE MKT by NYSEROA1, NYSEROE1 and NYSEROS1 respectively. We also denote Return on Asset, Return on Equity and Return on Sales before IPO on SZSE Small Business Board by SZSEROA1, SZSEROE1 and SZSEROS1 respectively.

Firstly, we test the Cross-sectional dependence of NYSE MKT and their SZSE Small Business Board counterpart. We then test unit root of each data set and also perform co-integration analysis. Finally, we perform granger causality test. We use MathType for our formulae entry. Breusch–Pagan  $\chi^2$  test is given by:

$$y_{it} = \alpha_i + \beta_{it} X_{it} + \mu_{it} \quad (1)$$

where  $i = 1, \dots, N$  and  $t = 1, \dots, T$ ,  $\beta_{it}$  is a  $K \times 1$  vector of parameters to be predicted,  $X_{it}$  is a  $K \times 1$  vector of regressors,  $\alpha_i$  represent time-invariant individual nuisance parameters and  $\mu_{it}$  is said to have an independent distribution. Here, we use  $H_0$  for each of our null hypothesis above and  $H_1$  for the alternate. The null hypothesis of no cross-sectional dependence is written as:

$$H_0 = \rho_{ij} = \rho_{ji} = \text{cor}(\mu_{it}, \mu_{jt}) = 0 \text{ for } i \neq j \quad (2)$$

$$H_1 : = \rho_{ij} = \rho_{ji} \neq 0 \text{ for some } i = j$$

Where

$$\rho_{ij} = \rho_{ji} = \frac{\sum_{t=1}^T \mu_{it} \mu_{jt}}{\left(\sum_{t=1}^T \mu_{it}^2\right)^{1/2} \left(\sum_{t=1}^T \mu_{jt}^2\right)^{1/2}} \quad (3)$$

The Breusch–Pagan (1980) LM test statistic is given by

$$LM = \sum_{i=1}^{N-1} \sum_{j=1+1}^N T_{ij} \hat{\rho}_{ij}^2 \rightarrow X^2 N(N-1)/2 \quad (4)$$

Where the  $\hat{\rho}_{ij}$  is the correlation coefficients obtained from the residuals of the model. Pesaran (2004) alternative test is based on the average of the pairwise correlation coefficients  $\hat{\rho}_{ij}$  from the residuals of the ADF regressions and is computed as follows:

$$CD_{LM} = \sqrt{\frac{2T}{N(N-1)}} \sum_{i=1}^{N-1} \sum_{j=i+1}^N \hat{\rho}_{ij} \rightarrow N(0,1) \quad (5)$$

Pesaran (2004) is suitable for our study because of its small sample power. The result is presented in **table 3**.

### 5.2 Panel Unit Root Test

Because our data covers different periods with diverse disturbances, they tend to be non-stationary and thus cause unit root and unit root in turn cause spurious regression. In order to produce a reliable test result, we institute a panel-based unit root test since we employ panel data in our study. Due to the cross sectional dependence nature of our data, we adopt Pesaran (2007) to test for the presence of panel unit root. Pesaran (2007) is an augmented ADF regression with the cross-section averages of lagged levels and first-differences of the individual series. The cross-sectionally augmented Dickey–Fuller (CADF) regression is:

$$\Delta y_{it} = \alpha_i + \beta_i y_{it-1} + \theta_i \bar{y}_{t-1} + \sum_{j=1}^{\rho} y_{ij} \Delta y_{it-1} + \sum_{j=0}^{\rho} \vartheta_{ij} \Delta \bar{y}_{t-j} + d_i t + \varepsilon_{it} \quad (6)$$

Where  $\bar{y}_t = \frac{1}{N} \sum_{i=1}^N y_{it}$  and its inclusion in the equation serve as a proxy for the effects of an unobserved common factor (Pesaran, 2007). According to Pesaran (2007), the unit root test can be performed on the t-value of  $\beta_i$ , either individually or combined and the test is as follows:

$$CIPS(N,T) = \frac{1}{N} \sum_{i=1}^N t_1(N,T) \quad (7)$$

Where  $t_i(N, T)$  is the t-value of  $\beta_i$  in the above equation Pesaran provides the critical values. The result is presented in **table 4**.

