

STOCK INDEXES

Asian Stock Index Correlations

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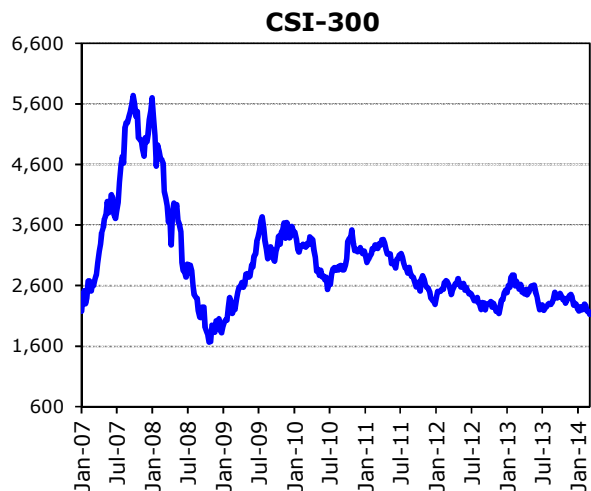
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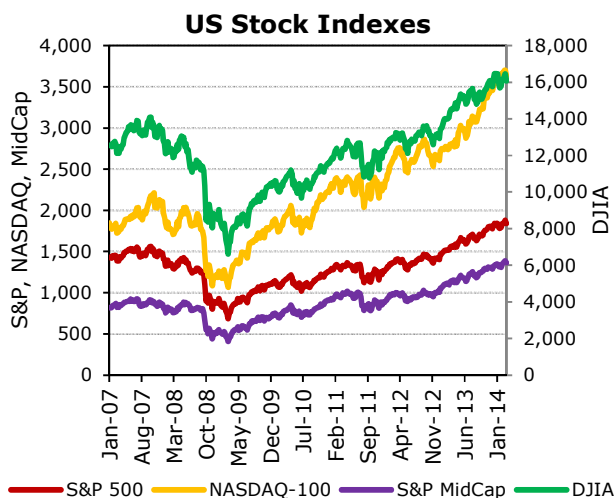
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Stock index futures are useful trading tools because they provide a proxy for taking on a position in a particular national stock market or stock market sector. While some degree of correlation may be observed between various national stock market benchmarks, these markets do indeed serve distinctly different purposes. This point may be demonstrated by a study of correlations amongst various national stock market averages.

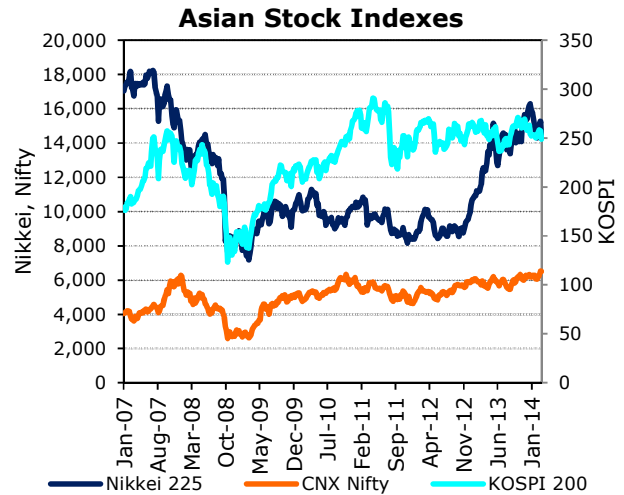
In particular, we focus on the Chinese national stock market as measured by the Shanghai Shenzhen China Stock Index 300 (CSI-300) as a benchmark that is distinctly different from either U.S. or other regional Asian national equity markets.



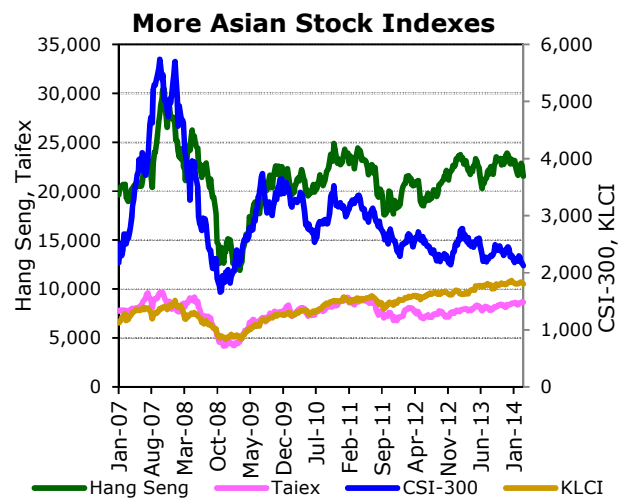
For these purposes, we draw comparison to several U.S. stock indexes including the Standard & Poor's 500 (S&P 500), NASDAQ-100, S&P MidCap 400 and the Dow Jones Industrial Average (DJIA).



We further extend this investigation to the Nikkei 225, CNX Nifty Index, KOSPI 200 Index representing the national stock markets of Japan, India and South Korea, respectively.



Finally, we extend this study to the Hang Seng Index (HSI), the Taiwan Stock Exchange Cap-Weighted Index (TAIEX), and the FTSE Bursa Malaysia Kuala Lumpur Composite (KLCI), representing the Hong Kong, Taiwan and Malaysia markets, respectively.



Note that actively traded stock index futures are available for all the stock indexes in question on various exchanges. The characteristics of these futures contracts are summarized in Table 1 below.

While these various indexes and associated stock index futures may share many common characteristics in terms of their design and

construction, they are not necessarily legitimate substitutes one for the other.

Correlations

There are often high positive correlations between movements of various stock indexes, particularly stock indexes that represent a specific national equity marketplace. As shown in Table 2 below, correlations amongst the U.S. indexes are quite high ranging from 0.979 between the S&P 500 and DJIA to 0.891 between DJIA and S&P MidCap 400.

This suggests that the S&P 500 and DJIA are reasonable proxies for each other while the traditional blue-chips included in the DJIA depart in character from the high-tech stocks that tend to dominate the Nasdaq-100.¹

But correlations across national equity markets ("inter-market correlations") typically decline sharply relative to correlations within a specific national equity marketplace ("intra-market correlations").

We focus on correlations between the CSI-300 and other indexes to the extent that CSI-300 represents perhaps the most popularly referenced benchmark of equity valuation in the People's Republic of China (PBOC).

CSI-300 Correlation with World Indexes
(Weekly Samples from Jan-07 thru Jan-14)

	Unadjusted	Adjusted by Exchange Rate
S&P 500	0.110	0.112
Nasdaq-100	0.133	0.136
DJIA	0.107	0.109
Midcap 400	0.107	0.110
Nikkei 225	0.209	0.216
CNX Nifty	0.189	0.226
KOSPI 200	0.266	0.273
Hang Seng	0.364	0.371
Taïex	0.284	0.289
KLCI	0.353	0.355

¹ Correlations were calculated using week-to-week changes in the spot index values from January 2007 through March 14, 2014. Note that closing times of U.S., European and Asian markets are not entirely synchronized, which may reduce correlations.

Note that unadjusted correlations between the CSI-300 and U.S. national equity indexes are generally recorded just above the 0.100 mark.²

Correlations between the CSI-300 and other Asian national indexes tend to be a bit higher – from 0.189 vs. the CNX Nifty upwards to 0.355 relative to the KLCI. But even this level would be considered unacceptably low if one were to consider a "cross-hedge" of Chinese equities with the use of the KLCI based derivatives.³

Exchange Rate Adjusted Correlations

The relationship between an investment in equities of another nation is further impacted by fluctuating exchange rates. Thus, we translated stock index values into U.S. dollars (USD) as a common denomination and ran our correlations again as shown in Table 3 below.

The correlations between the CSI-300 and U.S. and other Asian stock indexes do not change considerably from correlations derived using only spot index values. Rather, they remain rather low – ranging from 0.216 vs. the Japanese Nikkei 225 upwards to 0.355 vs. the Malaysian KLCI.

Conclusion

Correlation analysis suggests that there is no reasonable substitute for the CSI-300 amongst various U.S. or Asian national stock indexes. The CSI-300 is a benchmark measure of Chinese stock performance which may be considered a unique economy in its own right, reflected in the value of its national equity market.

² The term "unadjusted" is a reference to fact that we did not account for the exchange rate fluctuations but rather correlated the raw stock index levels without consideration of the fact that the stocks underlying the various indexes are denominated in divergent currencies.

³ The Financial Accounting Standards Board (FASB) issues statements that prescribe accounting standards for U.S. entities. Per FASB Statement #133, one may qualify for "hedge accounting treatment" by demonstration that a high correlation exists between the item one wishes to hedge and the hedging vehicle. Practitioners generally consider a threshold correlation of 0.80 as sufficiently high to qualify for hedge accounting practices. While perhaps arguable, we may regard a correlation of 0.80 as a reasonable standard of "substitutability."