### 5.3 Panel Co-integration Test

The next step in our analysis, we conduct a panel co-integration test since unit root exists in our data. We conduct co-integration analysis to determine if ROA, ROE and ROS of listed SMEs on NYSE MKT have long-run co-integration relationship with their SZSE SME Board of China counterparts

As stated above, our data is cross-sectionally dependent so we adopt panel co-integration test developed by Westerlund (2007). Westerlund (2007) allows for the cross-sectional dependence by means of bootstrap methods. This test is noted for its strong result in small samples like ours. The test has the null hypothesis of no co-integration. More specifically, Westerlund (2007) tests are based on the error-correction process that is written as:

$$\Delta y_{it} = \delta'_i d_t + \alpha_i (y_{i,t-1} - \beta'_i X_{i,t-1}) + \sum_{j=i}^{pi} \alpha_{ij} \Delta y_{i,t-j} + \sum_{-qi}^{pi} y_{ij} \Delta X_{i,t-j} + e_{it} \quad (8)$$

where  $t=1, \dots, T$  and  $i=1, \dots, N$ ,  $d_i$  denotes the deterministic components, and  $pi$  and  $qi$  are the lag and lead orders which can vary across individual country. The result is presented in **table 5a-c**.

### 5.4 Panel Causality Analysis

In the final stage of our data analysis, we implement Granger Causality test to determine whether financial performance of listed SMEs on NYSE MKT Granger cause financial performance of listed SMEs on SZSE SME Board of China. In other words, we test whether ROA, ROE and ROS of listed SMEs on NYSE MKT Granger cause ROA, ROE and ROS of listed SMEs on SZSE SME Board of China. By this means we establish whether the financial performance of SMEs listed on the stock exchange of an advanced economy influence the financial performance of SMEs listed on the stock exchange of an emerging economy and vice versa. The result is presented in **table 6a and 6b**.

## 6. Results

### 6.1 Descriptive Statistics

The yearly financial data used in this study covers the period from 2006 to 2010 before IPO period and 2011 to 2015 after IPO period for two stock exchanges for small businesses, NYSE MKT and SZSE SME Board. The sample is restricted to those small firms with similar characteristics and for which before IPO and after IPO financial data was available in the sample period.

**Table 1** presents descriptive statistics for SMEs listed on developed and developing stock exchanges from panels A to D. Panels A and B of table 1 present descriptive statistics before IPO for developed and developing countries respectively whereas Panels C and D present descriptive statistics after IPO for the developed and developing countries respectively. Panel A and B show that, SMEs' financial performance, as measured by ROA, ROE and ROS before IPO is better in the developed country than in the developing country with a mean of performance 0.23, 0.27 and 0.28 in the developed country as against 0.17, 0.22 and 0.21 in the developing country. However, the story is different after IPO. In panel C and D, the means of all the measuring variables are higher in the developing country than in the developed country suggesting that, SMEs on a developed country's stock exchange perform poorly than their counterparts in a developing country. It is also significant to note that the means of all the measuring variables after IPO are in negative in the developed country whilst the developing country maintained its positive sign.

In comparing performance before IPO in panel A and B and after IPO in panel C and D of table 1, the mean performance of companies decreased from 0.23, 0.27 and 0.28 in developed country to -0.0093703, -0.0669245 and -0.0441491 of ROA, ROE and ROS. Similarly, panel D shows that, compared to before IPO, the mean performance after IPOs as measured by ROA, ROE and ROS all saw decline from 0.166656, 0.2183487 and 0.206244 to 0.0282813, 0.0356708 and 0.0789123 respectively. The post IPO story of the developed country is no different to the developing country except that all the mean performance is positive in the developing country but negative in the developed country. The sum effect of all the aforementioned suggests that SMEs financially perform better before IPO than after IPO and the case is worse in developed economies than developing ones.

**Table 1: Descriptive statistics before IPO**

Variable	No. of obs.	Mean	Std. Dev.	Min	Max
<b>Panel A</b>					
NYSEROA1	250	.2336698	.168759	.00292	1.07114
NYSEROE1	250	.2743029	.2185864	.0084	1.66958
NYSEROS1	250	.2753792	.2614519	.01495	2.01495
<b>PANEL B</b>					
SZSEROA1	250	.166656	.130533	.0027	.6457
SZSEROE1	250	.2183487	.2093281	.0233	1.6484
SZSeros1	250	.206244	.1388709	.0019	.683
<b>PANEL C</b>					
NYSEROA	250	-0.0093703	.1723292	-0.90519	.66436
NYSEROE	250	-0.0669245	.3554923	-2.3801	.74798
NYSEROS	250	-0.0441491	.5170326	-5.27752	.90708
<b>PANEL D</b>					
SZSEROA	250	.0282813	.0660891	-0.5068877	.3809074
SZSEROE	250	.0356708	.1509523	-1.44836	1.6484
SZSeros	250	.0789123	.165178	-1.08366	.9708429