Table 1: Comparing Stock Index Futures
(As of 1/31/14)

Futures Contract	Exchange	Contract Multiplier	Index	Currency	Currency Value	Contract Value (USD)
E-mini S&P 500	CME Group	\$50	1,782.59	USD	1	\$89,130
E-mini Nasdaq-100	CME Group	\$20	3,521.92	USD	1	\$70,438
E-mini (\$5) DJIA	CME Group	\$5	15,698.85	USD	1	\$78,494
E-mini S&P MidCap 400	CME Group	\$100	1,313.08	USD	1	\$131,308
Nikkei 225	TSE	¥1,000	14,914.53	JPY	0.009800	\$146,162
Nikkei 225	CME Group	¥500	14,914.53	JPY	0.009800	\$73,081
Nikkei 225	CME Group	\$5	14,914.53	USD	1	\$74,573
CNX Nifty	NSE	INR 50	6,266.75	INR	0.015993	\$5,011
E-mini CNX Nifty	CME Group	\$10	6,266.75	USD	1	\$62,668
E-micro CNX Nifty	CME Group	\$2	6,266.75	USD	1	\$12,534
KOSPI 200	KRX	KRW 500,000	252.89	KRW	0.09248	\$116,936
Hang Seng	HKEX	HKD 50	22,035.42	HKD	0.12878	\$141,886
Taonex	TAIFEX	TWD 200	8,462.57	TWD	0.032960	\$55,785
CSI-300	CFFEX	CNY 300	2,202.45	CNY	0.16502	\$109,034
KLCI	BM	MYR 50	1,804.03	MYR	0.2986	\$26,934

Table 2: Correlations between Spot Index Values
(Sampled Weekly from January, 2007 thru March 14, 2014)

	S&P 500	Nasdaq-100	DJIA	Midcap 400	Nikkei 225	CNX Nifty	KOSPI 200	Hang Seng	Taiex	CSI-300	KLCI
S&P 500	-										
Nasdaq-100	0.925	-									
DJIA	0.979	0.891	-								
Midcap 400	0.961	0.914	0.920	-							
Nikkei 225	0.671	0.639	0.666	0.662	-						
CNX Nifty	0.547	0.544	0.541	0.549	0.547	-					
KOSPI 200	0.606	0.621	0.587	0.642	0.671	0.624	-				
Hang Seng	0.638	0.616	0.612	0.651	0.711	0.695	0.734	-			
Taiex	0.530	0.555	0.506	0.543	0.596	0.581	0.726	0.676	-		
CSI-300	0.110	0.133	0.107	0.107	0.209	0.189	0.266	0.364	0.284	-	
KLCI	0.375	0.353	0.351	0.391	0.498	0.560	0.554	0.624	0.531	0.353	-

Table 3: Correlations between Spot Index Values Translated from Native Currency to USD
(Sampled Weekly from January 1, 2007 thru March 14, 2014)

	S&P 500	Nasdaq-100	DJIA	Midcap 400	Nikkei 225	CNX Nifty	KOSPI 200	Hang Seng	Taiex	CSI-300	KLCI
S&P 500	-										
Nasdaq-100	0.925	-									
DJIA	0.979	0.891	-								
Midcap 400	0.961	0.914	0.920	-							
Nikkei 225	0.601	0.556	0.588	0.587	-						
CNX Nifty	0.557	0.547	0.548	0.561	0.493	-					
KOSPI 200	0.651	0.655	0.625	0.682	0.646	0.669	-				
Hang Seng	0.639	0.618	0.614	0.653	0.676	0.701	0.768	-			
Taiex	0.545	0.566	0.519	0.560	0.596	0.613	0.767	0.692	-		
CSI-300	0.112	0.136	0.109	0.110	0.216	0.226	0.273	0.371	0.289	-	
KLCI	0.464	0.429	0.435	0.482	0.482	0.643	0.645	0.676	0.610	0.355	-

Futures and options trading is not suitable for all investors, and involves the risk of loss. Futures are leveraged investments, and because only a percentage of a contract's value is required to trade, it is possible to lose more than the amount of money initially deposited for a futures position. Therefore, traders should only use funds that they can afford to lose without affecting their lifestyles. And only a portion of those funds should be devoted to any one trade because they cannot expect to profit on every trade. All matters pertaining to rules and specifications herein are made subject to and are superseded by official CME rules. Current rules should be consulted in all cases concerning contract specifications.

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