Source: Authors' calculation

In further analysis, we test the hypothesis that *Public offering does not affect the financial performance of SMEs listed on the on SZSE SME Board and NYSE MKT*. In other words, we test if ROA, ROE and ROS differ statistically significant from before IPO on both SZSE SME Board in China and NYSE MKT in US as suggested by the descriptive analysis above.

We also test if SMEs in a developing economy's financial performance is statistically and significantly different from their counterparts in developed economy. We employ Wilcoxon matched-pairs for this test. Wilcoxon matched pairs test examines mean equalities in a given subsample and it is run for each selected pair of subsamples. The advantage of Wilcoxon matched-pairs test is that observations do not have to be normally distributed and as a result, we did not test whether or not our samples are normally distributed. In panel A of **table 2**, we report the result of SMEs that issued IPO on the SZSE Small Business Board. The test result shows sufficient ground to vehemently reject the null hypothesis that *Public offering does not affect SMEs financial performance*. This suggests that, SMEs listed on the SZSE SME Board perform worse after IPO than before IPO. This means, at all significance levels, SMEs' financial performance before-IPO-periods are statistically and significantly higher than after-IPO-periods.

In panel B of **table 2**, we report the result of SMEs that issued IPO on the NYSE MKT. The story here is no different from that of the SZSE market. The test result shows sufficient ground to also vehemently reject our null hypothesis that *Public offering does not affect SMEs financial performance*. This suggests that, small companies listed on the NYSE MKT perform worse after IPOs than before IPOs. This also means, at 1% significance level, SMEs' financial performance before-IPO-periods are statistically and significantly higher than after-IPO-periods.

Now, we test the statistical significance of our second hypothesis that *there is no difference in the financial performance of publicly traded SMEs in developing stock market and that of developed stock market*. The result is presented in Panel C of **table 2**. According to the result, there is no sufficient ground to reject our null hypothesis at 5% significant level. This can be interpreted that financial performance of SMEs listed on SZSE SME Board does not differ statistically significant from SMEs listed on NYSE MKT. It can be recalled that, earlier in this paper, SMEs on NYSE MKT failed to report positive values for ROA, ROE and ROS whereas SMEs on SZSE SME Board recorded positive values. However, these differences are not statistically significant according to our Wilcoxon matched pairs test at 5% significant level. It can also be said that financial efficiency of SMEs in US are higher at the time they have not issued IPOs than their Chinese counterparts.

**Table 2:** Wilcoxon Matched Pairs Tests Results

Variable	Z-Statistic	P-Value
<b>Panel A</b>		
Inszseroa-Inszseroa1	-8.096	0.0000
Inszseroe-Inszseroe1	-7.763	0.0000
Inszseros-Inszseros1	-7.355	0.0000
<b>Panel B</b>		
Innyseroa-Innyseroa1	-8.575	0.0000
Innyseroe-Innyseroe1	-8.506	0.0000
Innyseros-Innyseros1	-7.846	0.0000
<b>Panel C</b>		
Inszseroa1-Innyseroa1	1.282	0.7043
Inszseroe1-Innyseroe1	4.231	0.0518
Inszseros1-Innyseros1	-3.042	0.0869

Source: Authors' calculation

It is interesting to note that, the sampled firms on both SZSE SME Board and NYSE MKT performed worse after IPOs. Due to this interesting result from our study, we decided to do further analysis to ascertain whether or not the financial performance on the SZSE SME Board is influenced by the performance of NYSE MKT. We do this by testing co-integration and follow up with granger causality test to establish the causal relationship between the two exchanges as far as SME financial performance is concerned. In line with literature, we first test cross sectional dependence.

**Table 3: Cross-sectional dependence test results after IPO**

Variables	Breusch–Pagan $\chi^2$		Pesaran CD normal	
	CD Statistics	P-Value	CD Statistics	P-Value
Lnnyseroa - Inszseroa	7.11	0.0038	5.13	0.000
Lnnyseroe - Inszseroe	53.02	0.000	-1.41	0.000
Lnnyseros - Inszseros	20.51	0.000	4.28	0.000

Source: Authors' calculations

## 6.2 Cross-Sectional Dependence Test

In **Table 3** above, we present the results for the cross-sectional dependence tests. According to Breusch–Pagan  $\chi^2$  test, our data is not cross-sectionally independent but rather some forms of dependence exist among our measuring variable of both SZSE SME Board and NYSE MKT. It is useful to note that all the test reject the hypothesis and clearly establish at 1% significant level that there is cross sectional dependence in our data, except ROA which is rejected at 5% significant level in Breusch–Pagan  $\chi$ -square. The Pesaran (2004) CD test results confirm Breusch–Pagan at 1% significant level.

**Table 4: Unit root test**

CIPS			
Variable	Level	1 <sup>st</sup> difference	Critical vale at 5%
Innyseroa	-2.153	-2.45	-2.33
Innyseroe	-2.046	-2.69	-2.33
Innyseros	-2.009	-2.75	-2.33
Inszseroa	-1.943	-2.99	-2.33
Inszseroe	-1.863	-2.57	-2.33
Inszseros	-1.937	-2.77	-2.33

We used Schwarz Information Criterion (SIC) for optimal lag length

## 6.3 Panel Unit Root Test

Literature is awash with the fact that the cross-sectional dependence is critical in data analysis and leaving it out would lead to serious size distortions and power loss. For this reason, authors such as Chang (2002), Choi (2002), Phillips and Sul (2003), Bai and Ng (2004), Moon and Perron (2004), Smith et al. (2004), Breitung and Das (2005), Choi and Chue (2007), Pesaran (2007), Demetrescu et al. (2009) and Pesaran et al. (2009) propose different panel unit root tests allowing for cross-section dependence.

This study follow literature and employs cross sectionally augmented panel unit root test (CIPS) proposed by Pesaran (2007) to test for the presence of panel unit root. Pesaran (2007) is a panel unit root test that allows for cross-sectional dependence. As shown in **Table 4** above, the CIPS value at level, in absolute terms, are all less than the critical value at 5% significant level. Thus this results show unit root exists in all our measuring variables. We further test the first difference and realized that all first difference values are more than critical value at 5% significant level. This therefore suggests that our measuring variables are integrated in the first order value at 5% significant level.

**Table 5a: Co-integration - Innyseroa, Inszseroa**

Statistic	Value	Z-value	P-value	Robust P-value
Gt	-1.569	-3.107	0.000	0.000
Ga	-3.269	0.848	0.000	0.000
Pt	-11.598	-5.311	0.000	0.000
Pa	-3.264	-5.564	0.000	0.000

Source: Authors' calculations We used Schwarz Information Criterion (SIC) for optimal lag length. We allow for a constant but no trend



**Table 5b: Co-integration-Innyseroe, Inszseroe**

Statistic	Value	Z-value	P-value	Robust P-value
Gt	-2.179	-8.174	0.000	0.000
Ga	-3.394	0.634	0.014	0.000
Pt	-13.911	-8.825	0.000	0.000
Pa	-3.614	-6.319	0.000	0.000

Source: Authors' calculations. We used Schwarz Information Criterion (SIC) for optimal lag length. We allow for a constant but no trend

**Table 5c: Co-integration-Innyseros, Inszseros**

Statistic	Value	Z-value	P-value	Robust P-value
Gt	-1.854	-5.966	0.000	0.000
Ga	-3.211	0.918	0.021	0.000
Pt	-12.155	-7.321	0.000	0.000
Pa	-2.933	-4.656	0.000	0.000

Source: Authors' calculations. We used Schwarz Information Criterion (SIC) for optimal lag length. We allow for a constant but no trend

**6.4 Co-integration Test**

Since the variables in our panel data set are integrated in order one and are cross-sectionally dependent, we use Westerlund (2007) co-integration test, which is also a second-generation co- integration test. According to the results in **Table 5a to 5c**, the null hypothesis of no co-integration is vehemently rejected at 5% significant level. This suggests evidence of long-run equilibrium relationship between ROA, ROE and ROS of listed SMEs on SZSE SME Board and NYSE MKT.

**Table 6a: Granger Causality**

Ho: SZSE does not granger cause NYSE MKT			Bootstrap critical value		
Variable	Coefficient	Wald Statistics	10%	5%	1%
ROA	0.2004	1.324	3.167	3.976	5.183
<b>ROE</b>	<b>0.2005</b>	<b>3.270***</b>	<b>3.182</b>	4.421	5.938
ROS	-0.1508	0.438	2.658	3.456	4.786

Source: Authors' calculations. \*\*\* represent 10% confidence level \*\* 5% confidence level and \* 1% confidence level

**Table 6b: Granger Causality**

Ho: NYSE MKT does not granger cause SZSE			Bootstrap critical value		
Variable	Coefficient	Wald Statistics	10%	5%	1%
ROA	0.3015	2.221	3.753	5.770	6.231
<b>ROE</b>	-0.2006	2.143	4.290	5.503	5.790
ROS	0.2011	3.546	4.410	6.230	6.862

Source: Authors' calculations. \*\*\* represent 10% confidence level \*\* 5% confidence level and \* 1% confidence level

**6.5 Granger Causality Test**

**Table 6a and 6b** report Wald test statistics and the corresponding Bootstrap critical value for the individual variables to test the hypothesis that *Equity performance of SMEs on NYSE MKT in US (developed economy) does not cause equity performance of SMEs on the SME Board of SZSE in China (developing economy)* is rejected t 10% significant level. This implies that investors and other market participants on SZSE SME Board take interest in the equity performance of SMEs on NYSE MKT and act accordingly. This position is however rejected at 5% and 1% critical level. On the whole, our result does not give us cause to reject our null hypothesis. This suggest that ROA, ROE and ROS of SMEs on NYSE MKT in US do not influence the ROA, ROE and ROS of SMEs on the SZSE SME Board in China and vice versa.

## 7.0 Conclusion

In this paper, we mainly studied the financial performance of listed SMEs on SZSE Small Business Board in China and NYSE MKT in US. We analyzed SME financial performance before IPO and after IPO on both exchanges and draw conclusions. We also conducted a comparative analysis of the financial performance of listed SMEs on these two exchanges and finally, we tested the causality of the SMEs' financial performance on these two exchanges. Through unit root, we found that, the financial performance of SMEs listed on NYSE MKT in US and on SZSE SME Board in China were all not stationary but had unit root. Our co-integration analyses showed that, the financial performance of SMEs on these stocks have long-run relationship.

In testing our hypothesis, our test result showed sufficient ground to vehemently reject the null hypothesis that *Public offering does not affect SMEs financial performance*. This suggested that, SMEs listed on the NYSE MKT and SZSE SME Board performed worse after IPO than before IPO. This also meant, at 5% significance level, SMEs' financial performance before-IPO-periods were statistically and significantly higher than after-IPO-periods.

Our second hypothesis is that *there is no difference in the financial performance of publicly traded SMEs in developing stock market and that of developed stock market*. According to our result, there is no sufficient ground to reject our null hypothesis at 5% significant level. This can be interpreted that financial performance of SMEs listed on SZSE SME Board does not differ statistically significant from SMEs listed on NYSE MKT. However, we found at 10% significant level, the null hypothesis that the equity performance of SMEs on NYSE MKT in US does not granger cause the equity performance of small businesses on the SME Board of SZSE is rejected. This implies that investors and other market participants on SZSE SME Board take interest in the equity performance of small businesses on NYSE MKT and act accordingly and vice versa. This position was however rejected at 5% level. On the whole, our result does not give us cause to reject our null hypothesis that *financial performance of listed SMEs in developed market does not influence the financial performance of listed SMEs in developing market* and vice versa.

Based on our result and similar ones by other authors, we suggest policy direction that will remove all the bottlenecks that frustrate SMEs to perform better after IPO as this will significantly resolve the access to funds challenge of SMEs. SME stock analysts and other stakeholders in developing countries should take considerable interest in the SME stock performance in the developed world and vice versa.

## References

- Ahmad A. (2011). Ownership Structure and the Operating Performance of Malaysian Companies. *International Review of Business Research Papers*, 7(6), 1–14
- Alsaaty, F. (2017). "Dwindling Entrepreneurial spirit in the United States: A Time for Rethinking and Action." *Journal of Small Business and Entrepreneurship Development* **Volume 5** (Issue 1 ): 55-63.
- Ayyagari, M., Demirgüç-Kunt, A., Maksimovic, V., (2011). Small vs. young firms across the world: contribution to employment, job creation, and growth. *World Bank Policy Research Working Paper*, (5631).
- Banz, R. W. (1981). The relationship between return and market value of common stocks. *Journal of Financial Economics*, 9, 3–18.
- Beck, T., Demirgüç-Kunt, A., Maksimovic, V., (2005). *Financial and legal constraints to growth: does firm size matter? the J. Financ.* 60 (1), 137–177.
- Beck, T., Demirgüç-Kunt, A., Laeven, L., Maksimovic, V., (2006). The determinants of financing obstacles. *J. Int.MoneyFinanc.* 25 (6), 932–952.
- Breusch, T. S., & Pagan, A. R. (1980). The Lagrange multiplier test and its applications to model specification in econometrics. *The Review of Economic Studies*, 47(1), 239-253.
- Du, J., Guariglia, A., & Newman, A. (2015). Do social capital building strategies influence the financing behavior of Chinese private small and medium-sized enterprises? *Entrepreneurship, Theory & Practice*, 39(3), 601–631.
- Ding, Y., Nowak, E., & Zhang, H. (2010). Foreign vs. domestic listing: *An entrepreneurial decision. Journal of Business Venturing*, 25(2), 175–191
- Economist Intelligence Unit (2009). Surviving the drought. <https://www.sba.gov/sites/default/files/files/SBA-SPFI-Report-2015.pdf>
- Elston, J. A., Chen, S., & Weidinger, A. (2016). The role of informal capital on new venture formation and growth in China. *Small Business Economics*, 46, 79–91

- Jensen, M., & Meckling, W. H. (1976). Theory of the firms: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305–360
- Kim, K. A., Kitsabunnarat, P., & Nofsinger, J. R. (2004). Ownership and operating performance in an emerging market: Evidence from Thai IPO firms. *Journal of Corporate Finance*, 10, 355–381.
- Mikkelsen, W. H., Partch, M. M., & Shah, K. (1997). Ownership and operating performance of companies that go public. *Journal of Financial Economics*, 44, 281–307.
- Moballegghi, M., & Moghaddam, F. G. (2013). Firm size, beta and financial leverage: Stock exchange in Iran. *SCMS Journal of Indian Management*, 10, 40–47.
- Newman, A., Gunessee, S., & Hilton, B. (2012). Applicability of financial theories of capital structure to the Chinese cultural context: A study of privately owned SMEs. *International Small Business Journal*, 30(1), 65–83
- Nofsinger, J. R., & Wang, W. (2011). Determinants of start-up firm external financing worldwide. *Journal of Banking & Finance*, 35, 2282–2294
- OECD, 2015. New Approaches to SME and Entrepreneurship Financing: Broadening the Range of Instruments. Final report.
- Pastusiak, R., Miszczyńska, K., & Krzeczewski, B. (2016). Does public offering improve company's financial performance? The example of Poland. *Economic Research-Ekonomska Istraživanja*, 29(1), 32-49.
- Pastusiak, R., Bolek, M., Malaczewski, M., & Kacprzyk, M. (2016). Company Profitability Before and After IPO. Is it a Windows Dressing or Equity Dilution Effect?. *Prague Economic Papers*, 2016(1), 112-124.
- Pesaran, M. H. (2007). A simple panel unit root test in the presence of cross-section dependence. *Journal of Applied Econometrics*, 22(2), 265-312.
- Pesaran, M. H., Schuermann, T., & Weiner, S. M. (2004). Modeling regional interdependencies using a global error-correcting macro econometric model. *Journal of Business & Economic Statistics*, 22(2), 129-162.
- Reinganum, M. R. (1982). A direct test of roll's conjecture on the firm size effect. *Journal of Finance*, 37, 27–35.
- Roll, R. (1981). A possible explanation of the small firm effect. *Journal of Finance*, 36, 879–888.
- Shumacher, E.F., (1973). *Small is Beautiful: Economics as if People Mattered*. Perennial Library, New York.
- Smith, A. (1937). *The wealth of nations*. Cannan edition (Modern Library. New York).
- Tang, Z. & Tang, J. *J Bus Ethics* (2016) 136: 147. doi:10.1007/s10551-014-2518-8
- Wang, Ch. (2005). Ownership and Operating Performance of Chinese IPO. *Journal of Banking and Finance*, 29(7), 1835–1856. DOI: 10.1016/j.jbankfi n.2004.07.003
- Westerlund, J. (2007). Testing for error correction in panel data. *Oxford Bulletin of Economics and statistics*, 69(6), 709-748.